

# SHARPS REDMORE

ACOUSTIC CONSULTANTS ▪ Established 1990



## Report 1

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**WHSmith, The Mall, Wood Green**

Plant Noise Assessment

**Prepared by**

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**Project No** 2321722

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This report has been prepared with all reasonable skill, care and diligence commensurate with an acoustic consultancy practice under the terms and brief agreed with our client at that time. Sharps Redmore provides no duty or responsibility whatsoever to any third party who relies upon its content, recommendations or conclusions.

## **1.0 Introduction**

- 1.1 Sharps Redmore (SR) has been instructed to undertake a noise impact assessment of fixed building services plant associated with the former WHSmith retail store in Wood Green, London.
- 1.2 Several new items of building services plant are expected to be installed within new external plant decks adjacent the existing service yard as part of the fit-out, specific details are still being drawn up but proposals will likely consist of ducted air handling units and condensers.
- 1.3 A background noise survey within the site vicinity has been undertaken to determine the existing noise climate, the data obtained has been used to set noise limits for new items of fixed building services plant in line with relevant standards whilst also considering local authority guidance.
- 1.4 Section 2 of this report contains a discussion of the available methods of assessment and assessment criteria. Section 3 of this report sets out the findings of an environmental noise survey, Section 4 presents an assessment of noise.
- 1.5 The assessment conclusions are contained in Section 5 of this report.

## 2.0 Assessment Methodology and Criteria

### 2.1 National Policy

The National Planning Policy Framework (NPPF), July 2021, sets out the Government's planning policies for England and "these policies articulate the Government's vision of sustainable development." In respect of noise, Paragraph 185 of the NPPF states the following:

*"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;*
- 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*
- c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation".*

Guidance on the interpretation of the policy aims contained within the NPPF is contained within the National Planning Policy Guidance (NPPG). The NPPG introduces the concept of a noise exposure hierarchy based on the likely average response to noise. The guidance contained in the NPPG is summarised in the table below.

**Table 1 – NPPG**

| Perception                     | Example of outcomes                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Increasing effect level                   | Action                           |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|----------------------------------|
| Not noticeable                 | No effect                                                                                                                                                                                                                                                                                                                                                                                                                                                                | No observed effect                        | No specific measures required    |
| 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      |                                  |
| 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. 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. Affect 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 |                                  |
| Noticeable and disruptive      | The noise causes a material change in behaviour and/or attitude, 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 the 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 the change in acoustic character of the area. | Significant observed adverse effect level | Avoid                            |
| Noticeable and very disruptive | Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress of physiological effects, e.g. Regular sleep deprivation/awakening; loss of appetite.                                                                                                                                                                                                                                                         | Unacceptable adverse effect               | Prevent                          |

The NPPF reinforces the March 2010 DEFRA publication, “Noise Policy Statement for England” (NPSE), which states three policy aims, as follows:

*“Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:*

- 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 improvement of health and quality of life.”

It also outlines the concepts from toxicology utilised for noise impacts and extended to derive a ‘significant’ level for the purposes of the NPSE.

- NOAL: No Observed Effect Level: The level below which no effect can be detected. There is no detectable effect on health and quality of life due to noise. avoid significant adverse impacts on health and quality of life;
- LOAEL: Lowest Observed Adverse Effect Level: The level above adverse effects on health and quality of life can be detected.
- SOAEL: Significant Observed Adverse Effect Level: For these purposes, the level above which significant adverse effects on health and quality of life occur.

Taking into consideration the aims and guidance of the national policy when considering the impact of noise, the fact that sound can be heard and causes impact, is not reason alone for refusal of an application as consideration should also be given to the significance of the impact and the mitigation measures available.

It is possible to apply objective standards to the assessment of noise and the effect produced, the introduction of a certain noise source may be determined by several methods, as follows:

- i) The effect may be determined by reference to guideline noise values, such as those contained in the World Health Organisation (WHO) “Guidelines for Community Noise”.
- ii) Alternatively, the impact may be determined by considering the change in noise level that would result from the proposal, in an appropriate noise index for the characteristic of the noise in question. There are various criteria linking change in noise level to effect. This is the method that is suited to, for example, to the assessment of noise from road traffic because it is capable of displaying impact to all properties adjacent to a road link irrespective of their distance from the road.
- iii) Another method is described within British Standard 4142:2014 +A1:2019 ‘*Method for rating industrial and commercial sound*’ (BS 4142) to determine the significance of sound impact from sources of industrial and/or commercial nature. The sources that the revised standard is intended to assess are sound from industrial and manufacturing processes, sound from fixed plant installations, sound from loading and unloading of goods at industrial and/or commercial premises and the sound from mobile plant and vehicles, such as forklift, train or ship movements.

