THE EQUUS PARTNERSHIP

Member of the Association of Noise Consultants

CONSULTANTS IN ACOUSTICS

HEATHSIDE PREPARATORY SCHOOL

Proposed Change of Use of 76 Heath Street To Provide Additional Curriculum Facilities

Noise Impact Statement

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Report prepared for:

Heathside Preparatory School

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APPENDICES

1 INTRODUCTION

This **Noise Impact Statement** accompanies a planning application submitted by Heathside Preparatory School. The Planning Application seeks the change of use of 76 Heath Street from Class A3 to part Class D1 (School) (to provide additional curriculum facilities to the existing school) and part Class A1 (Retail) use.

This **Noise Impact Statement** presents:

- The results of noise monitoring undertaken at the site to determine existing environmental noise levels that characterise the site.
- Discussion regarding the significance of measured noise levels in the context of relevant 'industry standard' design guidance.
- Discusses the potential noise impacts that will arise from the proposed change of use, with particular regard to the creation of new external teaching/garden areas.
- Discusses noise control measures that are to be implemented within the scheme design to mitigate noise impacts, in accordance with relevant national, regional and local planning policy.
- Contrasts the potential noise impact of the site with that which could be permitted by the continued A3 use of the site.

2 SITE DESCRIPTION

Heathside Preparatory School is a co-educational, non-denominational school for boys and girls aged 3 to 11 years. The school currently operates from two sites, including premises at 86A Heath Street. These premises were originally constructed as the Church Hall and ancillary accommodation for Heath Street Church, which adjoins the school to the north.

The internal accommodation of the school is principally arranged over ground and lower ground floor levels, with an external "L" shaped play area at lower ground floor level which runs parallel to Heath Street and returning back towards Heath Street alongside the Church.

Neighbouring buildings on Heath Street appear to have commercial uses at ground and lower ground floor levels, with residential use on the upper floors.

The change of use application relates to no. 76 Heath Street, also located on the eastern side of Heath Street. The premises are a mid terrace, four storey building (including basement). The ground floor and basement are currently vacant, but have previously been used as a restaurant (Use Class A3). The upper floors have residential use (Class C3).

The location of the site and its general environs are shown on **Figure 1** attached at **Appendix A**.

3 DEVELOPMENT PROPOSALS

The proposed development seeks the change of use of the ground and basement areas of no 76 Heath Street. Planning permission is sought to change the use of the "front" portion of the building (fronting Heath Street) to retail (Class A1) use, with the major rear portion changing to use Class D1 to provide additional curriculum facilities for the school. Proposed uses include a new science laboratory, auditorium, lunch room, food preparation area, multi-functional space space and outside teaching area. The proposals also include internal and external alterations to the existing school building at 86A Heath Street to facilitate improvements to circulation between 86A and 76 Heath Street.

The current number of children on the school roll is 250. The proposed development scheme does not seek to materially increase this number. In that regard, the development proposals do not seek a major intensification of the school use, but will provide additional resources, enabling the school to provide improved learning environments and general circulation for their students.

Full details of the proposed scheme are shown on the Harper Downie Architects' drawings which accompany the Application.

The proposed development includes the creation of new external areas. As shown on Harper Downie Architects' drawings, these spaces are intended to provide more formal external learning environments including an external teaching area (which will create a covered and partially enclosed space) and an external library area.

4 PLANNING POLICY CONTEXT & ASSESSMENT GUIDANCE

In considering the potential noise impact of the proposed development, reference will be made to the following policy guidance and 'industry standard' design guidance.

4.1 National Policy

Current governmental guidance relating to the determination of planning applications is given in the "**National Planning Policy Framework"** (NPPF). The NPPF replaces earlier governmental Planning Guidance including Planning Policy Guide Note 24: Planning and Noise (PPG24) which has guided development for the previous 18 years.

Paragraph 109 of the NPPF advises:

> *"The planning system should contribute to and enhance the natural and local environment by:*
>
> - *protecting and enhancing valued landscapes, geological conservation interests and soils;*
> - *recognising the wider benefits of ecosystem services;*
> - *minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*
> - *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; and*
> - *remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.*

With specific regard to noise, paragraph 123 of the NPPF states:

> *"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."*

With regard to the *"adverse impacts"* referred to in the first two of the above bullet points, the NPPF directs the reader to the advice contained in DEFRA's "**Noise Policy Statement for England"** (NPSE). This Policy Statement introduces the concept of a "*Significant Observed Adverse Effect Level*" (SOAEL), "Lowest Observed Adverse Effect Level" (LOAEL) and "*No Observed Adverse Effect Level*" (NOAEL). However, whilst the intent of the NPSE in relation to the NPPF is clear, the Noise Policy Statement for England does not, at this time, provide any quantitative threshold values for each identified level of "effect". Indeed, the NPSE carefully highlights that:

> *"It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available."*

The Government has now issued "National Planning Practice Guidance" to assist in understanding the perception of noise effects, outcomes and actions that should be taken to align decision making with the NPPF.

The table below sets out this guidance:

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	**No specific measures required**
No Observed Adverse Effect Level (NOAEL)			
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	**No specific measures required**
Lowest Observed Adverse Effect Level (LOAEL)			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows for some of the time because of the noise. Potential for non-awakening sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	**Mitigate and reduce to a minimum**
Significant Observed Adverse Effect Level (SOAEL)			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. having to keep windows closed most of the time, avoiding certain activities during periods of intrusion. 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	**Avoid**
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	**Prevent**

In light of the above, it can be seen that whilst the NPPF and associated planning practice guidance set out stringent imperatives to ensure the satisfactory development of land in relation to possible noise impacts, the NPPF does not generally provide any detailed technical guidance defining what may be considered to constitute a "significant" or "other" adverse impact. In the absence of such technical guidance, reference will need to be been made to sustainable development standards set out in local policy and relevant *'industry standard'* guidance, as set out later in this report.

4.2 Regional Policy

4.2.1 The London Plan 2011

The London Plan includes policies to make London a more attractive, well-designed and green city. With regard to the noise, Policies 5.3 (Sustainable Design and Construction) and 7.15 (Reducing Noise and Enhancing Soundscapes) are most relevant.

