

create
CONSULTING
ENGINEERS LTD

51 CALTHORPE STREET, LONDON
Planning Noise Assessment

51 CALTHORPE STREET, LONDON

Planning Noise Assessment

Client: Mr Simon Firth

Engineer: Create Consulting Engineers Limited
109-112 Temple Chambers
3-7 Temple Avenue
London
EC4Y 0HA

Tel: 0207 822 2300

Email: enquiries@createconsultingengineers.co.uk

Web: www.createconsultingengineers.co.uk

Report By: Christy Ponsford

Checked By: Mark Powers, BEng (Hons), CEng, MICHT

Reference: CP/GL/P12-385/12

Date: August 2013

51 CALTHORPE STREET, LONDON
Planning Noise Assessment

51 CALTHORPE STREET, LONDON

Planning Noise Assessment

Contents

- 1.0 Introduction
- 2.0 Site Description
- 3.0 Assessment Criteria
- 4.0 Existing Noise Climate
- 5.0 Noise Assessments
- 6.0 Conclusion
- 7.0 Disclaimer

Appendices

- A. Aerial Photograph Showing Site and Surrounding Area
- B. Environmental Noise Data

Registration of Amendments

Revision	Amendment Details	Revision Prepared By	Revision Approved By

1.0 INTRODUCTION

- 1.1 Create Consulting Engineers Ltd has been commissioned by Mr Simon Firth to undertake a noise assessment in support of the planning application for a proposed block of flats to be located on the site of 51 Calthorpe Street, London.
- 1.2 The primary objective of this assessment is to determine the site's suitability for residential use, in accordance with the requirements of Camden Council along with relevant credited guidance.
- 1.3 Additionally, the need for a satisfactory internal noise environment for future occupants has been considered, having regard to appropriate guidance contained within the World Health Organisation, 2000 (WHO) '*Guidelines for Community Noise*' and BS 8233:1999: '*Sound Insulation and Noise Reduction for Buildings – Code of Practice*'.
- 1.4 Noise control measures required to protect internal and external amenity have been recommended.

2.0 SITE DESCRIPTION

- 2.1 The site is located on the west side of Calthorpe Street. The existing building is currently being used for offices, storage and light industrial space. The surrounding area is commercial and residential in nature with the Mount Pleasant Royal Mail Depot located to the south (across Calthorpe Street), a nine-storey Holiday Inn hotel to the east, three-storey terraced houses to the west and Cubitt Street play centre and residential gardens to the north of the site.
- 2.2 The dominant source of noise affecting the development site has been established as road traffic along Calthorpe Street and on the surrounding road network which includes Farringdon Road. Activity noise from the Royal Mail depot and aircraft flyovers contributed to a lesser extent.
- 2.3 The development site is to include 16 residential units. It is noted that a significant portion of the existing building is to be retained including the majority of the external walls and floors.
- 2.4 Appendix A contains an aerial photograph showing the existing site layout and surrounding area.

3.0 ASSESSMENT CRITERIA

- 3.1 In March 2012, the National Planning Policy Framework (NPPF) for England replaced all previous Planning Policy Statements (PPSs) and Planning Policy Guidance (PPGs), notably Planning Policy Guidance Note 24 'Planning and Noise' (PPG24) which sets out the Government's policy on noise related planning issues.
- 3.2 The new framework does not contain specific noise policies. Therefore, following liaison with Camden London Borough Council and a review of Camden's Development Policies (DP28 – Noise and Vibration), the following assessment criteria have been established as being relevant to the proposed development.

