Cole Jarman

300 Kilburn High Road

Plant Noise Assessment

Report 11/5430/R1

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15/08/2012

Attachments

Plant Noise Assessment 15/08/2012

1 Introduction

1.1 Retrospective planning permission is sought for a kitchen extract fan which serves a café restaurant at 300 Kilburn High Road.

1.2 Cole Jarman have been appointed to carry out a noise survey, and to assess noise emissions from the extract fan.

1.3 This report details the noise measurements carried out, along with recommendations for mitigation measures as necessary and practicable.

2 Site Description

2.1 300 Kilburn High Road is occupied by a café restaurant on the ground floor, with 3 storeys of residential flats above.

2.2 The building is adjoined on both sides to premises that are similarly of commercial use on the ground floor with three floors of residential dwellings above.

2.3 The ground floor extends further to the rear than the residential flats, leaving a flat roof at first floor level to the rear where the kitchen extract fan is located.

2.4 A residential window is located approximately 1m from the fan itself.

3 Noise Assessment

Criteria

3.1 The local planning authority have confirmed the noise from the fan should be controlled to a level 5dB below the existing L_{90} background noise level (without the fan running), or 10dB below if noise from the fan has a tonal characteristic.

Plant Installation

3.2 The kitchen extract fan is a cased axial fan and is located to the rear of the building.

3.3 The fan itself oriented vertically at first floor level, with the atmospheric side ductwork running up the rear façade and terminating at the eaves of the building. The roomside ductwork turns through 90° below the fan and runs horizontally to a roof penetration near the back of the roof.

3.4 The fan has atmospheric and room side in-duct silencers fitted, both of which are located immediately adjacent to the fan.

3.5 A photograph of the fan is attached to this report as Appendix A.

Noise measurements

3.6 Short term noise measurements were carried out at a single measurement position in front of the rear first floor residential window nearest to the fan, both with and without the fan running.

3.7 The measurements were carried out between 2320 hours and 0005 hours on the evening of July 17th 2012.

3.8 The noise measurements were carried out using the equipment listed the table below:

Item	Manufacturer	Type
Sound Level Analyser	Norsonic	118
Acoustic Calibrator	Norsonic	1251

T1 Equipment used during attended noise survey.

3.9 The sound level meter was calibrated before and after the measurements to ensure a consistent and acceptable level of accuracy was maintained. No drift was noted to have occurred.

3.10 The weather conditions during the survey period were observed to be warm, dry, still and cloudy.

3.11 At the measurement position noise breaking out through the fan casing was noted to be audible, but no noise was noted to be audible from the duct termination.

3.12 The background noise at the measurement position without the fan running was observed to be controlled by other mechanical services plant items serving neighbouring commercial premises on Kilburn High Road.

3.13 The L_{A90} background noise level measured with the fan running at the nearest window was found to be 53.2dB. The L_{A90} background noise level without the fan running at the same position was found to be 49.5dB, controlled by plant serving other commercial premises on Kilburn High Road. The contribution from the extract fan to the overall noise levels at the window is therefore assessed to be 50.8dB.

3.14 Noise from the extract fan was not found to have a tonal characteristic.

3.15 Based on the measured background noise levels and the local authority requirements as set out in section 3.1, the noise limit to apply to the extract fan is 45dB(A).

Assessment

3.16 The noise level from the fan at the nearest residential window has been found to be 51dB(A). The noise limit for the fan is 45dB(A), a 6dB reduction is therefore required for the fan to comply with the noise limit.

3.17 Noise breaking out through the fan casing was found to be the main contributor to the overall noise level at the nearest residential window. It is therefore appropriate to treat the fan itself.

3.18 We recommend an acoustic fan jacket is fitted to control the casing noise breakout. A suitable product would be a Wilhams AFJ-1080, a data sheet for which is attached as Appendix B.

3.19 With the fan jacket fitted, the noise levels are expected to be comfortably reduced to within the noise limit at the nearest residential window.

4 Conclusions

4.1 Retrospective planning permission is sought for a kitchen extract fan which serves a café restaurant at 300 Kilburn High Road.

