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Project **Spaghetti House**
15 Goodge Street, London, W1T 2PQ

Title **Noise Impact Assessment**

Sub Title

Client Fenton Property Management Company Ltd
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1. INTRODUCTION

1.1 A noise assessment have been commissioned by Fenton Property Management Company Ltd to undertake a noise impact assessment and report for the proposed development at Spaghetti House 15 Goodge Street London W1T 2PQ.

1.2 The proposed development is to redevelop the commercial floors above the Goodge Street Spaghetti House Restaurant to provide a single residential apartment.

1.3 The existing restaurant extract fan and condenser units located on the building roof are being relocated into a new plant room to the rear of the building.

1.4 The London Borough of Camden has requested an assessment on noise emissions from the existing plant in order to assess the impact that the relocation of the plant will have.

1.5 The following tasks have been undertaken as part of noise impact assessment:

- Automated environmental noise survey to establish the existing background and ambient noise levels at the boundary of the nearest noise sensitive premises and the proposed development.
- Analysis of the measured data to determine the impact on the nearest noise sensitive receiver.

1.6 As this is a technical report it will be necessary to make use of some technical terms. To assist the reader, a glossary has been included in Appendix A.

2. NATIONAL AND LOCAL PLANNING POLICY

National Planning Policy

2.1 Since March 2012 national planning policy has been governed by the National Planning Policy Framework (NPPF). Paragraph 123 of the NPPF gives generic advice with regard to noise and vibration.

"Planning policies and decisions should aim to:

(i) *avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of the new development;*
(ii) *mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from the new development, including through the use of conditions;*
(iii) *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*
(iv) *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."*

2.2 Further guidance with regard to the phases and "significant adverse impacts" and "adverse impacts" is given in the Noise Policy Statement for England (NPSE) which provides the following guidance.

2.3 *"There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:*

2.4 NOEL – No Observed Effect Level

2.5 *This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.*

2.6 LOAEL – Lowest Observed Adverse Effect Level

2.7 *This is the level above which adverse effects on health and quality of life can be detected.*

2.8 *Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.*

2.9 *SOAEL – Significant Observed Adverse Effect Level*

2.10 *This is the level above which significant adverse effects on health and quality of life occur."*

2.11 The NPSE further clarifies that due to the complex and subjective nature at which noise impacts are perceived by individuals or groups of individuals that:

2.12 *"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."

2.13 A hierarchy of noise impacts has been published by the Department for Communities and Local Government as part of the National Planning Practice Guidance (NPPG). This hierarchy is presented as a table and has been reproduced below.

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 Level (NOAEL)	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, e.g. 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

Perception	Examples of Outcomes	Increasing Effect Level	Action
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	Significant Observed Adverse Effect	Prevent

Table 1680/T1 – National Planning Practice Guidance with regard to Noise

Local Planning Policy

2.14 The following planning policy in relation to noise and vibration is taken from the Local Development Framework adopted by the London Borough of Camden in 2010:

Policy DP28 – Noise and Vibration

"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 phase of development. Where these phases are likely to cause harm, conditions and planning obligations may be used to minimise the Impact".

2.15 The following criteria provided by the Local Authority regarding noise levels on residential sites at which planning permission will not be granted are reproduced below:

Noise description and location of measurement	Period	Site adjoining railways	Site adjoining roads
Noise at 1 metre external to a sensitive façade	Day (07:00 – 19:00)	74 dB $L_{Aeq,12h}$	72 dB $L_{Aeq,12h}$
	Evening (19:00 – 23:00)	74 dB $L_{Aeq,4h}$	72 dB $L_{Aeq,4h}$
	Night (23:00 – 07:00)	66 dB $L_{Aeq,8h}$	66 dB $L_{Aeq,8h}$

Table 1680/T2 – Local Authority Criteria (Noise Levels on Residential Sites)

2.16 The following criteria provided by the Local Authority regarding noise levels on residential sites at and above which attenuation measures will be required are reproduced below:

Noise description and location of measurement	Period	Site adjoining railways	Site adjoining roads
Noise at 1 metre external to a sensitive façade	Day (07:00 – 19:00)	65 dB $L_{Aeq,12h}$	62 dB $L_{Aeq,12h}$
	Evening (19:00 – 23:00)	60 dB $L_{Aeq,4h}$	57 dB $L_{Aeq,4h}$
	Night (23:00 – 07:00)	55 dB $L_{Aeq,1h}$	52 dB $L_{Aeq,1h}$
Individual noise events several times an hour	Night (23:00 – 07:00)	>82dB L_{Amax} (S time weighting)	

