



5 Swallowfield Way, Hayes

Plant Noise Assessment

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prepared for

SS&A

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1.0 Introduction

1.1 It is proposed to reconfigure some of the service yard areas at 5 Swallowfield Way, Hayes to improve the useability of the site for potential new tenants. The existing internal volume/footprint of the of the unit is to remain unchanged, however as part of the wider development, new items of plant are to be installed, replacing some existing plant items.

1.2 This report details an assessment of noise emissions from the proposed mechanical services units to the nearest noise sensitive receptors. A noise survey has been undertaken at the site to determine the existing noise climate at the nearest noise sensitive receptors. The survey results have been used to set plant noise limits in line with the requirements of the London Borough of Hillingdon and undertake an assessment of noise emissions to the nearest sensitive receptors. Noise from the operation of the service yard has also been considered as appropriate.

2.0 Site Description

2.1 The site is located at located at Unit 5 Swallowfield Way, Hayes, UB13 1DQ. It is occupied by a large commercial warehouse with associated office provision, situated within a brick 'wing' projecting from its northern façade. The property fronts on to Swallowfield Way in a northerly direction and falls under the jurisdiction of the London Borough of Hillingdon.

2.2 The location of the site in the context of its surrounds can be seen illustrated on the following **Image 1**.

Image 1. Aerial photo showing site location

--- Approximate site boundary



Aerial imagery courtesy of Google Maps

2.3 The warehouse building is located to the south west of the site, with the currently used car parking provision to the north, and the service yard and loading doors associated with the unit on the property's eastern extent, with entrance via an access road running along the eastern site boundary. Beyond the site boundary to the south is a section of railway (both at ground level and elevated) that serve Great Western Railway and the Elizabeth Line services running between Southall and West Drayton Stations to the east and west respectively.

2.4 The area to the north of the site beyond Swallowfield Way is occupied by further commercial units, beyond which is the Grand Union Canal and green space.

2.5 Traffic around the site is frequent, with a large proportion of activity comprising HGV movements serving the other commercial units in the area.

3.0 Planning Context

3.1 The site is located within the jurisdiction of the London Borough of Hillingdon (LBH). The London Boroughs of Hillingdon, Hounslow and Richmond Upon Thames published a joint Supplementary Planning Document in July 2014 entitled 'Development Control for Noise Generating and Noise Sensitive Development'.

3.2 The SPD sets out noise requirements for new noise generating industrial and commercial development, which are based upon relevant national standards and guidance documents¹ as set out within the attached **Appendix B**.

4.0 Noise Survey

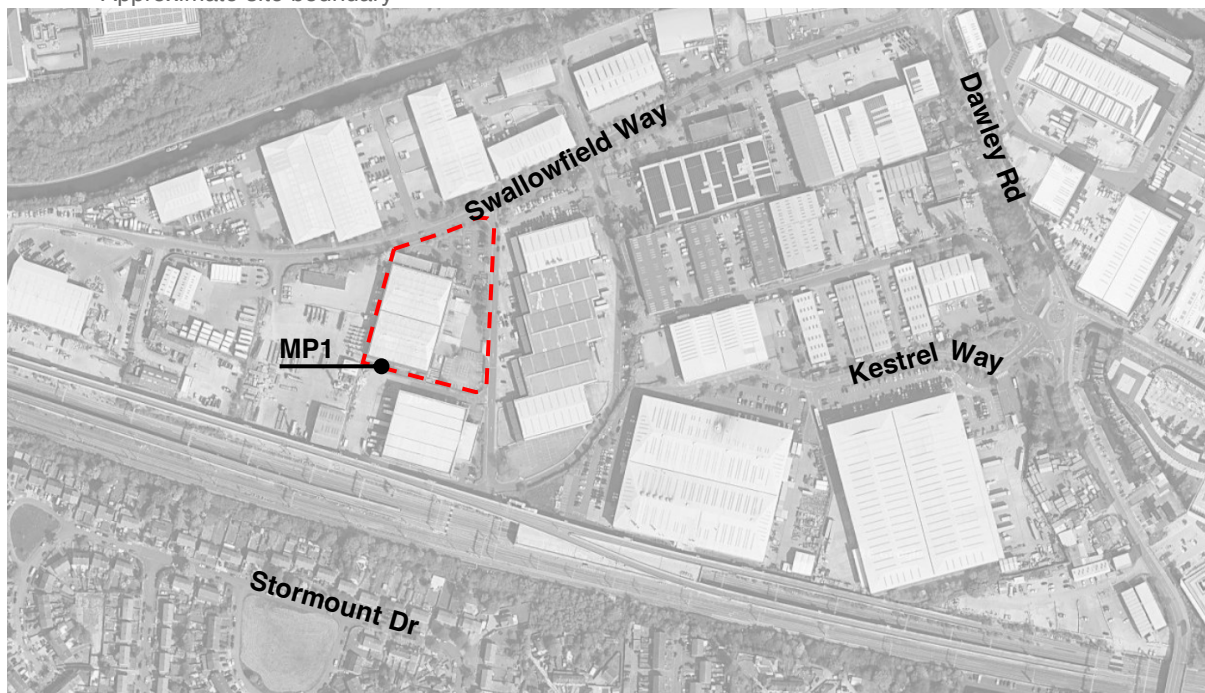
4.1 A noise survey was undertaken at the site between 1345 on Friday 1st May and 1300 on Wednesday 6th May 2026. Full details of the survey can be found in **Appendix A** of this document. While part of this survey fell across a bank holiday weekend, this is not deemed to have a significant effected on the assessed background noise levels.

