

Broomfield House Stage D Report final 01

Appendix P

Acoustic Engineer Report

for The London Borough of Enfield

BROOMFIELD HOUSE

Noise Survey Report and Assessment

for

Faithful and Gould

February 2011

project no. 8272

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1 EXECUTIVE SUMMARY

An assessment of environmental noise has been carried out for a proposed residential development site at Broomfield Park, Enfield, London, for the purposes of a PPG24 assessment.

Noise levels were dominated by traffic noise during the survey, which puts the site into the road traffic sources category.

A noise survey was carried out during both the daytime and night-time periods to determine the PPG 24 noise exposure categories (NECs) for the site. The measured noise levels during the daytime place the site boundary on Broomfield lane into NEC B, and the main area of the site behind the Park wall into NEC A.

At night the site is in NEC B.

NEC A states that 'Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as a desirable level.'

NEC B states that 'Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection against noise.'

Suitable mitigation methods have been proposed for areas of the site in NEC B.

The redevelopment of Broomfield House includes a small community area with a small cafe. The cafe is expected to have a mechanical ventilation system installed to provide fresh air supply and extract. Noise emission limits for the community cafe have been proposed according to BS4142 methodology.

2 INTRODUCTION

Ramboll Acoustics has conducted an environmental noise survey around the site of Broomfield House in Enfield, London. It is proposed to redevelop Broomfield House and the site of the stables and Paddock Lodge site to provide residential dwellings. There will also be the development of a small community area with associated cafe built within the existing Broomfield House building. The scheme comprises the erection of new buildings, the demolition and redevelopment of some existing buildings, with landscaped courtyards and provision of 20 car parking spaces.

The survey was conducted by Phil Mudge during the day and night of 9 and 10 February 2011. The purpose of the noise survey is to make a Planning Policy Guidance document 24 (PPG 24) assessment. Background noise measurements conducted around the site used for the PPG 24 assessment are also suitable for setting noise limits for any plant operation from the development that might impact upon the nearest noise sensitive receivers. At this stage it is understood that plant will likely consist of no more than a simple fresh air supply and extract system for the cafe kitchen.

This report presents the results of the survey, the assessment methodology and results.

3 ASSESSMENT CRITERIA

PPG24:1994 *Planning and Noise* offers guidance on the development of residential areas near to new or existing noise sources. It also defines noise exposure categories (NECs) for day and night-time to assess whether or not it is appropriate to allow the development of residential properties for a given noise climate. The categories relate to different noise bands depending on the source of noise, i.e. road, rail, air, or mixed noise sources. For this assessment the road traffic noise sources category has been used as traffic noise was the dominant source of noise at the site.

The noise exposure categories given in PPG 24 for road traffic sources are reproduced below in Table 1. The associated advice provided in PPG24 relating to the granting of planning permission for residential use is reproduced in Table 2.

Noise Levels⁰ Corresponding to the Noise Exposure Categories for new dwellings $L_{Aeq,T}$ dB				
Noise Exposure Category				
Noise Source	A	B	C	D
Road Traffic 0700-2300	<55	55-63	63-72	>72
2300-0700 ¹	<45	45-57	57-66	>66

Table 1 Noise exposure categories for new dwellings near existing Road Traffic noise sources

⁰ Noise Levels: the noise levels ($L_{Aeq,T}$) used when deciding the NEC of a site should be representative of typical conditions.

¹ Night time noise levels (23:00-07:00hrs): sites where individual noise events regularly exceed 82 dB L_{ASmax} several times in any hour should be treated as being in NEC C, regardless of the $L_{Aeq,8hr}$ (except where the $L_{Aeq,8hr}$ already puts the site in NEC D).

NEC A	Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as a desirable level.
NEC B	Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection against noise.
NEC C	Planning permission should not normally be granted. Where it is considered that permission should be given, for example because there are no alternative quieter sites available, conditions should be imposed to ensure a commensurate level of protection against noise.
NEC D	Planning permission should normally be refused

Table 2 Definitions of noise exposure categories for new dwellings near existing noise sources

As part of the development, it is possible that a small supply and extract mechanical ventilation system for the cafe may be required. BS4142: 1997 *Method for rating industrial noise affecting mixed residential and industrial areas* gives a method for designing operational plant noise to meet any specified criteria. Noise levels measured during the survey will provide the background noise level and will be used by the design team for this purpose as required.