Policy 5.3 requires that:

> *"The highest standards of sustainable design and construction should be achieved in London to improve the environmental performance of new developments and to adapt to the effects of climate change over their lifetime."*

Policy 7.15 sets out the following aims:

Strategic

A *The transport, spatial and design policies of this plan will be implemented in order to reduce noise and support the objectives of the Mayor's Ambient Noise Strategy.*

Planning decisions

B *Development proposals should seek to reduce noise by:*

a *minimising the existing and potential adverse impacts of noise on, from, within, or in the vicinity of, development proposals*

b *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*

c *promoting new technologies and improved practices to reduce noise at source.*

4.2.2 "Sounder City" – The Mayor's Ambient Noise Strategy (March 2004)

The Mayor's ambient noise strategy addresses three key noise issues:

- *Securing good, noise-reducing surfaces on Transport for London's roads.*
- *Securing a night aircraft ban across London.*
- *Reducing noise through better planning and design of new housing.*

Other priorities highlighted in the strategy are:

- *reducing noise through better planning and design, where London's growth in people and jobs presents challenges, but redevelopment and refurbishment also offer opportunities - high density, mixed-use development can create quiet outdoor spaces away from traffic*

4.3 Local Policy

The London Borough of Camden's adopted *"Core Strategy 2010-2025"* includes the following policy which seeks to protect the amenity of existing neighbours from new development:

CS5 – Managing the impact of growth and development

The Council will manage the impact of growth and development in Camden. We will ensure that development meets the full range of objectives of the Core Strategy and

other Local Development Framework documents, with particular consideration given to:

a) providing uses that meet the needs of Camden's population and contribute to the borough's London-wide role;

b) providing the infrastructure and facilities needed to support Camden's population and those who work in and visit the borough;

c) providing sustainable buildings and spaces of the highest quality; and

d) protecting and enhancing our environment and heritage and the amenity and quality of life of local communities.

The Council will protect the amenity of Camden's residents and those working in and visiting the borough by:

e) making sure that the impact of developments on their occupiers and neighbours is fully considered;

f) seeking to ensure development contributes towards strong and successful communities by balancing the needs of development with the needs and characteristics of local areas and communities; and

f) requiring mitigation measures where necessary.

The London Borough of Camden's Local Development Framework *("Camden Development Policies 2010-2025")* includes the following policies:

DP26 – Managing the impact of development on occupiers and neighbours

The Council will protect the quality of life of occupiers and neighbours by only granting permission for development that does not cause harm to amenity. The factors we will
consider include:

a) *visual privacy and overlooking;*

b) *overshadowing and outlook;*

c) *sunlight, daylight and artificial light levels;*

d) *noise and vibration levels;*

e) *odour, fumes and dust;*

f) *microclimate;*

g) *the inclusion of appropriate attenuation measures.*

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.*

c) *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.

The Council will seek to minimise the impact on local amenity from the demolition and construction phases of development. Where these phases are likely to cause harm, conditions and planning obligations may be used to minimise the impact

The *"Noise and Vibration Thresholds"* referenced in DP28 are set out in Tables appended to the Development Policies document. No specific thresholds are identified for assessing the potential impacts of new school development. Any building services installations associated with such development would need to be designed to be at least 5dB(A) lower than the

existing background noise level at adjoining noise sensitive properties or 10dB(A) lower, if the noise exhibits tonal or impulsive characteristics.

Camden's DP document indicates that *"noise sensitive"* development includes housing, schools and hospitals as well as offices, workshops and open spaces. As such the criteria above will need to be achieved at 1m from the façade of adjoining dwellings, offices, workshops and/or buildings in educational use.

4.4 Other Guidance

BS 8233: 2014

"Guidance on Sound Insulation and Noise Reduction For Buildings"

The latest revision of BS 8233 indicates that acoustic design targets for hotel rooms should be similar to those for dwellings, for which the standard offers the following guidance values:

Activity	Location	07.00 to 23.00 hours	23.00 t0 07.00 hours
Resting	Living Room	35dB $L_{Aeq,16hour}$	--
Dining	Dining Room/Area	40dB $L_{Aeq,16hour}$	--
Sleeping (daytime resting)	Bedroom	35dB $L_{Aeq,16hour}$	30dB $L_{Aeq,8hour}$

Note 4 to the above Table states:

> *"Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$ depending on the character and number of events per night. Sporadic noise events could require separate values."*

The above values represent noise levels "within" dwellings. Given that an open window will typically provide an outside to inside sound reduction of 10-15dB(A), the above design guidance suggests that external noise levels would need to be around 55dB $L_{Aeq,16hour}$ daytime and 45dB $L_{Aeq,8hour}$ (night-time), unless there are additional sound insulation provisions that will provide greater control over external noise intrusion (e.g. the provision of

alternative means of ventilation that enable adjoining noise sensitive properties to keep windows closed).

BS 4142: 1997
"Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas"

This standard assists in assessing the likelihood of complaint from an industrial noise source affecting residential accommodation. It is thus a relatively safe assumption that if noise emissions are unlikely to provoke complaints, the noise source is unlikely to be upheld as a statutory noise nuisance.

The foreword to the Standard qualifies that the assessment procedure is intended for noises "of an industrial nature". However, the Standard is widely accepted as the most relevant assessment method for noise from fixed plant installations.
The assessment procedure outlined in BS 4142 essentially involves comparing the "Rating Level" of a noise source and the "Background Noise Level" when the source is not present.

The "Rating Level" (L_{Ar}) referred to is the specific noise level of the noise source under investigation (in terms of the L_{Aeq} noise index), to which corrections are applied if the noise has certain audible characteristics. If the noise has a distinct tone (whistle, whine, hiss, screech, etc.), distinct impulses (bang, click, clatter, thump, etc.) or irregular enough in character to attract attention, a correction of +5dB is added to the specific noise level.

The "Background Noise Level" (L_{A90}) represents the noise level that is exceeded for 90% of the stated measurement period. For assessment purposes, the background noise level needs to be determined without the noise source under investigation operating.

The time of operation needs to be taken into account. During the day (normally taken to be 07.00 to 23.00 hours) a one hour measurement period is considered appropriate. During the night (normally taken to be 23.00 – 07.00 hours) a 5 minute time period is normally used.

The assessment method of BS 4142 states that:

> *"Assess the likelihood of complaints by subtracting the measured background noise level from the rating level.*
> *NOTE. More than one assessment may be appropriate.*
> *The greater this difference the greater the likelihood of complaints.*
> *A difference of around +10dB or more indicates that complaints are likely.*

A difference of around +5dB is of marginal significance.
If the rating level is more than 10dB below the measured background noise level then this is a positive indication that complaints are unlikely."

***"Guidelines for Community Noise"* - World Health Organisation, 1999**

This document provide a comprehensive summary of research regarding the effects of noise on the community. The introduction of the Guidelines state:

> *"Community noise (also called environmental noise, residential noise or domestic noise) is defined as noise emitted from all sources, except noise at the industrial workplace. Main sources of community noise include road, rail and air traffic, industries, construction and public work, and the neighbourhood. Typical neighbourhood noise comes from premises and installations related to the catering trade (restaurant, cafeterias, discotheques, etc.); from live or recorded music; from sporting events including motor sports; from playgrounds and car parks; and from domestic animals such as barking dogs. The main indoor sources are ventilation systems, office machines, home appliances and neighbours.*

Section 2 of the Guidelines presents a general discussion regarding the types of noise affecting communities and their measurement. The guidelines promote the use of the $L_{Aeq,T}$ noise index. However, where there are distinct events to the noise, such as with aircraft or railway noise, the guidelines recommend that measures of the individual events should be obtained (using, for example, L_{Amax} or L_{AE}), in addition to $L_{Aeq,T}$ measurements.