4.2 Noise measurement position MP1 was located at approximately 1.5 metres above local round level on a façade-incident position on the site's southern boundary. This position can be seen illustrated on the following **Image 2**. Due to the significant distance from the proposed development to the nearest noise sensitive receptors, MP1 was adopted as a proxy position to represent noise conditions at residences to the south of site beyond the nearby trainline (discussed further in **section 5.0**).

¹ Largely drawn from BS 4142:2014+A1:2019 (Methods for rating and assessing industrial and commercial sound)

Image 2. Aerial photo showing noise measurement position

--- Approximate site boundary



Aerial imagery courtesy of Google Maps

4.3 The representative background noise levels captured over the relevant periods are set out within **Table 1**. The incoming tenants for the unit are not known and it is therefore assumed that the proposed plant could operate at any time over a 24 hour day.

Table 1 Representative measured background noise levels

Location	Representative Measured Background Noise Level, $L_{A90,T}$ dB	
	Daytime (0700-1900)	Night-time (2300-0700)
MP1: Site southern boundary	49	47

4.4 The existing noise climate was influenced by frequent train passbys and by various mechanical services units in the wider vicinity, in addition to commercial activity (vehicle movements). Existing mechanical services plant associated with Unit 5 was not subjectively identifiable within the prevailing noise climate.

5.0 Plant Noise Assessment

Plant Noise Limits

5.1 The new items of plant are to service the unit's offices. It is therefore expected that operational hours will likely conform to that of the incoming tenant. In order to not impose any time noise related constraints on the scheme as a result of the mechanical services design, unit noise emissions have been assessed against the lowest emissions limit, within the night time hours. This approach means that plant can operate at time over a 24 hour period and not exceed the relevant noise limits. This approach has been take to enable 24 hour operation of the unit if required by the incoming tenant.

5.2 Based on the guidance set out within the attached **Appendix B**, the following plant noise emission limits (in terms of rating levels) to apply at the nearest noise sensitive receptors have been set out in **Table 2**.

Table 2 Plant noise emission limits

Location	Noise Emission Limit, $L_{A,T}$ dB	
	Daytime 0700-1900, T: 1 hour	Night-time 2300-0700, T: 15 minutes
Nearest noise sensitive receptors	44	42

5.3 These limits are to apply to all plant items running simultaneously in the relevant time periods when at full design duty and are to apply at 1 metre from the outside of the nearest noise sensitive receptors to the proposed plant. Any plant with a tonal component or other distinctive feature out of character with the existing environment would be subject to a further penalty in line with the relevant guidance.

Proposed Installation

5.4 **Table 3** outlines the proposed plant items to be installed.

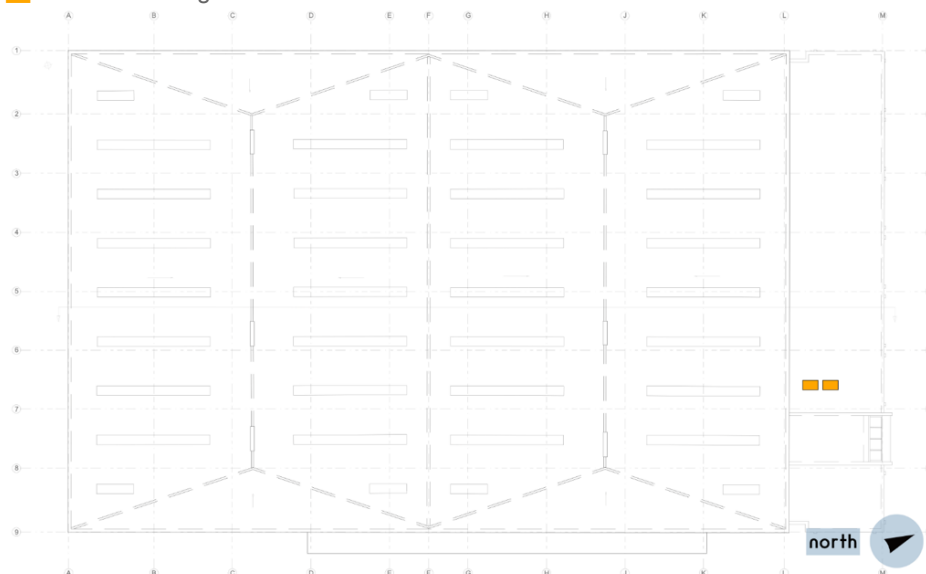
Table 3 Proposed mechanical services plant to be used at the site