4 NOISE SURVEY

4.1 Site Description

The proposed development site is situated on land bounded by Broomfield Lane to the south and east. At the north and west boundary are the public spaces of Broomfield Park. Approximately 500m south of the site is the A406 North Circular and approximately 500m east of the site is the A105 Green Lane. Both of these roads are busy with a mix of private vehicles, bus services and heavy goods vehicles. There is a railway line approximately 350m east of the site which carries regular service passenger trains.

The site forms part of Broomfield Park and is publicly accessible during the daytime. Broomfield House is surrounded by hoarding and fences and cannot be accessed; it is in a dangerous state of repair due to several fires. The area south of Broomfield House where the stables and Park Lodge are located is not publicly accessible as they form private residences and part of the parks and gardens site offices and sheds. A large brick wall approximately 9 feet high entirely surrounds this area with a small number of access gates. The wall provides significant screening from road traffic noise on Broomfield Lane.

The site is moderately quiet considering the busy urban location. During the daytime the public use the parks amenities and numerous wild animals exist in the trees, shrubs, and lakes of the parks. Ducks, Swans, and Geese are particularly prominent.

4.2 Survey Methodology

Noise measurements around the site were conducted by Phil Mudge of Ramboll Acoustics during the hours of 12:00 – 15:30 and 23:00 – 02:00 on 9 and 10 February 2011.

Weather conditions were noted as clear skies with some occasional wind, typically below 2m/s and from the south west. During the night the skies became overcast and the wind speed increased, but remained below 5m/s.

Noise measurements were taken at approximately 1.2 metres above local ground level and at least 3m away from any reflecting facades. The measurements are considered representative of freefield measurements. The measurement duration was 15 minutes during the daytime and 5 minutes during the night.

The daytime noise measurements were undertaken using the methodology of the Department of Transport's "Calculation of Road Traffic Noise" (CRTN) 'shortened measurement procedure'. This procedure allows the noise to be measured over any three consecutive hours between 10:00 and 17:00.

During the night-time period (23:00 to 02:00 hours) measurements were taken at each location with one measurement in each consecutive hour. The logarithmic average of the three measurements taken in the first three hours or last three hours of the night time period gives good correlation to the full 8 hour L_{Aeq} that would occur during the night.

The measured noise data was used to obtain the ambient daytime (16 hour) and night-time (8 hour) 'period' noise levels; these were then compared against the criteria in PPG 24.

These measurement periods are sufficient to determine the appropriate control measures for the proposed development i.e. façade acoustic performance and to ascertain appropriate atmospheric noise limits for emissions from the development.

4.3 Measurement Equipment

The following measurement equipment was used to conduct the survey.

- 1off Brüel and Kjær 2270 'Class 1' Sound Level Analyser
- 1off Brüel and Kjær 4189 'Class 1' Pre-polarised ½" microphone
- 1off Brüel and Kjær 4189 'Class 1' Acoustic Calibrator

4.4 Measurement Locations

Figure 1 shows a site diagram with the measurement locations, existing buildings for proposed refurbishment, and the new buildings to be developed. Also shown is the existing masonry park wall which provides significant screening from traffic noise on Broomfield Lane.