## 2.2 British Standard 4142:2014 +A1:2019 (BS 4142)

In respect to atmospheric noise from building services plant, the assessment of fixed plant noise is principally undertaken in accordance with the methodology in BS 4142:2014+A1:2019 '*Methods for rating and assessing industrial and commercial sound*'. The scope of this standard states that it is suitable for the assessment of:

*"a) sound from industrial and manufacturing processes;*

*b) sound from fixed installations which comprise mechanical and electrical plant and equipment;*

*c) sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and d) sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site."*

The significance of sound impact is to be determined according, in summary, to the following process:

- i) Determine the typical background sound levels, in terms of the index  $L_{A90}$ , at the receptor locations of interest.
- ii) Determine the specific sound level of the source being assessed, in terms of its  $L_{Aeq,T}$  level (T = 1 hour for day or 15 minutes for night), at the receptor location of interest.
- iii) Apply a rating level acoustic feature correction if the source sound has tonal, impulsive, intermittent, or other characteristics which attract attention.
- iv) Compare the rating sound level with the background sound level; the greater the difference between the two, the higher the likelihood of adverse impact.
- v) A difference (rating – background) of around +10 dB is an indication of significant adverse impact, depending on the context; a difference of around +5 dB is an indication of an adverse impact, depending on the context. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending upon context.

BS 4142 introduces the concept of 'context' to the process of identifying noise impact. Section 11 of BS 4142 explains "The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs (our emphasis). An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context" (our emphasis).

There are many context points to consider when undertaking an assessment of sound impact including:

- The absolute level of sound;
- The character and level of the specific sound in the context of the existing noise climate; for example, is the sound to occur in a location already characterised by similar activities as those proposed?
- The sensitivity of the receptors;
- The time and duration that the specific sound is to occur;
- The conclusions of assessments undertaken using alternative assessment methods, for example WHO guideline noise values or change in noise level;

It is therefore entirely possible that whilst the numerical outcome of a BS 4142 assessment is indicative of adverse or significant adverse impact, when the proposal is considered in context the significance of the impact is reduced to an acceptable level.

### 2.3 ProPG: Planning & Noise (2017)

On 22nd June 2017, a professional practice guidance document (ProPG) was launched to provide practitioners with guidance on evaluating the potential impact of existing (predominantly transportation) noise on new residential development. This has been jointly produced by the Chartered Institute of Environmental Health (CIEH), Institute of Acoustic (IOA) and Association of Noise Consultants (ANC).

The primary goal of the ProPG is to assist in the delivery of sustainable development by promoting good health and well-being through the effective management of noise.

The ProPG recommends a 2-stage approach, an initial noise risk assessment of the proposed development and where the results indicate that noise requires further consideration a full assessment in the form of an Acoustic Design Statement (ADS) which would include four key elements as follows:

- Stage 1: An initial noise risk assessment of the proposed development site;
- Stage 2: A systematic consideration of four key elements

The advice contained within ProPG is based on the policy objectives contained within the NPPF and the objective noise guidelines within British Standard 8233:2014 '*Guidance on sound insulation and noise reduction for buildings*'.

Paragraph 1.3 of ProPG 2017 states:

*"The scope of this ProPG is restricted to the consideration of new residential development that will be exposed predominantly to airborne noise from transport sources (noting that good professional practice should have regard to any reasonably foreseeable changes in existing and/or new sources of noise)," and also states:*

*"... detailed consideration of ... other sources of noise (such as dominant noise from industrial, commercial or entertainment premises) and of ground-borne noise and vibration, is outside the scope of this document."*

The redevelopment of the retail units utilises the same principles as ProPG in terms of many aspects of good design and practice but is not applied in its fullest form here as this is a city centre mixed use development rather than a large greenfield out-of-town residential scheme for which this guidance is most applicable. Para 2.3.4 of Pro PG states:

