Planning Noise Assessment

January 2015

TEMPLE

LEADERS IN ENVIRONMENT, PLANNING & SUSTAINABILITY.

Report for – University College London Hospitals Charity (UCLHC)
T3020 – Arthur Stanley House
Planning Noise Assessment

Final

Document Version Control

Version	Date	Author	Reviewed by	Reviewed and Approved by
Draft	28.11.2014	Theo Hatzis	Mark Furlonger	John Fisk
Final	08.01..2015	Theo Hatzis	Mark Furlonger	John Fisk

Report for: **Peter Burroughs**
UCLH Charity

Main Contributors: **Theodore Hatzis**
Antony Gregson

Copy to Llewelyn Davies

This report has been prepared by the Temple Group Ltd (Temple) with reasonable skill, care and diligence within the agreed scope and terms of contract and taking account of the manpower and resources devoted to it by agreement with its client.

The advice and opinions in this report should be read and relied on only in the context of the report as a whole, taking account of the terms of reference agreed with the client. The findings are based on the information made available to Temple at the date of the report and on current UK standards, codes, technology and practices as at that time. They do not purport to include any manner of legal advice or opinion. New information or changes in conditions and regulatory requirements may occur in future, which will change the conclusions presented here.

The content of this report is, at least in part, based upon information provided by others and on the assumption that all relevant information has been provided by those parties from whom it has been requested. Information obtained from any third party has not been independently verified by Temple, unless otherwise stated in the report.

This report is confidential to the client and whilst the client may submit the report to regulatory bodies, where appropriate, we disclaim any responsibility to the client and others in respect of any matters outside the scope of the above. We accept no responsibility to third parties to whom this report, or any part, thereof is made available and it should be noted that no third party is able to acquire any rights whatsoever, contractual or otherwise, against Temple except as expressly agreed with the terms of contract. Any such party relies upon the report at their own risk.

Contents

Appendix

1.0 Introduction

University College of London Hospitals Charity (UCLHC) are part refurbishing and redeveloping the existing Arthur Stanley House site located on Tottenham Street, London, W1T to form a new mixed use scheme, comprising residential and commercial uses.

This environmental noise investigation and report has been commissioned in connection with re-development of the site.

The site is exposed to existing road traffic noise. Therefore, an assessment has been undertaken to assess its suitability for noise sensitive residential development. These noise levels have been assessed in line with the London Borough of Camden's (LBC) guidance and relevant national standards.

Details of the assessment methodology used, together with the results of the survey undertaken and the subsequent conclusions and recommendations, are presented within the following report.

2.0 Noise principles and standards used

2.1 National Policy

2.1.1 National Planning Policy Framework (NPPF)

The National Planning Policy Framework was introduced by the Department of Communities and Local Government in March 2012. The document sets out the Government's planning policies for England and how these are expected to be applied.

The planning system is required to contribute to and enhance the natural and local environment. Consequently, the aim is to prevent both new and existing development from contributing to or being put at unacceptable risk from noise, or being adversely affected by unacceptable levels of noise pollution.

Therefore 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 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 that have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

2.1.2 Noise Policy Statement for England (NPSE)

The Noise Policy Statement for England (NPSE) seeks to clarify the underlying principles and aims in existing policy documents, legislation and guidance that relate to noise. The statement applies to all forms of noise, including environmental noise, neighbour noise and neighbourhood noise.

The statement sets out the long-term vision of the government's noise policy, which is to *"promote good health and a good quality of life through the effective management of noise within the context of policy on sustainable development".*

The guidance promotes the effective management and control of noise, within the context of Government policy on sustainable development and thereby aims to:

- Avoid significant adverse impacts on health and quality of life;
- Mitigate and minimise adverse impacts on health and quality of life; and
- Where possible, contribute to the improvements of health and quality of life.

The statement adopts established concepts from toxicology that are currently being applied to noise impacts. The concept details noise levels, at which the effects of an exposure may be classified into a specific category. The classification categories as detailed within NPSE are as follows:

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

It is recognised that SOAEL does not have a single objective noise-based level that is applicable to all sources of noise in all situations and therefore the SOAEL is likely to be different for different sources, receptors and at different times of the day.

No guidance has been issued at the time of writing to identify the SOAEL and LOAEL for typical noise sources and receptors.

