Cole Jarman

69 Highgate High Street

Noise Break-In Assessment

Report 15/0708/R1

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Report 15/0708/R1

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0	First Issue	18 February 2016	Adam Sharpe	Matthew Heyes
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Attachments

1 Introduction

1.1 It is proposed to construct a new four storey development comprised of mixed residential and commercial/retail properties at 69 Highgate High Street, London, N6 6DA.

1.2 This report sets out details of a noise survey that was conducted onsite to quantify the existing ambient noise climate. An assessment of the façade and glazing has been undertaken to demonstrate that suitable noise levels of amenity can be provided for future residential occupiers of the site.

2 Site Description

2.1 The site is located at the junction of Highgate High Street and Highgate West Hill at 69 Highgate High Street, London, N6 6DA. The site is currently occupied by a single storey building with adjoining outbuilding which houses a small market trader.

2.2 The site is the easternmost property within a terrace of mixed use properties of varying sizes running southwest along Highgate High Street until its intersection with South Grove.

2.3 The site currently fronts on to an alley bordering it on its south façade. This connects Highgate West Hill to Pond Square, which is surrounded by terraces of residential properties of various sizes. Across from this alley lies several retail units with residential properties above, running down Highgate West Hill.

2.4 Opposite the site to the north across Highgate High Street is Highgate School and an adjoining dance school which forms a large campus running northwards up the B519, North Hill.

2.5 To the east of the site is a large three storey public house, beyond which are several restaurants with residential properties above, running along Hampstead Lane.

2.6 The site and surrounds can be seen in attached site plan 15/0708/SP1.

2.7 The traffic around the site is busy, with the main activity primarily focused along Highgate High Street as well as Highgate West Hill. These roads still see frequent activity during the night time hours, as Highgate High Street is part of several bus routes.

2.8 The proposals will see the construction of a four storey building comprised of a lower ground commercial unit, upper ground retail unit. The upper two floors are to be used as a new dwelling. Access to the residential and commercial units will be through lane bordering on the southern façade, with the retail unit fronting on to Highgate High Street.

3 Guidance

3.1 Planning and Noise National Planning Policy Framework

3.1.1 The National Planning Policy Framework (NPPF) published in 2012 replaces much of what previously existed with regard to planning guidance, including PPG24: Planning and Noise. The NPPF is now the relevant document for defining the national policy towards noise sensitive development. It refers to the Noise Policy Statement for England (NPSE).

3.1.2 PPG24 permitted noise sensitive development in areas subject to low levels of environmental noise while discouraging noise sensitive development in areas subject to high levels of environmental noise. The current policy on sustainable development can be considered as subtly altering the emphasis. The development of a quiet, rural site is by most measures less sustainable than the development of a busy, urban site and the rating of development sites based on prevailing noise levels should now reflect this.

3.1.3 Specifically on the subject of noise, paragraph 123 of NPPF states:

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 business 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 area of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.*

3.1.4 Paragraph 123 references to the Noise Policy Statement for England, and no other particular standards.

3.1.5 On the general issue of amenity, paragraph 17 states that planning should:

Always seek to secure high quality design and a good standard of amenity for all existing and future occupants of land and buildings

3.2 Noise Policy Statement for England

3.2.1 This document does not set quantitative guidelines for the suitability of noise sensitive development in an area depending on the prevailing levels of noise. Absent, therefore, is reference to specific noise thresholds (e.g. the Noise Exposure Categories as defined in PPG

24) which determine whether noise sensitive development is suitable and, if so, whether particular mitigation factors need to be considered.

3.2.2 Instead, the NPSE sets out three main aims:

The first aim of the Noise Policy Statement for England

Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy of sustainable development.

The second aim of the Noise Policy Statement for England

Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

The third aim of the Noise Policy Statement for England

Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

3.2.3 In essence, therefore, each development site must be judged on its ability to deliver on each of these aims, and while rating the prevailing noise against predefined thresholds is no longer necessary, defining the prevailing noise levels is an essential first step in assessing a given site under the current regime.

3.3 Planning Practice Guidance

3.3.1 In March 2014 the Department of Communities and Local Government (DCLQ) launched the national Planning Practice Guidance (PPG) web-based resource.

3.3.2 The PPG on Noise expands upon the NPPF and NPSE and sets out more detailed guidance on noise assessment. Like the NPPF and NPSE, the guidance does not include any specific noise levels but sets out further principles that should underpin an assessment.

