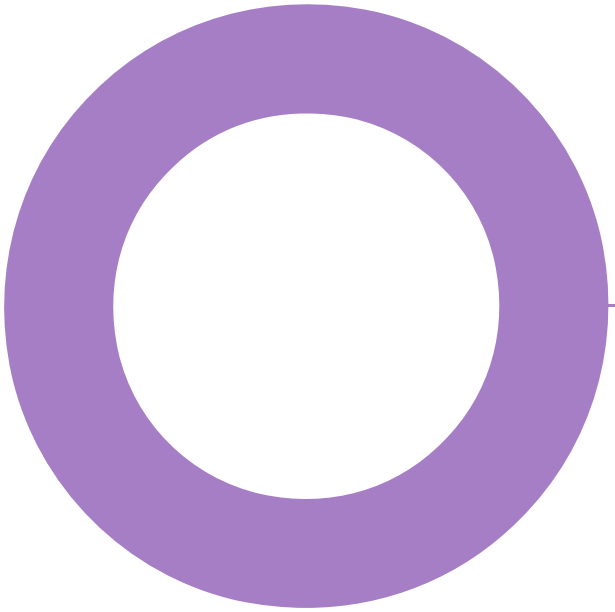
HOARE LEA

BSU, Anatomy Rodents Plant Replacement.
Gower Street, Bloomsbury, London.
UCL.

ACOUSTICS
NOISE ASSESSMENT REPORT

REVISION 02 – 25 JANUARY 2024



Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
00	08/12/2023	For issue.	RI	GV	GV
01	12/12/2023	Planning Consultant comments included.	RI	GV	GV
02	25/01/2024	Removed SW18 roof assessment.	BHJ	RI	RI

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Contents.

Executive summary

This report has been prepared on behalf of University College London for the refurbishment the BSU in the Anatomy Building on Gower Street. Proposals include replacement of air handling units and installation of associated air source heat pump units at roof level.

It is recognised that external noise emissions from new plant will need to be controlled so as to protect the amenity of existing noise-sensitive uses nearby. This report serves to present an acoustic assessment of the plant proposals and demonstrate that the planning requirements of the London Borough of Camden can be achieved.

Baseline sound survey.
An environmental sound survey has been undertaken at the proposed development site to establish the baseline acoustic environment. Unattended measurements were captured over a representative period inclusive of a weekend, to establish long-term trends in the local sound climate. Further attended measurements were captured on Gower Street to gain an understanding of how the sound climate changes with height.

Prevailing sound levels across the site are predominantly influenced by road and pedestrian traffic on the local road network. Following a typical daily cycle driven by activity in the local area, reaching a peak during the day before receding into the early hours of the morning.

The measurement data from the survey have been used to inform the assessment of external noise emission from building services plant.

Assessment of noise emissions.
External plant associated with the development is understood to comprise replacement of two number air handling units and installation of associated air source heat pump units on the Darwin Building roof. External noise limits for new equipment have been established at the nearest noise-sensitive receivers in accordance with the London Borough of Camden's planning guidance and good practice.

The assessment of the proposals indicates that plant noise levels are expected to be -6 dB below prevailing background sound levels when assessed the nearest noise-sensitive receivers. This aligns with the "amber" noise threshold as set out within Camden Local Plan and would be considered indicative of low impact in the context of BS 4142.

With mechanical mitigation in the form of attenuation on the AHU atmospheric connections, the assessment demonstrates that the "green" noise threshold is achievable. Accordingly, insertion loss requirement of in-duct attenuator has been specified for implementation on to the installed plant.

The proposals are therefore considered compliant with the strategic objectives of Camden's Policy A4 which seeks to prevent "*development likely to generate unacceptable noise and vibration impacts".*

1. Introduction.

Hoare Lea LLP have been appointed by the University College London to provide a noise assessment for the proposed plant replacement associated with the refurbishment of the BSU in the Anatomy Building on Gower Street in Bloomsbury.

The proposals include the replacement of and installation of new fixed plant equipment at roof level on the Darwin Building. The new plant equipment has been identified as potential new source of noise.

An acoustic survey has been undertaken at various locations at and around the development site, including locations representative of the nearest identified noise sensitive receptors. Noise emission limits are proposed based on the results of the survey following current British Standard guidance, in line with local and national planning policy. The proposals are subject to agreement with the Local Planning Authority, Camden London Borough Council.

Operational noise associated with the proposed new fixed plant noise sources has been assessed and mitigation is discussed.

This report is suitable for submission alongside the planning application for the development.

2. Site context.

The Anatomy Building of University College London is located on Gower Street in Bloomsbury.

The prevailing noise climate is typical of a busy city centre location close to a primary road traffic route. Dominant noise is from traffic on Gower Street. Existing building services plant associated with University College London and other nearby buildings is also present and contributes to the prevailing noise climate.