Item	Manufacturer	Type
Air Conditioning Condensers (x2)	Mitsubishi	PURY-EP350YNW-A2

5.5 The proposed units are to be installed on new support systems on the second story flat roof on the northern end of the site, in the same area as the existing mechanical services units, all of which are to be removed. The units can be seen marked in **orange** on the following excerpts from the *Perseverance Architects* 'Roof Plan 01 Proposed Layout' drawing (ref: 2602_220_011, dated 7th April 2026), included as **Image 3**.

Image 3. Excerpt from *Perseverance Architects* 'Roof Plan 01 Proposed Layout'

■ Air Conditioning Condensers



Assessment Methodology

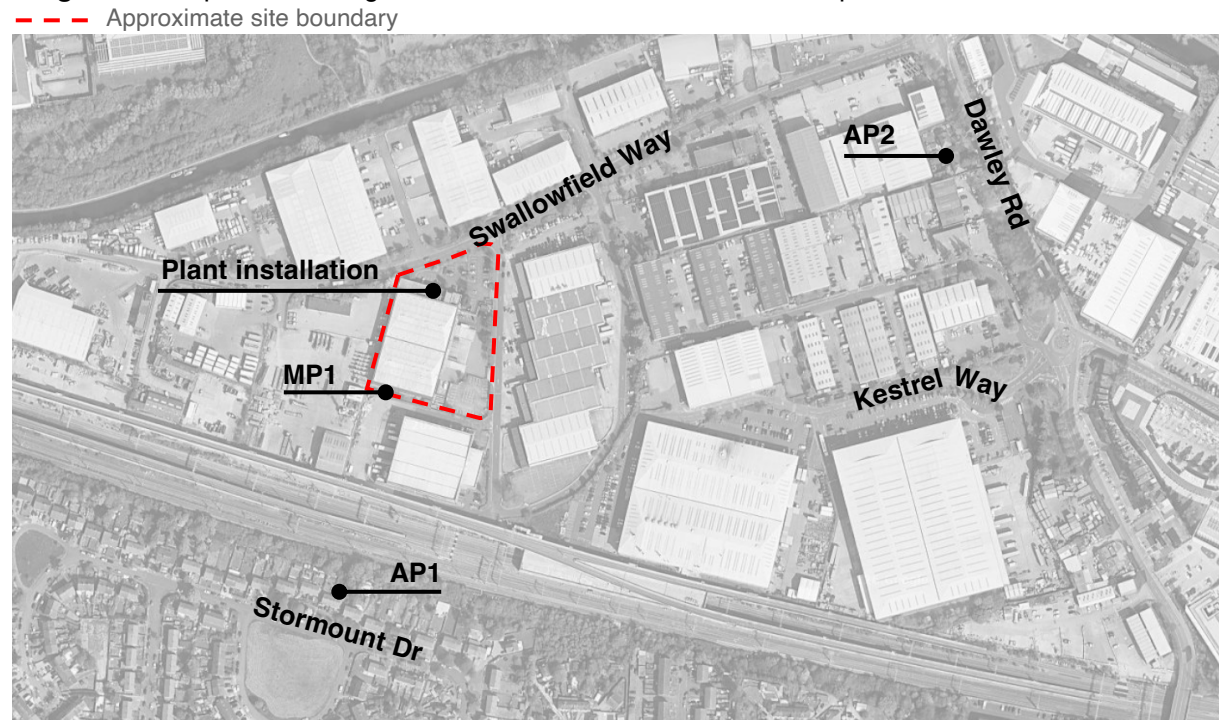
5.6 The assessment has been based on manufacturer's noise data for each plant item. This noise data and the expected operational regime of the plant suggests that no acoustic character corrections need be applied.

5.7 Noise emissions from the proposed plant installation have been assessed to the nearest noise sensitive receptors as described below and illustrated on **Image 4** as positions 'AP1' and 'AP2'.

- AP1: First floor northern facing residential windows on Stormount Drive;
- AP2: First floor western facing residential windows on Dawley Road.

5.8 It must be borne in mind that these receptors are both a substantial distances from the proposed installation (circa 250 m to the south at AP1 and 400 m to the east at AP2).