*Where the LPA accepts that there is a justification that the internal target noise levels can only be practically achieved with windows closed, which may be the case in urban areas and at sites adjacent to transportation noise sources, special care must be taken to design the accommodation so that it provides good standards of acoustics, ventilation and thermal comfort without unduly compromising other aspects of the living environment. In such circumstances, internal noise levels can be assessed with windows closed but with any façade openings used to provide “whole dwelling ventilation” in accordance with Building Regulations Approved Document F (e.g. trickle ventilators) in the open position. (See supplementary Document 2) Furthermore in this scenario the internal  $L_{Aeq}$  target noise levels should not generally be exceeded.*

## 2.4 Local Guidance

The scheme sits within The London Borough of Haringey (LBH) and whilst the council have started work on a new Local Plan, it is understood that they currently rely on guidance within the existing Local Plan (dated November 2016) with assistance from the wider London Plan.

Whilst we are not aware of the Council having a specific policy for all schemes in relation to building services plant noise emissions, reference is made to DM Policy 23 and the need to mitigate and minimise environmental noise associated with new developments.

SR anticipate based on experience of similar schemes within the Borough, for the Local Planning Authority (LPA) to request submission of a plant noise assessment for approval, a condition enforced on building services plant for other tenancies of The Mall complex is set out below and used as a reference for establishing plant noise limits.

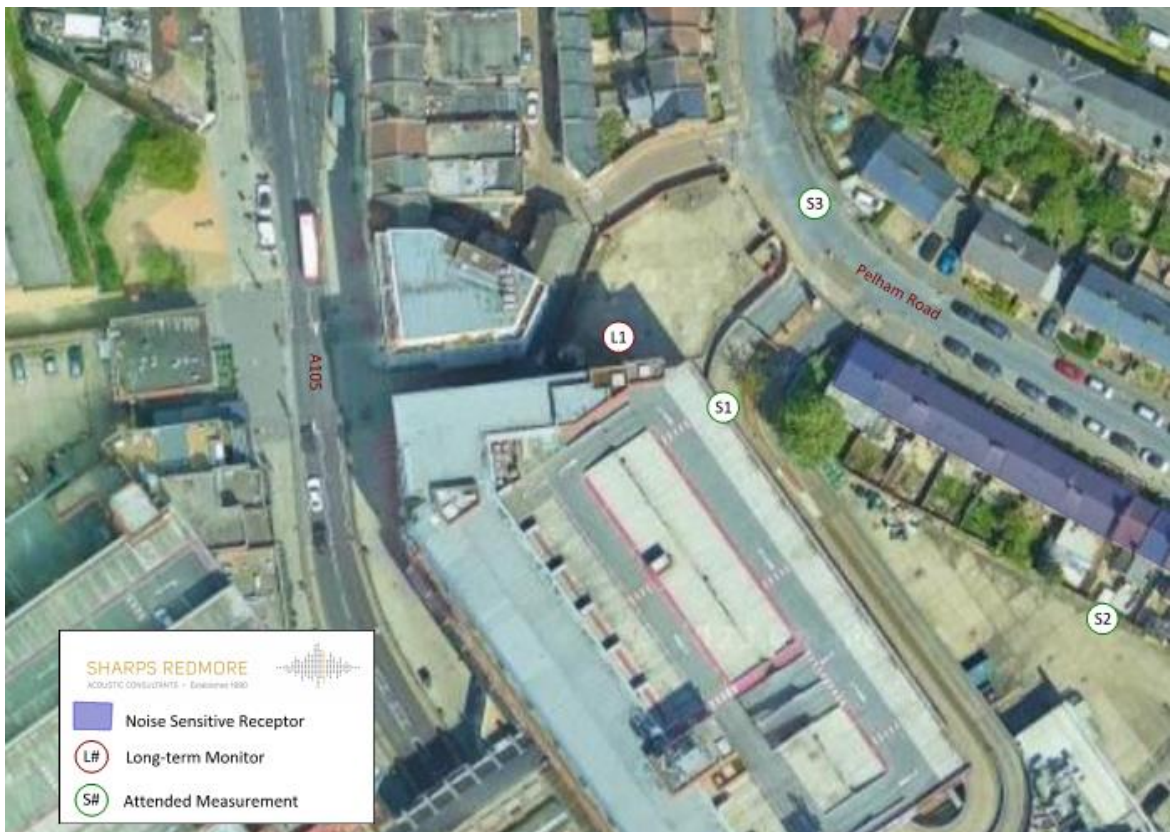
*“The design and installation of new items of fixed plant hereby approved by this permission shall be such that, when in operation, the cumulative noise level  $L_{Aeq}$  15 min arising from the proposed plant, measured or predicted at 1m from the facade of nearest residential premises shall be a rating level of at least 5dB(A) below the background noise level  $LAF90$ . The measurement and/or prediction of the noise should be carried out in accordance with the methodology contained within BS 4142: 1997. Upon request by the local planning authority a noise report shall be produced by a competent person and shall be submitted to and approved by the local planning authority to demonstrate compliance with the above criteria.*