The surrounding uses are mixed including residential, commercial and education uses. The nearest noise sensitive receptor has been identified as the student accommodation at Arthur Tattersall House,

The image below highlights the proposed plant locations and identified nearest identified noise sensitive receptors:

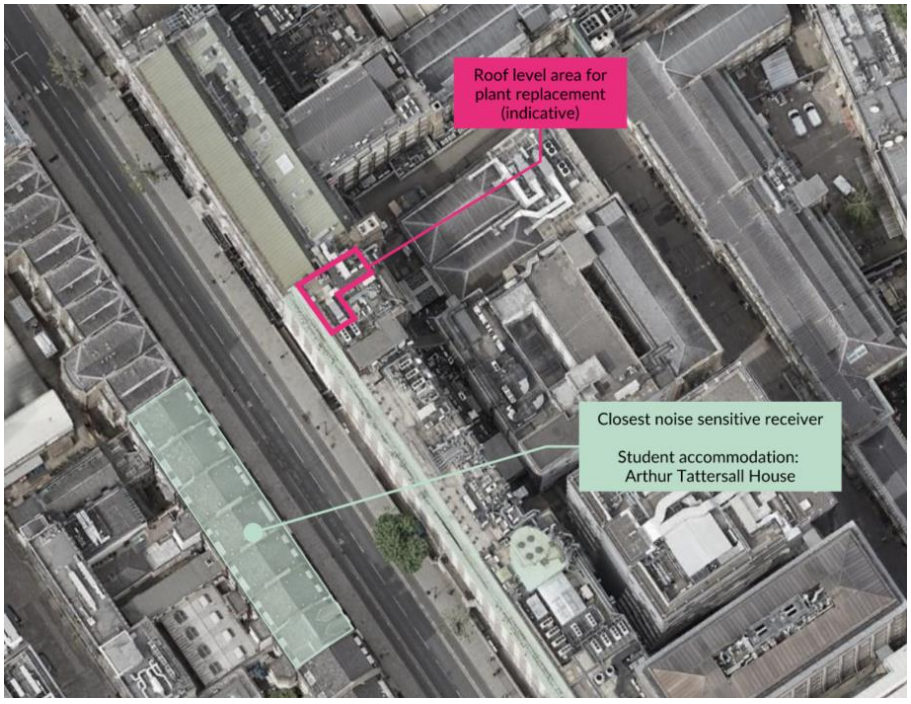

Figure 1: Site context and location of nearest noise sensitive receptors.

3. National and Local Planning Policy.

3.1 National policy

Noise Policy Statement for England

Noise Policy Statement for England (NPSE) advises that noise impacts should be assessed on the basis of adverse and significant adverse effect but does not provide any specific guidance on assessment methods or numerical noise limits.

Paragraphs 2.20 and 2.22 of NPSE introduce the concepts summarised in Table 1, which can be applied when considering the significance of noise impacts, as defined by the World Health Organization.

Paragraph 2.15 of the document advises that it is not possible to have *'a single objective noise-based measure that is... applicable to all sources of noise in all situations*'. NPSE further advises in paragraph 2.22 that the sound level at which an adverse effect occurs is likely to be '*different for different noise sources, for different receptors at different times*'.

Effect Level	Description
No Observed Effect Level (NOEL)	This is the noise level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.
Lowest Observed Adverse Effect Level (LOAEL)	This is the level above which adverse effects on health and quality of life can be detected.
Significant Observed Adverse Effect Level (SOAEL)	This is the level above which significant adverse effects on health and quality of life occur.

Table 1: NPSE observed effect levels.

National Planning Policy Framework

National Planning Policy Framework (NPPF, Dec 2023) sets out the Government's planning policies and how these are expected to be applied. In relation to noise and vibration, NPPF section 15 paragraphs 180, 191 and 193 are presented below:

'180. Planning policies and decisions should contribute to and enhance the natural and local environment by:

...

e) *preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution...'.*

'191. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) *mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life[69];*
b) *identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and ...'*

'193. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of

development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.'

Planning Practice Guidance

Online Planning Practice Guidance (PPG) has been published to provide greater details in relation to the relevance of noise to the planning process following the introduction of NPPF and NPSE.

This guidance states, under the heading *'How can noise impacts be determined'*, that the following should be considered by local authorities:

- *'whether or not a significant adverse effect is occurring or likely to occur;*
- *whether or not an adverse effect is occurring or likely to occur; and*
- *whether or not a good standard of amenity can be achieved.'*

In line with NPSE, this includes identifying where noise exposure is above or below the significant observed adverse effect level and the lowest observed adverse effect level for a given situation during the operation of the Proposed Development.

Further guidance on each of the various observed effect levels set out in NPSE is provided in the table contained within the section headed *'How can it be established whether noise is likely to be a concern?'* which is reproduced below in Table 2.

It is important to note that no specific noise parameters or target noise levels are defined in the text.

Under the heading *'What factors influence whether noise could be a concern?'*, the subjective nature of noise is discussed. It is stated that the relationship between noise levels and the impact on those affected is not simple, as this depends on how various factors combine in particular situations.

Perception	Example of outcomes	Increasing effect level	Action
Not present	No effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude, or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect Level	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

Table 2: PPG Observed Effects.

3.2 Local policy.

3.2.1 Camden Local Plan.

Planning policies for development in the Borough of Camden are included in the Camden London Borough Council *Camden Local Plan 2017*. The Local Plan includes a section on noise and vibration within chapter 6 *Protecting amenity*. The section includes the following relevant policy, Policy A4, which is reproduced below:

Policy A4 Noise and vibration

The Council will seek to ensure that noise and vibration is controlled and managed.

Development should have regard to Camden's Noise and Vibration Thresholds (Appendix 3). We will not grant planning permission for:

a. development likely to generate unacceptable noise and vibration impacts; or

b. development sensitive to noise in locations which experience high levels of noise, unless appropriate attenuation measures can be provided and will not harm the continued operation of existing uses.

We will only grant permission for noise generating development, including any plant and machinery, if it can be operated without causing harm to amenity. We will also seek to minimise the impact on local amenity from deliveries and from the demolition and construction phases of development.