Image 4. Aerial photo showing noise measurement and assessment positions



Aerial imagery courtesy of Google Maps

5.9 Levels of plant noise have been calculated at the assessment position by correcting for radiation, screening, and distance losses where appropriate. Calculation sheets are not included for the sake of brevity but can be provided upon request.

Results

5.10 With the units installed in the location described in the previous sections, the following plant noise levels are predicted at the assessment positions.

Table 4 Noise emission levels at the nearest noise sensitive receptors

Location	Assessed Rating Noise Level, <i>L_{Ar,Tr}</i> dB (Limit)
	24-hour
AP1: Stormount Drive residences	9 (42)
AP2: Dawley Road residences	0 (42)

5.11 It can be seen that with the proposed installation in place as per the previous sections, the noise limits set out within this report are not expected to be exceeded during the operational periods and no mitigation measures are required. No adverse noise effects are therefore anticipated as a result of the proposed services installation.

6.0 Service Yard and Car Parking Noise

6.1 As described in Section 2.0, the site comprises an existing operational commercial unit with an active service yard located on its eastern extent. The noise survey detailed in Section 4.0 captured the prevailing noise climate at the site against which the proposed plant has been assessed; no activity within the Unit 5 service yard itself was observed during the survey set-up or collection but such activity is known to have occurred at various points over the survey.

6.2 The proposals comprise a reconfiguration of the existing service yard rather than an intensification of use. The works will expand the usable yard area through the removal of the southern car park and existing internal ramps, and will introduce two additional level-access loading doors on the southern elevation of the building. The unit is to remain unchanged.

6.3 A Transport Statement has been prepared in support of the planning application by i-Transport (ref. LB/SPH/ITB210831-002). The Transport Statement confirms that the reconfiguration is not anticipated to materially alter existing traffic volumes or HGV trip generation. The two additional loading doors are not provided to facilitate additional HGV trips, but rather to support the more efficient operation of the expanded yard area. Swept path analysis included within the Transport Statement also demonstrates that articulated vehicles will be able to enter, manoeuvre to the loading bays, and exit the site in a forward gear.

6.4 On the basis of the information set out within the Transport Statement, the frequency, type and duration of HGV movements and ancillary yard activity (including forklift operations and loading and unloading activity) at Unit 5 are not expected to change materially due to the proposals. The prevailing noise climate at the site is in any event dominated by train passbys on the Great Western Railway / Elizabeth Line corridor to the south and by activity associated with neighbouring commercial units (including forklift movements within the service yard immediately to the south of the site, which were observed during the survey period), rather than by activity associated with Unit 5 itself.

6.5 It is again noted that the nearest noise sensitive receptors are also at substantial distances from the Unit 5 service yard (circa 250 m to the south at AP1 and 400 m to the east at AP2). It is highly unlikely that these receptors would be able to distinguish noise from current or future activity relating specifically to Unit 5.

6.6 In addition to the service yard reconfiguration, the proposals include changes to the on-site car parking provision. As described within the Transport Statement, the existing provision of 86 spaces (comprising 45 spaces within the northern car park, 33 spaces within the southern car park, and 8 spaces within the service yard) is to be rationalised to a total of 53 spaces through the removal of the southern car park, with the northern car park and service yard parking provision

retained in their existing form. Five EV charging spaces are also to be introduced within the northern car park, and the existing covered cycle store is to be retained.

6.7 The northern car park is to be retained in its existing form and location, and noise associated with its operation is therefore not expected to differ materially from the existing situation. The southern car parking area is (at time of writing) not currently used and therefore its removal is not expected to give rise to result in a perceptible change in noise level at those receptors.

6.8 On this basis, the proposed reconfiguration of the service yard and the associated changes to the on-site car parking provision are not considered to result in a material change in noise emissions at the nearest noise sensitive receptors. No adverse noise effects are therefore anticipated as a result of the proposed works, and no specific mitigation in respect of service yard or car parking noise is considered necessary.

7.0 Conclusions

7.1 It is proposed to reconfigure the existing service yard and associated car parking areas at 5 Swallowfield Way, Hayes, together with the installation of new mechanical services plant to support the Unit's offices.

7.2 An unattended noise survey has been undertaken at the site, from which suitable plant noise emission limits have been set based on guidance issued by the London Borough of Hillingdon and the methodology set out within BS 4142:2014+A1:2019. The subsequent assessment of plant noise emissions has demonstrated that the proposed units will meet the relevant noise emission limits at the nearest noise sensitive receptors without the need for any acoustic mitigation.

7.3 Noise from the operation of the reconfigured service yard and car parking has also been considered, having regard to the findings of the Transport Statement prepared by i-Transport in support of the planning application. The service yard and car parking reconfiguration is not considered to give rise to a material change in noise at those receptors.