3.3.3 The PPG includes a section on noise, which states:

'Local planning authorities' plan-making and decision taking should take account of the acoustic environment and in doing so consider:

- *whether or not a significant adverse effect is occurring or likely to occur;*
- *whether or not an adverse effect is occurring or likely to occur; and*
- *whether or not a good standard of amenity can be achieved.'*

3.3.4 It then refers to the NPSE and states that the aim is to identify where the overall effect of the noise exposure falls in relation to SOAEL, LOAEL and NOAEL.

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
		Lowest Observed Adverse Effect Level	
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
		Significant Observed Adverse Effect Level	
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

T1 Summary of noise exposure hierarchy (from draft Planning Practice Guidance).

SOAEL: the level of noise exposure above which significant adverse effects on health and quality of life occur.

LOAEL: the level of noise exposure above which adverse effects on health and quality of life can be detected.

NOEL: the level of noise exposure below which no effect at all on health or quality of life can be detected

3.3.5 The implication of the final line of the above table is that only the 'noticeable and very disruptive' outcomes are unacceptable and should be prevented. All other outcomes (i.e. all other lines in the table) can be acceptable, depending upon the specific circumstances and factors such as the practicalities of mitigation.

3.3.6 Under the topic of further considerations relating to mitigating the impact of noise on residential developments, the PPG states:

'The noise impact may be partially off-set if the residents of those dwellings have access to:

a relatively quiet external amenity space for their sole use, (e.g. a garden or balcony). Although the existence of a garden or balcony is generally desirable, the intended benefits will be reduced with increasing noise exposure and could be such that significant adverse effects occur, and/or;

a relatively quiet, protected, nearby external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings, and/or;

a relatively quiet, protected, external publically accessible amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minute walking distance).'

3.3.7 This is not to say that access to the above items is mandatory, rather that it can help to offset any noise impacts.

3.4 Internal Noise Levels

3.4.1 Buildings can be designed to achieve specific levels of insulation against external noise. It is reasonable, therefore, to set specific internal noise standards as the test of whether a development satisfies the requirements of the NPPF and the aims of the NPSE. In essence, these require a high quality design that achieves a good standard of amenity.

3.4.2 BS 8233:2014 provides guidance with respect to suitable indoor ambient noise levels in different building types. For dwellings BS 8233 gives the following guidance on internal ambient noise levels:

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

Note 7 Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.

T2 Table 4 of BS 8233:2014

The previous edition of BS8233 included quantitative guidance with respect to night-time L_{Amax} noise levels in bedrooms. BS8233:2014 does not provide such guidance, however in paragraph 7.7.5.1.1 it is noted that the recommendations for ambient noise in hotel bedrooms are similar to those for living accommodation and Table H.3 in Annex H.3 gives example night-time L_{Amax} limits in hotel bedrooms of 45-55dB.

3.4.3 In potentially noisy environments with good transport connections, suitable levels of amenity should still be achieved when applying the 5dB relaxation as allowed under note 7 of the above table. The aim of this project though is to achieve the main standards set out in the table.

3.4.4 We would suggest that meeting these internal noise level criteria equates to an effect below the *Lowest Observed Adverse Effect Level* defined in the NPSE and referred to in the PPG.

3.5 London Borough of Camden Planning Policy

3.5.1 The London Borough of Camden's Development Policies document published in 2010 sets out various planning policies. The Development Policies document refers to the (now outdated) PPG24. Because of this, an enquiry was raised with the London Borough of Camden's Panning Department, from which confirmation was received from Edward Davis, a noise officer at the council, that BS8233:2014 is the current criteria used by the authority.

3.5.2 Due to the information supplied above, the assessment will be undertaken with the noise limits detailed within section 3.4.2 used as minimum targets for the development's internal ambient noise levels.

4 Noise Survey

4.1 Methodology

4.1.1 15 minute attended measurements were taken during both the day and night time hours within the hours of 1200 – 1400 and 2300 – 0100 respectively. The day time measurements were taken in line with the CTRN shortened measurement procedure. These measurements were taken on Thursday 4th February and the morning of Friday 5th February 2016.