4.2 A noise survey has been carried out to assess noise emissions from the extract fan, and quantify background noise levels without the fan running.

4.3 A noise limit has been set based on the background noise measurements taken, and the local authority requirements.

4.4 It has been recommended that an acoustic fan jacket be fitted, in order to control noise levels to within the limit set.

End of Section

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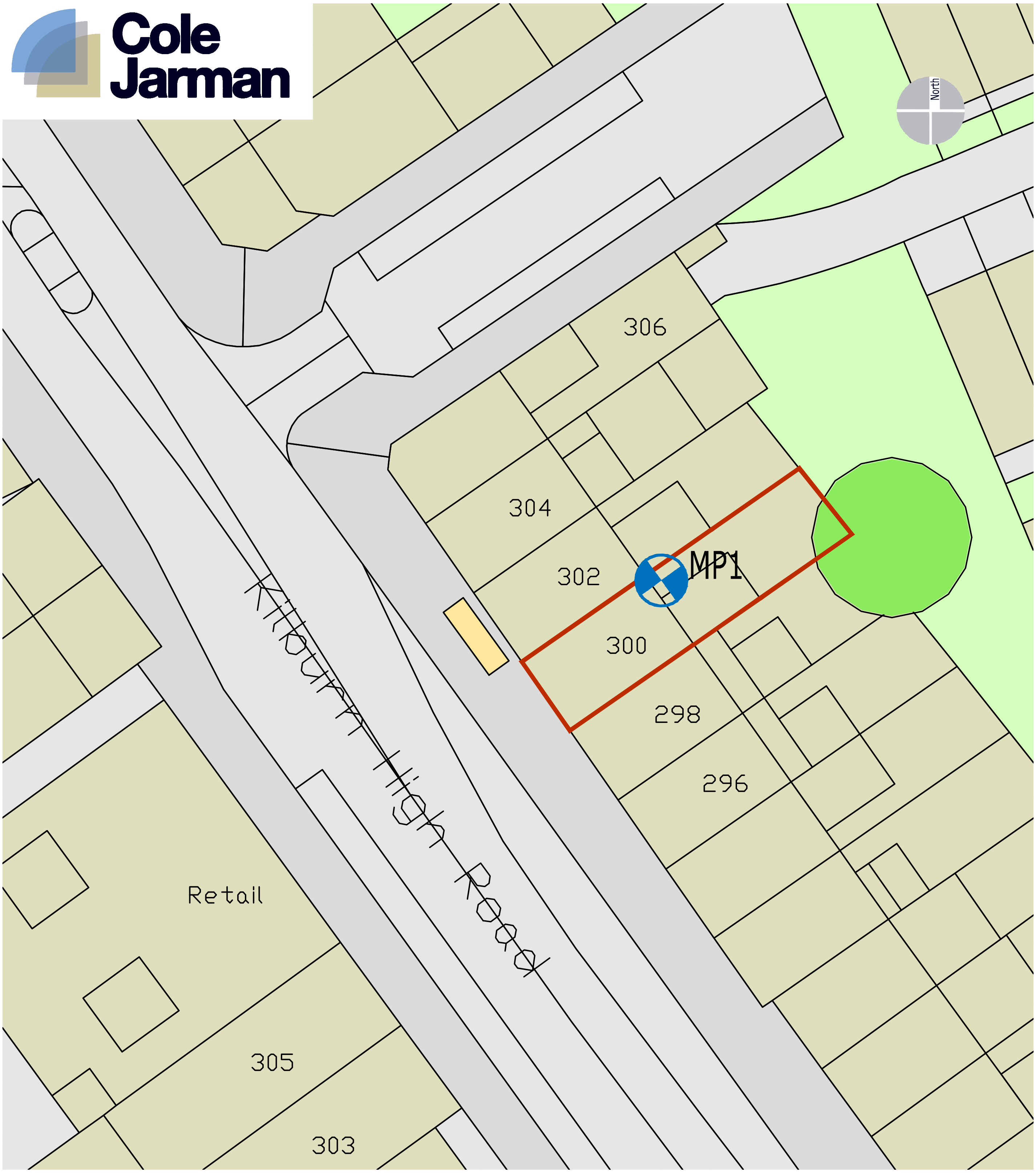