Planning Policy Guidance Note 24 (PPG24)

- 3.3 Planning Policy Guidance Note 24 (PPG24), published in September 1994, set out the Government's policies on noise related planning issues. The document set out a range of 'Noise Exposure Categories' (NECs), defined by ranges in noise level. It also provided advice to consider during the planning stage of noise sensitive developments. The four Noise Exposure Categories A-D had varying ranges of noise level, measured as $L_{Aeq,T}$ dB, depending on whether the dominant noise source was attributable to road, rail, aircraft or a mixture of transport noise sources.
- 3.4 In the context of this development, the most dominant noise source is road traffic. Therefore, the PPG24 criteria for road traffic sources have been used in this assessment. The four categories defined for road noise source are set out in Table 1, overleaf, with the corresponding noise levels and advice on noise considerations. It should however be noted that the noise levels for traffic noise are the same as those for mixed sources (involving combinations of road, rail, air and industrial noise) where no one source dominates.
- 3.5 PPG24 provided further criteria for night-time maximum noise levels. Guidance Note 1 stated the following with regard to noise levels during the night time period (2300 – 0700 hours):

"Sites where individual noise events regularly exceed 82dB L_{Amax} (S time weighting) several times in any hour should be treated as being in NEC C, regardless of the $L_{Aeq,8h}$ (except where the $L_{Aeq,8h}$ already puts the site in NEC D)."

Noise Exposure Category (NEC)	Free-field noise levels corresponding to the Noise Exposure Categories for new Dwellings $L_{Aeq,T}$ dB	
	Traffic Noise Sources	
	0700-2300 hrs	2300-0700 hrs
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.	<55	<45
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.	55-63	45-57
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.	63-72	57-66
D Planning permission should normally be refused.	>72	>66

Table 1: Extract from PPG24 (Annex 1)

Source: *Planning Policy Guidance 24 (Annex 1)*

- 3.6 At locations where the noise levels are found to be on the borderline between two noise exposure categories, it is at the discretion of the Local Planning Authority into which NEC the site should fall. If a site falls into different categories for the day-time and night-time periods, the highest category will be used to define the site.
- 3.7 It should be noted that PPG24 recommended a maximum level of 55dB L_{Aeq} in gardens.

Internal and External Guidelines on Noise

- 3.8 To ensure an acceptable internal and external noise environment is provided for future occupants, reference has been made to relevant credited guidance. BS8233: 1999 '*Sound Insulation and noise Reduction for Buildings-Code of practice*' suggests suitable internal design criteria and limits for intrusive external noise within different types of buildings.
- 3.9 In addition, the World Health Organisation (WHO) document '*Guidelines for Community Noise*' (1999) recognises the importance of noise levels in relation to sleep disturbance and also provided guideline noise values for community noise in specific environments, which are set at a level of the lowest adverse health effect.
- 3.10 Table 2 below provides a summary of the relevant WHO and BS8233 guidance for the development.

Organisation	Typical Situation	Noise Level dB $L_{Aeq,T}$	
		Good	Reasonable
BS8233: 1999	Living Rooms	30	40
	Bedrooms	30	35
WHO, 1999	Internal Noise Level	30 dB (night) and 35 dB (day)	
For a reasonable standard in bedrooms at night, both the WHO guidelines and BS8233 recommend that individual noise events (measured with F time-weighting) should be limited to/not normally exceed 45dB L_{Amax} . The WHO guidelines refer to research that identifies that 10-15 occurrences per night of the limiting maximum noise level may be considered acceptable.			

Table 2: Summary of Recommended Guideline Indoor Noise Levels

- 3.11 For balconies, terraces and outdoor living areas the WHO guidelines state that: *'to protect the majority of people from being seriously annoyed during the daytime, the sound pressure level should not exceed 50 dB $L_{Aeq,16hour}$ and 55 dB $L_{Aeq,16hour}$ should be regarded as an upper limit for a steady continuous noise.'*
- 3.12 It is understood that the Council recommends that an internal noise level standard of 'good' be designed to.

4.0 EXISTING NOISE CLIMATE

Measurement Period

- 4.1 Measurements of the existing environmental noise level between 13.00 hours on Thursday 1 November and 13.00 hours on Friday 2 November 2012 were undertaken at Position 1, while measurements were taken from 10.00 hours to 13.00 hours at Position 2, Friday 2 November 2012.
- 4.2 Weather conditions for the survey periods, whilst not actively measured for during the survey period, were mild and dry with predominantly light winds. The weather was conducive to the monitoring of noise.