4.1.2 The measurement positions are shown on the attached site plan 15/0708/SP1 and are described below:

- MP1 – Facing on to Highgate High Street, 1m from site's façade, 1.5m above ground level at 1m from the kerb.
- MP2 – On Snow Hill, 1m from the site's southern façade, 1.5m above ground level, roughly 15.5m from the kerb of Highgate West Hill.

4.1.3 MP1 and MP2 were chosen to quantify the levels of noise that will be incident upon each façade of the proposed dwellings.

4.1.4 Measurements of the L_{Aeq}, L_{Amax} and L_{A90} indices were recorded over consecutive 15 minute periods (see attached Glossary of Acoustic Terms for an explanation of the noise units used).

4.1.5 The weather conditions during the day time measurements was overcast and cool with damp roads and some breeze. During the night time survey, the weather was clear, still and cool with damp roads. These conditions are considered suitable for the measurements that were taken.

4.1.6 Noise measurements were made using the equipment detailed in table T3 below.

Item	Manufacturer	Type
Sound Level Analyser	Rion	NL-52
Acoustic Calibrator	Rion	NC-74
Weatherproof windshield	Rion	WS-15

T3 Equipment used during attended noise survey.

4.1.7 The equipment was calibrated before and after the measurement duration in order to ensure that acceptable levels of accuracy were maintained throughout. No significant drift was observed.

4.2 Results

4.2.1 Results of the noise measurements at MP1 and MP2 are presented within the attached schedule 15/0708/SCH1.

4.2.2 The noise climate on site at both measurement positions was dominated by activity from Highgate High Street and Highgate West Hill. This was the case for both the day and night time hours, albeit with varying levels of activity across the day.

4.2.3 The resultant average day and night time period noise levels recorded at the measurement positions are presented in table T4. The 16 hour L_{Aeq} levels have been derived using the CRTN shortened measurement procedure.

	Daytime		Night Time	
Position	$L_{Aeq, 3h}$	**Calculated** $L_{Aeq, 16h}$	$L_{Aeq, 3h}$	**Typical** $L_{AFmax, 1min}$
MP1 – Highgate High Street	71	68	67	86
MP2 – Snow Hill	61	58	55	74

T4 Average weekday period noise levels

4.2.4 The lowest measured $L_{A90,15min}$ background noise levels during the survey's day and night time periods at both measurement positions are set out below in table T5.

Location	**Minimum Background Noise Level, dB(A)**	
	Daytime (0700-2300 only)	**Night time (2300 - 0700)**
MP1 – Highgate High Street	63	43
MP2 – Snow Hill	54	37

T5 Lowest measured background noise levels, $L_{A90, 15min}$

4.3 Plant Noise Limits

4.3.1 Camden's UDP requires that noise levels arising from new plant or machinery are at least 5dB below the background L_{A90} at 1m from the external façade of noise sensitive premises. It further

mentions that noise that has a distinguishable discrete continuous note (whine, hiss, screech or hum) should be assessed to 10dB below the L_{A90}.

4.3.2 Plant noise limits at nearby noise sensitive locations are shown in table below.

Location	Noise Emission Limit, dB	
	Daytime (0700-2300 only)	Night time (24-hour)
Dwellings on Highgate High Street	58	38
Dwellings behind site	49	32

T6 Plant noise emission limits at the nearest residential properties.

4.3.3 As stated above, where plant items are found to have a tonal characteristic or intermittent nature, it will be necessary to reduce the above limits by 5dB to help prevent adverse impacts from this type of noise.

5 Noise Break-in Assessment

5.1 General

5.1.1 In order to adequately control noise ingress to habitable rooms and bedrooms within the property, it will be necessary for the various elements of the external building fabric to provide certain minimum levels of sound insulation performance.

5.1.2 An assessment of noise intrusion has therefore been carried out based on the survey data gathered on site. Corrections have been applied where necessary in order to calculate noise levels at the various building façades.

5.1.3 In general when considering sound reduction, it is the openings in the structure that limit the overall sound insulation performance. More specifically, windows tend to form the weakest elements of any building due to their limited mass when compared to most typical types of exterior wall construction.

5.1.4 It is proposed to construct the façade of the building from a light weight system. The construction is detailed below:

- 2x layers 12.5mm Foil backed plasterboard to the inner face of the metal channels with insulation between the channels. To the outer face of the construction is 1 layer of 12.5mm Cement Particle board (or Ply Wood) followed by a cladding system comprising thermal insulation and either oak boards or a sto render finish.

