
Great Ormond Street Hospital – Octav Botnar Wing

Noise Statement for Planning

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Report Prepared by:

L. Weber, BSc(Hons), MSc, AMIOA
Graduate Acoustic Consultant

**Report Checked by:**

R. Grove BEng(Hons) PG Dip MIOA
Head of Acoustics - London

**Revision History**

Revision	Section	Comments	Author	Checked by
-			LW	RG

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Executive Summary

BDP has been appointed by Balfour Beatty to undertake a baseline noise survey and produce a noise statement report in support of the planning application for the installation of a new external plant, which is part of the refurbishment works at the Octav Botnar Wing (OBW) of Great Ormond Street Hospital (GOSH), London WC1N 3JH.

The new plant is proposed to be located on the balcony on Level 5 of OBW building and is mainly bounded by the hospital building with some residential and commercial properties in direct line of sight in Lamb's Conduit Street.

Attended and unattended environmental noise surveys were undertaken at positions representative of nearby noise sensitive receptors during both the day and night-time periods.

Subjectively, the ambient noise climate primarily consisted of road traffic on Lamb's Conduit Street. Other noise sources which contributed to the noise climate of the area included road traffic on Great Ormond Street, distant road traffic and distant construction noise. During daytime, the hospital staff occasionally accessed the balcony where the sound level meter was installed. However the balcony is not accessible in the night and hence, no noise contribution of this kind occurred on measurements undertaken during the night-time

In order to meet London Borough of Camden Development Policy 28 relating to noise emissions from fixed plant, plant noise emissions limits have been applied as follows:

Noise description and location of measurement	Period	Time	Plant Noise Emissions Limit
Noise at 1 metre external to a sensitive façade	Day	07:00 – 23:00	42
	Night	23:00 – 07:00	41
Noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum), or distinct impulses (bangs, clicks, clatters, thumps), at 1 metre external to a sensitive façade.	Day	07:00 – 23:00	37
	Night	23:00 – 07:00	36

Consideration should be given to the temporal nature of existing environmental noise, and the variability of duty on operational plant, which may include some or all of the following:

- The time of plant operation;
- The duration of plant operations;
- The duty placed upon plant during different times of the day and night;
- The reasons for operating plant, which may be limited to maintenance testing of emergency plant only.

In order to ensure the requirements of London Borough of Camden Development Policy 28 are met, the following mitigation measures may be considered as part of the design if found to be necessary:

- Management of plant use, potentially through the use of 'on-demand' building management systems;
- Purchasing of low-noise plant equipment incorporating low noise switch gear;
- Acoustic attenuation applied to inlets and outlets of plant as appropriate;
- Acoustic shrouds where appropriate and feasible.

1. Introduction

1.1. BDP has been appointed by Balfour Beatty to undertake a baseline noise survey and produce a noise statement report in support of the planning application for the installation of a new external plant, which is part of the refurbishment works at the Octav Botnar Wing (OBW) of Great Ormond Street Hospital (GOSH), London WC1N 3JH.

1.2. This report provides information regarding the following items:

- A formal record of the existing noise climate around the proposed plant location;
- Plant noise emissions limits in line with local and national planning policy and BS4142:2014 *Methods for rating and assessing industrial and commercial sound*.

2. Assessment Criteria

London Borough of Camden Development Policy 28

2.1. Development Policy 28 (DP28) of the London Borough of Camden (LBC) Local Development Framework sets out the noise policy as follows:

“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.”

2.2. Table 1 below summarises the noise emissions requirements as set out by London Borough of Camden.

Noise description and location of measurement	Period	Time	Noise Level
Noise at 1 metre external to a sensitive façade	Day, evening and night	00:00-24:00	5dB(A) <LA90
Noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum) at 1 metre external to a sensitive façade	Day, evening and night	00:00-24:00	10dB(A) <LA90
Noise that has distinct impulses (bangs, clicks, clatters, thumps) at 1 metre external to a sensitive façade	Day, evening and night	00:00-24:00	10dB(A) <LA90
Noise at 1 metre external to sensitive façade where LA90>60dB	Day, evening and night	00:00-24:00	55dBLAeq

Table 1: London Borough of Camden DP28 Noise Emissions Limits

National Planning Policy Framework (NPPF)

2.3. The National Planning Policy Framework (NPPF), published in 2012, has superseded Planning Policy Guidance documents, and with specific regard to noise, PPG24. The NPPF states the following in relation to noise:

*“The planning system should contribute to and enhance the natural and local environment by...preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or **noise** pollution or land instability.*