*Reason: In order to protect the amenities of nearby residential occupiers consistent with Policy D14 of the London Plan 2021 and Policies DM1 and DM23 of The Development Management DPD 2017.”*

### 3.0 Environmental Noise Survey Details

- 3.1 An environmental noise survey has been undertaken in the site vicinity, measurement was made at several different locations on Monday 16th, Tuesday 17th, Thursday 26th and Friday 27th January 2023. The data was obtained from both short-term attended and long-term unattended measurement at locations considered to be representative of background noise at the nearest residential properties.
- 3.2 The measurement locations are shown in Figure 1, summarised below and charted in Appendix A.
- Unattended Location 1 (L1): An auto-logging measurement location was established by fixing a microphone on a pole from a 4th floor window of the Travelodge Hotel overlooking the service yard and Pelham Road, logging noise continuously throughout the measurement period.
  - Attended Location 1 (S1): Top floor of The Mall east car park overlooking Pelham Road
  - Attended Location 2 (S2): WHSmith Service Yard Perimeter
  - Attended Location 3 (S3): Pelham Road

**Figure 1: Plan Showing Measurement Location and NSRs**



- 3.3 Measurements were carried out using Norsonic Class 1 precision sound level meters, which were calibrated before and after the surveys with no drift noted. Weather conditions throughout the survey were generally dry and with light winds, therefore considered suitable for taking noise measurements.
- 3.4 For each attended short-term measurement, the microphone was attached to the sound level meter and positioned approximately 1.5m above ground in free field conditions.
- 3.5 Based on observations when the monitoring equipment was set up and attended measurements were carried out, the existing noise climate is considered a combination of local traffic, and existing plant serving The Mall complex.
- 3.6 The noise survey results are summarised in Table 2 below and presented in full within Appendix A.

**Table 2: Unattended Noise Survey Data**

| Location | Daytime (0700-2300)      |                             | Night (2300-0700)        |                             |
|----------|--------------------------|-----------------------------|--------------------------|-----------------------------|
|          | Ambient L <sub>Aeq</sub> | Background L <sub>A90</sub> | Ambient L <sub>Aeq</sub> | Background L <sub>A90</sub> |
| L1       | 62 dB                    | 54 dB                       | 59 dB                    | 47 dB                       |

**Table 3: Attended Noise Survey Data**

| Location                  | Ambient L <sub>Aeq</sub> | Background L <sub>A90</sub> |
|---------------------------|--------------------------|-----------------------------|
| S1: East Car Park         | 64 dB                    | 57 dB                       |
| S2: Service yard boundary | 60 dB                    | 55 dB                       |
| S3: Pelham Road           | 61 dB                    | 53 dB                       |

- 3.7 BS 4142:2014, para 8.1 states “the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods.”
- 3.8 Comparison of data obtained at the long-term logging position and that obtained during short-term attended measurement at other locations suggests background L<sub>A90</sub> noise levels remain similar at different positions within the site vicinity, thus, data obtained from the noise logger data is considered representative.

#### Noise Criteria and Receptors

- 3.9 The nearest noise sensitive receivers to the proposed new plant items are considered as the existing dwellings on Pelham Road which bound the service yard to the east.

Based on noise data obtained from the environmental noise survey, plant noise limits at the rear windows of these potentially worst affected noise sensitive receivers are set out below, any other NSRs are either screened or located at greater distance from the new building services items and thereby afforded more noise attenuation losses.

