

1 VINYL SQUARE

THE OLD VINYL FACTORY

Joseph
Homes.

THE OLD
VINYL FACTORY

 waterman

NOISE IMPACT

ASSESSMENT

NOVEMBER 2019





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This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS OHSAS 18001:2007)

Issue	Date	Prepared by	Checked by	Approved by
01	Nov 2019	Jamie Newton Consultant 	Innes Urbanski Associate 	Innes Urbanski Associate 

Comments

Comments

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1. Introduction

Waterman Infrastructure & Environment Limited (hereafter referred to as 'Waterman') has been appointed by JH Veneer Limited (hereafter referred to as 'the Applicant') to undertake a noise assessment to support a planning application for the development of 1 Vinyl Square, The Old Vinyl Factory, Blyth Road, Hayes, London, UB3 1SY (hereafter referred to as 'the Site'), located within the administrative boundary of the London Borough of Hillingdon (hereafter referred to as 'LBH').

This report provides an assessment of the suitability of the Site for residential development against credited guidance, having regard of the requirements of LBH. Where necessary, noise control measures required to protect the amenity / living conditions of future occupants of the Development have been identified.

A glossary of the acoustic terminology used within this report is presented in **Appendix A**.

1.1 Proposed Development and Site Description

The existing Site is currently a vacant brownfield site.

The proposed development consists of the development of the site to provide a mixed-use development comprising 134 residential dwellings (C3 Use Class) and 395sqm (GIA) commercial floorspace (flexible A1/A2/A3/A5/B1 Use Class), car parking, cycle parking and associated landscaping.

The site location and planning application boundary are presented in **Figure 1**.

2. Noise Assessment Criteria

2.1 Criteria Overview

When selecting appropriate criteria for assessment, consideration has been given to advice contained within the following:

- National Planning Policy Framework (NPPF)¹;
- Noise Policy Statement for England (NPSE)²;
- ProPG 'Planning and Noise – New Residential Development'³

Further detail for the above criteria is presented in **Appendix B**.

2.2 London Borough of Hillingdon

Additional consideration has been given to advice contained within the following local authority documents:

- Hillingdon Local Plan: Part 1 Strategic Policies⁴;
- Hillingdon Unitary Development Plan (UDP)⁵;
- Noise Supplementary Planning Document (SPD)⁶;

Further detail for the above criteria is presented in **Appendix B**.

The environmental noise survey strategy was e-mailed to the Environment team at Hillingdon Council on 24th September 2019. No reply was received regarding the survey strategy.

¹ Department for Communities and Local Government (DCLG) (2019); '*The National Planning Policy Framework*', TSO.

² Department for Environment, Food and Rural Affairs (DEFRA) (2010); '*Noise Policy Statement for England*', DEFRA.

³ ANC, IoA, CIEH. (May 2017); Professional Practice Guidance on Planning & Noise. New Residential Development.

⁴ London Borough of Hillingdon (2012); '*Hillingdon Local Plan: Part 1 Strategic Policies*'.

⁵ London Borough of Hillingdon (1998, Saved Policy 2007); '*Hillingdon Unitary Development Plan (UDP)*'.

⁶ London Borough of Hillingdon (2006), *Noise Supplementary Planning Document*.

3. Baseline Environmental Conditions

3.1 Identification Sensitive Receptors

Existing properties within the vicinity of the proposed Development are predominantly residential in nature. Sensitive receptors around the site are described in **Table 3-1**.

Table 3-1: Nearest Sensitive Receptors

Receptor	Type of Receptor	Description / Name	Approximate Distance from Site Boundary (m)
SR A	Residential	Houses on Dawley Road	80m South-West
SR B	Residential	Empire House, Blyth Road	30m North
SR C	Residential	Jupiter House, Blyth Road	40m East
SR D	Education	Global Academy	45m East

In addition to the above existing buildings there are a number of residential developments in the area which have recently been granted planning permission namely Enterprise House and the Assembly Buildings which would also be given consideration as the design develops.

3.2 Baseline Noise Monitoring

A baseline environmental noise survey was undertaken at the Site to establish and quantify the existing noise climate. Monitoring was carried out from Wednesday 2nd October to Monday 7th October 2019 covering both a weekday and weekend period.

The monitoring locations are illustrated on **Figure 1** and described in Table 3.2.

Table 3-2: Noise Monitoring Positions

Monitoring Location (Figure 1)	Description	Observations and Predominant Noise Sources
LT1	Free field measurement at northern site boundary, 2m above ground level	Noise climate dominated by road traffic noise from Blyth Road, with contribution from road traffic noise from Dawley Road and occasional train passes on rail line to the south of the Site
ST1	Free field measurement 3m from Dawley Road, 1.5m above ground level	Noise climate dominated by road traffic noise from Dawley Road, with contribution from occasional train passes on rail line to the south of the Site
ST2	Free field measurement at western site boundary, 25m from Blyth Road, 1.5m above ground level	Noise climate dominated by road traffic noise from Blyth Road, with contribution from road traffic noise from Dawley Road and occasional train passes on rail line to the south of the Site
ST3	Free field measurement the corner of Pressing Lane and Powerhouse Lane, 9m from rail line, 1.5m above ground level	Noise climate dominated by occasional train passes on rail line, with contribution from road traffic noise from Dawley Road and Blyth Road.