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 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*
- *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.”*

2.4. In order to achieve the aims listed above the Noise Policy Statement for England (NPSE) was developed, stating its vision as follows:

“Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development”

2.5. The mechanism by which the vision is proposed to be fulfilled is detailed in the Explanatory Note to the NPSE, which provides three definitions of noise impact as follows:

- **NOEL – No Observed Effect Level;**
The level below which no detectable effect on the health and quality of life due to noise can be detected.
- **LOAEL – Lowest Observed Adverse Effect Level**
The level above which adverse effects on health and quality of life due to noise can be detected.
- **SOAEL – Significant Observed Adverse Effect Level**
The level above which significant adverse effects on health and quality of life due to noise can be detected.

BS4142:2014 Methods for rating and assessing industrial and commercial sound

2.6. The above definitions of noise impact broadly align with the assessment criteria for new fixed installations as per BS4142:2014 *Methods for rating and assessing industrial and commercial sound*, as follows:

- A difference of around +10 dB or more is likely to be an indication of significant adverse impact, depending on context (**SOAEL**)
- A difference of around + 5 dB is likely to be an indication of an adverse impact, depending on context (**LOAEL**)
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on context. (**NOEL**)

2.7. In addition, BS4142 states, with respect to tonality:

“For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible and 6 dB where it is highly perceptible.”

2.8. Notwithstanding the guidance provided in BS4142:2014, the London Borough of Camden DP28 is judged to be the overriding requirement when setting out plant noise emissions limits.

3. Site description and plant location

3.1. The Octav Botnar Wing building is part of Great Ormond Street Hospital and is a 7-storey building located on the corner between Great Ormond Street and Lamb's Conduit Street in London, WC1N 3JH.

3.2. The new plant is proposed to be located on the balcony on Level 5 of OBW building and is mainly bounded by the hospital building with some residential and commercial properties in direct line of sight across Lamb's Conduit Street.

3.3. The closest sensitive locations to the proposed plant location were identified as being the residential and commercial properties across Lamb's Court Street.

3.4. Figure 1 below indicates the location of the proposed plant along with locations of observed noise sensitive receptors.



Figure 1: Proposed plant location and closest noise sensitive receptors.

4. Survey Details

- 4.1. All measurements were undertaken in compliance with measurement procedures set out in *BS 7445 2003 Part 1 Environmental noise - Guide to quantities and procedures*.
- 4.2. All surveys were undertaken in the free field, with monitoring equipment located at least 1.5m from the ground and more than 1.5m from any facades.
- 4.3. An unattended continuous noise survey was carried out between 11:45 hrs on 14 August 2015 and 14:45 hrs on 18 August 2015. The following equipment was used:
- | | |
|--------------------------------|------------------|
| – Rion NL-52 Sound level meter | Ser No. 00242746 |
| – Rion Microphone UC-59 | Ser No. 06231 |
| – Rion Pre-amp NH-25 | Ser No. 32774 |
| – RION NC-74 Sound calibrator | Ser No. 35046790 |
- 4.4. The calibration of the sound level meter was checked before and after the measurements were taken, and no significant drift in calibration level was observed.
- 4.5. Measurements were undertaken continuously using a semi-permanent noise monitor in periods of 15 minutes. No further suitable locations were identified for attended noise measurements to be undertaken and as such attended noise measurements were not obtained. The data obtained from unattended noise measurements is judged to be sufficient for the purposes of assessment.
- 4.6. Weather conditions during the survey period were mostly dry with little wind and temperatures between 13-23°C. Occasional showers were reported during the afternoon on 14th August 2015 and light rain in the evening of the same day, but did not have any significant impact on this assessment.
- 4.7. The location of the semi-permanent continuous noise monitoring equipment is detailed in Figures 2 and 3 below. Since there was no access to the nearest noise sensitive receptor on Lamb's Conduit Street, the selected location was judged to be representative of the ambient noise levels at the nearest noise sensitive receptor. The measurement position was at a considerable distance and shielded from any extraneous noise source, such as existing plants from the hospital.