Appendix 3 of the *Local Plan* introduces a Red-Amber-Green system for assessing the significance of noise impact using the NPSE and PPG observed effect levels. For plant and machinery noise, the following guidance is given for assessment external to noise sensitive dwellings:

Assessment period	LOAEL (Green)	LOAEL to SOAEL (Amber)	SOAEL (Red)
Daytime (07:00 – 23:00)	Rating level 10 dB* below background	Rating level between 9 dB below and 5 dB above background	Rating level greater than 5 dB above background
Night-time (23:00 – 07:00)	Rating level 10 dB* below background and no events exceeding 57 dB L_{Amax}	Rating level between 9 dB below and 5 dB above background, or events between 57 dB and 88 dB L_{Amax}	Rating level greater than 5 dB above background, and/or events exceeding 88 dB L_{Amax}
*10 dB should be increased to 15 dB if the noise contains audible tonal elements (day and night). However, if it can be demonstrated that there is no significant difference in the character of the residual background noise and the specific noise from the proposed development then this reduction may not be required. In addition, a frequency analysis (to include, the use of Noise Rating (NR) curves or other criteria curves) for the assessment of tonal or low frequency noise may be required.			

Table 3: Camden Local Plan Appendix 3 Noise levels applicable to proposed industrial and commercial developments (including plant and machinery).

3.2.2 The London Plan.

The importance of managing noise is made clear throughout the London Plan.

Policy D14 specifically relates to noise:

"Policy D14 Noise

A *In order to reduce, manage and mitigate noise to improve health and quality of life, residential and other non-aviation development proposals should manage noise by:*

1) avoiding significant adverse noise impacts on health and quality of life

2) reflecting the Agent of Change principle as set out in Policy D13 Agent of Change

3) mitigating and minimising the existing and potential adverse impacts of noise on, from, within, as a result of, or in the vicinity of new development without placing unreasonable restrictions on existing noise-generating uses

4) improving and enhancing the acoustic environment and promoting appropriate soundscapes (including Quiet Areas and spaces of relative tranquillity

5) separating new noise-sensitive development from major noise sources (such as road, rail, air transport and some types of industrial use) through the use of distance, screening, layout, orientation, uses and materials – in preference to sole reliance on sound insulation

6) where it is not possible to achieve separation of noise-sensitive development and noise sources without undue impact on other sustainable development objectives, then any potential adverse effects should be controlled and mitigated through applying good acoustic design principles

7) promoting new technologies and improved practices to reduce noise at source, and on the transmission path from source to receiver.

B Boroughs, and others with relevant responsibilities, should identify and nominate new Quiet Areas and protect existing Quiet Areas in line with the procedure in Defra's Noise Action Plan for Agglomerations."

3.3 National Guidance and Standards

British Standard 4142:2014

British Standard 4142:2014 (BS 4142) (British Standards Institute, 2014) provides guidance for assessing commercial operations and fixed building services plant noise. The British Standard provides an objective method for rating the significance of impact from industrial and commercial operations. It describes a means of determining sound levels from fixed plant installations and determining the background sound levels that prevail on a site.

The assessment of the impacts is based on the subtraction of the pre-existing background sound level ($L_{A90,T}$) from the rating level ($L_{Ar,Tr}$).

The standard does not give a definitive method for determining the background sound level but instead, as a commentary, states that:

"the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods".

Clause 8.1.4, which discusses the monitoring duration, states *"there is no "single" background sound level as this is a fluctuating parameter. However, the background sound level used for the assessment should be representative of the period being assessed."* As a note to this clause the following commentary is given on obtaining a representative backgrounds sound level:

"To obtain a representative background sound level a series of either sequential or disaggregated measurements ought to be carried out for the period(s) of interest, possibly on more than one occasion. A representative level ought to account for the range of background sound levels and ought not automatically to be assumed to be either the minimum or modal value."

The rating level is defined objectively as the specific source noise level in question (either measured or predicted) with graduated corrections for tonality (up to +6 dB(A)), impulsivity (up to +9 dB(A)), intermittency (+3 dB(A)) and other sound characteristics (+3 dB(A)) which may be determined either subjectively or objectively, if necessary.

The background sound level is subtracted from the rating level. The following is considered when evaluating the potential impact:

- A difference of around +10 dB is likely to be an indication of a significant adverse impact, depending on context;

- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on context; and
- A difference of +0 dB or less is an indication of the specific sound source having a low impact, depending on the context, and the lower the rating is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact.

The importance of context is highlighted in BS 4142, which states that the following factors should be taken into consideration when the initial estimate of the impact needs to be modified due to the context:

"1) The absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.

Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.

Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.

2) The character and level of the residual sound compared to the character and level of the specific sound. Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound, to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would occur in the absence of the specific sound. Any sound parameters, sampling periods and averaging time periods used to undertake character comparisons should reflect the way in which sound of an industrial and/or commercial nature is likely to be perceived and how people react to it.

NOTE 3 Consideration should be given to evidence on human response to sound and, in particular, industrial and/or commercial sound where it is available. A number of studies are listed in the "Effects on humans of industrial and commercial sound" portion of the "Further reading" list in the Bibliography.

3) The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as:

i) facade insulation treatment;

ii) ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and

iii) acoustic screening."

4. Acoustic survey.

An acoustic survey of prevailing external noise levels was undertaken at the development site during November 2023.