2.1.3 Planning Practice Guidance (PPG) Noise

The Planning Practice Guidance (PPG) expands on the use of SOAEL: *"If the exposure is above this level the planning process should be used to avoid this effect occurring, by use of appropriate mitigation such as by altering the design and layout. Such decisions must be made taking account of the economic and social benefit of the activity causing the noise, but it is undesirable for such exposure to be caused."*

The PPG also goes on to identify unacceptable noise exposure: *"At the highest extreme, noise exposure would cause extensive and sustained changes in behaviour without an ability to mitigate the effect of noise. The impacts on health and quality of life are such that regardless of the benefits of the activity causing the noise, this situation should be prevented from occurring."*

2.2 Regional Policy

2.2.1 The London Plan – Spatial Development Strategy for Greater London

The Mayor of London has published the London Plan 2011. With specific reference to noise, the London Plan contains Policy 7.15: Reducing Noise and Enhancing Soundscapes:

"Planning Decisions:

> *B) Development proposals should seek to reduce noise by:*
>
> *Minimising the existing and potential adverse impacts of noise on, from, within, or in the vicinity of, development proposals;*
>
> *Separating new noise sensitive development from major noise sources wherever practicable through the use of distance, screening, or internal layout in preference to sole reliance on sound insulation;*
>
> *Promoting new technologies and improved practices to reduce noise at source."*

2.2.2 Sounder City: The Mayor's London Ambient Noise Strategy

The London Ambient Noise Strategy aims to minimise the adverse impacts of noise on people living, working in and visiting London by using the best available practices and technologies within a sustainable development framework.

The Strategy aims to work towards more compact city development, while minimising noise. This requires careful consideration of the adverse impact of noise on, from, within or in proximity to a development.

2.3 Local policy

2.3.1 Camden Development Policies 2010-2025 (Local Development Framework)

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."

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 Tables below, quoted from the document, show these limits:

Table 2.1 – Noise levels on residential sites adjoining railways and roads at which planning permission will not be granted

Noise Description and location of measurement	Period	Time	Site adjoining road
Noise at 1 metre external to a sensitive façade	Day	0700-1900	72 dB L_{Aeq},12hour
Noise at 1 metre external to a sensitive façade	Evening	1900-2300	72 dB L_{Aeq},4hour
Noise at 1 metre external to a sensitive façade	Night	2300-0700	66 dB L_{Aeq},8hour

Table 2.2 – Noise levels on residential streets adjoining railways and roads at and above which attenuation measures will be required

Noise Description and location of measurement	Period	Time	Site adjoining road
Noise at 1 metre external to a sensitive façade	Day	0700-1900	62 dB L_{Aeq},12hour
Noise at 1 metre external to a sensitive façade	Evening	1900-2300	57 dB L_{Aeq},4hour
Noise at 1 metre external to a sensitive façade	Night	2300-0700	52 dB L_{Aeq},1hour
Noise at 1 metre external to a sensitive façade	Night	2300-0700	>82 dB L_{ASMAX}

2.4 Standards and guidance

British Standard 7445

British Standard (BS) 7445: 1991 'Description and Measurement of Environmental Noise' defines parameters, procedures and instrumentation required for noise measurement and analysis.

British Standard 8233

British Standard 8233: 2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' provides criteria for the assessment of internal noise levels for various uses including dwellings and commercial properties. The standard suggests suitable internal noise levels within different types of buildings as shown in **Table 2.3**.

Table 2.3 – BS8233 Guideline Indoor Noise Levels for Dwellings

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,\ 8hour}$

Note 7: Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.

Planning Policy Guidance 24

PPG24 has been superseded, however it does include useful guidance for correcting measured $L_{A10\ 18hour}$ values (using CRTN procedure) to $L_{Aeq,\ 18hour}$ values for use in assessment.

Calculation of Road Traffic Noise

Department of Transport/Welsh Office Memorandum 'Calculation of Road Traffic Noise (CRTN)' describes procedures for traffic noise calculation, and is suitable for environmental assessments of schemes where road traffic noise may have an impact.

The document includes a shortened daytime measurements method for site dominated by road traffic, which is an alternative to 16-hour monitoring. This method requires L_{A10} noise levels to be measured over three consecutive 1-hour periods between 10:00 and 17:00 hours. Generally shortened measurements within each hourly period are considered to be representative.

BS4142

BS4142 : "Method for rating industrial noise affecting mixed residential and industrial areas"(2003): provides information of how to take precautions to minimize the influence on the readings from sources of interference such as, wind, heavy rain or electrical interference. The Standard also recommends the use of appropriate windshield to minimise turbulence at the microphone.