**Table 4: Minimum background noise levels and plant noise limits**

| Receptor  | Period    | Typical Minimum<br>$L_{A90}$ dB          | Cumulative<br>plant noise limit<br>rating dB $L_{Ar,Tr}$ |
|-----------|-----------|------------------------------------------|----------------------------------------------------------|
| All NSR's | 0700-2300 | $L_{A90, 15 \text{ minutes}} \approx 54$ | 49                                                       |
|           | 2300-0700 | $L_{A90, 5 \text{ minutes}} \approx 47$  | 42                                                       |

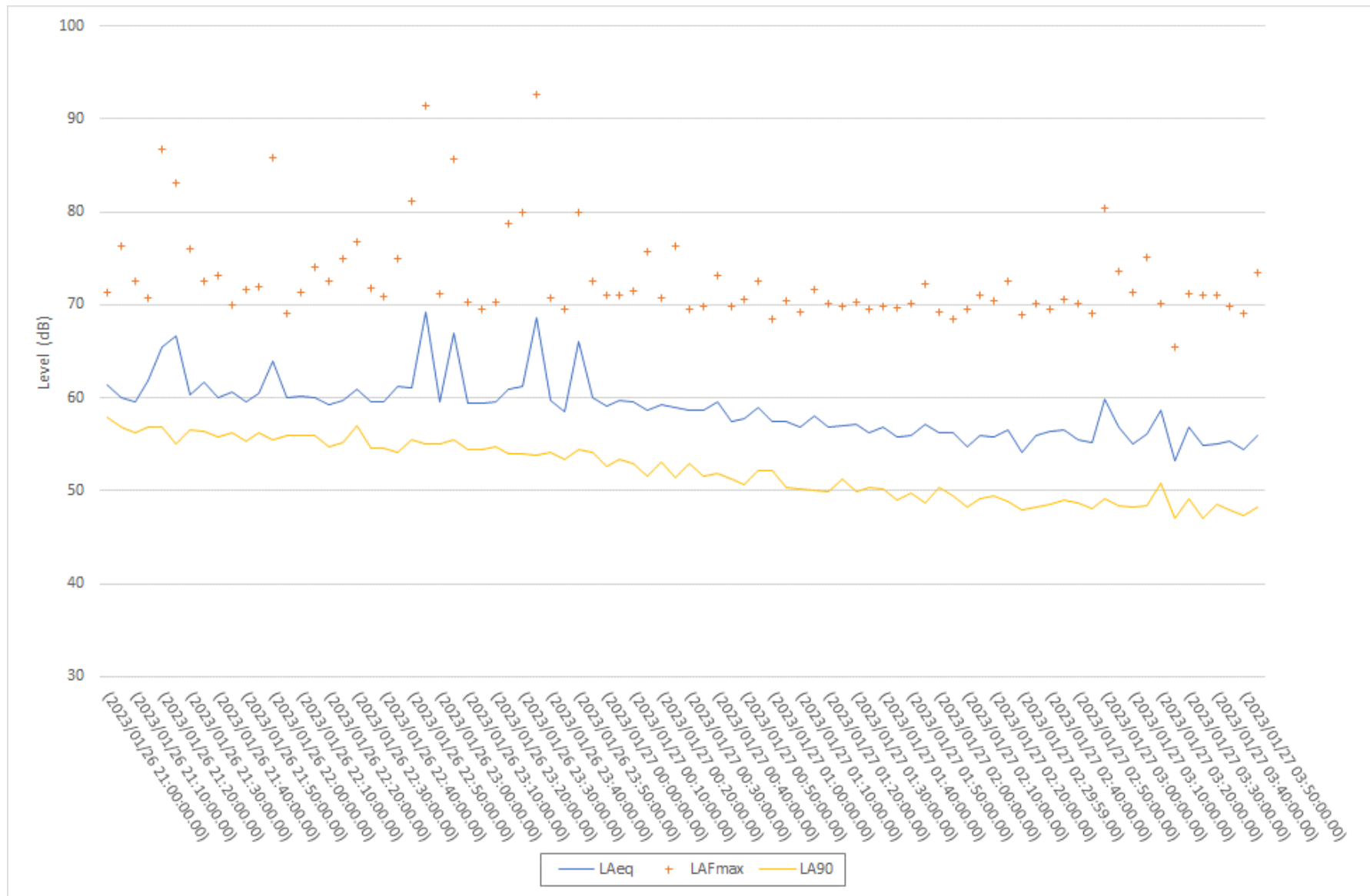
## **4.0 Conclusions**

- 4.1 Data obtained from the background noise survey undertaken within the site vicinity has been used to set plant noise limits for any new items of fixed building services plant associated with the former WHSmith, within The Mall complex in Wood Green.
- 4.2 Specific details of the plant are still being finalised but is expected to consist of AHUs and condensers, all of which will be located within new external plant decks that bound the existing service yard. Sharps Redmore have been appointed to undertake assessment of such plant once specifications are finalised.
- 4.3 Assessment will be undertaken in general accordance with BS 4142:2014+A1:2019 “Methods for rating and assessing industrial and commercial sound” against the criteria set out within section 3.
- 4.4 Mitigation where required will be proposed to ensure compliance with the criteria, noise from building services plant is therefore expected to be of a level that would fall below exceed the existing background noise climate, which BS 4142:2014 considers to be a “low impact.”

## **APPENDIX A**

### **MEASUREMENT DATA**

Figure A1 – Plot of unattended long-term measured noise levels (Location 1)