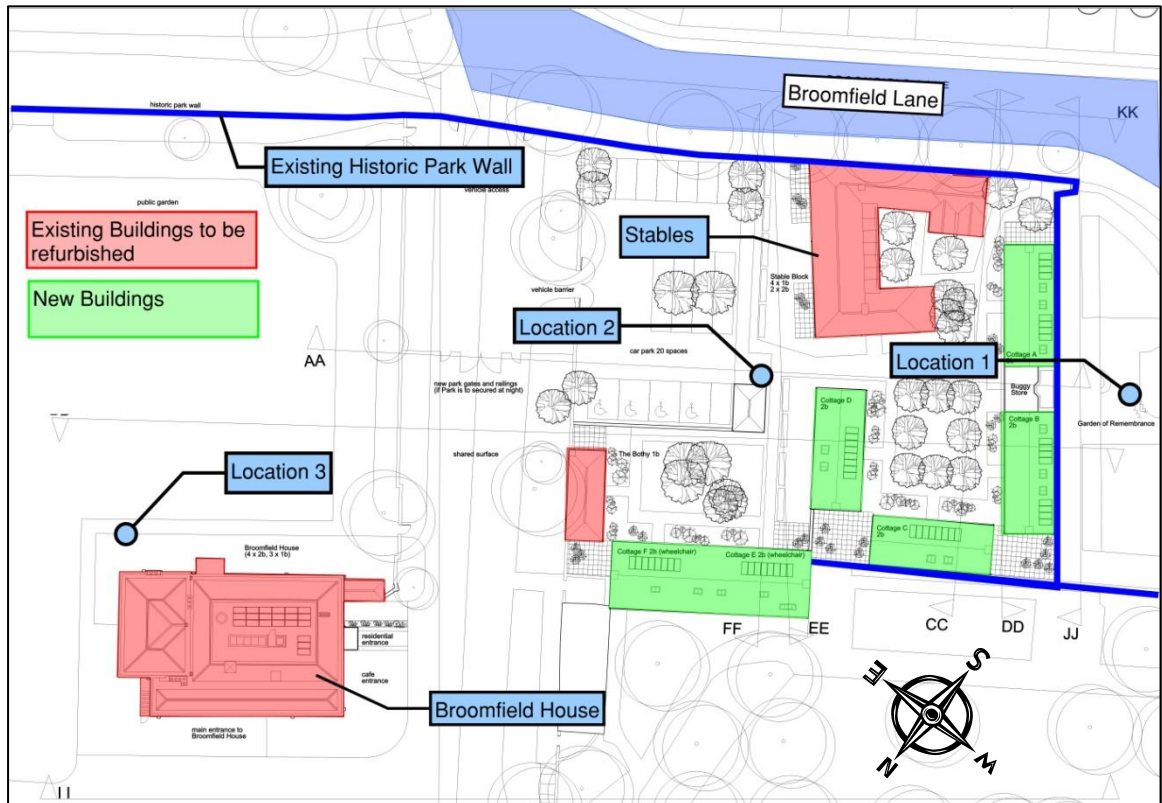


Figure 1 Site Plan Showing Measurement Locations and Other Points of Interest

4.4.1 Location 1

This measurement location is in the existing Garden of Remembrance at the rear of 2 of the proposed cottages. This location was in front of the Park wall with direct exposure to traffic noise from Broomfield Lane.

4.4.2 Location 2

This location is close to existing properties due for demolition (not shown in Figure 1) The high masonry park wall surrounds and forms a small courtyard, currently used by the parks and gardens operatives as a base and storage area. This location is representative of the properties in this area that are screened from Broomfield Lane.

4.4.3 Location 3

Location 3 is at the eastern corner of Broomfield House. The location is within the grounds of the public park and approximately 10m from the original facade of the building. Contractors hoarding and wire fencing prevents any closer access.

4.5 Noise Climate

The noise climate around the site is influenced by traffic noise from Broomfield Lane and other local roads. The traffic is predominantly a mix of private vehicles and light commercial vehicles. During the day the park was used extensively by the public for various recreational uses, including, dog walking, exercise classes, lunch breaks, and feeding the ducks.

Birdsong was a significant noise source during the day. This continued into the night with various ducks and other aquatic birds quacking loudly.

Noise from trains on the nearby railway line was occasionally audible, typically fast moving Electric Multiple Units (EMUs).

Noise from jet aircraft flying overhead was present although this was not dominant.

5 SURVEY RESULTS

Table 3 to Table 5 present the broadband results of the noise measurements. Octave band data was also recorded but the results are not included in this report.

Date	Start time, hh:mm	Duration, mm:ss	Statistical Noise levels, dB(A)			
			L ₉₀	L ₁₀	L _{eq}	L _{max}
09/02/2011	12:22	15:00	49	59	56	67
09/02/2011	13:23	15:00	50	59	57	69
09/02/2011	14:24	15:00	50	60	57	65
09/02/2011	23:01	05:00	46	52	50	59
10/02/2011	00:07	05:00	45	52	49	56
10/02/2011	01:03	05:00	42	50	47	58

Table 3 Measured noise level results at location 1

Date	Start time, hh:mm	Duration, mm:ss	Statistical Noise levels, dB(A)			
			L ₉₀	L ₁₀	L _{eq}	L _{max}
09/02/2011	12:45	15:00	45	50	48	59
09/02/2011	13:43	15:00	46	52	50	61
09/02/2011	14:45	15:00	46	51	50	64
09/02/2011	23:08	05:00	42	48	46	52
10/02/2011	00:13	05:00	43	47	45	51
10/02/2011	01:10	05:00	41	45	43	53