Defra Noise Maps

The Department for Environment Food and Rural Affairs has produced noise mapping for large urban areas, major transport sources and significant industrial sites in England in order to meet the requirements of the Environmental Noise (England) Regulation 2006. The maps represent a snapshot of the environmental noise situation in England for 2006.

The noise maps have been produced for use at a strategic level and give an acceptable level of accuracy for these purposes. They will not however necessarily properly represent the situation at a local level and the results of the noise mapping should not be used alone for any land use planning or location-specific assessments.

3.0 The site and its surroundings

The proposed site is an existing building at Tottenham Street, London, W1T. The site comprises the Arthur Stanley House, which is a 7 storey building and is situated on the corner of Tottenham Street and Tottenham Mews. Residential and commercial units surround the proposed development. Tottenham Street is a one-way street with relatively few cars compared to other surrounding roads.

Approximately 50m to the west of the site is Cleveland Street and about the same distance to the east is Charlotte Street. Both streets are quite busy roads leading to major London roads.

Please see **Figure 1** in **Appendix 1** showing the location of the noise monitors.

The redevelopment will include residential rooms and commercial spaces (offices). The surrounding area is a mixture of residential and commercial uses.

The ambient noise levels incident upon the site comprises distant traffic noise from the aforementioned roads and pedestrians.

For the duration of the survey, there were constructions works at worksites located at Tottenham Mews next to the proposed development and at the end of Tottenham Street leading to Cleveland Street. Further details are provided in Section 6.1.1.

4.0 Measurement methodology

The proposed development will be subject to noise generated by:

- Road Traffic – (Tottenham Street, Cleveland Street and Charlotte Street)

The above noise sources have been measured in order to assess any potential impact they will have on future occupants of the proposed development.

4.1 Unattended monitoring

Two long-term unattended environmental noise measurements were carried out between 14:40 on Monday 18th of August 2014 and 10:10 on Friday 22nd August 2014 to obtain full daytime and night-time ambient noise monitoring results during weekdays. The microphones were set up at 1m from the front façade at first floor level and 1 m from the rear façade at second floor level.

MP1: Unattended long term facing Tottenham Street.

MP2: Unattended long term facing the rear of the site.

The $L_{Amax(FAST)}$, L_{A10}, L_{Aeq} and L_{A90} sound pressure levels were measured continuously during the survey. Measurements are logged every 1 second; noise levels during appropriate measurement periods such as 1 hour, 5 minute, 15 minutes can then be calculated from the results.

The unattended measurement locations are shown in the site plan in **Figure 1** in Appendix 1.

4.2 Attended monitoring

Additional attended noise measurements were carried out due to construction noise from adjacent development affecting the unattended measurement position U1. All measurements locations are indicated in **Figure 1** in **Appendix 1**. Further detail regarding the attended measurement locations, including a description of their purpose is given below:

MP3: To the north east of the site; intended to measure road traffic noise levels from Charlotte Street. The sound level meter was on the pavement of Charlotte Street and Chitty Street and approximately 2m from the edge of the carriageway.

Measurements were carried out between 13:30 and 16:00 on 21st October 2014 including a 3 hour measurement in light of the CRTN shortened measurement procedure.

The sound level meter was set to measure continuous 15 minute time samples of $L_{Amax(FAST)}$, L_{A10}, L_{Aeq} and L_{A90} sound pressure levels during the measurement period. The 15 minute sample was chosen to represent the hourly L_{10} in accordance with the CRTN shortened measurement procedure.

For the attended measurement location the microphone was positioned at 1.2m height above the local ground level and is considered to be façade measurement.

4.3 Equipment and weather conditions

The equipment used is detailed in **Table 4.1** below. The sound level meters were fitted with windshields. Measurement systems were calibrated before and after the measurements and no variation occurred. Calibration certificates are available upon request.

Table 4.1 – Survey Equipment

Manufacturer	Item	Type	Serial Number
Rion	Sound Level Meter	NL52	00510141
Rion	Sound Level Meter	NL52	00410086
RION	Calibrator	NC-74	34936354
RION	Calibrator	NC-74	34936353

The weather conditions during the surveys were predominately dry with light winds apart from Monday the 18th were it rained from 16:40 to 23:55; consequently noise survey data has been excluded from the results during this time. Wind speeds were below the recommended maximum limits of 5m/s as specified in BS4142.

5.0 Noise survey results

5.1 Unattended measurement results

Presented within **Table 5.1** below, are the results of the long-term noise measurements at the unattended locations. A façade correction has been applied to the results due to reflections from the building envelope. A graph showing the time history of the measured results at the unattended monitoring locations is given in **Figure 2** in **Appendix 2**.