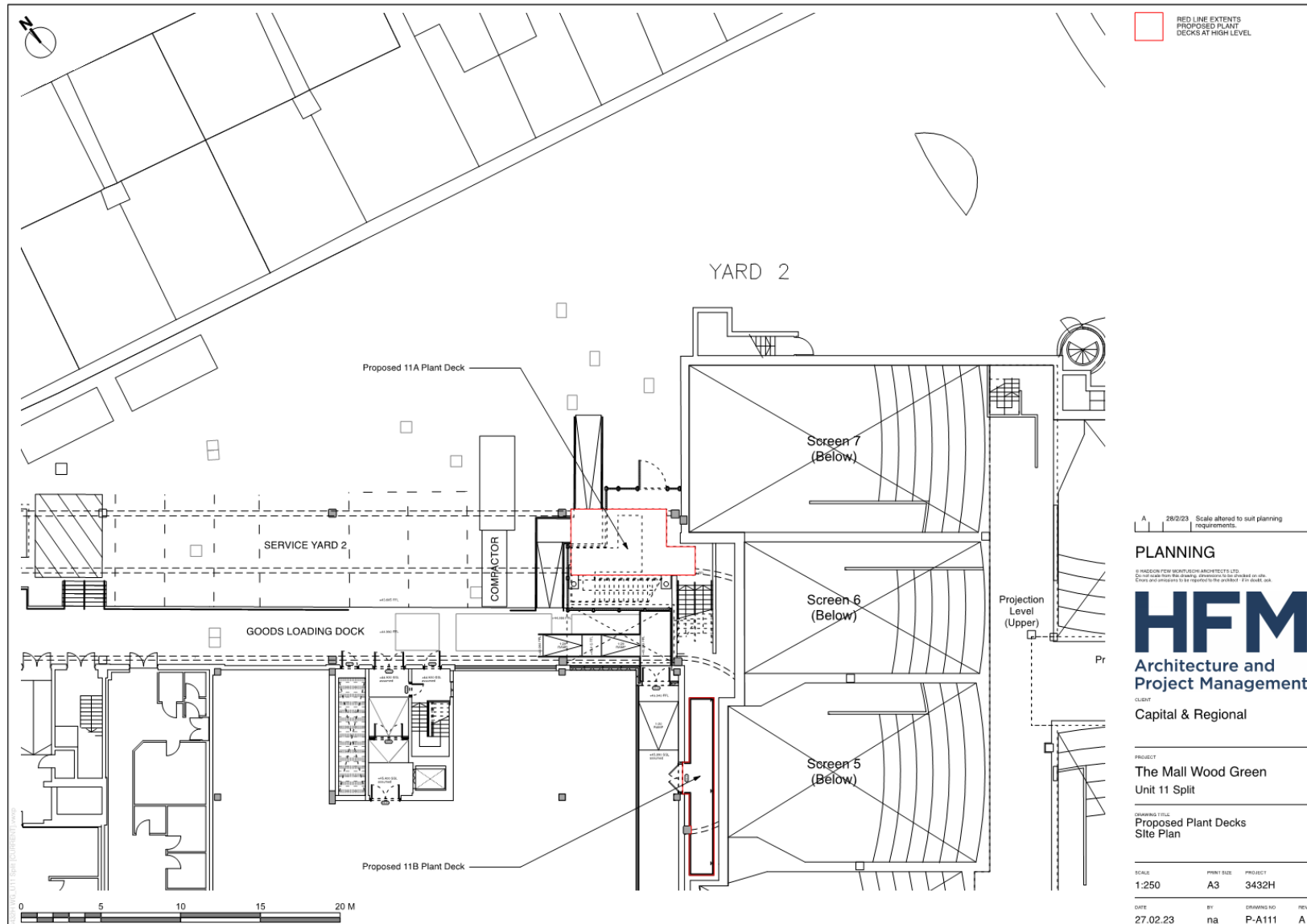


### Daytime Noise Survey Data

| Location | Date and Time      | $L_{Aeq,T}$ dB | $L_{AFmax}$ dB | $L_{A90}$ dB |
|----------|--------------------|----------------|----------------|--------------|
| S1       | (2023/01/16 15:30) | 63             | 79             | 58           |
|          | (2023/01/16 16:00) | 63             | 85             | 58           |
|          | (2023/01/16 16:05) | 65             | 92             | 58           |
|          | (2023/01/16 16:10) | 64             | 86             | 57           |
|          | (2023/01/16 16:15) | 64             | 90             | 58           |
| S2       | (2023/01/17 15:30) | 60             | 66             | 55           |
| S3       | (2023/01/26 13:00) | 64             | 79             | 53           |
|          | (2023/01/26 13:05) | 57             | 66             | 53           |
|          | (2023/01/26 13:10) | 58             | 61             | 52           |
|          | (2023/01/26 14:00) | 62             | 82             | 56           |
|          | (2023/01/26 14:05) | 60             | 77             | 53           |
|          | (2023/01/26 14:10) | 60             | 71             | 55           |
|          | (2023/01/26 15:00) | 60             | 77             | 53           |
|          | (2023/01/26 15:05) | 58             | 76             | 53           |
|          | (2023/01/26 15:10) | 59             | 73             | 55           |

## **APPENDIX B**

### **PLANT LOCATION DRAWINGS**



A 28/2/23 Scale altered to suit planning requirements.

## PLANNING

© HFM ARCHITECTURE AND PROJECT MANAGEMENT LTD.  
Do not scale from this drawing. Dimensions to be checked on site.  
Drawings and proposals to be submitted to the planning authority.

# HFM

Architecture and  
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CLIENT  
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PROJECT  
The Mall Wood Green  
Unit 11 Split

DRAWING TITLE  
Proposed Plant Decks  
Site Plan

| SCALE | PRINT SIZE | PROJECT |
|-------|------------|---------|