Table 4 Statistical measured noise levels at Location 2

Date	Start time, hh:mm	Duration, mm:ss	Statistical Noise levels, dB(A)			
			L ₉₀	L ₁₀	L _{eq}	L _{max}
09/02/2011	13:03	15:00	48	53	51	64
09/02/2011	14:01	15:00	49	54	52	66
09/02/2011	15:03	15:00	48	53	51	69
09/02/2011	23:15	05:00	44	48	46	59
10/02/2011	00:20	05:00	42	48	46	54
10/02/2011	01:16	05:00	41	47	44	50

Table 5 Statistical measured noise levels at Location 3

6 ASSESSMENT OF RESULTS

The noise survey has concluded that the Broomfield House site is exposed to moderate road traffic noise sources. The road traffic noise sources criteria have been used for this assessment.

The Noise Exposure Categories have been calculated from day and night time noise measurements.

6.1 Daytime

Table 6 shows the calculated 16 hour L_{Aeq} noise level according to PPG24 methodology and gives the resultant Noise Exposure Category.

Measurement Location	Calculated ambient noise level dBL _{Aeq 16hr}	Noise Exposure Category
1	56	B
2	48	A
3	50	A

Table 6 Calculated Daytime Noise Levels and resultant NEC

6.2 Night Time

Table 7 shows the calculated 8 hour L_{Aeq} noise level and gives the resultant Noise Exposure Category.

Measurement Location	Calculated ambient noise level dBL _{Aeq 8hr}	Noise Exposure Category
1	50	B
2	45	B
3	46	B

Table 7 Calculated Night Time Noise Levels and resultant NEC

7 NOISE MITIGATION RECOMMENDATIONS

7.1 Site Screening

The masonry Historic Park Wall that surrounds the proposed development site is providing significant acoustic screening from the traffic noise Broomfield Lane. It reduces noise levels within the development site area by approximately 10dB. It has been confirmed by Faithful and Gould that this wall will remain in place as part of the development.

It is recommended that the wall is inspected for any damage, holes, or gaps and, where appropriate, suitable repairs are made.

7.2 Building Design

The development site falls into NEC B at night. The PPG 24 recommendations for noise control for residential development in NEC B are for 'an adequate level of protection against noise'. BS 8233:1999 'Sound insulation and reduction for buildings' contains recommended internal noise levels for bedrooms and living areas. A reasonable standard for sleep in bedrooms at night is defined as 35dB_{L_{Aeq}}.

For dwellings located within the site an internal noise level of 35dBA (night-time) could be achieved by a partially open standard thermal double glazed window which typically provides 10 - 15dB of attenuation.

Dwellings with facades directly exposed to Broomfield Lane, south west facade of the Stables and south west facade of cottages A and B, could achieve night time internal noise levels of 35dBA with 'closed' acoustically rated double glazed windows. Adequate ventilation would be required when the window is closed and to ensure that there is no reduction in sound insulation, it is recommended that acoustically lined trickle vents are fitted to the windows. Acoustically lined trickle vents would only be required for habitable rooms overlooking Broomfield Lane.