The night-time $L_{Aeq,1hr}$ was derived by taking an arithmetic average of the maximum 1 hour values measured during each night.

The typical L_{A90} has been derived by taking the arithmetic average of the minimum values of the L_{A90} levels measured during each time period. .

The typical L_{Amax} has been derived by taking the average of all the L_{Amax} levels measured during the specified time period and adding one standard deviation of the results and checking this against visual interrogation of the time history graph.

Table 5.1 – Summary Noise Monitoring Results – MP 1

Time Period	$L_{Aeq,T}$ dB	Typical L_{A90}, dB	Highest L_{AFmax}, dB	Typical L_{AFmax}, dB
Day 07:00-19:00, T=16hrs	60.9	38.2	92.3	81.6
Evening 19:00-23:00h, T=4hrs	52.7	40.8	88.5	71.8
Night-time 23.00-07.00h T=1hrs	50.4	-	-	-
Night-time 23.00-07.00h T=8hrs	49.8	35.0	86.7	67.3

Table 5.2 – Summary Noise Monitoring Results – MP 2

Time Period	$L_{Aeq,T}$ dB	Typical L_{A90}, dB	Highest L_{AFmax}, dB	Typical L_{AFmax}, dB
Day 07:00-19:00, T=16hrs	55.9	38.2	89.5	75.8
Evening 19:00-23:00h, T=4hrs	51.6	40.4	78.4	59.5
Night-time 23.00-07.00h T=1hrs	44.0	-	-	-
Night-time 23.00-07.00h T=8hrs	43.5	38.0	70.4	54.7

Due to the effect of construction noise during the daytime we have excluded daytime noise data given above from the assessment.

5.2 Attended measurement results

Table 5.3 shows the results of the road traffic noise measurements at Locations MP1 and MP2. $L_{A10,3hr}$ values have been corrected to $L_{Aeq,16hr}$ in accordance with CRTN and PPG24 guidance. The CRTN shortened measurement method involves taking traffic noise measurements (L_{A10}) over representative time periods within any three consecutive hours between 10:00 hours and 17:00 hours. By using the $L_{A10\ (3\ hour)}$, as the arithmetic mean of the measured $L_{A10\ (1hour)}$ values, the $L_{A10\ (18\ hour)}$ value can then be calculated. The $L_{A10\ (18\ hour)}$ values were then converted into the equivalent $L_{Aeq\ (16\ hour)}$ values using the PPG24 correction (subtracting 2dB). The noise levels presented are

considered to represent free field conditions, well away from any existing buildings; measured noise levels have been reduced by 3 dB to correct for façade reflections. Approximate position of the attended monitoring location is illustrated in **Figure 1** in **Appendix 1.**

Table 5.3 – Daytime Road Traffic Noise Measurements Results – MP3

		Noise Levels (dB)				Noise Levels (dB)	PPG24 Correction
Monitoring Location	**Time**	**$L_{Aeq,15min}$**	**$L_{A90,15min}$**	**$L_{AFmax,15min}$**	**$L_{A10,\ 1\ hour}$**	**Calculated $L_{A10,18\ hour}$**	**Approx. $L_{Aeq,16h}$**
MP1	21/10/2014 13:30-13:45	64.1	57.8	78.8	67.4	63.6	61.6
	21/10/2014 14:30-14:45	63.8	57.8	82.4	67.4		
	21/10/2014 15:30-15:45	64.3	57.0	77.5	57.0		

6.0 Noise assessment results

6.1 External noise assessment

The data has been analysed in accordance with the requirements of LBC. The noise survey results have been adjusted to obtain the free field noise levels at front and rear façades. **Table 6.1** below summarises the external noise level at the different facades of the proposed development.

Table 6.1 – Noise Exposure of Site

Façade	Period	Noise at 1 metre external to façade $L_{Aeq,T}$ (dB)		
		Measured noise Level	LBC Criteria Planning Permission not granted	LBC Criteria Attenuation Measures required
Front façade	Day 07:00-19:00 T = 12hrs	64	72	62
	Evening 19:00-23:00 T = 4hrs	56	72	57
	Night 23:00-07:00 T = 1hr	53	n/a	52
	Night 23:00-07:00 T = 8hrs	53	66	n/a
Rear Facade	Day 07:00-19:00 T = 12hrs	59	72	62
	Evening 19:00-23:00 T = 4hrs	55	72	57
	Night 23:00-07:00 T = 1hr	47	n/a	52
	Night 23:00-07:00 T = 8hrs	47	66	n/a

Note 1- Please refer to Section 1.1.1 for explanation of the influence of the temporary construction noise has been allowed for as part of this assessment.