For dwellings, it is recommended that internal noise levels do not exceed a value of 35dB $L_{Aeq,T}$ in living rooms during the daytime (07.00 to 23.00 hours). These values equate to external sound levels of 50dB $L_{Aeq,T}$ incident on the windows of living rooms.

The WHO Guidelines also state that:

> *"During the daytime, few people are seriously annoyed by activities with L_{Aeq} levels below 55dB; or moderately annoyed with L_{Aeq} levels below 50dB."*

With regard to night-time noise, Section 4.3.2 of the WHO Guidelines state:

> *"At night, sound pressure levels at the outside façades of the living spaces should not exceed 45 dB L_{Aeq} and 60 dB L_{Amax}, so that people may sleep with bedroom*

windows open. These values have been obtained by assuming that that the noise reduction from outside to inside with the window partly open is 15 dB."

4.4.4 IOA/IEMA Draft "Guidelines for Noise Assessment" (2002)

This draft document has been prepared jointly by the Institute of Acoustics (IOA) and Institute of Environmental Assessment (IEMA) and is intended to set good practice standards for the scope, content and methodology of noise impact assessments.

Section 7 of the draft guidelines deals with the subjective assessment of potential noise impacts. The guidance given suggests that noise impacts are assessed by considering the significance of any change in baseline noise levels (in terms of the L_{A90} or L_{Aeq} noise indices, as considered appropriate) and any increase in the number or magnitude of typical event noise levels (in terms of the L_{Amax} noise index).

With regard to categorising the likely significance of noise level changes, the following example guidance is given:

Noise Change (dB)	Category
0	No Impact
0.1 – 2.9	Slight Impact
3.0 – 4.9	Moderate Impact
5.0 – 9.9	Substantial Impact
10.0 and more	Severe impact

5 EXISTING NOISE ENVIRONMENT

In order to determine existing environmental noise levels at the site, a noise survey was undertaken between 11th and 13th June 2014.

5.1 Measurement Location

Noise levels were continuously monitored at a location within the existing playground of the school, to the rear of existing properties fronting Heath Street, as shown on **Figure** 2 attached at **Appendix B**.

The measurement microphone was fixed to a microphone boon and located approximately 4m above ground level within the playground (setting the microphone at approximately ground floor level of the adjoining properties fronting Heath Street).

5.2 Instrumentation

The following instrumentation was used for the survey:

Brüel and Kjær Precision Sound Level Analyser	Type 2250
Brüel and Kjær ½" Condenser Microphone	Type 4189
Brüel and Kjær Sound Level Calibrator	Type 4230
Brüel and Kjær Outdoor Microphone Kit	Type UA 1404

5.3 Survey Procedure

The automated datalogger was configured to make measurements of the L_{A90}, L_{Aeq} and $L_{Amax,fast}$ sound levels over consecutive 15 minute periods. The analyser was also programmed to record corresponding octave band frequency spectra and make contemporaneous digital audio recordings to assist in noise source identification.

Please refer to **Appendix C** for an explanation of the acoustic terminology used above.

The sound level analyser was calibrated prior to the survey and the calibration was checked upon completion. No drift was found to have occurred.

5.4 Weather Conditions

Weather conditions during the survey were fine and dry with typical maximum daytime temperatures of 22-25°C and minimum night-time temperatures of around 12-13°C); no precipitation and light, north to north-easterly winds (below 5km/h).

5.5 Noise Survey Results

Measured noise levels are presented on **Time History Graphs 1** and **2** attached at **Appendix D**.

5.6 Discussion of Results

When the school is open, underlying levels of background noise levels are predominantly influenced by the sounds of children at play (animated conversations, laughter, singing, shouts, etc.). Such noise punctuates the underlying levels of background noise showing increasing ambient noise levels, as shown on **Time History Graphs 1** and **2**. The graphs do, however, clearly show that such noise is primarily concentrated between 09.00 to 16.00 hours.

The current daytime[1] noise levels measured during our survey was 68.8 dB $L_{Aeq,12hour.}$ It should be noted that these noise levels were measured approximately 4m above ground level of the play area, in close proximity to play equipment and thus additional propagation losses will need to be applied to determine noise levels incident on neighbouring residential windows. Calculations estimate that the current daytime noise level incident on the closest windows to the existing play area (1st floor windows to the rear of 80 Heath Street) is 56dB $L_{Aeq,12\ hour}$.

When the school is closed, ambient noise levels are dominated by local and distant traffic noise, aircraft overflying the site and birdsong. The current evening[2] noise level measured during our survey was 48.5 dB $L_{Aeq,4hours}$. The current night-time[3] noise level measured was 43.5 dB $L_{Aeq,8hour}$. Since these measurements are dominated by "distant" sources (rather than

[1] Defined as 07.00 to 19.00 hours, adopting the definition in Policy DP28 of Camden's Development Policies document.
[2] Defined as 19.00 to 23.00 hours, adopting the definition in Policy DP28.
[3] Defined as 23.00 to 07.00 hours, adopting the definition in Policy DP28.

localised activity in the playground), the measured noise levels are considered to provide a reasonable indication of noise levels likely to be experienced by neighbouring properties.

5.7 Significance of Measured Noise Levels

It is inevitable that the use of external play areas associated with schools will generate noise, as readily observed during the survey of this site. The measured daytime noise level calculated at adjoining dwellings marginally exceeds the daytime guidance values set out in World Health Organisation's *"Guidelines for Community Noise"*. That is perhaps an unsurprising conclusion given the relatively close proximity of the school to adjoining dwellings. However, it is also relevant to note that such impacts only occur during the 'normal' working day. There is no noise impact from the school when it is closed and measured noise levels clearly show that current evening and night-time noise levels are both below World Health Organisation guideline values. It is equally relevant to note that noise from the existing playground would not occur for extended time periods, during school holidays.

In light of the above, it is concluded that whilst the existing operation of the school has some noise impact on adjoining dwellings, the existing D1 use also enables neighbours to enjoy a high level of residential amenity during the evenings, at night, at weekends and during school holidays.

6 NOISE IMPACT OF PROPOSED CHANGE OF USE

The proposed change of use of the front portion of the site to Class A1 (Retail) use is not considered to raise any significant noise impact concerns, particularly when viewed in the context of a site having existing A3 use which can raise a number of noise impact concerns (e.g. general customer activity, customer access/egress, opening times into the evening/night-time period (subject to licensing restrictions) and need for mechanical services installations (e.g. kitchen extract fans, provision of comfort cooling, etc.).