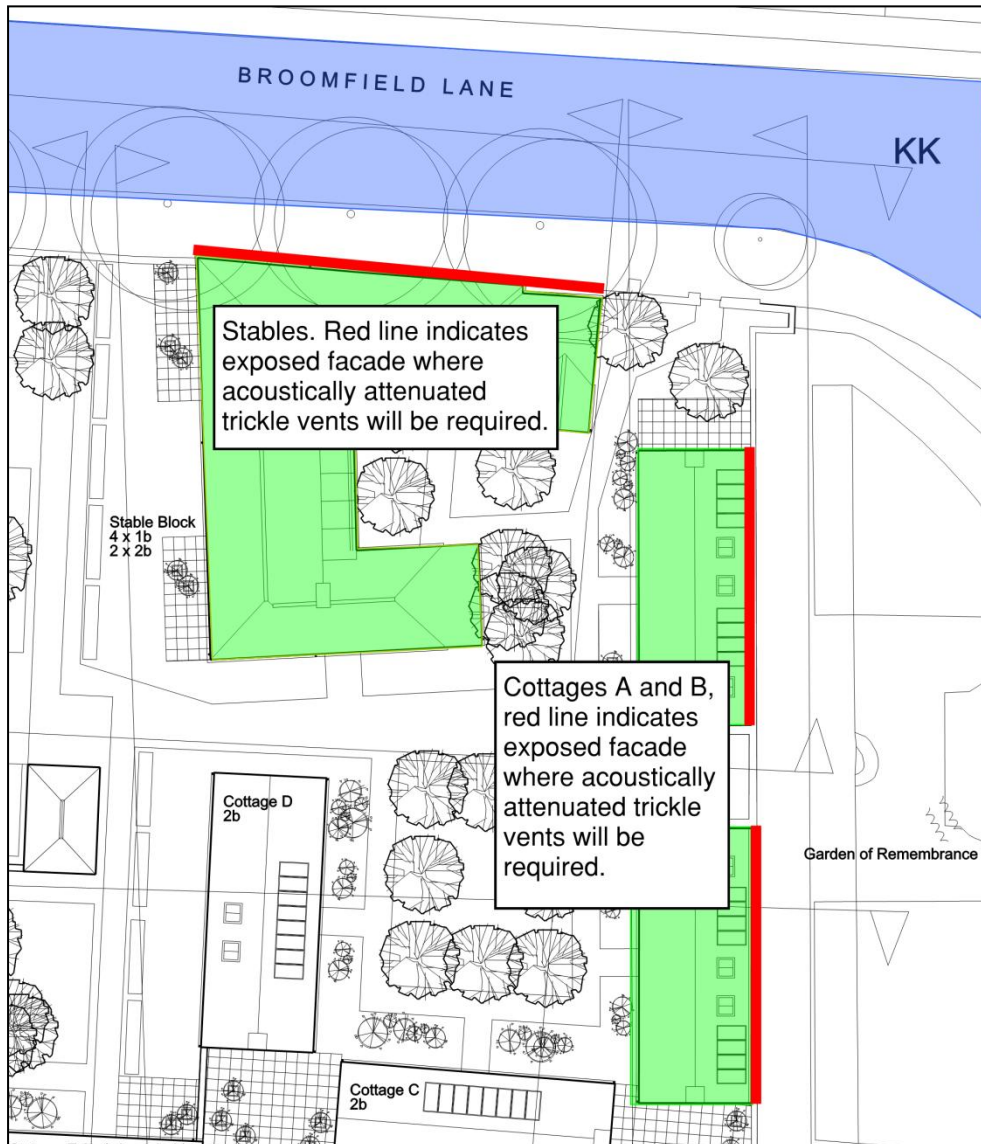


Figure 2 Site Plan showing location of exposed facades.

7.3 Building Services Noise

As part of the development, Broomfield House will contain a small community area with a cafe serving teas, coffees and light snacks. At this stage the community area operator has not been appointed but it is expected that the opening times of the cafe will be 09:00 – 18:00. Building services plant is expected to be no more than a simple ducted fresh air supply and extract system with externally mounted fans. At this stage no significant details of the plant types or locations is known.

The site is considered quiet and is likely be regarded as a tranquil place for relaxation and recreation. Therefore careful noise control of building services plant is critical. Typical noise levels measured on site during the day are in the range 48 – 49 dBL_{Aeq}. The proposed plant noise emission criteria for any plant associated with the new buildings is 43dBL_{Aeq} at the nearest noise sensitive receiver. This is calculated from the lowest measured background noise level of 48dBL_{A90} – 5dB. The nearest noise sensitive receivers are identified as the proposed dwellings within Broomfield House and users of the parks and gardens within the immediate vicinity of Broomfield House.

8 CONCLUSIONS

A noise survey has been conducted on the proposed development site of Broomfield House. Noise levels measured on site were influenced by traffic noise from Broomfield Lane, distant traffic noise, and birdsong. Traffic was busy during the day and night with a mix of private vehicles and light commercial vehicles. At night, ducks on the various duck ponds and other birds were a significant noise source.

The site is considered to have typical noise levels for this type of location in an urban environment and does not represent anything out of the ordinary. Noise levels measured on site during the survey remained within the range 43 – 52dB_{L_{Aeq}}.

The PPG24 assessment has concluded that the development site falls into NEC A during the day except for the Stables and Cottages A and B where the facades exposed to Broomfield lane are in NEC B. At night the entire site is in NEC B.

Where areas of the development fall into NEC B appropriate mitigation measures should be provided to give suitable levels of sound insulation. This could be provided by measures such as acoustically rated double glazing with attenuated trickle ventilation.

Suitable noise emission limits have been set for building services plant associated with the community area cafe.