For the façade facing Tottenham Street, i.e. the front façade, the day and night time noise levels are respectively 2dB(A) and 1dB(A) above the limits from the LBC whereby appropriate attenuation measures will need to be provided,

The measured day, evening and night time noise levels for the rear facade are below the LBC threshold levels.

Unfortunately L_{ASmax} levels were not collected during the survey; however the L_{AFmax} may be used as an analogue to compare against the criterion and is generally 2-3dB higher than the L_{ASmax} when the noise climate is dominated by road traffic. The highest measured L_{AFmax} levels on the front façade exceed the maximum noise level criterion whereby appropriate attenuation measures will need to be provided. However the typical L_{AFmax} is well below the limit and the limit is only exceeded a maximum of 2 times per night. Therefore typically the limit is only exceeded by the occasional event.

All measured noise levels are well below the LBC thresholds that would otherwise mean that planning permission should not be granted.

6.1.1 Construction noise influence on results

The dominant noise source during the daytime in the existing noise climate was noted to be construction noise from adjoining construction sites and distant construction noise from a site

located at the end of Tottenham Street to Cleveland Street. During the monitoring set up it was noted that HGV's were coming in and out from the aforementioned construction sites.

Road traffic noise measurements were undertaken of the local roads, noise from which dominates the underlying typical noise climate at the development. The results from the attended measurement at the measurement position 1 were used to predict the typical noise climate at the development during the day; corrections were applied for distance, screening and angle of view. The resultant $L_{Aeq,16hr}$ is 56.2 dB which in comparison with the unattended location MP1 which was heavily influenced by construction noise during the day is approximately 5 dB lower. The result is also taking into consideration the road traffic noise from Charlotte Street. This difference is an indication that, during the daytime, typical noise levels due to road traffic with no influence from construction will be lower than those measured.

In addition to the calculated results the measured noise levels were then compared to the levels given at the site locations by the Defra noise maps. The site falls into the 0 – 54.9 dB(A) L_{den} and the 0-49.9 dB(A) L_{night} noise band on the Defra noise maps. The results of the noise mapping should not be used alone for any land use planning or location-specific assessments, however along with the additional road traffic measurements and observations on site it is likely that daytime noise levels on the front façade of the development would not exceed the limits from the LBC typically.

6.2 Internal noise levels assessment

Guidance on acceptable noise design levels inside rooms for proposed development is set out in BS 8233:2014.

It is proposed that internal noise levels in the development is controlled using appropriate attenuation measures to 30 dB $L_{Aeq,8hr}$ and 45 dB $L_{AFMax,8hr}$ in bedrooms at night and 35 to 40 dB $L_{Aeq,16hr}$ in habitable rooms during the day in accordance with the BS8233 guidance.

Table 6.3 shows the free field external noise levels against the relevant internal noise level criteria.

Table 6.3 – BS8233 internal Noise Levels

Description	**External Noise Levels, dB**			**BS 8233/WHO Criteria, dB**		
	$L_{Aeq,16hr}$	**$L_{Aeq,8hr}$**	**$L_{AFmax,\ night}$**	**$L_{Aeq,16hr}$**	**$L_{Aeq,8hr}$**	**$L_{AFmax,\ night}$**
Front Facade	61	50	67	35	30	45
Rear Façade	56	44	55	35	30	45

It is proposed that noise from the development is controlled to 30 dB L_{Aeq} and 45 dB $L_{Af,max}$ in bedrooms at night and 35 to 40 dB L_{Aeq} in habitable rooms during the day in accordance with BS 8233:2014. To achieve these levels the sound insulation provide by the front façade will need to reduce the external noise levels by approximately R_{W+ctr} 20 dB during the night time and R_{W+ctr} 25 dB in the daytime. The performance is therefore dictated by the night time criterion.

The required performance cannot be achieved with open windows which would normally provide between 10 – 15dB sound reduction. The sound insulation performance of building facades is typically controlled by the glazing and ventilation systems selected. The required performance

described above is typically achieved using a standard acoustic double glazing (in conjunction with acoustic passive ventilation).

On the rear facing and more sheltered facades of the development, where lower noise levels are encountered a more standard natural ventilation system may be appropriate using attenuated ventilation openings.