Detailed acoustic survey measurements were obtained at various discrete points local to development. The acoustic survey locations are shown in the figures below:

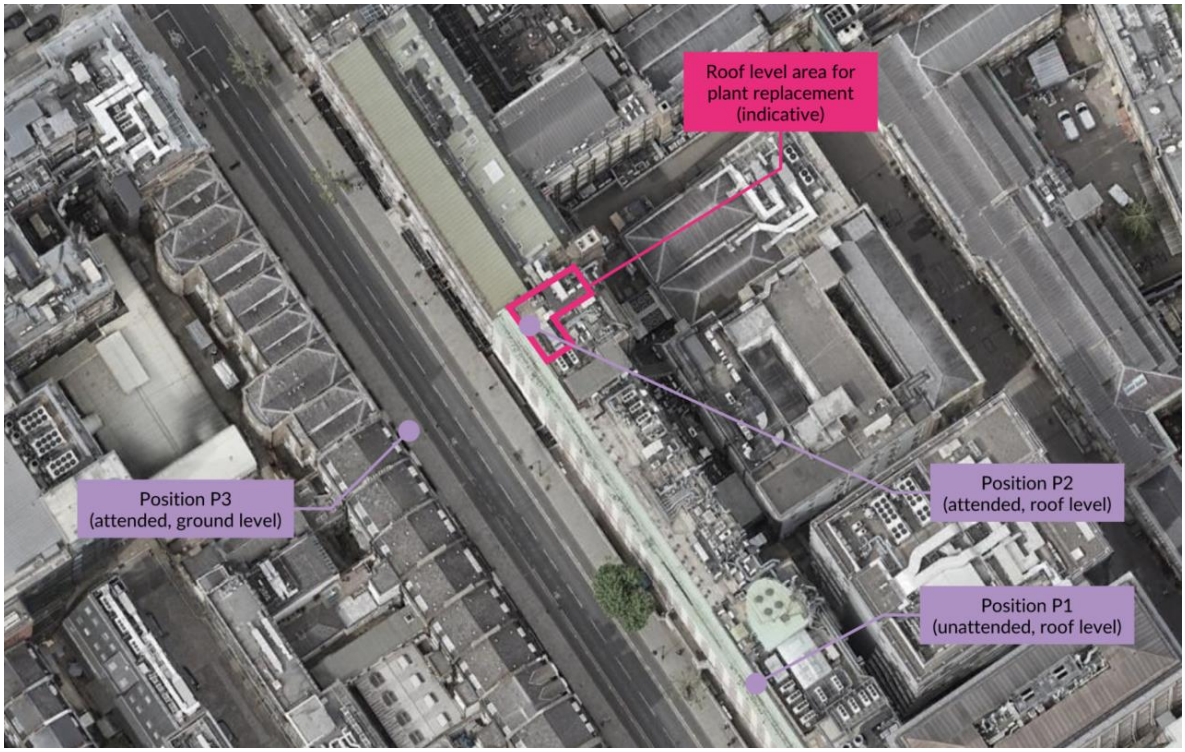

Figure 2: Aerial photograph showing the positions of acoustic survey locations.

Figure 3: Survey position 1 overlooking Gower Street.

Figure 4: Survey Position 3 on Gower Street, looking upward towards plant area.

Measurements at positions 1 and 3 are considered representative of the receptors on Gower Street.

Measurements at positions 2 were to benchmark the existing roof level plant noise levels, including equipment to be retained and equipment to be replaced.

The time history chart below shows the ambient band background sound levels at position 1.