Title: Site plan showing noise survey measurement position

Figure 11/5430/F1

Project: 300 Kilburn High Road

Date: 15 August 2012

Revision: -

Scale: Not to scale

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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: Photograph of extract fan
Project: 300 Kilburn High Road
Date: August 2012

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Appendix B

Subject: Fan jacket datasheet
Project: 300 Kilburn High Road
Date: August 2012

ACOUSTIC FAN JACKETS TYPE AFJ

WILHAMS INSULATION LTD. www.wilhams.co.uk

Data sheet 8/02

Advantages

- Flexible and easy to handle and install.
- Available in two product formats.
- Provides a cost effective sound barrier solution.
- Durable and wear resistant.
- Resistant to oils and water etc.

Applications

Wilhams AFJ acoustic fan jackets are employed to efficiently reduce the noise breakout from axial flow fan casings.

Description

Wilhams AFJ acoustic fan jackets are manufactured from polymeric barrier supported by a 25mm or 50mm acoustic foam space layer. The polymeric barrier is backed with a hessian substrate for strength and dimensional stability with the following options:

AFJ-1060 is a standard acoustic fan jacket, manufactured from 5 kg/m² polymeric barrier.

AFJ-1080 is a high performance acoustic fan jacket, manufactured from 10 kg/m² polymeric barrier.

Both fan jackets are available with a choice of foams:

- Wilhams WH25/1FR fire retardant acoustic foam.
- Wilhams PUNF Class 'O' foam.

The acoustic foam thickness 25mm or 50mm, should be selected to match the duct flange height.

Jackets are supplied with either Velcro straps or buckle and straps and Class 'O' foil facing.

Technical Information

Wilhams AFJ acoustic fan jackets conform to the following specifications:

AFJ–1060

- Barrier material surface density – 5kg/m²
- Barrier material flammability –
  FMVSS 302 : self extinguishing
- Operating temperature – -30 to +65ºC
- Acoustic foam technical data – see data sheets 1/03 (type -A) and 1/01 (type –B).

AFJ–1080

- Barrier material surface density – 10kg/m²
- Barrier material flammability –
  FMVSS 302 : self extinguishing
- Operating temperature – -30 to +65ºC
- Acoustic foam technical data – see data sheets 1/03 (type –A) and 1/01 (type –B).

Physical Information

Dimensions

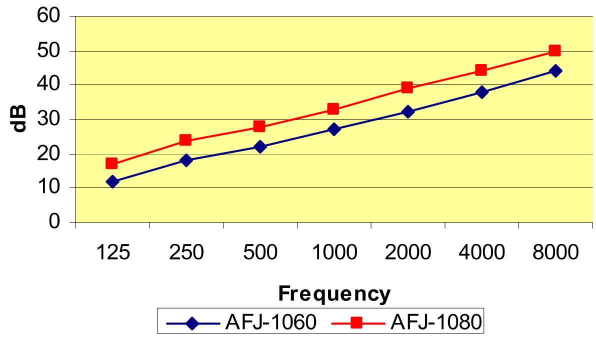
Made to measure.

Acoustic Performance

Wilhams AFJ acoustic fan jackets have the following acoustic performance data.

Transmission Loss Data (tabulated and graphical)

Material \ Frequency	125	250	500	1k	2k	4k	8k
AFJ-1060	12	18	22	27	32	38	44
AFJ-1080	17	24	28	33	39	44	50



Wilhams acoustic fan jackets typically provide the following reduction after installation:

AFJ – 1060 type product will provide 7 to 9 dB reduction
AFJ – 1080 type product will provide 10 to 14 dB reduction

Recommendations

To further reduce duct work noise we recommend:

Breakout noise –
Wilhams WB barrier (data sheet 2/01) to the external walls of the duct work, alternatively lag the duct work with a Wilhams WIL-LAG (data sheets 4/01 & 4/02).

Internally line –
Wilhams Acoustic Foam (data sheet 1/01 or 1/03).

Fan connections –
Wilhams FDC flexible duct connectors (data sheet 8/01).

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