Provided the internal noise climate can be maintained at a reasonable standard and occupants will have a satisfactory alternative to openable windows, there is no reason why, acoustically, the residential development should not be considered appropriate.

Please note that the detailed prediction of noise ingress is dependent upon the precise façade make up (glazed area etc.) and the acoustic characters of the proposed internal spaces. This information is not currently available; as such the above advice has been provided to demonstrate the feasibility of the mitigation. A more detailed assessment may be required once the design progresses.

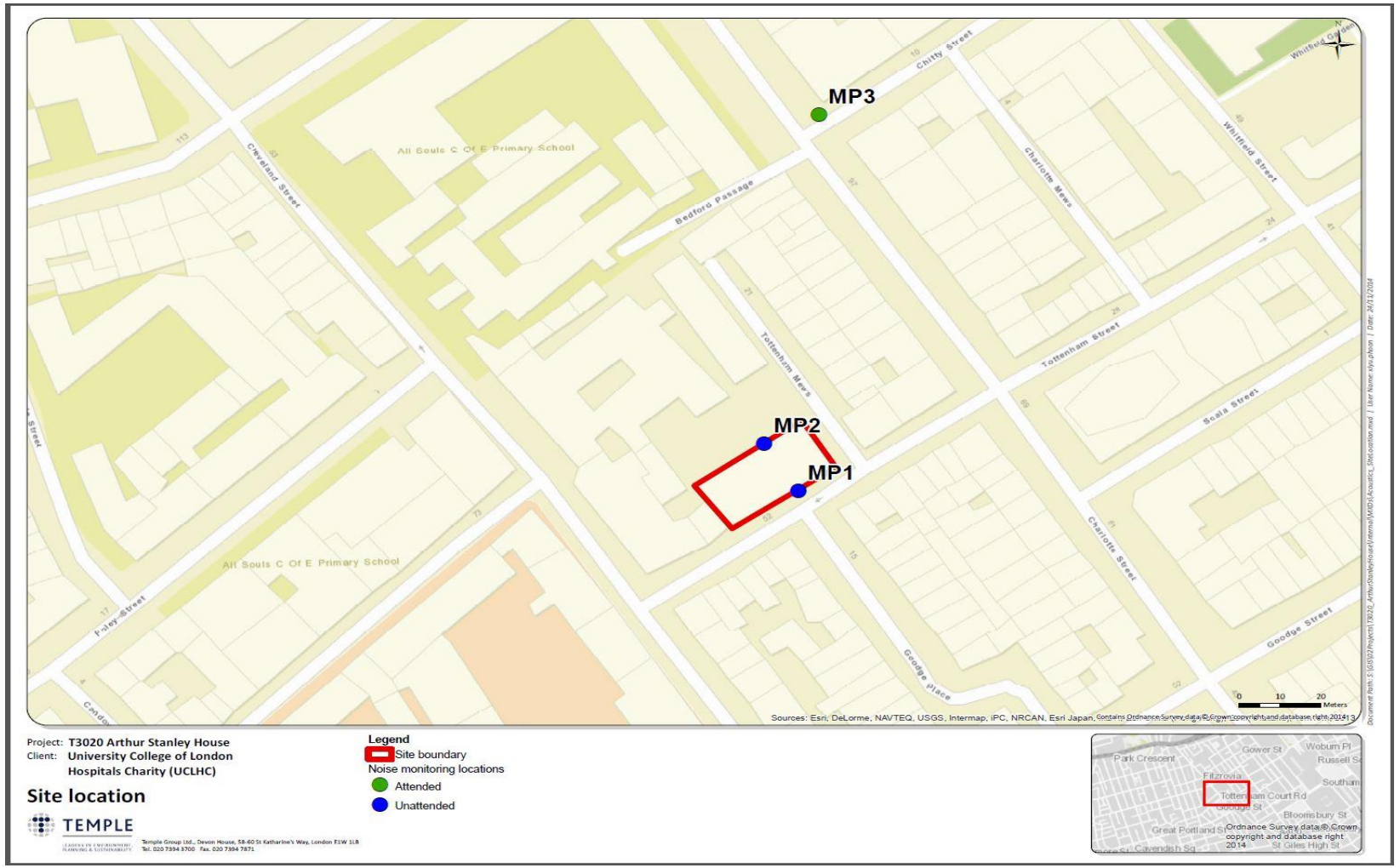
7.0 Conclusion

Temple Group has been appointed to undertake a noise assessment for the proposed mixed use refurbishment/ redevelopment of Arthur Stanley House at Tottenham Street, London, W1T. The assessment has been undertaken to determine the impact of noise associated with road traffic on the proposed residential development.