All noise measurements were taken with calibrated precision grade (Class 1) level meters, with the meter

at positions LT2 and LT3 recording one-third-octave band sound. The sound level meters were set-up to record over consecutive 5-minute periods the L_{eq} , L_{90} , L_{10} and L_{max} noise indices in the A-weighting network over 0.1s fast response time constant intervals for the duration of each survey. The indices are described in **Appendix A** of this report. Details of the instrumentation used for the noise measurements are presented within **Appendix C** with calibration certificates available on request.

Weather conditions, whilst not actively measured during the survey period, were monitored remotely throughout. A summary of weather conditions over the survey period are presented within Appendix C.

A summary of the measured noise levels is detailed in Table 3.3 with full details presented in **Appendix C**.

Table 3-3: Summary of Baseline Noise Measurements

Monitoring Location (Figure 1)	Period	Duration	$L_{Aeq, T}$	$L_{A10, T}$	$L_{A90, T}$ dB	$L_{AFmax, 5min}$ dB
			Ave ¹	Ave ²	Ave ³	90th Percentile
LT1	Day	16hr	65 dB	68 dB	56 dB	81 dB
	Night	8hr	59 dB	59 dB	46 dB	79 dB
ST1	Day	55 Mins	76 dB	79 dB	68 dB	91 dB
ST2	Day	60 Mins	58 dB	61 dB	52 dB	76 dB
ST3	Day	60 Mins	62 dB	64 dB	52 dB	79 dB

Notes: ¹ Logarithmic average; ² Arithmetic average; ³ Modal average of integer $L_{A90, T}$ values; All figures rounded to nearest whole decibel.

4. Assessment of Residential Amenity

A 3-dimensional noise model has been developed using the software package CADNA-A® and calibrated using the results of the baseline noise survey. The noise model has then been used to generate daytime $L_{Aeq,16hr}$ (0700-2300), night-time $L_{Aeq,8hr}$ (2300-0700) noise contours across the existing Site to inform potential design constraints. The daytime and night-time contour plots are presented as **Figure 2** and **Figure 3**.

4.1 Level 1 Initial Site Noise Risk Assessment

The noise survey at location LT1 indicates that the prevailing noise levels at the northern Site boundary with Blyth Road falls into the ProPG 'Medium' noise risk category for both the day (65 dB $L_{Aeq,16hr}$) and night-time (59 dB $L_{Aeq,8hr}$) period.

Noise modelling of the whole Site, as illustrated in **Figures 2** and **3**, illustrates that during the daytime period approximately one third of the Site nearest Blyth Road is categorised as 'Medium' noise risk with the remaining two thirds further south as 'Low' noise risk. During the night-time period the whole of the Site is categorised as 'Medium' noise risk.

4.2 Level 2 Noise Assessment

Preliminary acoustic design considerations based on the results of the initial site noise risk assessment are presented to facilitate the development of good acoustic design within the development proposals.

4.2.1 Element 1 – Good Acoustic Design

The following commonly used acoustic design strategies are typically considered early in the design:

- Design Strategy 1: Maximise set-backs from noise sources and screening via site layout and intervening buildings;
- Design Strategy 2: Within individual residential units, living spaces and bedrooms should be oriented away from noise sources, where possible;
- Design Strategy 3: Any external amenity areas, including communal areas, should maximise screening from buildings within proposed development; and
- Design Strategy 4: Provision of building façade system with appropriate level of resistance to the passage sound to protect the amenity of future residents.

With regards to Design Strategy 1, a degree of screening from Dawley Road to the west and the railway line to the south is provided by the intervening buildings.

Design Strategy 3 is addressed in Section 4.2.3.

Design Strategy 4 concerns the façade primarily and is covered in more detail in Section 4.2.2 below.

4.2.2 Element 2 – Internal Noise Levels

It is generally accepted that where daytime façade noise levels are $\leq 50\text{dB } L_{Aeq,16h}$ the internal ambient noise level (IANL) with windows open would be $\leq 35\text{dB } L_{Aeq,16h}$ thereby satisfying the criteria of BS8233:2014. Similarly, night-time façade noise levels of $\leq 45\text{dB } L_{Aeq,8h}$ and $\leq 60\text{dB } L_{Amax}$ would result in IANLs of $\leq 30\text{dB } L_{Aeq,8h}$ and $\leq 45\text{dB } L_{Amax}$ with windows open, again satisfying the criteria of BS8233.

Where the design intent is a natural ventilation strategy through opening of windows then BS8233:2014 considers that IANLs could be increase by 5dB and reasonable internal conditions are still provided. This

equates to a daytime façade noise level of $\leq 55\text{dB } L_{Aeq,16h}$. This approach is also reflected in ProPG.