7.4 Overall, the proposed development is not anticipated to result in any adverse noise effects at the nearest noise sensitive receptors, and no acoustic mitigation is considered necessary in respect of the proposed plant installation, the service yard reconfiguration, or the associated changes to the on-site car parking provision.



Appendix A: Noise Survey

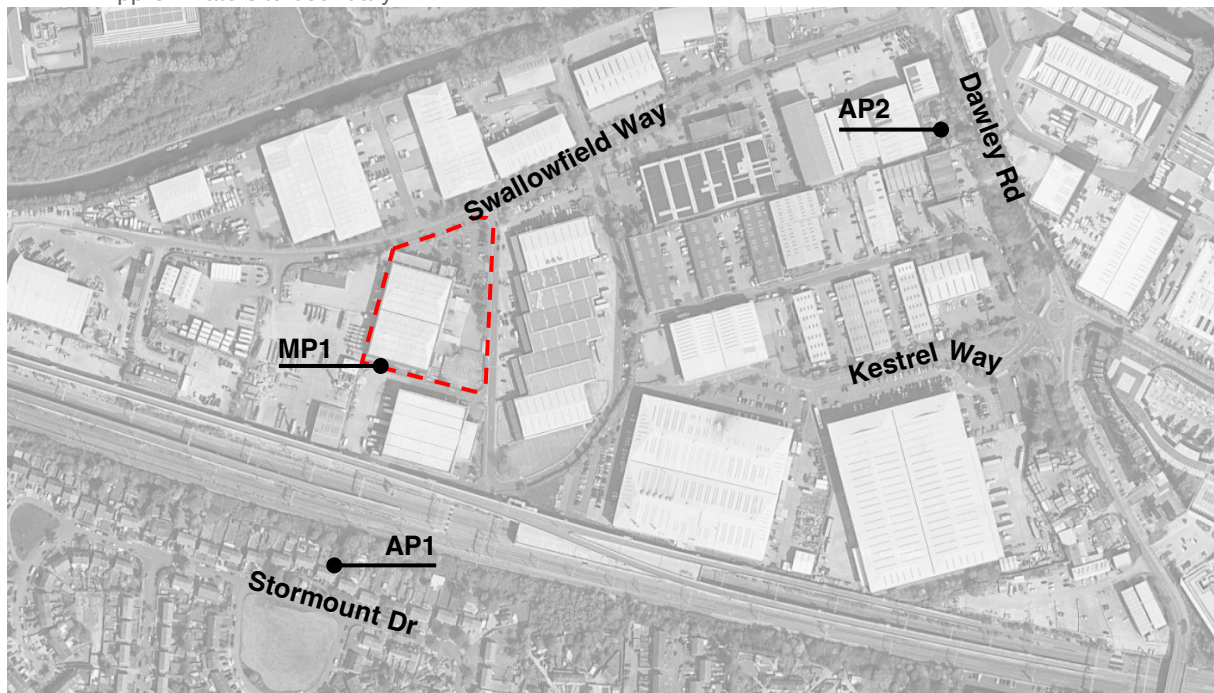
Details and results of the environmental noise survey

Methodology and Instrumentation

An unattended noise survey was undertaken at a single position on between 1345 on Friday 1st May and 1300 on Wednesday 6th May 2026. The unattended measurement position is denoted as 'MP1' on the following image.

Image A1. Aerial photograph showing noise measurement locations

--- Approximate site boundary



Aerial imagery courtesy of Google

Measurements of the L_{Aeq} , L_{Amax} and L_{A90} indices were recorded over consecutive 15-minute periods for the duration of the survey. A detailed summary of the measurement position is set out in the following table.

Noise measurement locations

Location	Detail
MP1	Microphone at approximately 1.5 m above local ground level, in a façade-incident position along the site's southern boundary. Measurements were unattended. The noise climate was controlled by various mechanical services units in the vicinity, in addition to commercial activity (vehicle movements). Existing mechanical services plant associated with Unit 5 was not specifically identifiable. Frequent train passbys were noted to the south on both raised and ground level sections of track, which dominated the noise climate when present. During collection of the survey, activity (forklift movements) within the service yard to the south of the site was also noted.

Noise measurements were made using the equipment set out within the following table. The sound level meters were fitted within weatherproof enclosures and the meters calibrated both before and after the survey to confirm an acceptable level of accuracy. The sound level meter was fitted within a weatherproof enclosure and was calibrated both before and after the survey to confirm an acceptable level of accuracy. No significant drift was noted to have occurred.

Noise measurement equipment

Location	Item	Detail
MP1	Sound Level Analyser	Norsonic Nor140
	Outdoor Microphone Kit	Norsonic Nor1217
	Acoustic Calibrator	Norsonic Nor1255

The weather conditions when setting up the survey equipment were clear and dry. When collecting the equipment, the conditions were overcast and dry. Historical weather data captured at a nearby weather station² shows a single period of rainfall across the survey duration. This period (rounded to 15-minute windows to match the noise survey data) has been set out within the following table, and the corresponding measurements omitted from our assessments.