The proposed change of use of the remainder of the site to Class D1 use does, however, merit further consideration. In respect of activities within the buildings, the proposed change of use is not considered to raise any greater concerns that might have previously been associated with the historic A3 use of the premises. General teaching activities will tend to be characterised by modest levels of speech, and use of other areas for dining, etc. are considered unlikely to generate any greater impact than a commercial restaurant. As such, it is considered that noise associated with the use of internal spaces should be adequately controlled by the existing fabric of the buildings, without detriment to the amenity of adjoining residential neighbours. Notwithstanding this, it should be noted that the development proposals also include a number of design measures that will help further optimise the sound insulation of the buildings. In light of the above, the greatest potential noise impact associated with the proposed change of use, is likely to arise from the use of new external areas and this is addressed below.

6.1 Source Noise Levels

As highlighted above, the external space associated with 76 Heath Street will provide a new external teaching space and a new library area. The more structured use of these spaces will typically be characterised by significantly lower noise levels than experienced in playground areas. Based on noise data extracted from the EQUUS Partnership's in-house database, the typical operational noise level of a classroom type environment is around 60-65dB $L_{Aeq,5mins}$, the noise level primarily being dominated by raised, human speech.

6.2 Design Considerations

As noted earlier and shown on the drawings prepared by Harper Downie accompanying the application, the proposed external teaching space is to be partially covered and enclosed by

a glazed roof. In order to minimise reverberant noise build-up within the covered space, it is proposed to apply an acoustically absorptive wall treatment, as shown on **Figure 3** attached at **Appendix E.** This treatment will help prevent acoustical reflections within the covered space. This will not only assist in helping to preserve speech intelligibility and effective communication between teachers and pupils, but also assist in minimising noise overspill from this area to adjoining properties.

The new library space to be created within the courtyard will also assist in further minimising noise overspill to residential properties to the east of the site.

6.3 Noise Propagation to Adjoining Flats

Based on the above assumed operational noise level within the external teaching space, the noise level incident on the nearest residential property (1st floor flat above 80 Heath Street) is calculated to be 47dB $L_{Aeq,5mins}$.

6.4 Noise Impact Assessment

As noted earlier, the existing daytime sound level estimated to be experienced by the flats above 80 Heath Street was 56dB L_{Aeq}.

It follows that the "additional" noise that may result from the simultaneous use of the new external areas to be created by the proposed change of use, will cause an increase of just 0.5dB on the existing ambient noise level. It is generally accepted that the average human ear cannot discern a sound level difference of less than 3dB(A), and as such the calculated increase to the existing noise environment is not considered to be significant. This is also supported by the suggested classification of noise level impacts set out in the IOA/IEMA draft *"Guidelines for Noise Impact Assessment"* which would conclude that there would only be a "slight" impact.

6.5 Conclusions

The noise impact assessment presented above concludes that the proposed external teaching space will not have any *"significant adverse impacts on health and quality of life"* and thus accords with national and local planning policy. Furthermore, as highlighted above the proposed development includes a number of design features intended to minimise and

control the acoustic environment of the proposed outdoor spaces and minimise noise overspill into the general environment. This again accords with national planning policy which imposes an obligation to "*mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development".*

In light of the above, it is concluded that the proposed change of use complies fully with both national and local planning policy.

7 RE-USE OF THE SITE FOR A3 OPERATIONS

As noted earlier, the development site currently has Class A3 use. It is, therefore, considered to be a material planning consideration to consider the potential impact of the possible continued use of the site for A3 purposes, relative to that predicted for the proposed change of use.

In order to make this comparison, the potential impact of the external space (if used for external eating/drinking) has been considered.

7.1 Source Noise Data

Source noise data for an equivalently sized external dining area has been extracted from the EQUUS Partnership's in-house database. The selected premises had a ground floor terrace which was located in front of an existing two storey property. The premises were in a relatively quiet village location, set back from adjoining roads thus enabling noise generated by the use of the terrace to be measured without any significant influence from extraneous activity. The survey was undertaken on a warm summer's evening with approximately 40 people seated on the terrace.

The typical noise level measured at a location approximately 6m from the side of the terrace were 55dB $L_{Aeq,5mins}$ and 70dB $L_{Amax,fast}$.

7.2 A3 Operational Noise Levels Incident On Adjoining Properties

Based on the above source noise data, the sound level likely to be experienced at the nearest flat overlooking the external terrace (1st floor flat above 80 Heath Street) is calculated to be 53dB $L_{Aeq,5mins}$ and 68dB $L_{Amax,fast}$.

7.3 Noise Impact Assessment

It is concluded that the use of the external space for continued A3 use would generate a noise level notably higher (6dB) than that predicted for the proposed change of use to Class D1. It follows that there would be a greater daytime noise impact from the external areas associated with 76 Heath Street under continued A3 use, compared with that resulting from educational use.

Whilst the above conclusion will, in itself, provide support to the potential amenity benefit that would result from the proposed change of use, a more important consideration is that the "insignificant" noise impact that would arise from a D1 use would only occur during the daytime period, whereas a restaurant may well experience its peak trading potential during the evening.

If the predicted A3 operational noise level is compared with the results of the automated noise monitoring and WHO guideline values, the following conclusions would be drawn:

(a) The existing evening noise level is 48dB $L_{Aeq,4hours}$. This is below the WHO "evening" guidance value of 50dB. The predicted operational noise associated with continued A3 use is 53dB. This is above the suggested WHO "evening" guidance value. Continued A3 use could therefore materially reduce the amenity of adjoining residential properties during the evenings.

(b) In terms of "noise change", the continued A3 use of the site, would increase existing ambient noise levels by 5.8dB. The IOA/IEMA draft *"Guidelines for Noise Impact Assessment"* would indicate that this is a 'substantial' adverse impact. Subjectively, such a change would also be very noticeable.

7.4 Conclusions

The above noise impact assessment clearly demonstrates that the proposed change of use should offer a significant benefit to the amenity of local residents. First, the magnitude of noise generated by an educational use of the site is likely to be lower than that associated with a commercial hospitality business. Second, and perhaps, more importantly, the continued A3 use of the premises could potentially expose residents to "significant" noise impacts during the evening, which will not occur from a D1 use.

In light of the above, it is concluded that the proposed change of use actually provides an opportunity to improve the existing soundscape of the site relative to the continued A3 use of the site, and would generally help to enhance the amenity and quality of life for those residing in adjoining properties. This accords with the general requirements of:

- **National planning policy** (to "*…contribute to and enhance the natural and local environment…",* in accordance with paragraph 109 of the NPPF*);*

- **Regional planning policy** (by "…..*reducing noise through better planning and design….",* in accordance with the priorities of the Mayor's "Ambient Noise Strategy"); and,

- **Local planning policy** (by "….*protecting and enhancing our environment and heritage and the amenity and quality of life of local communities", in accordance with Policy CS5 of Camden's adopted "Core Strategy").*

8 CONCLUSIONS

An environmental noise survey has been undertaken to determine existing noise levels characterising the proposed development site. During the daytime, existing noise levels were found to be dominated by use of the existing play areas associated with the School. During the evening and night, noise levels were dominated by local and distant road traffic movements, aircraft, and birdsong.