Measurement Positions

- 4.3 Unattended noise monitoring was undertaken over a 24-hour period on the rear first floor roof of the existing building (Position 1).
- 4.4 The measurement location, although influenced primarily by road traffic noise was partially screened by the existing building and the neighbouring Holiday Inn hotel. Due to the screening at Position 1 an additional attended three hour noise survey was undertaken at the front of the building (Position 2).
- 4.5 Measurement Position 2 was at a height of 1.2m in a free-field position.

Noise Measurement Equipment

- 4.6 Table 3, below, contains details of the noise monitoring equipment used during the survey period.

Measurement position	Description	Model / serial no.	Calibration date	Calibration certificate no.
1	Class 1 Sound level meter	Svantek 949 / 12262	07/04/2011	13680
	Condenser microphone	SV22 / 4012444		
	Preamplifier	Svantek SV12L / 13163		
	Calibrator	Svantek SV 40A / 10847	07/04/2011	13679
2	Class 1 Sound level meter	Svantek 945A / 6436	29/06/2011	13728
	Condenser microphone	GRAS 40AE / 86699		
	Preamplifier	Svantek SV11 / 5861		
	Calibrator	CEL 284/2 /3/01920312	02/11/2012	14112

Table 3: Noise monitoring equipment

- 4.7 The on-site calibration of both sound level meters was checked before and after each survey and found to be within permitted tolerances.

Noise Level Measurements

- 4.8 The following broadband noise parameters were measured over 15-minute intervals:

$L_{Aeq,T(fast)}$	The "A" weighted equivalent continuous noise level
$L_{A90,T(fast)}$	The "A" weighted level exceeded for 90% of the sample period
$L_{A90,T(fast)}$	The "A" weighted level exceeded for 10% of the sample period
$L_{Amax(fast)}$	The "A" weighted maximum noise level
$L_{Amax(slow)}$	The "A" weighted maximum noise level (slow time-weighting)

- 4.9 In addition to the above one-third octave band frequency data was measured at Position 1 and 2 and one second time histories were recorded at Position 1 (these can be provided on request).

Assessment Methodology

- 4.10 The noise levels from the 24-hour survey (Position 1) have been divided into the daytime period (07.00-23.00) and the night-time (23.00-07.00) period in accordance with WHO, BS8233 and PPG24.
- 4.11 The noise measurements at Position 2 were taken simultaneously with those at Position 1 to allow for a direct comparison with the measured noise levels at Position 1. In addition, the three hour survey allowed for the shortened daytime *Calculation of Noise from Road Traffic*

(CRTN) method to be used in order to calculate the $L_{Aeq,16hr}$. This was done by subtracting 3dB from the measured $L_{A10,3hr}$.

- 4.12 Overall, the difference between Position 1 and Position 2 has been calculated to be 10dB, therefore the $L_{Aeq,16hr}$ and $L_{Aeq,8hr}$ levels at Position 1 have been adjusted accordingly in order to represent the levels without screening. Table 2 presents the adjusted and unadjusted noise levels at Position 1.
- 4.13 In order to predict the approximate internal noise levels, a reduction of 13dB through a partially open window has been assumed since BS8233 states a sound reduction of 10-15dB is typically provided.

Results

- 4.14 The results of the unattended and attended noise monitoring at Positions 1 and 2 have been summarised in Table 4, below. The full set of measured noise levels can be found Appendix B.