Table 1680/T3 – Local Authority Criteria (Noise Levels on Residential Sites)

2.17 The following criteria provided by the Local Authority regarding noise levels from plant and machinery at which planning permission will not be granted are reproduced below:

Noise description and location of measurement	Period	Noise level
Noise at 1 metre external to a sensitive façade	Day, evening and night	5dB(A) < L_{A90}
Noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum) at 1 metre external to a sensitive façade	Day, evening and night	10dB(A) < L_{A90}
Noise that has distinct impulses (bangs, clicks, clatters, thumps) at 1 metre external to a sensitive façade	Day, evening and night	10dB(A) < L_{A90}
Noise at 1 metre external to sensitive façade where LA90>60dB	Day, evening and night	55dB(A) < L_{Aeq}

Table 1680/T4 – Local Authority Criteria (Noise Levels from Plant and Machinery)

3. THE SITE AND ITS SURROUNDINGS

3.1 The site address is Spaghetti House 15 Goodge Street London W1T 2PQ.

3.2 The proposed development is to redevelop the commercial floors above the Spaghetti House Restaurant to provide a single residential apartment.

3.3 The existing restaurant extract fan and condenser units located on the building roof are being relocated into a new plant room to the rear of the building.

3.4 The nearest noise sensitive receptor has been identified as the proposed residential apartment which is to be formed on the third and fourth floors of Spaghetti House building.

3.5 The noise climate is dominated by the mechanical plant noise from the rooftop plant during the daytime period and the ambient road traffic during the night-time.

4. MEASUREMENT METHODOLOGY

4.1 An environmental noise survey was undertaken on site between Thursday 13th August 2015 and Tuesday 18th August 2015. The noise survey consisted of one noise monitoring position.

4.2 The meter was located on the top roof at the rear of the existing building fixed to the safety handrail, set at least 1.5m above the ground and at least 3m from any other reflective surface. It can, therefore, be considered to be in semi free-field conditions so no corrections would need to be applied to the measured noise levels (Figure 1680/F1).

Figure 1680/F1 – Microphone location

4.3 The locations of the noise survey equipment along with the approximate development boundary are shown on the attached site plan Figure 1680/SP 1 which is appended to this report.

4.4 Noise levels were measured as a continuous set of discrete 15-minute measurements and included measurements of the acoustic parameters $L_{Aeq,T}$, $L_{A90,T}$ and L_{AFMax}.

4.5 Survey measurements were carried out in accordance with guidelines laid down in BS 7445:1991 Part 2 and other relevant standards.

4.6 An on-site sensitivity check was carried out on the sound level meter used during the survey and the readings found to be within the tolerances of British Standard BS EN IEC 61672-1:2003.

Measurement Equipment

4.7 The equipment used during the noise survey is presented in Table 1680/T5, below. Calibration certificates are available on request.

Description	Manufacturer/Model	Serial number	Last Date	Certificate Number
Integrating Sound Level Meter	Cirrus Optimus Green CR:171A	G061849	Sept 2014	221987

Description	Manufacturer/Model	Serial number	Last Date	Certificate Number
Integrating Sound Level Meter	Cirrus Optimus Green CR:171A	G061849	Sept 2014	221987
Acoustic Calibrator	Cirrus CR:515	64545	Oct 2014	100285

Table 1680/T5 – Noise Survey Equipment

Weather Conditions

4.8 The weather during the unattended survey has been assessed using a locally based weather station. The weather was mostly dry with some rain and some wind speeds above 5m/s^{-1}.

5. NOISE SURVEY RESULTS AND DISCUSSION

5.1 A summary of the noise survey results is presented in Table 1680/T3 below. To assist the reader the results have been presented in terms of the daytime (07:00 – 19:00), evening (19:00 – 23:00), night-time (23:00 – 07:00) periods. A graphical representation of these results may be found in Figure 1680/TH 1 which is appended to this report.

Noise Measurement Position	Time Period	Ambient Noise Level ($L_{Aeq,T}$)	Minimum Background Noise Level ($L_{A90,T}$)
Position 1	Day (07:00 – 19:00)	64.4	49 dB
	Evening (19:00 – 23:00)	64.5	51 dB
	Night (23:00 – 07:00)	47.5	47 dB

Table 1680/T6 – Summary of Noise Survey Results

5.2 The measured noise levels were affected by the noise from the existing extract fan and condenser units which are proposed to be moved. However, this did not appear to affect the lowest recorded $L_{A90,T}$.