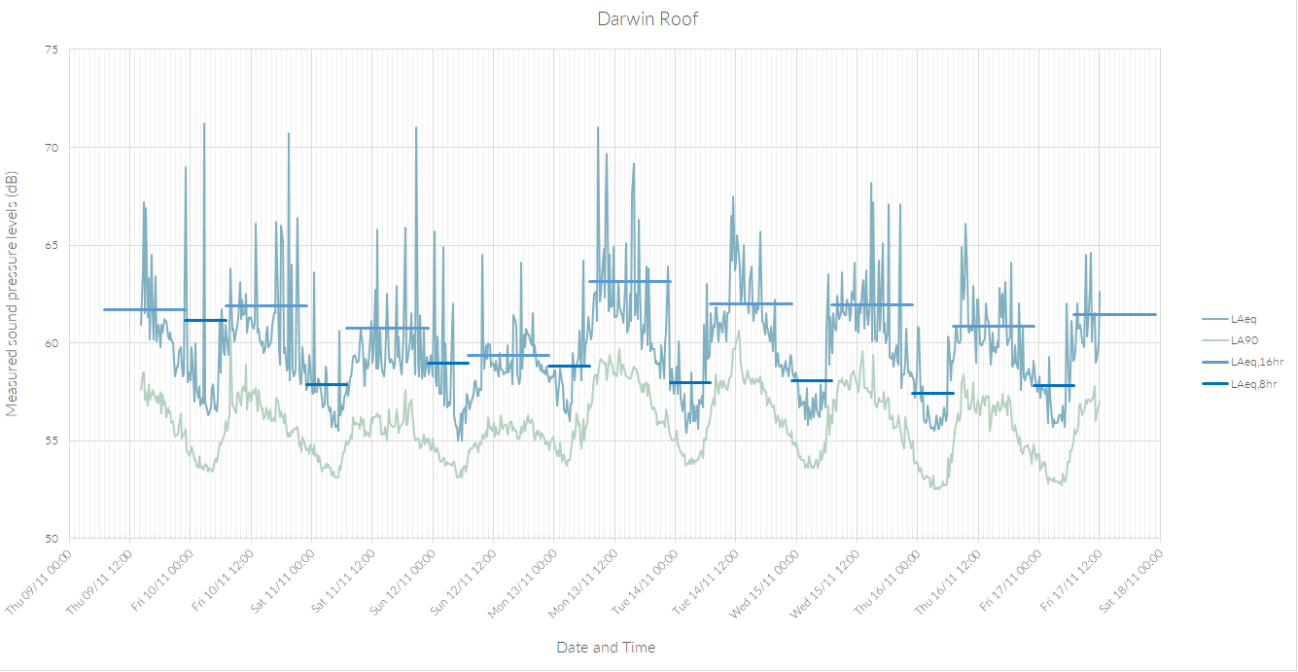

Figure 5: Time history chart of the measured noise levels at Position 1 (Roof Level, Darwin Building overlooking Gower Street).

The table below summarises the ambient noise level acoustic survey results at each measurement position.

Survey position	Description	Ambient noise level, $L_{Aeq,T}$	
		Daytime	Night-time
1.	Roof Level, Darwin Building overlooking Gower Street	62 dB	59 dB
2.	Darwin Building Roof Level Plant Area	65 dB	-
3.	Ground level, Gower Street	70 dB	-

Table 4: Summary of measured external ambient noise levels.

The Camden London Borough Council Local Plan requires plant noise to be assessed following BS 4142, which includes determining the typical background sound level.

In line with the guidance given in BS 4142, in order to *"quantify what is typical during particular time periods"*, a statistical analysis of the measured background sound levels has been undertaken.

The periods of interest for this development are daytime and night-time. Daytime is taken as between the hours of 07:00 and 23:00. Night-time is taken as between the hours of 23:00 and 07:00.

The 15 minute duration background sound values measured during the day will never be higher than the $L_{A90,1\,h}$ for that period so represent a worst-case. The measured 15 minute values will be used in place of the daytime 1 hour reference time interval required by BS 4142.

The following charts provides an analysis of the daytime and night-time period of interest background sound levels.

In line with the guidance given in BS 4142, in order to *"quantify what is typical during particular time periods"*, a statistical analysis of the measured background sound levels has been undertaken.

The periods of interest for this development are daytime and night-time. Daytime is taken as between the hours of 07:00 and 23:00. Night-time is taken as between the hours of 23:00 and 07:00.

The 15 minute duration background sound values measured during the day will never be higher than the $L_{A90,1\ h}$ for that period so represent a worst-case. The measured 15 minute values will be used in place of the daytime 1 hour reference time interval required by BS 4142.

The following charts provides an analysis of the daytime and night-time period of interest background sound levels.

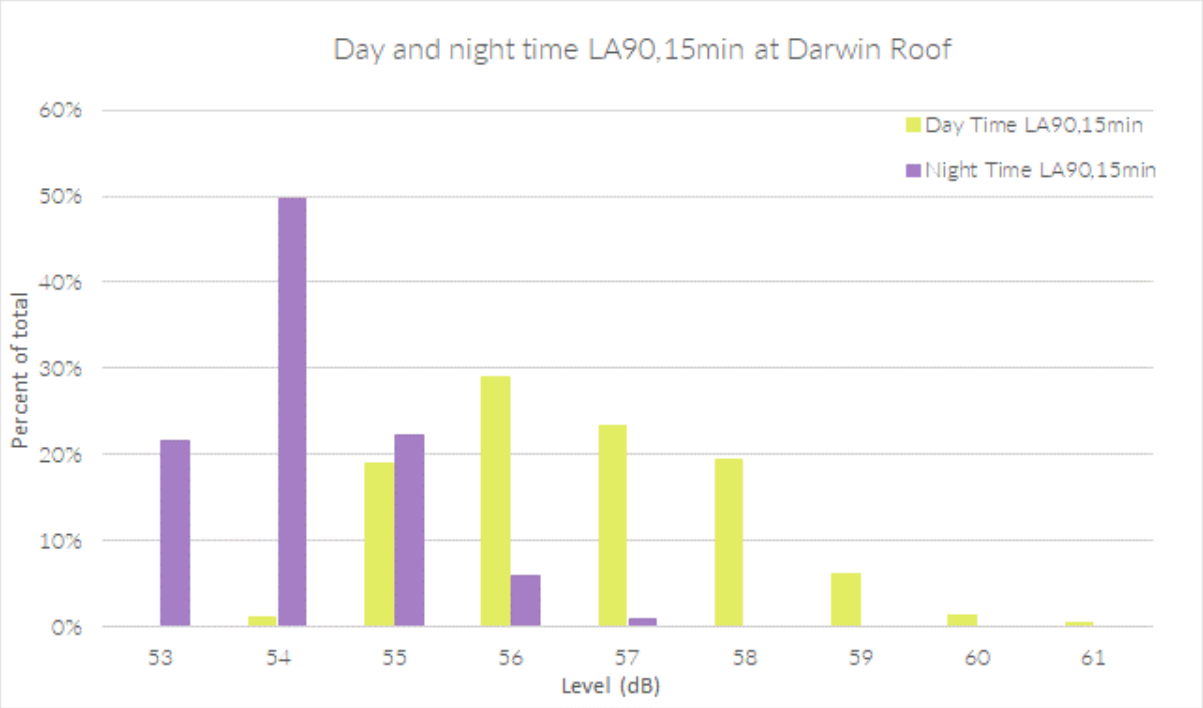

Figure 6: Statistical analysis of the background sound levels measured at Position 1.