| 1:250 | A3         | 3432H   |

| DATE     | BY | DRAWING NO | REV |
|----------|----|------------|-----|
| 27.02.23 | na | P-A111     | A   |

## **APPENDIX C**

### **ACOUSTIC TERMINOLOGY**

D.1 These are the main noise indices in use in the UK:

**dB(A):** The human ear does not hear all frequencies with the same intensity. It is most sensitive to sounds in the 500 Hz-8 kHz range. Above and below this range the ear becomes progressively less sensitive. To compensate for this, sound level meters incorporate electronic filtering to correspond with the varying sensitivity of the ear. This filtering is called A-weighting and Sound Pressure Levels obtained with this weighting are referred to as A-weighted and signified as dB(A).

**$L_{A90}$ :** The sound level (in dBA) exceeded for 90% of the time. This unit gives an indication of the sound level during the quieter periods of time in any given sample. It is used to describe the “background noise level” of an area.

**$L_{Aeq, T}$ :** The equivalent continuous sound pressure level over a period of time, T; (in dBA). This unit may be described as “the notional steady noise level that would provide, over a period, the same energy as the varying noise in question”. In other words, the energy average level. This unit is now used to measure a wide variety of different types of noise of an industrial or commercial nature, as well as road traffic, aircraft and trains.

**$L_{A1}$ :** The sound pressure level (in dBA) exceeded for 1% of the time. This unit can give an indication of a regular maximum noise level from such activities as dance music.

**$L_{Ae}$ :** The sound exposure level, (previously denoted SEL) is the noise level of an event, such as a train or aircraft event, normally expressed in a 1 second time period.

**$L_{Amin}$ :** The minimum sound pressure level (in dBA) measured over the time period.

**$L_{Amax}$ :** The maximum level of sound (in dBA), i.e. the peak level of sound measured in any given period. This unit is used to measure and assess transient noises, i.e. gun shots, individual vehicles, etc.