The potential noise impact of the proposed change of use has been assessed. This concludes that the proposed development will not have any significant adverse noise impact. It is therefore concluded that the proposed change of use accords with national and local planning policy. The proposed development also includes a number of design features intended to minimise and control the acoustic environment of the proposed outdoor space and minimise noise overspill into the general environment. This again accords with national planning policy which imposes an obligation to *"mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development".*

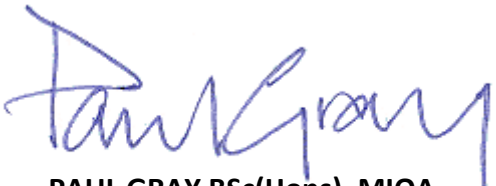
The potential impact of the proposed change of use has been contrasted with possible noise impacts from the continued A3 use of the site. It is concluded that:

(a) The magnitude of noise generated by an educational use of the site is likely to be lower than that associated with a commercial hospitality business.

(b) The continued A3 use of the premises could potentially expose residents to "significant" noise impacts during the evening, which would not occur from a D1 use.

It is therefore concluded that the proposed change of use actually provides an opportunity to improve the existing soundscape of the site (relative to continued A3 use), and generally enhance the amenity and quality of life of adjoining noise sensitive properties.

In light of the above, it is concluded that the proposed change of use complies fully with national, regional and local planning policy.



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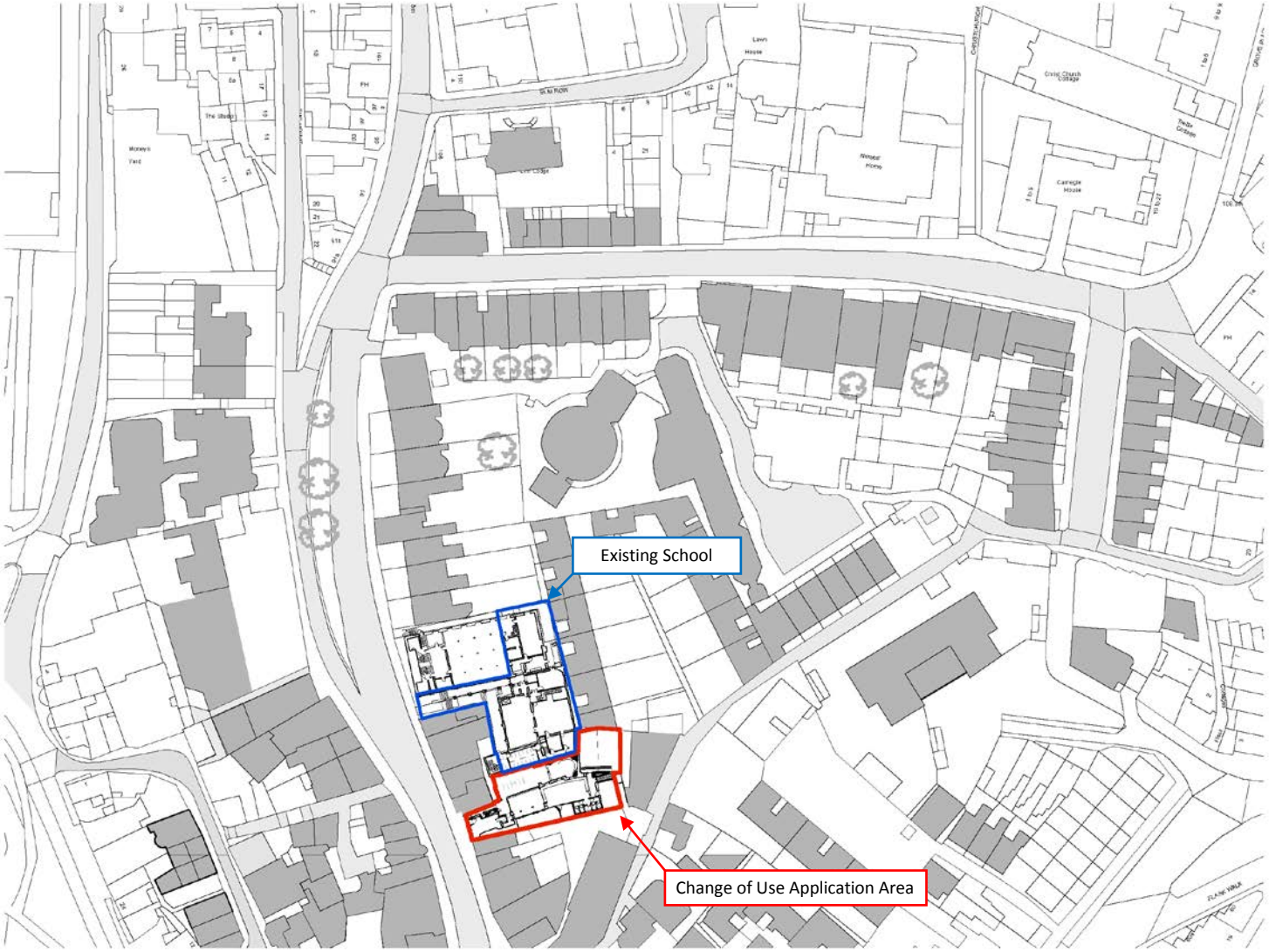
APPENDIX A