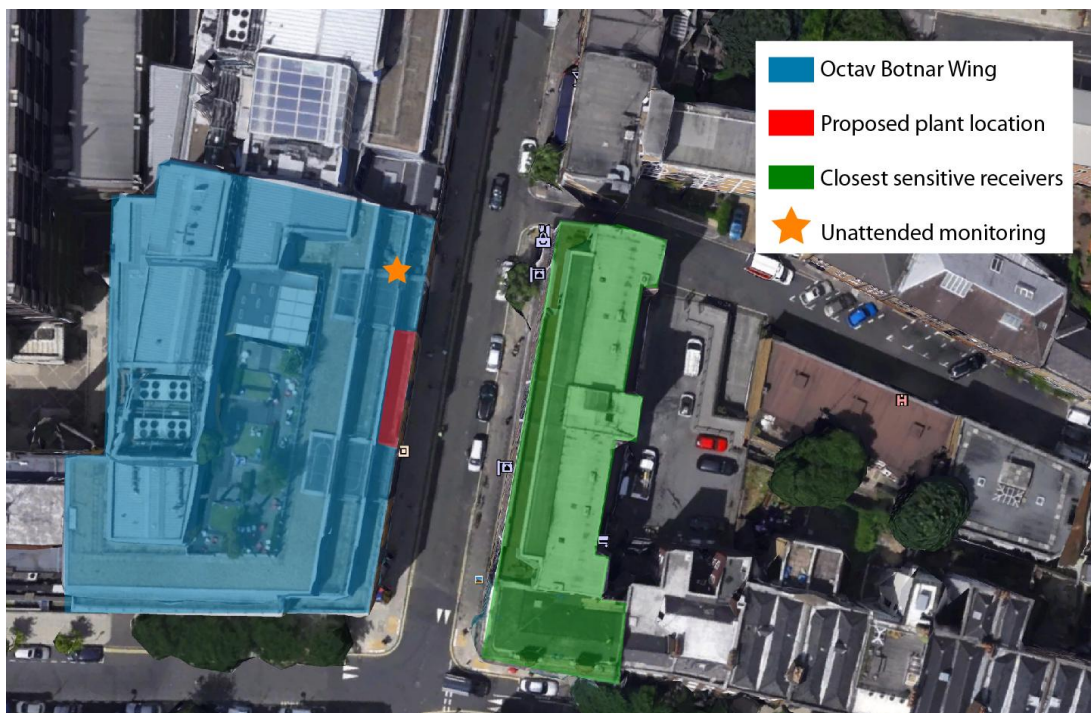


Figure 2: Unattended measurement location



Figure 3: Unattended sound level monitor in the measurement position.

5. Ambient noise climate

- 5.1. The ambient noise climate consisted predominantly of road traffic on Lamb's Conduit Street.
- 5.2. Other noise sources which contributed to the noise climate included audible road traffic on Great Ormond Street, distant road traffic on surrounding roads affected by screening provided existing buildings, and distant construction noise.
- 5.3. During daytime, the hospital staff occasionally accessed the balcony where the sound level meter was installed, contributing to the noise levels measured during the day. The balcony is not accessible in the night and hence, no such contribution occurred on measurements undertaken during the night-time.

6. Measured Survey Results

- 6.1. A large range of statistical noise data was captured; however, the following A-weighted noise parameters are presented for information:

L_{Aeq}	Time-averaged sound pressure level. This is generally considered to be an acceptable representative descriptor of environmental noise;
L_{A90}	Sound pressure level exceeded for 90% of the measurement period, this is generally accepted to be indicative of the continuous background noise level.
L_{AMax}	The maximum sound pressure level recorded within any measurement period.

- 6.2. For the purposes of planning, the L_{A90} background noise measurements are of most interest.

Unattended continuous noise measurements

6.3. A time history of measurements is provided in Appendix A of this report. A summary of the results is provided below:

Time Period	A-weighted sound pressure level (dB re. 2×10^{-5} Pa)		
	Highest $L_{Aeq, 15 \text{ mins}}$ (dB)	Highest $L_{Amax, 15 \text{ mins}}$ (dB)	Lowest $L_{A90, 15 \text{ mins}}$ (dB)
Daytime (0700-2300 hrs)	68	85	47
Night time (2300 – 0700 hrs)	68	81	46

Table 2: Summary of unattended continuous noise measurements

Note: A few individual measurements presented L_{Amax} values above 85dB and, based upon analysis of the frequency spectrum, are most likely related to sirens from vehicles in Lamb's Conduit Street. Such measurements have not been included in this assessment as they represent transient single events.

7. Plant Noise Emissions Limits

7.1. In order to meet the requirements of London Borough of Camden Development Policy 28, the following plant noise emissions limits at 1m from the nearest noise sensitive receptors should be considered when selecting plant and associated mitigation measures. Plant noise emissions limits have been set based upon unattended noise measurements.