Periods where monitoring data has been omitted due to adverse weather conditions

Date	Start Time	End Time
02/05/2026	0530	0630

Results

The following tables set out the period noise levels captured across the duration of the unattended noise survey (the worst case day and night time periods).

² <https://www.wunderground.com/dashboard/pws/IWESTD32>

Summary period noise levels measured during the unattended noise survey, dB

Measurement Position	Daytime (0700-2300)	Night-time (2300-0700)
	$L_{Aeq,16hr}$	$L_{Aeq,8hr}$
MP1: Site southern boundary	62	64

The following table sets out the octave band noise level spectra pertaining to each period is set out in the table above.

Noise survey octave band results

Measurement Position	Index	Noise Level, dB							
		63	125	250	500	1k	2k	4k	8k
MP1	$L_{Aeq,16hr}$	73	63	57	52	51	55	57	33
	$L_{Aeq,8hr}$	78	65	64	57	53	57	57	32

The table below sets out a summary of the representative background noise levels captured during the day and night-time periods.

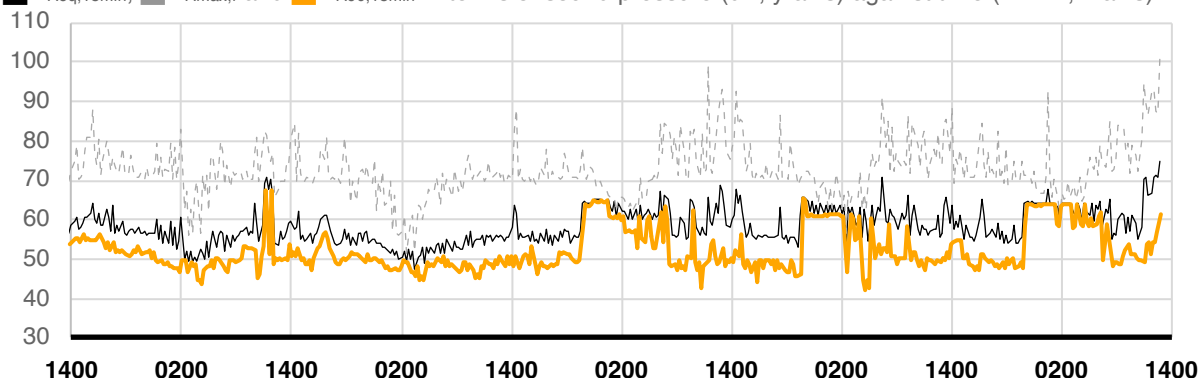
Representative background noise levels

Measurement Position	Representative Background Noise Level, $L_{A90,T}$ dB	
	Daytime (0700-2300)	Night-time (2300-0700)
MP1	49	47

The following time history graphs present the measured noise levels captured at both assessment positions throughout the survey duration.

Image A2. Noise measurement results at position MP1

■ $L_{Aeq,15min}$, ■ $L_{Amax,f}$ and ■ $L_{A90,15min}$ in terms of sound pressure (dB, y-axis) against time (hhmm, x-axis)



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Appendix B: Planning Policy and Guidance

Local Policy

The London Boroughs of Hillingdon, Hounslow and Richmond Upon Thames published a joint Supplementary Planning Document in July 2014 entitled 'Development Control for Noise Generating and Noise Sensitive Development'. Section 6 of the document sets out guidance on new noise generating industrial and commercial development.

Table 2 of the document sets out the Borough's stance with regard to the assessment of new noise sources of an industrial/commercial nature (such as mechanical services plant), based on the guidance set out within BS 4142 (discussed in the following section). This is replicated as **Image B1** for ease of reference.

Image B1. Joint SPD Table 2: New Industrial and Commercial Development – External Noise Standards

Table 2: New Industrial and Commercial Development - External Noise Standards

Noise Impact From Relevant Proposed Industrial Or Commercial Premises Or Plant	Development Outcome
Rating Level (L _A r,Tr) is at least 5 dB(A) below the Background Level LA90	Normally acceptable
Rating level (L _A r,Tr) is no more than 5 dB(A) above the Background Level LA90	Acceptable only if there are overriding economic or social reasons for development to proceed
Rating level (L _A r,Tr) is more than 5 dB(A) above the Background Level LA90	Normally unacceptable

Note: All terms as defined in BS4142

National Policy

National Planning Policy Framework

The NPPF is the relevant document for defining the national policy toward noise sensitive development. The document was originally published in March 2012 and most recently updated in December 2024.