5.3 Based on these survey results, the following mechanical plant noise emission limits apply.

Noise Measurement Position	Time Period	Minimum Background Noise Level ($L_{A90,T}$)	Mechanical Plant Noise Emission Limit
Position 1	Day (07:00 – 19:00)	49 dB	44dB
	Evening (19:00 – 23:00)	51 dB	46dB
	Night (23:00 – 07:00)	47 dB	42dB

Table 1680/T7 – Mechanical Plant Noise Emission Limits

5.4 The nearest noise sensitive receiver to the new plant room is the proposed residential property which will be formed on the upper levels of the Spaghetti House as part of the development proposals.

5.5 Predictions of the noise emissions from the new plant room have been undertaken using manufacturer's noise emission data and the predicted noise levels at the nearest noise sensitive premises are as follows.

Receptor	Time Period	Predicted Mechanical Plant Noise Level	Complies
New Residential Window	All Times	50 dB	NO

Table 1680/T8 - Predicted Mechanical Plant Noise Levels

5.6 The predicted mechanical plant noise level without any additional attenuation measured does not comply with the requirements of the Local Planning Authority. Therefore, further mitigation should be considered.

Mitigation Measures

5.7 A review of the noise predictions shows that the predicted noise levels are being controlled by the noise emissions from the louvred area of the plant room. Therefore, it is recommended that an acoustic louvre be installed with the following insertion losses.

Frequency	63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000hz	8000hz
Insertion Loss (dB)	5	5	6	7	13	13	13	12

Table 1680/T9 - Acoustic Louvre Performance

5.8 With the addition of this acoustic louvre the predicted noise levels at the nearest noise sensitive receptor are as follows.

Receptor	Time Period	Predicted Mechanical Plant Noise Level	Complies
New Residential Window	All Times	40 dB	YES

Table 1680/T10 - Predicted Mechanical Plant Noise Levels with Louvre

5.9 These predicted noise levels are below the Local Authority's requirements and, therefore, the mechanical plant system should comply with the Local Authority's requirements.

6. CONCLUSION

6.1 Adnitt Acoustics were commissioned by Fenton Property Management Company Ltd to undertake a noise assessment for the proposed development at Spaghetti House 15 Goodge Street London W1T 2PQ.

6.2 An environmental noise survey was undertaken on the site to determine prevailing day-time, evening and night-time ambient and background noise levels.

6.3 Predictions of mechanical plant noise emissions were undertaken using the details provided by the manufacturer and the architect's drawings.

6.4 The predicted noise levels without any additional mitigation exceeded the Local Authority's noise emission criteria and it was recommended that an acoustic louvre is installed to reduce noise levels at the nearest noise sensitive premises.

6.5 The insertion losses of the proposed acoustic louvre have been provided within this report.

6.6 The predicted noise levels with the addition of the acoustic louvre are below the Local Authority's criteria and, therefore, provided the acoustic louvre is installed this application should not be refused upon noise grounds.

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for ADNITT ACOUSTICS

APPENDIX A: GLOSSARY OF ACOUSTIC TERMS

Ambient Noise	The noise climate heard over a period of time due to all normal sources, in the absence of extraneous or atypical sounds. Used to describe noise in the absence of the introduced sound, generally.	
Ambient Noise Level	Describes the average noise level of the ambient noise over a stated period of time, e.g. hourly noise	
	Parameter: A-weighted Continuous Equivalent Sound Pressure Level determined over the time period T.	$L_{eq,T}$ or $L_{Aeq,T}$
	Expressed in decibels / A-weighted decibels	dB(A) or dB
Decibel scale dB	A linear numbering scale used to define a logarithmic amplitude scale, thereby compressing a wide range of amplitude values to a small set of numbers	
dB(A)	An electronic filter in a sound level meter, which approximates under defined conditions the frequency response of the human ear.	
$L_{Aeq,T}$	The equivalent continuous sound level. The steady dB(A) level which would produce the same A-weighted sound energy over a stated period of time as the measured sound pressure level.	
L_{Amax}	The maximum dB(A) level measured during a survey period.	
L_{A10}	The dB(A) level exceeded for 10% of the survey period, often used as a quantifier of traffic noise level.	
L_{A90}	The dB(A) level exceeded for 90% of the survey period. Used in BS 4142:1997as being representative of the background noise level.	
Acoustic screening	Physical barrier to sound formed by fence, wall, building or other structure, which has the effect of reducing the sound transmitted.	
Individual Event Noise	The noise of a distinctive event with the varying noise climate, usually a transient activity, such as a vehicle pass-by, aircraft flyover or similar, rather than an isolated impulsive noise.	
Individual Event Noise Level	Describes the highest noise level during the event as measured under particular conditions of time-weighting	
	Parameter: A-weighted Maximum Sound Pressure Level with FAST or SLOW time weighting	$L_{Amax,FAST}$ or $L_{Amax,F}$ $L_{Amax,SLOW}$ or $L_{Amax,S}$
	Expressed in decibels / A-weighted decibels	dB(A) or dB
Sound Reduction Index R_w	Single number rating used to describe the sound insulation of building elements as defined in BS EN ISO 717 1997.	
Weighted element-normalized level difference $D_{n,e,w}$	Single number rating used to describe the sound insulation of building elements as defined in BS EN ISO 717 1997.	