Position	Period (T)	Unadjusted $L_{Aeq,T}$ (dB)	Adjusted $L_{Aeq,T}$ (dB) ¹	Number of instances where the external $L_{Amax(slow)}$ exceeded 82dB (PPG24)	Predicted number of instances where the internal $L_{Amax(fast)}$ exceeded 45dB (WHO and BS8233) ²
1	Daytime (07.00 - 23.00 hours)	55	65	N/A	N/A
	Night-time (23.00 - 07.00 hours)	50	60	0	8
2	Daytime (07.00 - 23.00 hours)	65	N/A	N/A	N/A

Table 4: Summary of noise monitoring results

Note 1: Measured levels have been increased by 10dB to remove the effect of screening

Note 2: Assumed 13dB sound reduction through a partially open window

- 4.15 It should be noted that six of the eight $L_{Amax(fast)}$ events which exceeded the internal level of 45dB(A) occurred between 23.00 and 00.00. The total number of events is, however, less than the 10-15 occurrences considered acceptable in WHO.
- 4.16 The internal noise levels through a partially open window have been predicted to be 52dB(A) and 47dB(A) during the daytime and night-time periods, respectively.

- 4.17 To assist with façade design and glazing specification for the proposed building, sample frequency data, in single-octave bands, measured at Position 2 has been provided in Table 5, below.

Frequency (Hz)	$L_{Aeq,15mins}$ (dB) Position 2
63	72
125	63
250	60
500	60
1000	60
2000	57
4000	50
8000	43

Table 5: Sample frequency data at Positions 2

5.0 NOISE ASSESSMENTS

- 5.1 Table 6 below provides a summary of the assessment results based on the noise levels which are representative of the most noise affected façade (facing Calthorpe Street).

Position	Period (T)	PPG24 NEC	Internal WHO/BS8233 (good) guidelines met with partially open window?
1 ¹	Daytime (07.00 - 23.00 hours)	C	No
	Night-time (23.00 - 07.00 hours)	C	No
2	Daytime (07.00 - 23.00 hours)	C	No

Table 6: Summary of assessment results for the most affected façade

Note 1: Based on adjusted noise levels

- 5.2 The results of the PPG24 assessment (Table 6) demonstrate that the site falls within NEC C at the most noise affected façade. The guidance contained within PPG24 for the above classification is:

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 commensurate level of protection against noise”.

- 5.3 It should however be noted that the unadjusted noise levels measured at Position 1 (Table 4) *meet* the recommended external levels provided in WHO for gardens and terraces.
- 5.4 For partially open windows, the airborne sound insulation is approximately 10-15dB (13dB reduction assumed for internal noise prediction). Therefore, based on measured and predicted noise levels it will not be possible to meet the internal noise criteria given in Table 2 if open windows are to be used for natural ventilation. Consequently, it is necessary to consider how adequate ventilation is to be provided to the most noise exposed building facades.

Mitigation Measures

- 5.5 The following recommendation are provided to ensure that the proposed development achieves the guidelines for ‘good’ indoor noise levels provided in BS8233 along with relevant WHO and PPG24 guidelines as recommended by the Council.

- 5.6 In addition it should be noted the recommendations provided below are consistent with advice provided in BS8233 and the Council's PD28.

Ventilation Strategy

- 5.7 Given the external noise levels incident on the most noise exposed façades, acoustically attenuated ventilation should be incorporated in the building design on this façade to enable satisfactory building ventilation and temperature regulation without the need for opening windows, thereby maintaining the sound reduction performance of the building façade and safeguarding internal target criteria levels (30dB $L_{Aeq,T}$ in bedrooms and living rooms).
- 5.8 A scheme based on this method is used for insulating dwellings against road traffic noise under the Noise Insulation Regulations. Under these Regulations, a sound attenuating permanent vent and a sound attenuating mechanical ventilator are provided in each habitable room to provide adequate ventilation in bedrooms and living rooms facing noisy roads. A number of ventilation systems are available that meet the requirements of the Noise Insulation Regulations.
- 5.9 On ventilation, BS 8233 advises that:

The Building Regulations on ventilation recommend that habitable rooms in dwellings have background ventilation. Trickle ventilators can provide this, and sound attenuating types are available. Where sound insulation requirements preclude opening windows for rapid ventilation and cooling, acoustic ventilation units incorporating fans are available for insertion in external walls; these can provide sound reduction comparable with domestic secondary glazing.