5.1.5 In order to meet the internal noise limits it will be necessary to change the internal layers of plasterboard to 15mm dense board. The insulation between the metal channels must be either Mineral Wool or Rockwool and fill the whole cavity. The Cement Particle board cannot be replaced with Ply Wood.

5.1.6 As the construction of the curved elements of the northern façade will not be feasible with Cement Particle board, it will be necessary to substitute this with something of a similar mass, such as two layers of normal density plasterboard. This will only be required as part of the curved element of the second floor living room, as the first floor en-suite is not deemed to be a noise sensitive receptor.

5.1.7 The performance values for the proposed façade construction can be found below in table T7.

Required Sound Reduction	**Octave Band Centre Frequency (Hz)**					
	125	**250**	**500**	**1k**	**2k**	**4k**
Proposed Façade Construction	26	35	43	49	50	50

T7 Required façade performance

5.1.8 The calculations have allowed for the proposed construction of the external façade along with the required improvements detailed within the paragraph above.

5.2 Glazing performance

5.2.1 Due to the varying noise levels at either side of the site it will be necessary to install different glazing types. Three glazing types have been selected and their required performance values are shown below in table T8.

Required Sound Reduction	**Octave Band Centre Frequency (Hz)**					
	125	**250**	**500**	**1k**	**2k**	**4k**
Type A	26	32	42	47	46	55
Type B	24	26	40	48	46	54
Type C	22	23	33	41	44	46
Type D	22	22	28	39	39	42

T8 Required glazing performance

5.2.2 The glazing types shown above should be achievable using the following glazing specifications.

- Type A – 6mm glass, 16mm air gap, 13.1mm acoustic laminated glass
- Type B – 6mm, 16mm air gap, 8.8mm acoustic laminated glass
- Type C – 4mm glass, 12mm air gap, 6.8mm acoustic laminated glass
- Type D – 6mm glass, 12mm air gap, 4mm glass

5.2.3 With regards to the glazing locations, Type A glazing will be necessary to service the lower ground studio. Windows looking out onto High Street from the master bedroom will require Type A glazing, while those fronting onto Snow Hill will require Type B glazing. Type D glazing should be installed in the smaller bedrooms. Type C glazing will be required for all windows servicing the top floor maisonette, including roof lights.

5.2.4 Typical glazing configurations are quoted for guidance only and alternatives may be utilised, in any case the acoustic performance of the system proposed must be demonstrated to the satisfaction of the consultant. The sound reduction performance quoted above must be achieved by the glazing system taken as a whole in its installed condition. The specification therefore applies to the glazing, the frames and all seals on any openable parts of the system and any required ventilation or condensation control mechanisms. This list is not exhaustive: no part of the glazing system shall cause the above figures not to be achieved.

5.2.5 The supplier should be expected to prove by means of certified test results that the above sound reduction figures can be achieved by the system being proposed. The tests shall be conducted in accordance with BS EN ISO 10140 Part 2:2010 or BS EN ISO 140-5:1998.

5.2.6 Where external glazing is located within a curtain wall system that passes the ends or internal separating walls or floors, consideration must be given to the flanking performance.

5.3 Ventilation Performance

5.3.1 Due to the existing noise levels at the proposed facades the internal noise criteria won't be achievable with open windows. To minimise the requirements to open windows where it is necessary to provide an alternative method of ventilation. This is expect to be achieved using trickle vents, however Mechanical Ventilation Heat Recovery (MVHR) units will also allow the requirements to be achieved.

5.3.2 In order to reach suitable internal noise levels within the lower ground studio, the installation of an acoustic trickle vent will be necessary. The performance value of this can be found below.

Required Sound Reduction	**Octave Band Centre Frequency (Hz)**					
	125	**250**	**500**	**1k**	**2k**	**4k**
Acoustic trickle vent	48	39	44	52	66	66

T9 Required ventilation performance

5.3.3 It is expected that standard non-acoustic trickle vents will be sufficient in all rooms within the development. The master bedroom ventilation system must be located within the façade bordering onto Snow Hill. If this cannot be achieved, it will be necessary for a reassessment of noise break in to the room to be conducted with information of the preferred ventilation façade in mind.