Noise description and location of measurement	Period	Time	Plant Noise Emissions Limit
Noise at 1 metre external to a sensitive façade	Day	07:00 – 23:00	42
	Night	23:00 – 07:00	41
Noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum), or distinct impulses (bangs, clicks, clatters, thumps), at 1 metre external to a sensitive façade.	Day	07:00 – 23:00	37
	Night	23:00 – 07:00	36

Table 3: Plant noise emissions limit to meet LBC DP28

7.2. Mitigation of noise emissions from individual items of plant should be designed such that the cumulative noise emissions of all items of plant do not exceed the values stated above at 1m from the nearest noise sensitive receptor.

7.3. Consideration should be given to the planned hours of operation for each item of plant and mitigation measures designed accordingly.

7.4. Consideration should be given to the temporal nature of existing environmental noise, and the variability of duty on operational plant, which may include some or all of the following:

- The time of plant operation;
- The duration of plant operations;
- The duty placed upon plant during different times of the day and night;
- The reasons for operating plant, which may be limited to maintenance testing of emergency plant only.

8. Potential Mitigation Measures

8.1. In order to ensure the requirements of London Borough of Camden Development Policy 28 are met, the following mitigation measures may be considered as part of the design:

- Management of plant use, potentially through the use of 'on-demand' building management systems;
- Purchasing of low-noise plant equipment incorporating low noise switch gear;
- Acoustic attenuation applied to inlets and outlets of plant as appropriate;
- Acoustic shrouds where appropriate and feasible.

8.2. As plant selections become available and are confirmed, assessments should be made of the plant noise emissions and plant mitigation applied appropriately.

9. Conclusions

9.1. BDP has been appointed by Balfour Beatty to undertake a baseline noise survey and produce a noise statement report in support of the planning application for the installation of a new external plant, which is part of the refurbishment works at the Octav Botnar Wing (OBW) of Great Ormond Street Hospital (GOSH), London WC1N 3JH.

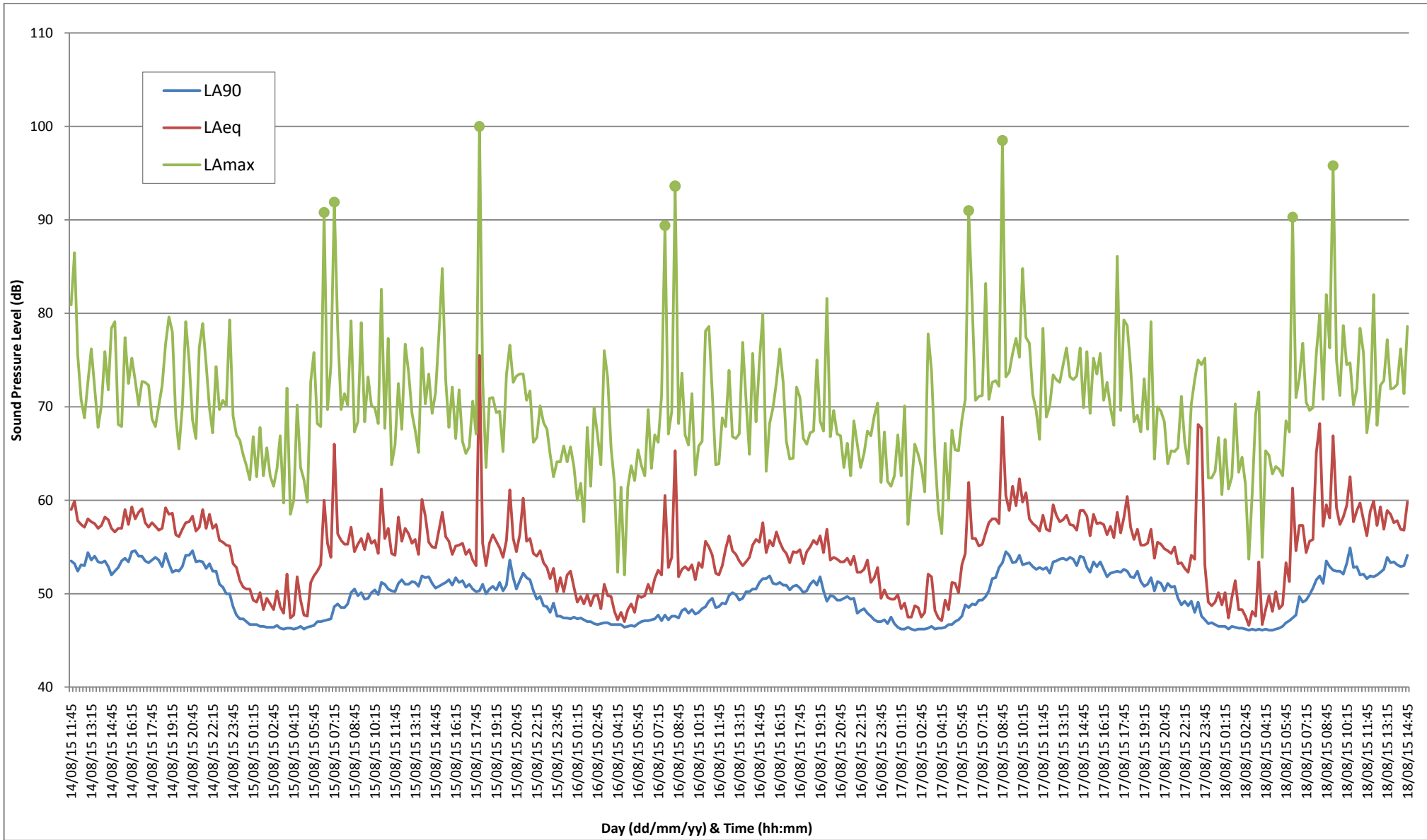
9.2. The new plant is proposed to be located on the balcony on Level 5 of OBW building and is mainly bounded by the hospital building with some residential and commercial properties in direct line of sight across Lamb's Conduit Street.