Figure 1680/ SP 1 : Site Plan showing Noise Measurement Location

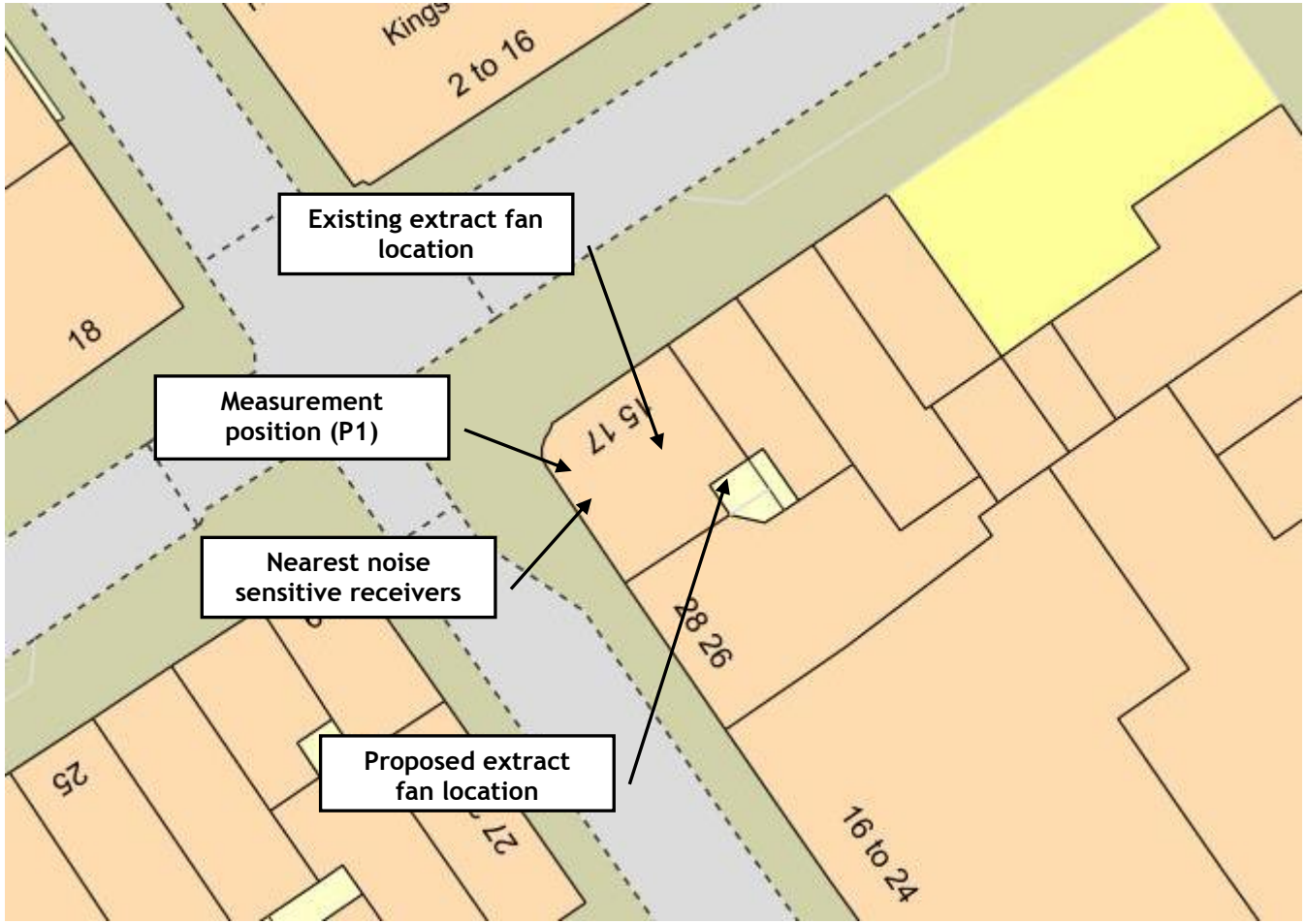

Figure 1680/ TH 1 : Time History of Automated Noise Monitoring