5.3.4 The required $D_{n,e}$ values above assume that three vents are required for the maisonette kitchen/living room and one vent per bedroom and must be achieved with the vent in its open position. If more vents are required per room it will be necessary to select higher performing vents, the performance of which will need to be confirmed by the acoustic consultant.

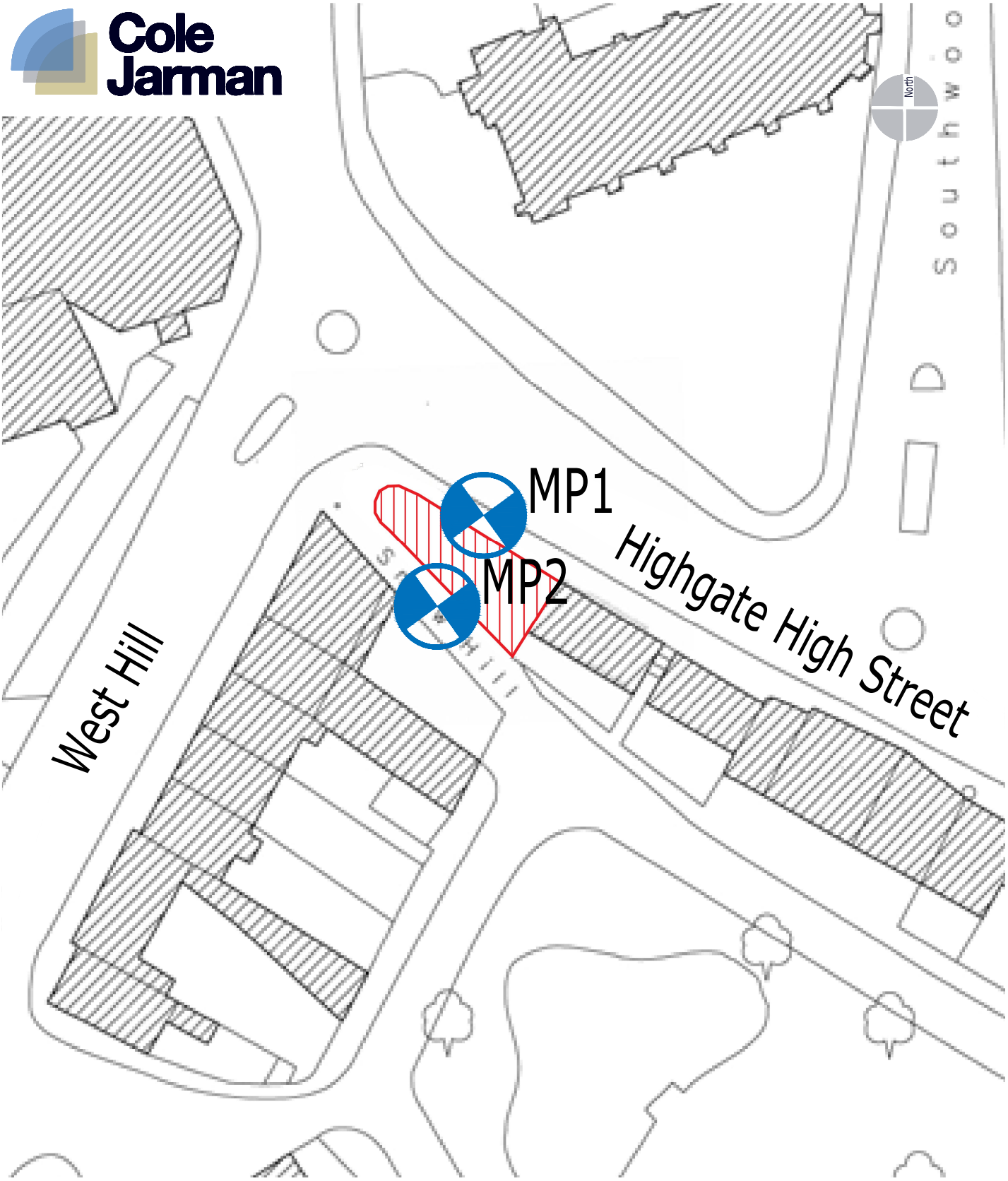
6 Conclusions

6.1 It is proposed to construct a new four storey development comprised of mixed residential and commercial/retail properties at 69 Highgate High Street, London, N6 6DA.