9.3. Attended and unattended environmental noise surveys were undertaken at positions representative of nearby noise sensitive receptors during both the day and night-time periods.

9.4. Subjectively, the ambient noise climate consists predominantly of road traffic on Lamb's Conduit Street. Other noise sources which contributed to the noise climate included road traffic on Great Ormond Street, distant road traffic and distant construction noise. During daytime, the hospital staff occasionally accessed the balcony where the sound level meter was installed, but the balcony is not accessible in the night and hence, no noise contribution of this kind occurred on measurements undertaken during the night-time.

9.5. In order to meet London Borough of Camden Development Policy 28 relating to noise emissions from fixed plant, plant noise emissions limits at 1m from the noise sensitive locations of between 41dB (night) and 42dB (day) have been set depending upon whether or not plant has distinguishable discreet acoustic notes or distinct acoustic impulses.

APPENDIX A – Unattended Noise Survey Results



● Transient single events that do not form part of the acoustic environment of the area, most likely related to sirens. Measurements excluded from the acoustic assessment.

APPENDIX B – Calibration Certificates



CERTIFICATE OF CONFORMANCE

Date of Issue 16 December 2014
Customer BDP Ltd
Certificate Number CONF121412

	Manufacturer	Type	Serial Number
Sound Level Meter	Rion	NL-52	00242746
Preamplifier	Rion	NH-25	32774
Microphone	Rion	UC-59	06231

This is to certify that the instrument was tested and calibrated at the Manufacturer's factory according to their specification and that the product satisfied all the relevant requirements of the following Standards:

IEC 61672-1:2002 Class 1.

The instrument also received a functional check by ANV Measurement Systems prior to despatch in the UK, in accordance with our standard procedures.

Signed *Amrat C Patel*
Amrat C Patel

Position. Laboratory Manager Date. 16th December 2014

BEAUFORT COURT, 17 ROEBUCK WAY, MILTON KEYNES, MK5 8HL

☎ 01908 642846 ☎ 01908 642814

✉ info@noise-and-vibration.co.uk 🌐 www.noise-and-vibration.co.uk

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CERTIFICATE OF CONFORMANCE

Date of Issue 16 December 2014
Customer BDP Ltd
Certificate Number CONF121410

	Manufacturer	Type	Serial Number
Acoustic Calibrator	Rion	NC-74	35046790

This is to certify that the instrument was tested and calibrated at the Manufacturer's factory according to their specification and that the product satisfied all the relevant requirements of the following Standards:

IEC 60942:2003 Class 1 (Electroacoustics - Sound Calibrators)

The instrument also received a functional check by ANV Measurement Systems prior to despatch in the UK, in accordance with our standard procedures.

Signed Amrat C Patel Position. Laboratory Manager Date. 16th December 2014
Amrat C Patel

BEAUFORT COURT, 17 ROEBUCK WAY, MILTON KEYNES, MK5 8HL

☎ 01908 642846 ☎ 01908 642814

✉ info@noise-and-vibration.co.uk 🌐 www.noise-and-vibration.co.uk