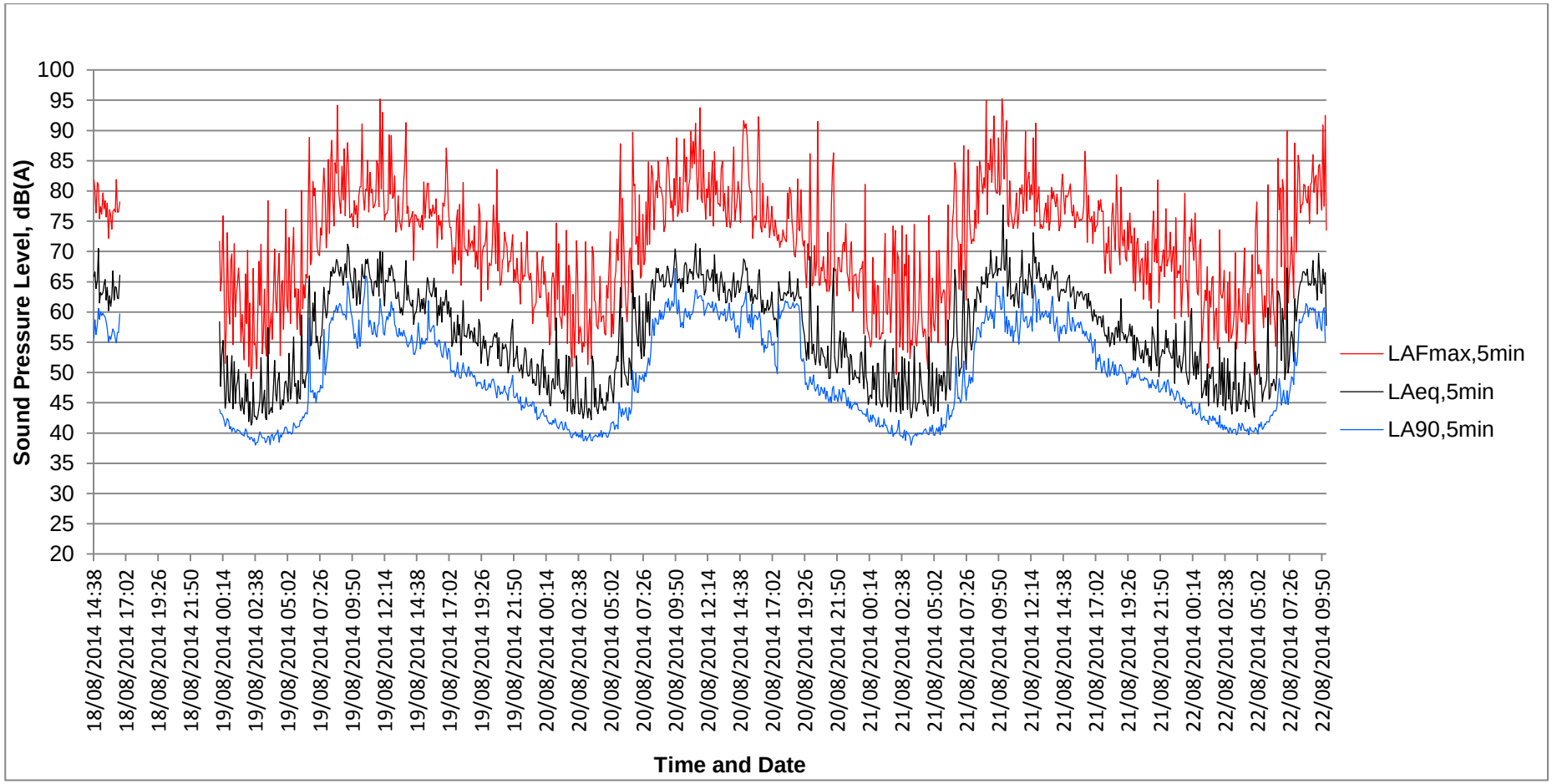
The noise levels at the proposed development are below the Noise threshold limits of the London Borough of Camden.

It is likely to be feasible to achieve the proposed internal noise levels recommended in BS8233 with acoustic glazing and attenuated passive ventilation to the front façade and conventional thermal double glazing and trickle ventilators to the rear. This is based on an outline facade assessment and detailed calculations will be required once the façade design has been finalised.