6.2 Cole Jarman have conducted a survey at the site in order to establish the existing noise climate. Details of the survey have been provided within the report.

6.3 Internal noise criteria have been proposed within this report in line with the London Borough of Camden's Developmental Policies. An assessment has been conducted which has shown that with a mixture of acoustic glazing and trickle vents the internal noise criteria can be achieved at all locations around the site. Full details of the required glazing and vent specifications and locations have been provided within this report.

End of Section



Title: Site Plan detailing attended survey measurement positions

Figure 15/0708/SP1

Project: 69 Highgate High Street

Date: 08 February 2016 Revision: -

Scale: Not to scale

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Attended Noise Survey Results

Measurement Position 1 – Highgate High Street

Period	L_{Aeq}	L_{Amax}	L_{A90}
1201-1216	71.6	93.9	63.4
1303-1318	70.9	89.5	63.7
1414-1429	69.3	87.3	63.5
2311-2326	69.1	88.3	58
0001-0016	67.5	83.7	50.5
0100-0115	62.8	81.5	43.3

Measurement Position 2 – Snow Hill

Period	L_{Aeq}	L_{Amax}	L_{A90}
1226-1241	62	85.5	54.4
1334-1349	60	74.8	55.2
1431-1446	59.4	73.5	54.5
2328-2343	57.1	78.3	47.1
0020-0035	54.4	68.4	43
0116-0131	50.1	67	37.1

Glossary of Acoustic Terms

L_{Aeq}:

The notional steady sound level (in dB) which over a stated period of time, would have the same A-weighted acoustic energy as the A-weighted fluctuating noise measurement over that period. Values are sometimes written using the alternative expression dB(A) L_{eq}.

L_{Amax}:

The maximum A-weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise when occasional loud noises occur, which may have little effect on the L_{Aeq} noise level. Unless described otherwise, L_{Amax} is measured using the "fast" sound level meter response.

L_{A10} & L_{A90}:

If non-steady noise is to be described, it is necessary to know both its level and degree of fluctuation. The L_{An} indices are used for this purpose. The term refers to the A-weighted level (in dB) exceeded for n% of the time specified. L_{A10} is the level exceeded for 10% of the time and as such gives an indication of the upper limit of fluctuating noise. Similarly L_{A90} gives an indication of the lower levels of fluctuating noise. It is often used to define the background noise.

L_{A10} is commonly used to describe traffic noise. Values of dB L_{An} are sometimes written using the alternative expression dB(A) L_{n}.

L_{AX}, L_{AE} or SEL

The single event noise exposure level which, when maintained for 1 second, contains the same quantity of sound energy as the actual time varying level of one noise event. L_{AX} values for contributing noise sources can be considered as individual building blocks in the construction of a calculated value of L_{Aeq} for the total noise. The L_{AX} term can sometimes be referred to as Exposure Level (L_{AE}) or Single Event Level (SEL).

Appendix A

Subject: **Acoustically rated alternative means of ventilation**
Project: **69 Highgate High Street**
Date: **25 February 2016**

A1 Introduction

This appendix sets out products and suppliers of acoustically treated means of ventilation alternative to open windows for residential applications. Products are grouped to achieve low, medium or high levels of passive acoustic attenuation, with additional details for mechanical ventilation systems. Supplier contact details are provided in the final section A6.

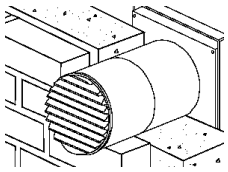
The $D_{n,e,w}$ value specifies the acoustic reduction of a vent, based on its area, standardised to an absorption area of $10m^2$. Therefore the figure is higher than the actual insertion loss that will be provided by the ventilator, as it is dependent on the area of the vent. The $D_{n,e,w}$ figure is only therefore useful in specifying the product against a given $D_{n,e,w}$ requirement. The acoustician should review the selected products, based on the test data provided by the manufacturer, to make sure the required performance will be achieved. Laboratory tests to conform with BS EN 140-10, 1992, ISO 140-10, 1991 – Laboratory measurement of airborne sound insulation of small building elements, and then rated in accordance with EN 717-1.

The data supplied here is based on manufacturer data, and will need to be confirmed by accredited laboratory test reports. These suggestions are intended to provide an indication of the type of products available, and it is recommended to be used on only as a guide, where similar products by other manufacturers may offer equivalent alternatives.