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HEATHSIDE PREPARATORY SCHOOL
HAMPSTEAD, LONDON

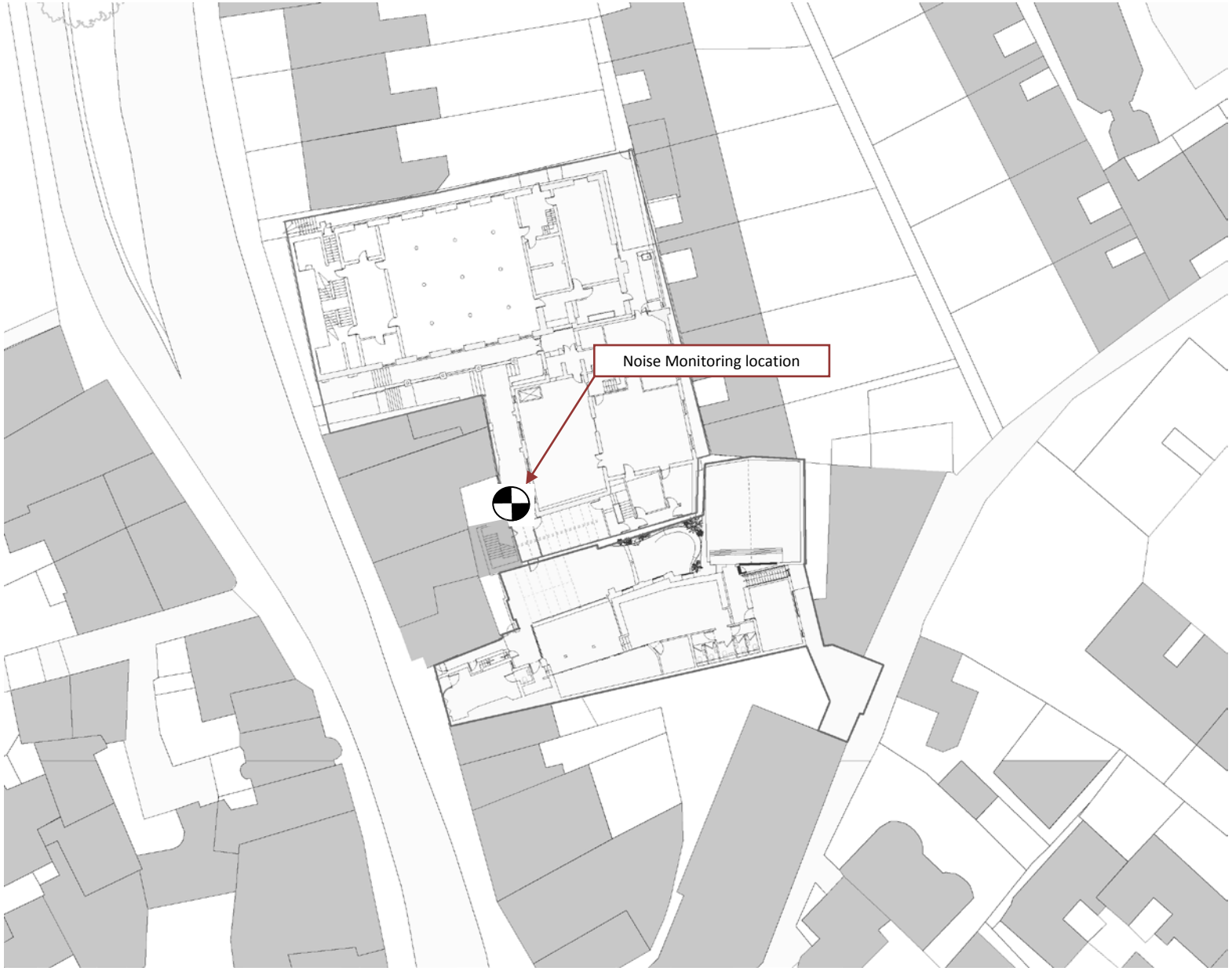
Site Location Plan

Date: July 2014

Scale: NTS

Drawing Ref: Figure 1

APPENDIX B



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HAMPSTEAD, LONDON

Site Location Plan Showing Noise Monitoring Location

Date: July 2014

Scale: NTS

Drawing Ref: Figure 2

APPENDIX C

GLOSSARY OF ACOUSTIC TERMINOLOGY

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General

A vibrating surface or turbulent fluid flow will cause pressure fluctuations in the surrounding air. These pressure fluctuations are perceived by the human ear as "sound".

Measurement Units

The human ear can detect sound pressures as low as about 20 µPa, and can tolerate (for short periods) sound pressures as high as 200 Pa, an amplitude range of 10 million times. To take account of this huge amplitude range, sound pressure levels (often written in "acoustic shorthand" as SPL or Lp) are quantified using a logarithmic scale, the decibel (dB) scale. This is based on a reference pressure of 20µPa, thus a sound pressure of 20µPa would equate to 0dB and a pressure of 200Pa would equate to 140dB.

Frequency (Pitch) Characteristics

The sound received at any particular location is not solely influenced by the sound pressure level, the frequency characteristics (pitch) of the noise is also an important factor. Noise audible to a human (with "normal" hearing), typically covers the frequency range 20 Hertz to 20,000 Hertz. Hertz (Hz) are defined as the number of times the sound pressure fluctuates in one second. "Low" pitched sounds fluctuate less times per second than "high" pitched sounds. Whilst humans are capable of detecting a wide range of frequencies, the ear is not equally sensitive to all frequencies – the ear is most sensitive at frequencies towards the middle of the audible range and less sensitive to the lower and higher frequencies.

To take account of this frequency response, sound pressure fluctuations are normally quantified by applying a frequency-weighting network or filter which simulates the frequency response of the ear. In essence, this means that more significance is given to the frequencies at which the ear is most sensitive and less significance to those at which the ear is less sensitive. Noise measurements relating to human reaction are generally made using an "A-weighting" network. These measurements are reported as A-weighted decibels or dB(A). The A-weighted sound pressure level is written in "acoustic shorthand" as L_A.

Variation of Sound with Time

It will be appreciated that the sound pressure level of most noise sources will fluctuate with time. In order to take account of the way in which the human ear perceives noise, it is normal for the sound pressure level to be quantified using a time weighting network, to mimic the speed of response of the human ear. The standardised setting for most types of noise is a "Fast" time weighting.

The manner in which sound fluctuates with time can also influence the subjective manner in which noise is perceived. Noise can be continuous (showing no significant variation with time as in the case of a fan), intermittent (i.e. the noise is transient in it's nature, such as a train pass-by) or impulsive (i.e. there is a sudden build up of noise - this can range from "clanking" types sounds as might be experienced next to railway goods yard or a high energy discharge such as an explosion)

Measurement of Sound

Sound pressure levels are measured using equipment comprising a pressure-sensitive microphone, associated amplifier, frequency weighting network, time weighted network and output indicator. In its simplest form this is a small hand-held instrument called a sound level meter. More sophisticated instrumentation (a sound level analyser) is also available which allows the real-time output of the frequency characteristics of the sound to be quantified.

Comparison of Sound Levels

To put the significance of noise measurement into context, the following Table presents the A-weighted sound pressure level of some typical sources:

Sound Pressure Level, dB(A)	Typical Noise Source . Activity
160	Saturn Rocket Taking Off
140	Military Jet Taking Off at 30m
100	Nightclub
90	Heavy goods vehicle driving past at 7m
80	Busy urban road
70	Domestic vacuum cleaner at 3m
60	Busy office environment
55	Normal speech at 1m
40	Whispered conversation at 2m
30	Bedroom at night (BS 8233: 1999)
20	Remote country location
0	Threshold of hearing – a very eery silence

Addition of Sound Levels

It is important to note that the use of a logarithmic scale to describe noise does not allow normal arithmetic addition. This means that two noise sources each generating a level of, say, 60dB(A) will not generate a combined sourd level of 120dB(A). The values must be added logarithmically, which would actually yield a combined sound level of 63dB(A) in this example.

Subjective Perception of Sound Levels Changes

With regard to the human perception of sound level changes, the human ear:

- Cannot generally perceive a sound level difference of less than 3dB(A)
- Will perceive a sound level difference of 4-5dB(A) as "noticeable"
- Will perceive a sound level difference of 10dB(A) as a doubling (or halving) of loudness.

GLOSSARY OF ACOUSTIC TERMINOLOGY

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Acoustic Terminology

As stated previously, most sources of noise will fluctuate with time. In order to characterize such noise, it is therefore normal to represent the noise climate using a variety of noise parameters and statistical indices. The most commonly adopted noise parameters are described below:

$L_{Aeq,T}$ This is the equivalent continuous A-weighted sound level measured over a specified time period "T". This is the notional continuous sound level which, over the time T, contains the same amount of energy as the actual fluctuating sound being measured. This parameter is widely accepted as being the most appropriate noise descriptor for most environmental noise and the effects of noise on humans.