Paragraph 135 states that planning policies and decisions should ensure that developments:

"create places that [...] promote health and well-being, with a high standard of amenity for existing and future users..."

Further to this and on the subject of noise, paragraph 187 states that planning policies and decisions should contribute to and enhance the natural and local environment by:

"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"

Paragraph 198 of the NPPF states:

“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;”*

Clause “a)” in paragraph 198 makes reference the Noise Policy Statement for England which is discussed in the following section.

The 'agent of change' principle is discussed in paragraph 200 of the NPPF. In terms of noise, this principle requires that those proposing a new noise sensitive development incorporate sufficient mitigation such that the operation of existing premises in the area is not unreasonably restricted in order to control noise impact upon the new development:

"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."

Noise Policy Statement for England

The NPSE (March 2010) also does not set quantitative guidelines for the suitability of noise sensitive development in an area depending on the prevailing levels of noise. Absent, therefore, is reference to specific noise thresholds which determine whether noise sensitive development is suitable and, if so, whether mitigation factors need to be considered.

Instead, the NPSE sets out the principle of “SOAEL, LOAEL and NOEL” which are defined as follows:

Significant Observed Adverse Effect Level (SOAEL): This is the level [of noise exposure³] above which significant adverse effects on health and quality of life occur.

Lowest Observed Adverse Effect Level (LOAEL): This is the level [of noise exposure²] above which adverse effects on health and quality of life can be detected.

No Observed Effect Level (NOEL): This is the level [of noise exposure²] 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.

Given the overall thrust of the NPSE, the SOAEL is an important assessment threshold although the NPSE also comments in section 2.22 that:

³ Additional text drawn from the Planning Practice Guidance Definition

“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.”

Attention is drawn to the fact that the SOAEL is the level above which significant adverse effects can be observed. Importantly, it should be noted again in respect of the NPPF that the overall objective is to avoid or minimise significant adverse impacts; some degree of impact is acceptable, and it is not necessary or reasonable to seek to achieve no impact at all.

In addition to the principles set out above, the NPSE sets out three key aims:

The first aim of the Noise Policy Statement for England

“Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.”

The second aim of the Noise Policy Statement for England

“Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.”

The third aim of the Noise Policy Statement for England

“Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.”

Paragraph 2.24 of the NPSE states that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life. It also states that this does not mean that such adverse effects cannot occur.

Each development site must be judged on its ability to deliver on each of these aims, and while rating the prevailing noise against predefined thresholds is no longer necessary, defining the prevailing noise levels is an essential first step in assessing a given site under the current regime.

Planning Practice Guidance (PPG)

In March 2014 the Department for Communities and Local Government (DCLG) launched the national Planning Practice Guidance (PPG) web-based resource. The PPG on Noise (last updated in July 2019) expands upon the NPPF and NPSE and sets out more detailed guidance on noise assessment.

Like the NPPF and NPSE, the guidance does not include any specific noise levels but sets out further principles that should underpin an assessment. The PPG includes a section on noise, paragraph 003 of the which states:

“Plan-making and decision making need to take account of the acoustic environment and in doing so consider:

- 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.”*

It then refers to the NPSE and states that the aim is to identify where the overall effect of the noise exposure falls in relation to the relevant SOAEL, LOAEL and, by inference, the NOEL. Definitions for these thresholds are provided again with the PPG, which differ very slightly in wording to the NPSE, but are taken to be identical in their meaning.

In relation to the SOAEL, LOAEL and NOEL, the PPG makes the following important statement:

“Although the word ‘level’ is used here, this does not mean that the effects can only be defined in terms of a single value of noise exposure. In some circumstances adverse effects are defined in terms of a combination of more than one factor such as noise exposure, the number of occurrences of the noise in a given time period, the duration of the noise and the time of day the noise occurs.”

The guidance then presents a table, which is reproduced in the following table. The implication of the final line of the table is that only the 'present and very disruptive' outcomes are unacceptable and should be prevented. All other outcomes (i.e. all other lines in the table) can be acceptable, depending upon the specific circumstances and factors such as the practicalities of mitigation.

On that basis, noise levels deemed to be below the SOAEL can be considered acceptable providing noise has been mitigated and reduced to a minimum.

Table 1.1. Planning Practice Guidance summary of noise exposure hierarchy.

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not present	No Effect	No Observed Effect	No specific measures required
NOEL - No Observed 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
LOAEL - 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
SOAEL - 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 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 change in acoustic character of the area.	Significant Observed Adverse Effect	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

It is noteworthy that the PPG states that:

"Noise impacts may be partially offset if residents have access to one or more of:

- a relatively quiet facade (containing windows to habitable rooms) as part of their dwelling;

- a relatively quiet external amenity space for their sole use, (e.g. a garden or balcony). Although the existence of a garden or balcony is generally desirable, the intended benefits will be reduced if this area is exposed to noise levels that result in significant adverse effects;
- a relatively quiet, protected, nearby external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings; and/or
- a relatively quiet, protected, external publically accessible amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minute walking distance).