A2 Low Attenuation

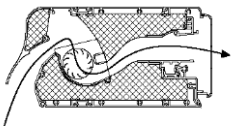
The following products are suitable for low attenuation requirements ($D_{n,e,w}$ up to 40dB).

A2.1 Rytons, 125mm Acoustic High Rise Aircore, AAH5HM



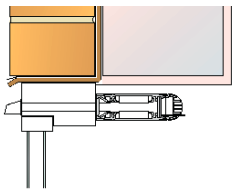
- $D_{n,e,w}$ 38dB
- Equivalent 3248 mm^2 free area

A2.2 **Renson, Sonovent V**



- $D_{n,e,w}$ 38 - 43dB
- Hybrid system using a forced ventilation of 220 $m^3/h/m$

A2.3 **Passivent, TVALdB, 450/40**



- $D_{n,e,w}$ 40dB
- Equivalent 4200 mm^2 free area

A3 Medium Attenuation

The following products are suitable for medium attenuation requirements ($D_{n,e,w}$ 41 – 49dB).

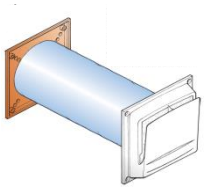
A3.1 **Rytons, 125mm Acoustic High Rise Aircore, AAC5**

- $D_{n,e,w}$ 41dB
- Equivalent 3970 mm^2 free area

A3.2 **Passivent, 800/42**

- $D_{n,e,w}$ 42dB
- Equivalent 4200 mm^2 free area

A3.3 **Passivent, Fresh TLF-dB**



- $D_{n,e,w}$ 44dB
- Equivalent 5000 mm^2 free area

A3.4 **Passivent, Fresh 90dB**

- $D_{n,e,w}$ 45dB
- Equivalent 6000 mm^2 free area

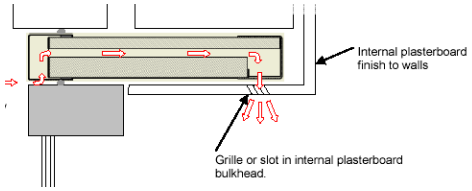
A3.5 **Greenwood Airvac, AAF**

- $D_{n,e,w}$ 43dB

A4 High Attenuation

The following products are suitable for high attenuation requirements ($D_{n,e,w}$ up to 60dB).

A4.1 CAICE, Acoustic Ventilator



- $D_{n,e,w}$ 50dB
- Equivalent 6000 mm^2 free area

A4.2 Renson : Sonovent or Invisivent, AK49

- $D_{n,e,w}$ 40 - 56dB available
- E.g. Sonovent = $D_{n,e,w}$ 56dB in open position for an (X-Large); 10 mm air slot and air volume up to 42 m^3/h/m

A4.3 Passivent, Fresh 80dB

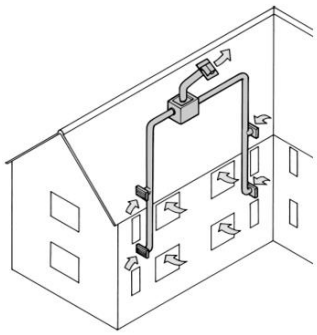
- $D_{n,e,w}$ 50dB
- Equivalent 4000 mm^2 free area

A4.4 Greenwood Airvac, MA3051

- $D_{n,e,w}$ 55dB
- Equivalent 2500 mm^2 free area

A5 Mechanical System

A5.1 Passivent AV+



- This is an example of a whole house type ventilation system, with a centralised extract fan.
- Such a system would typically utilise passive vents in the building façade, such as Passivent Fresh 80 vents set out above.

A6 Supplier Contact Details

A6.1 Rytons Building Products

- Telephone +44 (0) 1536 511874
- www.vents.co.uk

A6.2 Renson Ltd

- Telephone +32 (0)56 627111 (Belgium)
- www.renson.net

A6.3 Passivent Ltd

- Telephone +44 (0) 161 9627113
- www.passivent.com

A6.4 Greenwood Air Management Ltd

- Telephone +44 (0) 1903 771021
- www.greenwood.co.uk

A6.5 Caice UK Ltd

- Telephone +44 (0)844 8475370
- www.caice.co.uk

End of Section

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