$L_{Amax,fast}$ This is maximum A-weighted sound pressure measured with a fast frequency response recorded during the stated measurement period. It is typically used to characterise the highest sound level caused during a noise event.

$L_{A90,T}$ This is the A-weighted sound pressure level exceeded for 90% of the specified time period "T". It is normally used to describe the underlying background noise level of an environment since it inherently excludes the effects of transient noise sources.

Noise Rating (NR) Level

When describing noise from building services installations, it is common to express noise levels in terms of a Noise Rating (NR) Level. The NR level is determined by plotting the measured frequency spectrum of a noise against a series of reference curves, which roughly approximate to equal loudness values. This method permits higher sound levels at low frequencies corresponding to the sensitivity of the human ear. The NR level is defined as the value of the highest curve "touched" by the plotted frequency spectrum. For typical sources of building services noise, the overall A-weighted sound level is numerically around 5-6dB higher than the NR level of the noise.

α_w The "**Weighted Absorption Coefficient**" (α_w) is a single figure measure of the overall sound absorption capabilities of a building element determined in accordance with BS EN ISO 11654: 1997.

APPENDIX D

HEATHSIDE PREPARATORY SCHOOL

Proposed Change of Use of 76 Heath Street From Class A3 to part Class D1 (School) and part Class A1 (Retail)

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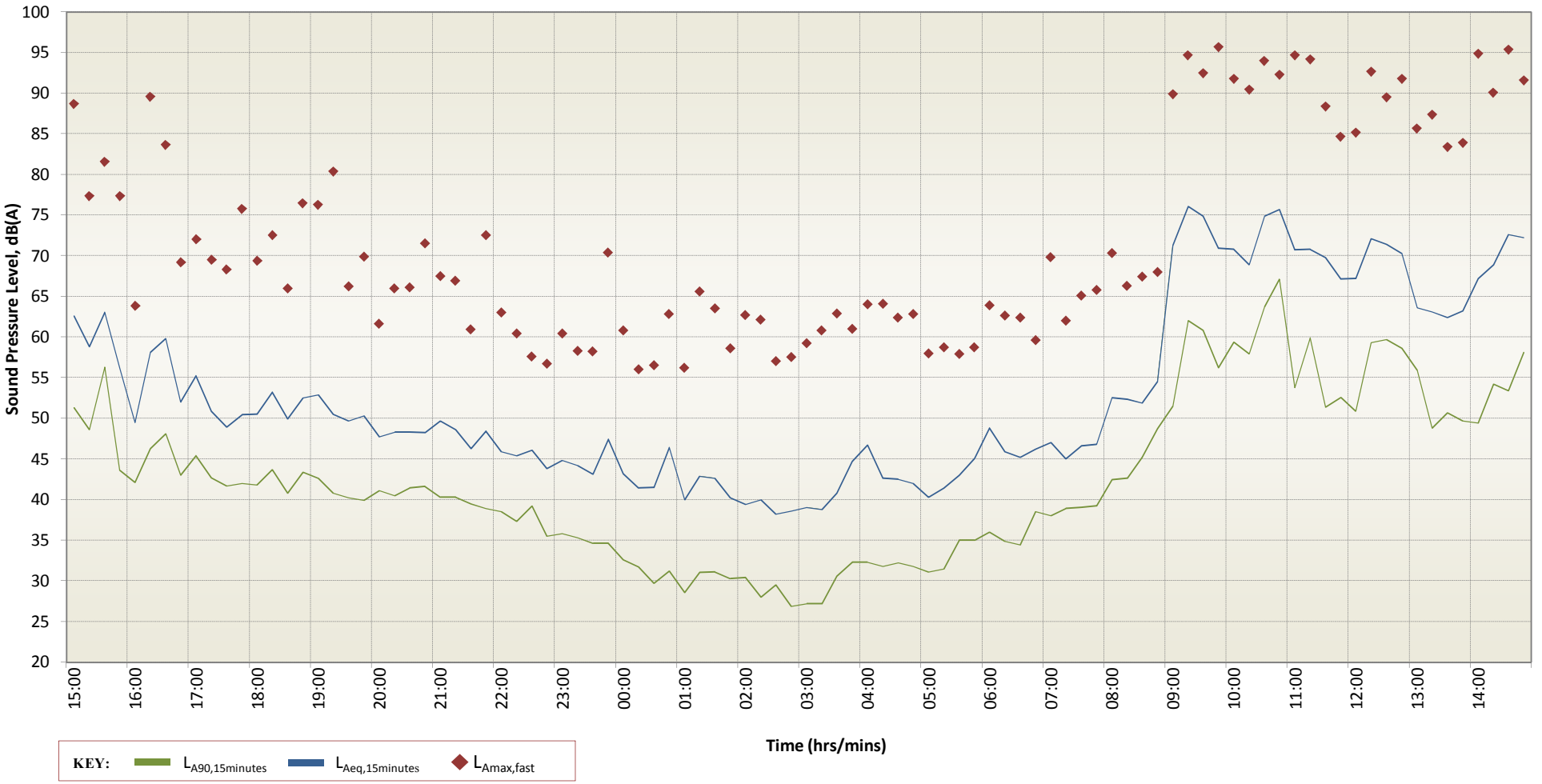
TIME HISTORY GRAPH 1

Results of Automated Noise Survey

Survey Date: 11-12 June 2014



HEATHSIDE PREPARATORY SCHOOL

Proposed Change of Use of 76 Heath Street From Class A3 to part Class D1 (School) and part Class A1 (Retail)