Glazing and external building fabric specification

- 5.10 There are standard glazing, external wall and roof constructions, which should provide the required level of attenuation to achieve the internal noise level criteria detailed in Table 2.
- 5.11 At this stage it is advised that either double glazing or secondary glazing be installed in order to achieve the 'good' guidelines stated in BS8233 as recommended by Camden Council.

Outdoor Amenity

- 5.12 The WHO Guidelines state that noise within external garden spaces should not exceed 50 – 55dB $L_{Aeq(16hours)}$. It is therefore recommended that the gardens and balconies (where proposed) should be located at towards the rear of the property, where they should sufficiently screened from the road traffic noise by the development itself (provided the proposed development provides sufficient screening) and surrounding building (Position 1-unadjusted noise levels, Table 4).

Discussion

- 5.13 Although the proposed development site falls within NEC C (and predicted internal noise levels exceed the threshold limit detailed in BS8233), appropriate internal noise levels should be achievable through a suitable scheme of mitigation.
- 5.14 It should also be noted that there are numerous existing residential properties surrounding the proposed development site that are subject to the same prevailing noise climate.
- 5.15 It has been concluded that the site is suitable for residential development subject to suitable mitigation being included in the scheme design.

6.0 CONCLUSION

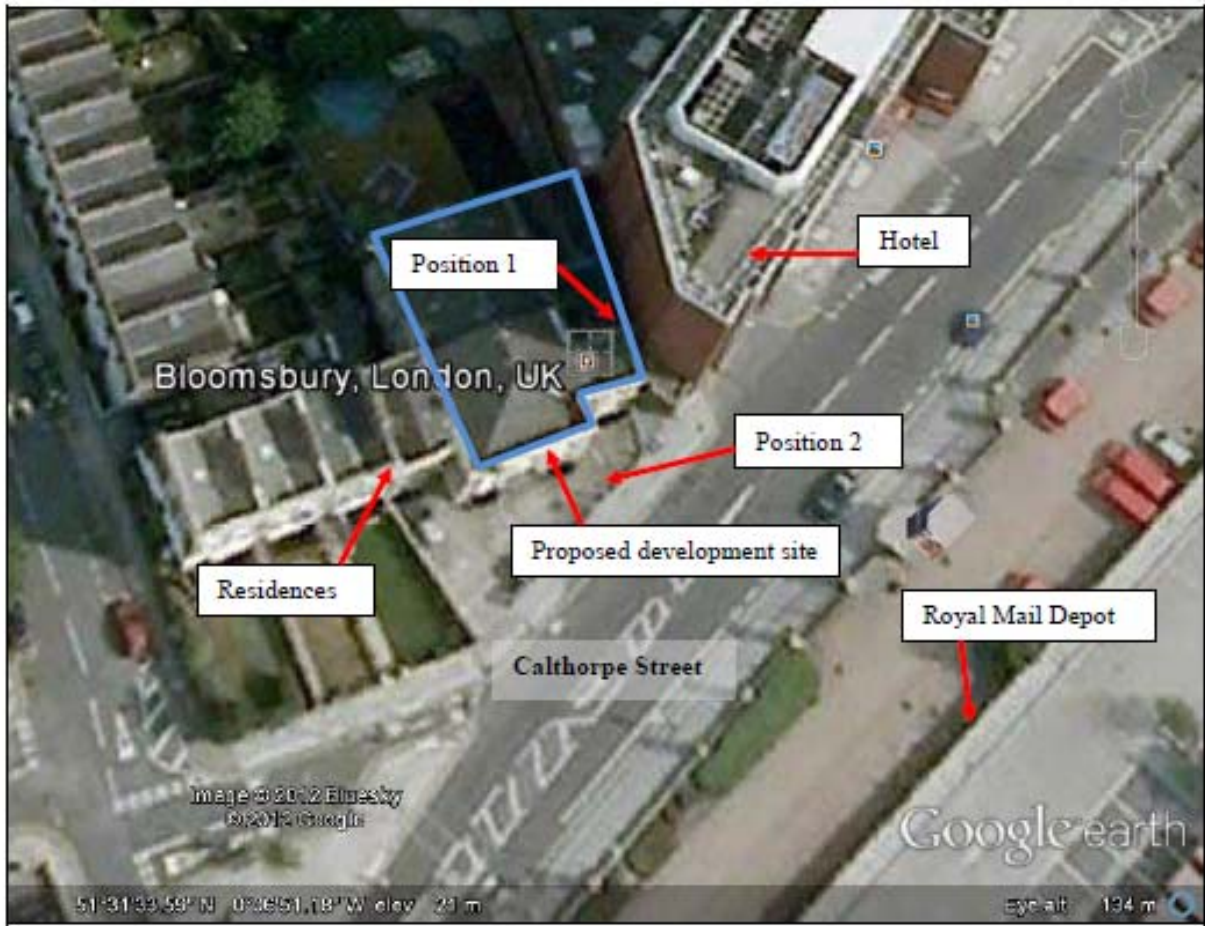
- 6.1 Create Consulting Engineers Ltd has been commissioned by Mr Simon Firth to undertake a noise assessment in support of the planning application for proposed flats to be located on the site of 51 Calthorpe Street, London. Noise surveys were undertaken to establish prevailing noise levels at the development site during the daytime and night-time periods.