The background sound level measured at Position 4 was 59 dB $L_{A90,15\ min}$. This is comparable to the synchronised measurement of 57 dB $L_{A90,15\ min}$ at Position 1. On this basis the measurements at Position 1 are considered representative of the receptors on Gower Street.

From the above statistical analysis chart and time history chart, given the context of the site, the following typical lower background sound levels have been determined representative for the periods of interest:

Assessment period	Background sound level
Daytime (07:00 – 23:00)	56 dB $L_{A90,1\ h}$
Night-time (23:00 – 07:00)	54 dB $L_{A90,15\ min}$

Table 5: Background sound levels.

5. Proposed noise emission limits.

Camden London Borough Council have established a series of noise thresholds with which to assess external noise emissions from new building services plant. These are defined within Appendix 3 of the Local Plan and apply to the cumulative rating level, established in accordance with BS 4142: 2014, when assessed at the nearest noise sensitive façade and compared to prevailing background sound levels.

These thresholds are presented in Table 6 alongside project specific design limits derived from the survey data.

Category	Description	Threshold	Project specific limits.
Green	LOAEL	Rating level 10 dB below background.	Day: 46 dB $L_{A90,1\ h}$ Night: 44 dB $L_{A90,15\ min}$
Amber	Between LOAEL and SOAEL	Rating level between 9 dB below and 5 dB above background.	Day: 47 - 60 dB $L_{A90,1\ h}$ Night: 45 - 58 dB $L_{A90,15\ min}$
Red	SOAEL	Rating level greater than 5 dB above background.	Day: 61 dB $L_{A90,1\ h}$ Night: 59 dB $L_{A90,15\ min}$

Table 6: Camden London Borough Council site specific noise thresholds.

Separate to Camden London Borough Council planning guidance, the assessment methodology of British Standard 4142: 2014 offers the following conclusions when the rating level is compared to background sound levels:

- A difference of around + 10 dB or more is likely to be an indication of a significant adverse impact, depending upon the context;
- A difference of around + 5 dB is likely to be an indication of an adverse impact, depending upon the context; and
- When the rating level does not exceed background sound levels, this is indication of a low impact, depending upon the context.

While the Camden London Borough Council green category is considered the ideal target for plant noise, the limits are not always practical to achieve with large plant installations. Designing to the amber thresholds is considered acceptable if steps to reduce noise as much as practicable have been taken.

Ensuring that plant noise does not normally exceed background sound levels would further reduce the risk of noise complaints as this would be a likely indication of a low impact when assessed in accordance with BS 4142.

6. Proposed new fixed plant equipment and assessments.

6.1 Sound sources.

A summary of the proposed MEP strategy is outlined in the figures below:

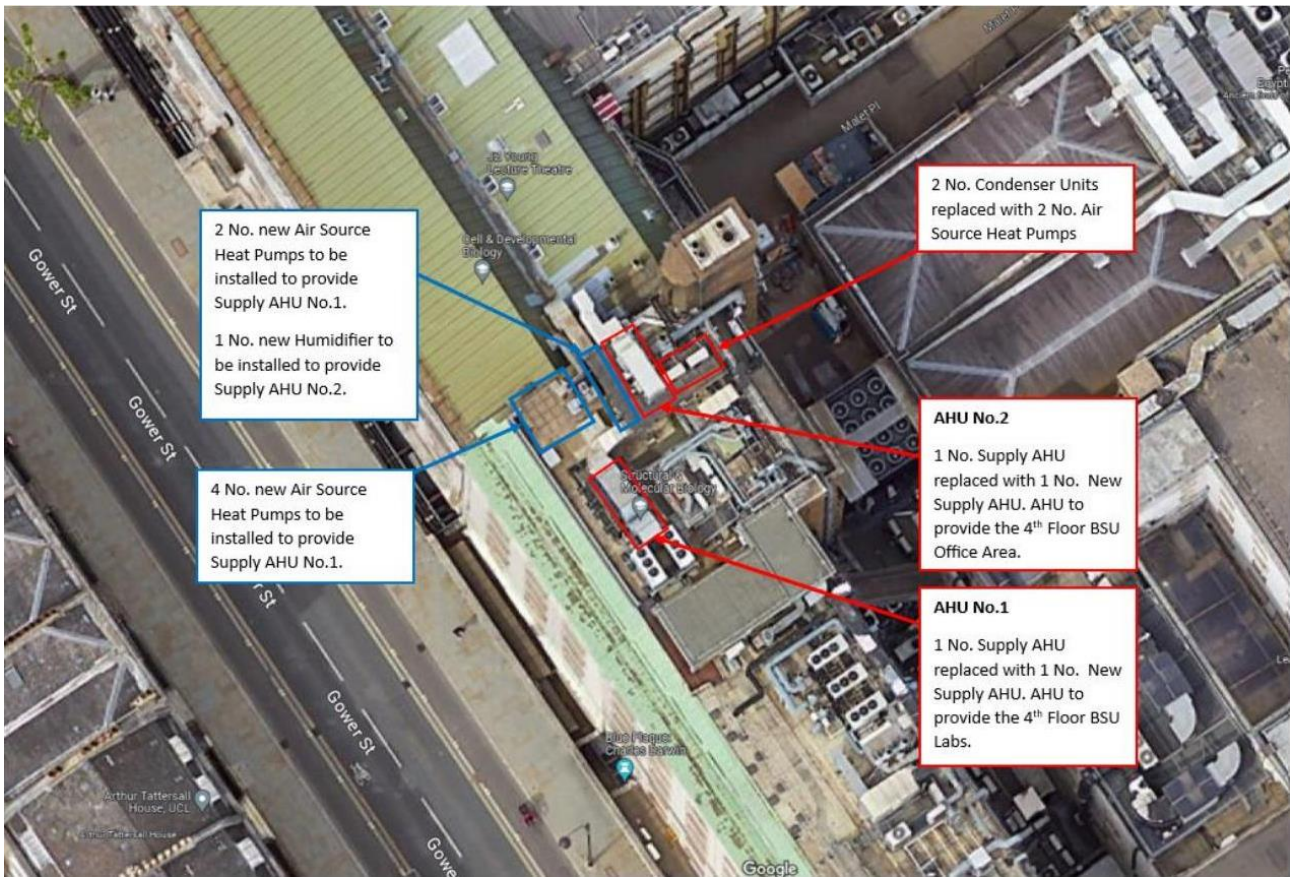

Figure 7: Summary of the proposed MEP strategy, Darwin Building roof.

The project MEP Contractor has provided noise data for the proposed plant equipment. Source sound levels are summarised below:

Sound source(s)	Number of items	Sound power level (per item)	Plant information.
AHU_01 Intake	1	Lw 73 dB(A)	Klimor EVO-S
AHU_01 Exhaust	1	Lw 85 dB(A)	
AHU_01 Casing	1	Lw 61 dB(A)	
AHU_02 Intake	1	Lw 82 dB(A)	Complete Ventilation Solutions ATC Millennium Line 2 H x 4 W
AHU_02 Casing	1	Lw 75 dB(A)	
ASHP	6	Lw 70 dB(A)	Mitsubishi PUZ-ZM250YKA. Darwin roof.

Table 7: Summary of noise source sound data.

6.2 Calculation methodology.

The principles of ISO 9613-2 have been followed, including barrier screening effect provided by the edges of the Darwin Building, to calculate noise emissions to the closest noise sensitive receptors.

The sound sources have potential to operate over 24 h. Night-time noise levels have been assessed as a worst case.

6.3 Preliminary assessment.

Using the received sound data, noise emissions have been calculated and assessed against the Camden London Borough Council site specific noise thresholds:

Total specific sound level	48 dB $L_{Aeq,15\ min}$	Logarithmic addition of the source sound levels, Table 7.
Acoustic feature correction	0 dB	Audible tonal elements are not anticipated given the masking provided by the prevailing ambient noise level c. 59 dB $L_{Aeq,15\ min\ during}$ the night-time.
Total specific sound level	48 dB $L_{Ar,15\ min}$	Logarithmic addition of the source sound levels.
Background sound level	54 dB $L_{A90,15\ min}$	See Table 5
Excess over background sound level	-6 dB	
CLBC Assessment category	Amber	Between LOAEL and SOAEL
BS 4142 assessment	Low impact.	

Table 8: Preliminary assessment of proposed plant equipment.

6.4 Recommended mitigation and subsequent assessment.

The mitigation strategy approach follows the flow chart in Figure 8. Mitigation options for the strategy are summarised in Table 9 below.

Operational mitigation	Includes selection (or re-selection) of plant items and operational setbacks.
Mechanical mitigation	Includes acoustic packages and attenuators
Architectural mitigation	Includes solid acoustic barrier around external plant areas and plant room enclosures

Table 9: Mitigation type options.

The mitigation advice is to be reviewed and developed to suit any changes to the mechanical engineering design.