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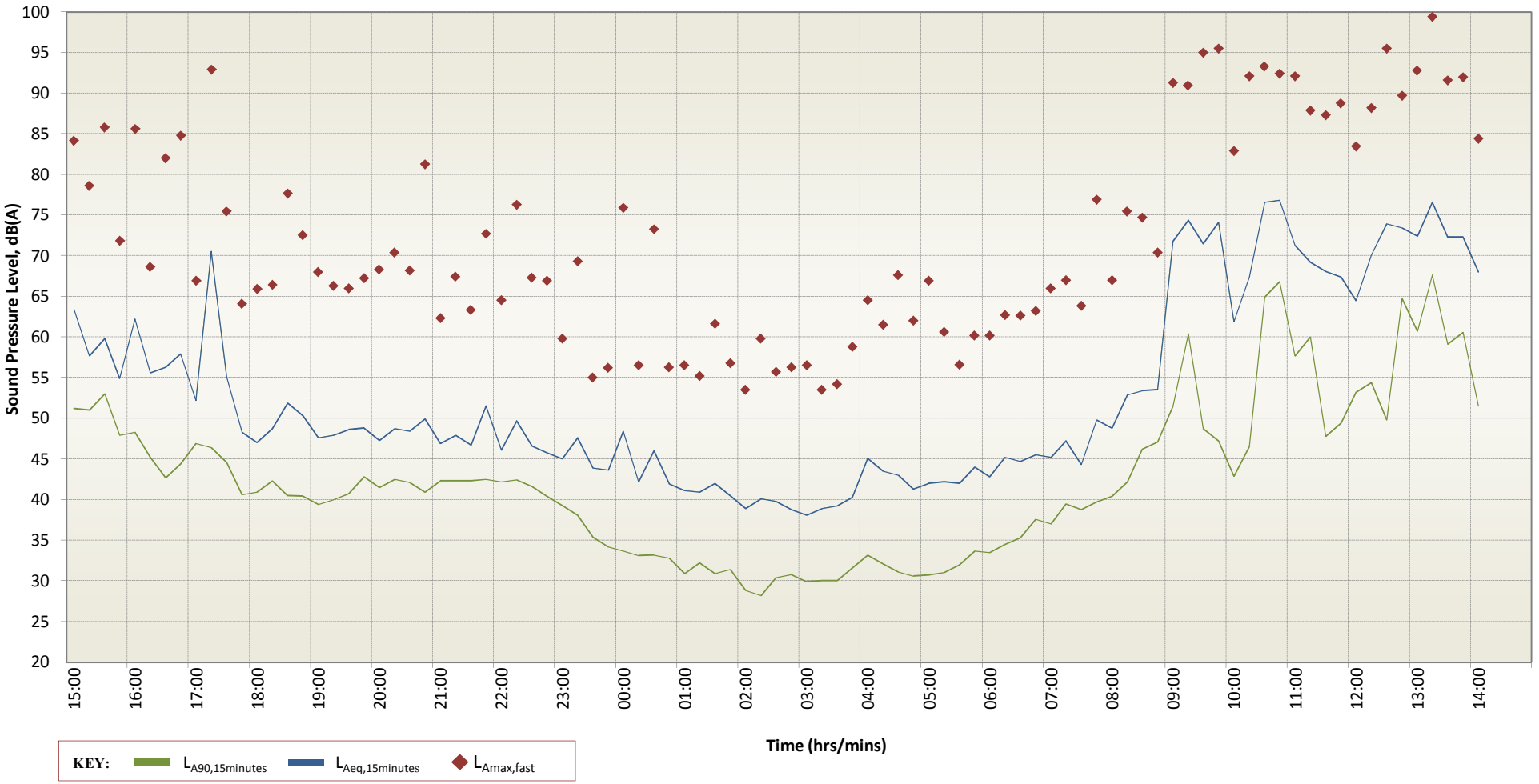
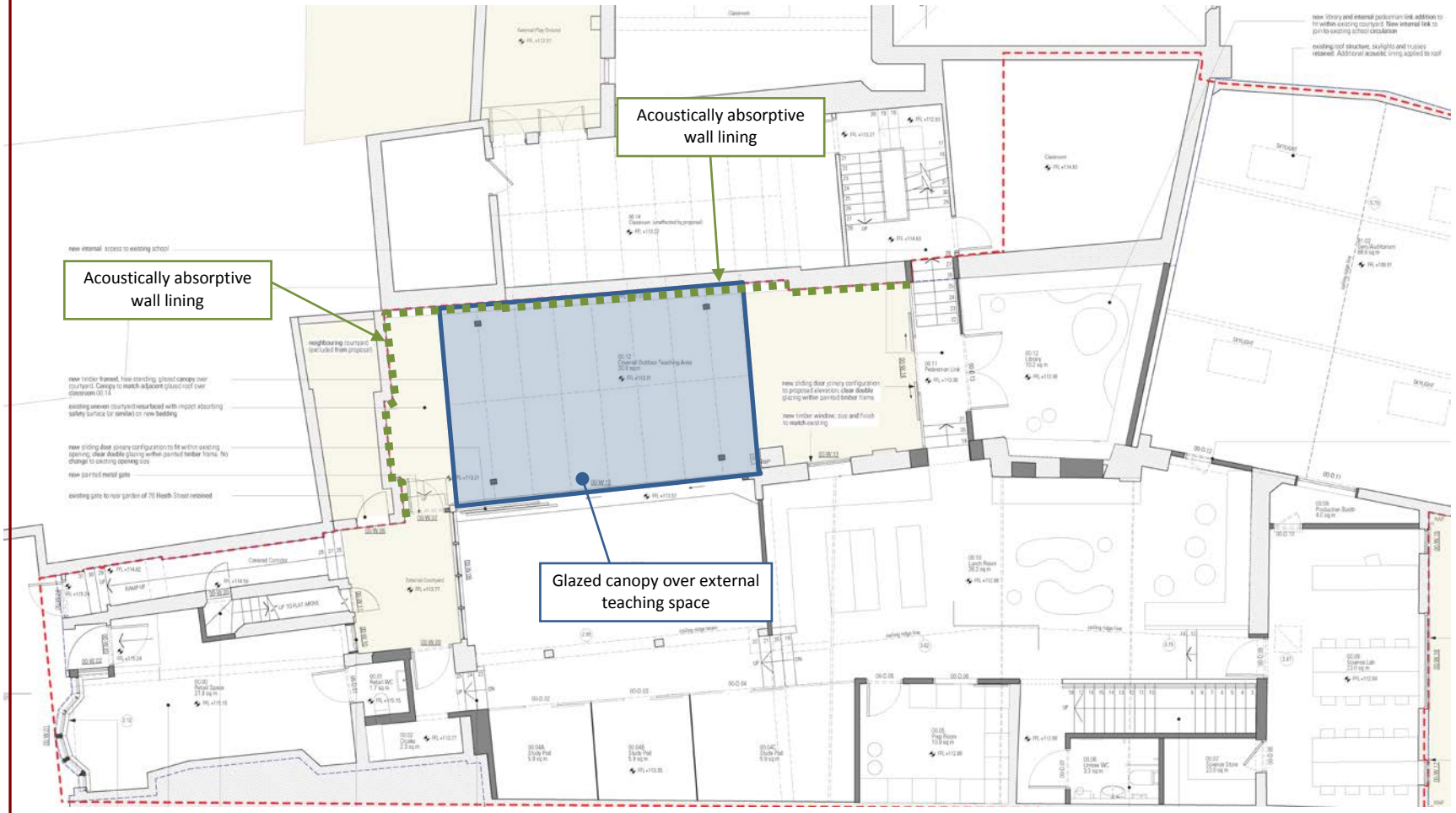
TIME HISTORY GRAPH 2

Results of Automated Noise Survey

Survey Date: 12-13 June 2014



APPENDIX E



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HEATHSIDE PREPARATORY SCHOOL
HAMPSTEAD, LONDON

Sketch Showing Proposed Noise Control/Mitigation

Date: August 2014

Scale: NTS

Drawing Ref: Figure 3