Guidance Documents

British Standard BS 4142

British Standard 4142:2014+A1:2019 (Methods for rating and assessing industrial and commercial sound) states in section 1.1:

“This British Standard describes methods for rating and assessing sound of an industrial and/or commercial nature, which includes:

- 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 fork-lift trucks, or that from train or ship movements on or around an industrial and/or commercial site.*

The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.”

The standard states its applications as,

“This standard is applicable to the determination of the following levels at outdoor locations:

- a) rating levels for sources of sound of an industrial and/or commercial nature; and*
- b) ambient, background and residual sound levels,*

for the purposes of:

- 1) investigating complaints;*
- 2) assessing sound from proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and*
- 3) assessing sound at proposed new dwellings or premises used for residential purposes.”*

BS 4142 sets out a daytime assessment period of 1 hour and night-time period of 15 minutes. The assessment methodology requires that a “specific level” from a given noise source is determined considering these time periods. Character corrections should be added if the noise has tonality, impulsivity, intermittency or other such characteristics; this gives the “rating level” of a given noise source. The level of the correction is based upon how the noise is perceived, as set out in the standard.

The rating level of noise, $L_{Ar, Tr}$, for the relevant assessment period is the calculated noise level at the nearest receiver location, adjusted to take into account the acoustic characteristic of the noise. Acoustic feature corrections can be made to account for tonality, impulsivity, intermittency and other characteristics present in the resultant sound at the receiver position. The magnitude or appropriateness of any correction will depend both on the type of noise source and the context in which it is perceived. Similarly, in accordance with BS 4142, the period of time for which an individual noise source is active during the relevant reference time period will also be considered in establishing the rating level.

It will also be necessary to consider the existing noise climate and what sound sources contribute to it. For example, where a noise generating activity is proposed adjacent to an existing similar noise generating site, the impact of the new noise source would be less than if it were to be planned in a location where its character and type is different to and more noticeable than any existing noise source nearby.

With regard to the background sound level against which the rating level is compared, the standard states the following:

“In using the background sound level in the method for rating and assessing industrial and commercial sound it is important to ensure that values are reliable and suitably represent both the particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods.”

The periods of interest over a 24-hour day are usually related to daytime activities (07:00-23:00h) and night time (23:00-07:00h). However the standard makes the following statement:

“Among other considerations, diurnal patterns can have a major influence on background sound levels and, for example, the middle of the night can be distinctly different (and potentially of lesser importance) compared to the start or end of the night-time period for sleep purposes. Furthermore, in this general context it can also be necessary to separately assess weekends and weekday periods.”

Therefore, the periods of time which can be considered as ‘waking up’ and ‘falling asleep’ stages, for example 06:00h to 07:00h and 23:00h to 24:00h, may need to be considered independently. Alternative periods may also be identified where breakdown beyond the standard day and night-time analysis will be necessary, for example where background sound levels are shown to be regularly elevated.

Once the rating level at each receptor has been calculated, reference can be made to the following commentary in BS 4142 in relation to conducting an initial assessment of the impact, based on the difference between the rating level of the noise source and the pre-existing background sound level.

“Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level (see Clause 8) from the rating level (see Clause 9), and consider the following.

NOTE 1 *More than one assessment might be appropriate.*

a) Typically, the greater this difference [between industrial site noise rating level and baseline background level], the greater the magnitude of the impact.

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

NOTE 2 Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."

In situations where background sound levels are low, it is important to again consider context, rather than simply basing an assessment of impact on a difference in noise level, as suggested above. With regards to context in relation to absolute noise levels, the standard states the following:

'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.'

British Standard BS 4142:2014 does not set out guidance for what constitutes low background noise levels. Instead, it can be inferred from the World Health Organisation Night Guidelines for Europe (2009) that a noise level of ≥ 30 dB $L_{\text{night, outside}}$ is not likely to give rise to any substantial observed noise effects.

Although the above criterion relates to an 8-hour period between 2300 and 0700 (i.e. the night-time), the application of the criterion to any given 15-minute period during the night-time (or one hour if applied to the daytime) effectively makes the criterion more stringent.

Taking into account the above therefore, it is suggested that noise limits for mechanical services plant equipment should be set with a lower threshold of 30 dB $L_{A,T,r}$. Noise levels equal to or below this threshold figure would not be expected to give rise to substantial observed effects (i.e. the impact would be low).

From the above, it can be concluded that ensuring noise emissions from a given site or activity do not exceed noise limits set at a level 5 dB above the representative background noise levels at a given receptors will provide an indication that noise adverse effect will **not** occur.