- 6.2 An assessment in accordance with PPG24, WHO and BS8233 has established that the site falls within Noise Exposure Category C and exceeds the recommended 'good' guidelines for indoor levels provided in BS8233.
- 6.3 Guidance on internal and external noise limits considered applicable to the development site has been provided based on the information contained within the Council's Development Policy DP28, WHO and BS 8233. Outline advice on mitigation measures required to achieve the criteria has been provided as follows:
- Ventilation strategy: the internal noise criteria will not be achievable using open windows for natural ventilation. Therefore, acoustically attenuated ventilators will be required.
 - Glazing and external building fabric: there are standard glazings, external walls and roof constructions which should provide the level of attenuation required. It is recommended that double or secondary glazing be used.
 - Outdoor amenity: the existing external levels at the rear of the building were found to be acceptable for gardens and terraces. Provided that the design of development continues to provide sufficient screening, noise levels within this area should not exceed 50 – 55dB $L_{Aeq(16hours)}$ (the recommended noise limit detailed in the WHO Guidelines).
- 6.4 Although the proposed development site falls within NEC C appropriate internal noise levels should be achievable through a suitable scheme of mitigation.
- 6.5 It should also be noted that there are numerous existing residential properties, including a hotel, surrounding the proposed development site which are subject to the same prevailing noise climate.
- 6.6 It has therefore been concluded that the site is suitable for residential development subject to suitable mitigation being included in the scheme design. Create Consulting Engineers Ltd can provide detailed advice with regard to the specification of mitigation measures on request.