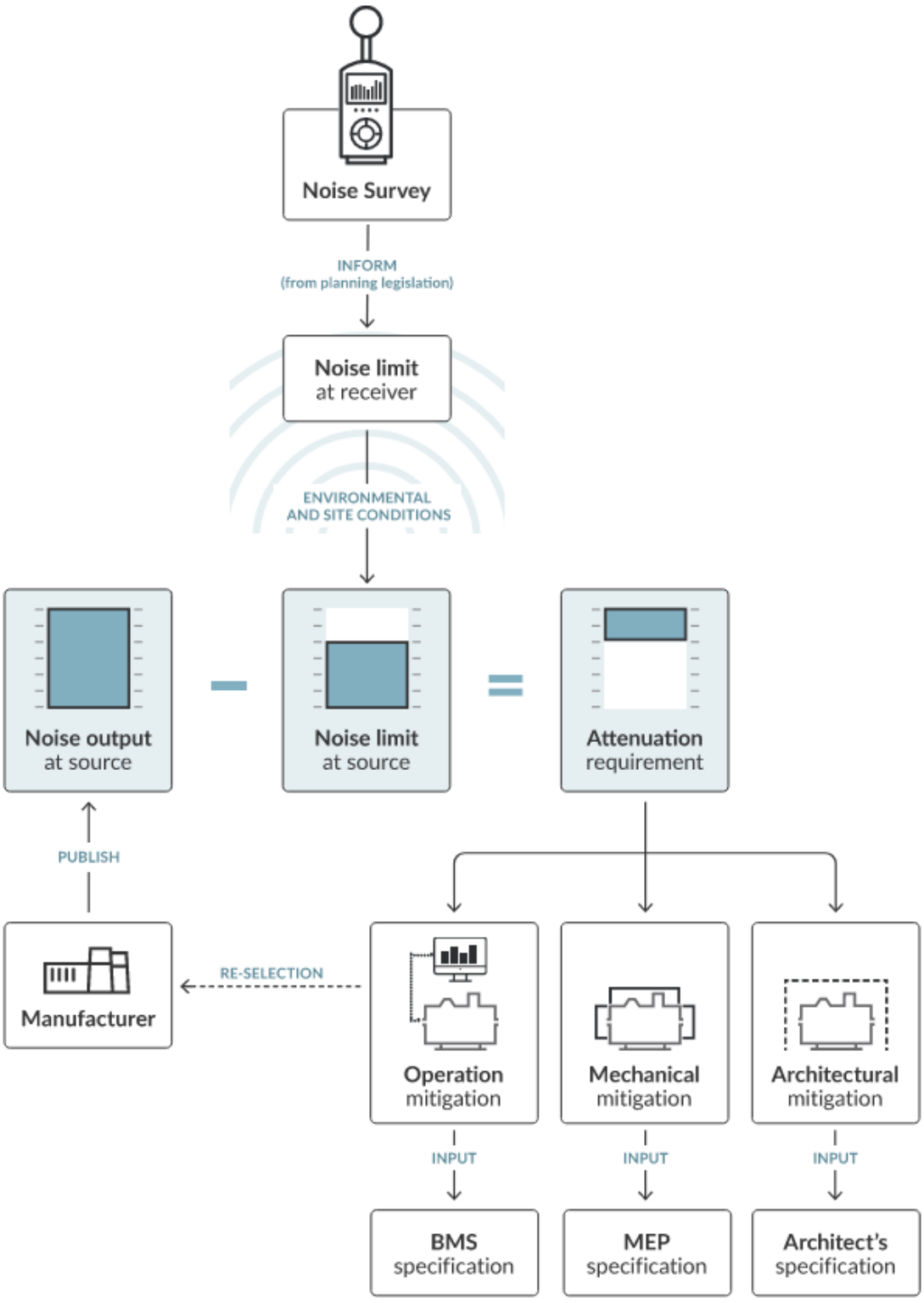

Figure 8: Noise mitigation strategy flow chart.

With noise control mitigation it is possible to reduce the specific sound level with a view to limiting noise levels to the 'green' assessment category. Suggested mitigation is summarised below:

Plant item	Suggested sound power level limit	Mitigation type	Details of mitigation.
AHU_01 Intake	L_W 58 dB(A)	Mechanical	Attenuator providing 15 dB(A) insertion loss.
AHU_01 Exhaust	L_W 65 dB(A)	Mechanical	Attenuator providing 20 dB(A) insertion loss.
AHU_02 Intake	L_W 68 dB(A)	Mechanical	Attenuator providing 13 dB(A) insertion loss.

Table 10: Recommended mitigation.

The above suggested mitigation has been discussed and agreed in principle with the project MEP Contractor

With the above mitigation applied, noise emissions have calculated and assessed against the Camden London Borough Council site specific noise thresholds:

Total specific sound level	44 dB $L_{Aeq,15\ min}$	Logarithmic addition of the source sound levels with mitigation, Table 7 and Table 10.
Acoustic feature correction	0 dB	Audible tonal elements are not anticipated given the masking provided by the prevailing ambient noise level c. 59 dB $L_{Aeq,15\ min\ during}$ the night-time.
Total specific sound level	44 dB $L_{Ar,15\ min}$	Logarithmic addition of the source sound levels.
Background sound level	54 dB $L_{A90,15\ min}$	See Table 5
Excess over background sound level	-10 dB	
CLBC Assessment category	Green	LOAEL
BS 4142 assessment	Low impact.	

Table 11: Assessment of proposed plant equipment with suggested mitigation.

The assessment demonstrates that with mitigation the Camden London Borough Council site specific noise threshold for the LOAEL is achievable.

7. Summary and conclusion.

Hoare Lea LLP have been appointed by the University College London to provide a noise assessment for the proposed plant replacement associated with the refurbishment of the BSU in the Anatomy Building on Gower Street in Bloomsbury.

The proposals replacement of and installation of new fixed plant equipment at roof level on the Darwin Building. The new plant equipment has been identified as potential new source of noise.

The closest noise sensitive receptors have been identified as the student accommodation dwellings directly opposite on Gower Street. The prevailing noise climate at a locations representative of the closest receptors has been quantified by direct measurement.

This report proposes noise limits for plant installations associated with the development, based on the results of the acoustic survey following the guidance of Camden London Borough Council. The proposed noise emission limits are subject to agreement with Camden London Borough Council.

The assessment of the proposals indicates that plant noise levels are expected to be -6 dB below prevailing background sound levels when assessed the nearest noise-sensitive receivers. Outline noise control advice has been provided for the likely required noise mitigation required to reduce noise emissions to below the LOAEL.

With mechanical mitigation in the form of attenuation on the AHU atmospheric connections, the assessment demonstrates that the Camden London Borough Council site specific noise threshold for the LOAEL is achievable.

The proposals are therefore considered compliant with the strategic objectives of Camden's Policy A4 which seeks to prevent "*development likely to generate unacceptable noise and vibration impacts".*

The report is suitable for submission alongside the planning application for the development and for use by the Local Planning Authority to agree operational noise limits.

HOARE LEA

ROBERT IAFRATI
ASSOCIATE

+44 1454 806 775
robertiafrati@hoarelea.com

HOARELEA.COM

Western Transit Shed
12-13 Stable Street
London
N1C 4AB
England