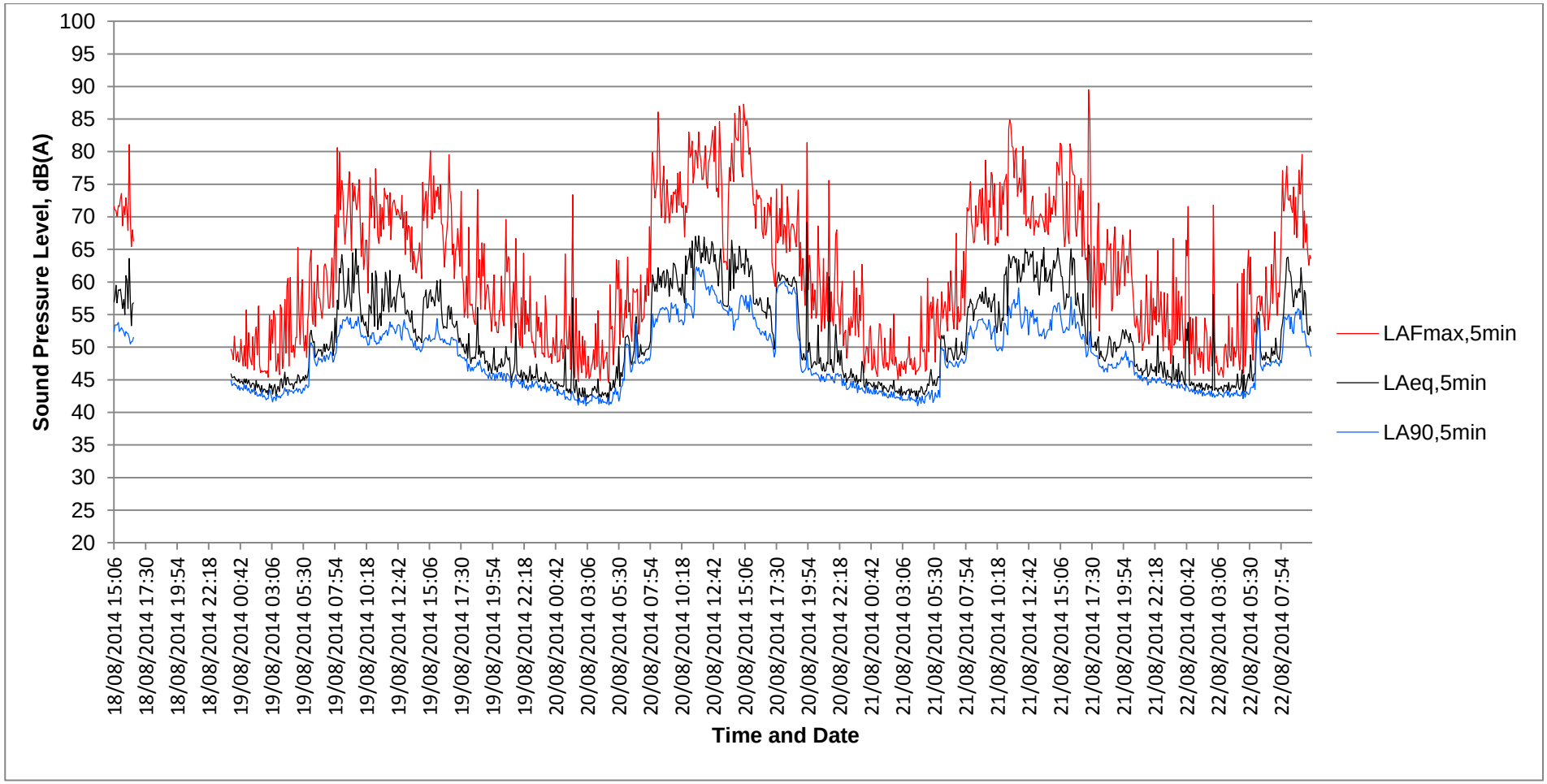
Appendix 1 Figure 1 – Noise Monitoring Locations



Appendix 1 Figure 2 – Unattended Noise Measurement Time History Graph – MP1



Appendix 1 Figure 3 – Unattended Noise Measurement Time History Graph – MP2



Temple Group Ltd
Devon House
58-60 St Katharine's Way
London E1W 1LB

Tel: +44 (0) 20 7394 3700
Fax: +44 (0) 20 7394 7871

www.templegroup.co.uk

TEMPLE

LEADERS IN ENVIRONMENT,
PLANNING & SUSTAINABILITY.