7.0 DISCLAIMER

- 7.1 Create Consulting Engineers Ltd disclaims any responsibility to the Client and others in respect of any matters outside the scope of this report.
- 7.2 The copyright of this report is vested in Create Consulting Engineers Ltd and Mr Simon Firth. The Client, or his appointed representatives, may copy the report for purposes in connection with the development described herein. It shall not be copied by any other party or used for any other purposes without the written consent of Create Consulting Engineers Ltd or Mr Simon Firth.
- 7.3 Create Consulting Engineers Ltd accepts no responsibility whatsoever to other parties to whom this report, or any part thereof, is made known. Any such other parties rely upon the report at their own risk.

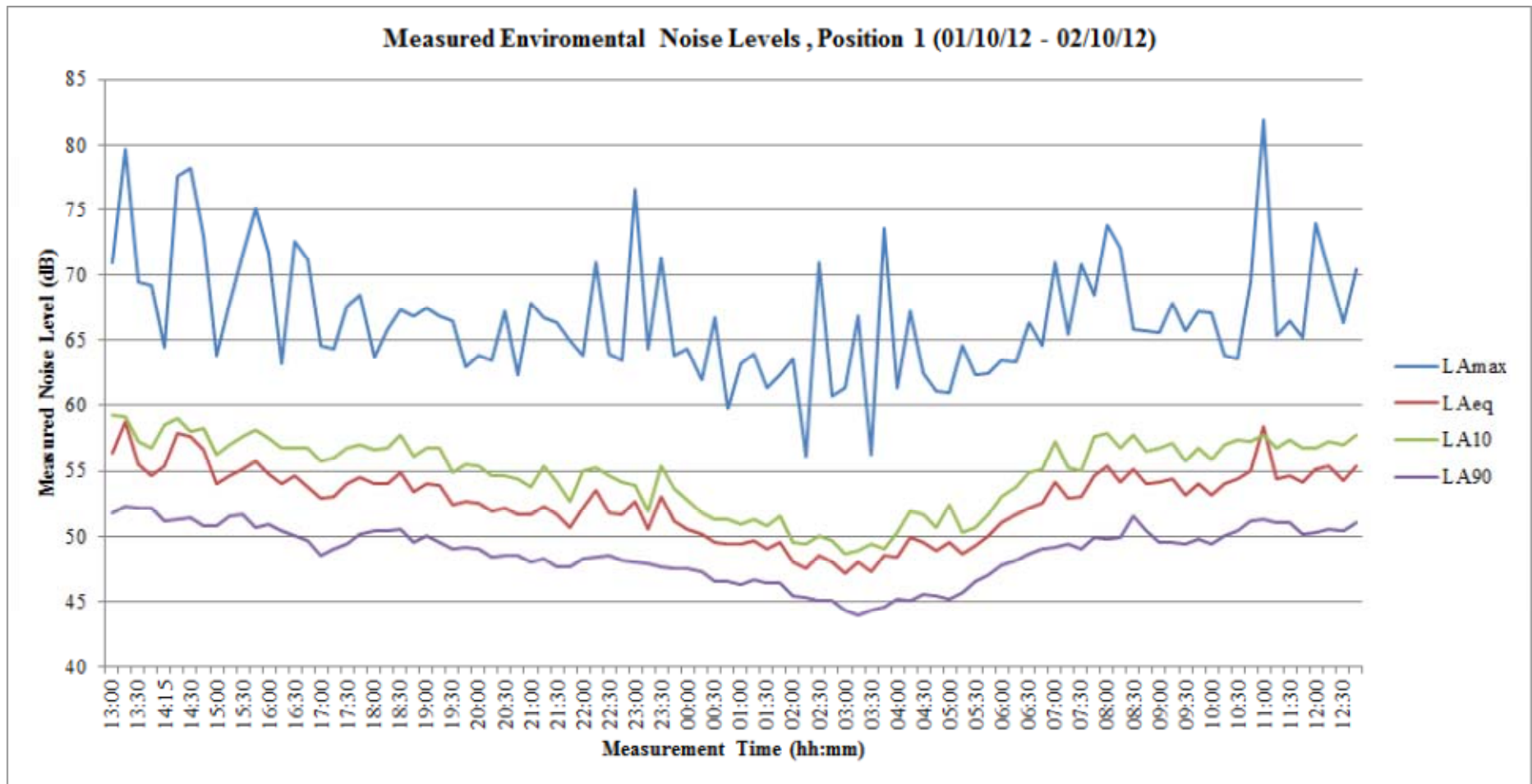
APPENDICES

APPENDIX A



Aerial photograph showing site and surrounding area

APPENDIX B



Environmental Noise Data

Time (hh:mm)	$L_{A(f)max}$ (dB)	L_{Aeq} (dB)	L_{A10} (dB)	L_{A90} (dB)
10:00	84	63	67	54
10:15	84	65	69	54
10:30	77	64	68	54
10:45	79	64	68	56
11:00	97	72	68	54
11:15	85	64	68	55
11:30	75	63	67	54
11:45	82	64	68	55
12:00	76	64	68	54
12:15	80	64	68	54
12:30	82	65	69	54
12:45	79	64	68	54

Measured Environmental Noise Levels, Position 2 (2/10/12)