Figure 4 presents the daytime predicted façade noise levels and **Figure 5** presents the night-time predicted façade noise levels, both presented as a free-field value (with no reflection). The figures also present the highest predicted noise level on each building façade and are therefore the worst-case scenario, in reality at lower floors to the rear of the site noise levels would be low enough to allow ventilation via openable windows. **Table 7** presents typical glazing and ventilation strategies based on prevailing noise levels.

Table 4: Indicative Glazing & Ventilation Strategy

External Noise Level Not Exceeding		Acoustic Performance Requirement	
Day (dB L_{Aeq})	Night (dB L_{Aeq})	Windows dB R_w+C_{tr}	Ventilators dB $D_{n,eW}+C_{tr}$
<50	<45	No requirement	
57	52	25	31
60	55	26	32
63	58	29	35
66	61	32	38
69	64	35	41
72	67	38	44
≥ 72	≥ 67	Requirements determined on a site-specific basis	

Through the incorporation of a suitable glazing and ventilation strategy the required internal noise levels would be achieved for all areas of the proposed development.

4.2.3 Element 3 – External Amenity

It is generally accepted that where external noise levels are $\leq 55\text{dB } L_{Aeq,16h}$ then it is suitable for external residential amenity. **Figure 4**, which illustrates the daytime façade noise levels, illustrates that this noise level is currently exceeded for a number of private balconies. However noise levels on all roof garden and podium areas would be below the $55\text{dB } L_{Aeq,16h}$.

With regard to balconies and terraces, BS 8233:2014 ‘Guidance on sound insulation and noise reduction for buildings’ states:

“In these locations, specification of noise limits is not necessarily appropriate. Small balconies may be included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses. However, the general guidance on noise in amenity space is still appropriate for larger balconies, roof gardens and terraces, which might be intended to be used for relaxation. In high noise areas, consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of $55\text{dB } L_{Aeq,T}$ or less might not be possible at the outer edge of these areas, but should be achievable in some areas of the space.”

Further to the above the guidance provided in ProPG states that elevated noise levels on private balconies should be acceptable providing an alternative quiet shared space such as a roof terrace/podium gardens are available within the development. As previously described such areas are provided within the development and noise levels within these areas would fall below the $55\text{dB } L_{Aeq,T}$ design goal for outdoor amenity spaces.

4.3 Local Authority Assessment

Noise at the site has also been assessed in accordance with Table 1 of the LBH Noise SDP⁷, which is reproduced in **Appendix B** of this report.

Modelling shows that the majority of the site falls into Noise SDP 'Category B' during both the day and night-time periods, with only the front 5m of the site adjacent to Blyth Road falling into Noise SDP 'Category C'. On this basis *"Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection against noise to meet the Council's recommended outdoor and indoor noise levels."*

⁷ London Borough of Hillingdon, 2006, Noise Supplementary Planning Document

5. Fixed Mechanical Plant Noise Limits

Due to the stage of the design, there is no specific detail on noise generating fixed mechanical plant that may be associated with the proposed Development. As such, noise limits have been specified based on data presented in Table 3-3 and in accordance with the LBH Noise Supplementary Planning Document, which states in section 4.22:

“the development should be controlled such that the rating level of the noise from the proposed development determined according to BS4142 is at least 5 dB below the background noise level LA90,T”

Table 5-1 presents the recommended rating level limit for external fixed mechanical plant and building services at the nearest noise sensitive receptors. This is based on the measured background noise levels at LT1. To take account of potential cumulative effects from plant, the rating level limit presented is 10dB below the measured modal background value.

Table 5-1: Plant Noise Limits

Receptor	Daytime / Night-Time Plant Noise Limit, dB L _{Ar,T}
All Sensitive Receptors	45 ¹ / 36

Note: ¹ A maximum noise limit of 45dB L_{Ar,Tr} is recommended for the daytime period

6. Summary and Conclusions

This report provides an assessment of the suitability of the Site for residential use derived through a baseline survey and subsequent noise modelling.

A 3-dimensional noise model has been produced calibrated using the results of a baseline noise survey at the site. In accordance with ProPG, the model illustrates that during the daytime period approximately one third of the Site nearest Blyth Road is categorised as 'Medium' noise risk with the remaining two thirds further south as 'Low' noise risk. During the night-time period the whole of the Site is categorised as 'Medium' noise risk.

To allow the required internal noise levels to be achieved indicative glazing and acoustic ventilator specifications have been provided for each façade of the Development. Provided such measures are incorporated within the design a good level of amenity would be provided for future residents.

Plant noise level limits to safeguard existing residential receptors have been provided based on the modal measured background noise level for the daytime and night-time periods. This aspect of the design will need to be revisited when the design is finalised to ensure that new fixed mechanical plant associated with the Development achieves the noise emission targets as set out by LBH.

The planning noise assessment concludes that provided a good acoustic design is followed, suitable residential amenity could be provided. Noise limits for fixed mechanical plant and building services associated with the development have been provided to safeguard the existing residential amenity.



Figures

Figures

1 Vinyl Square, The Old Vinyl Factory, Hayes

Document Reference:

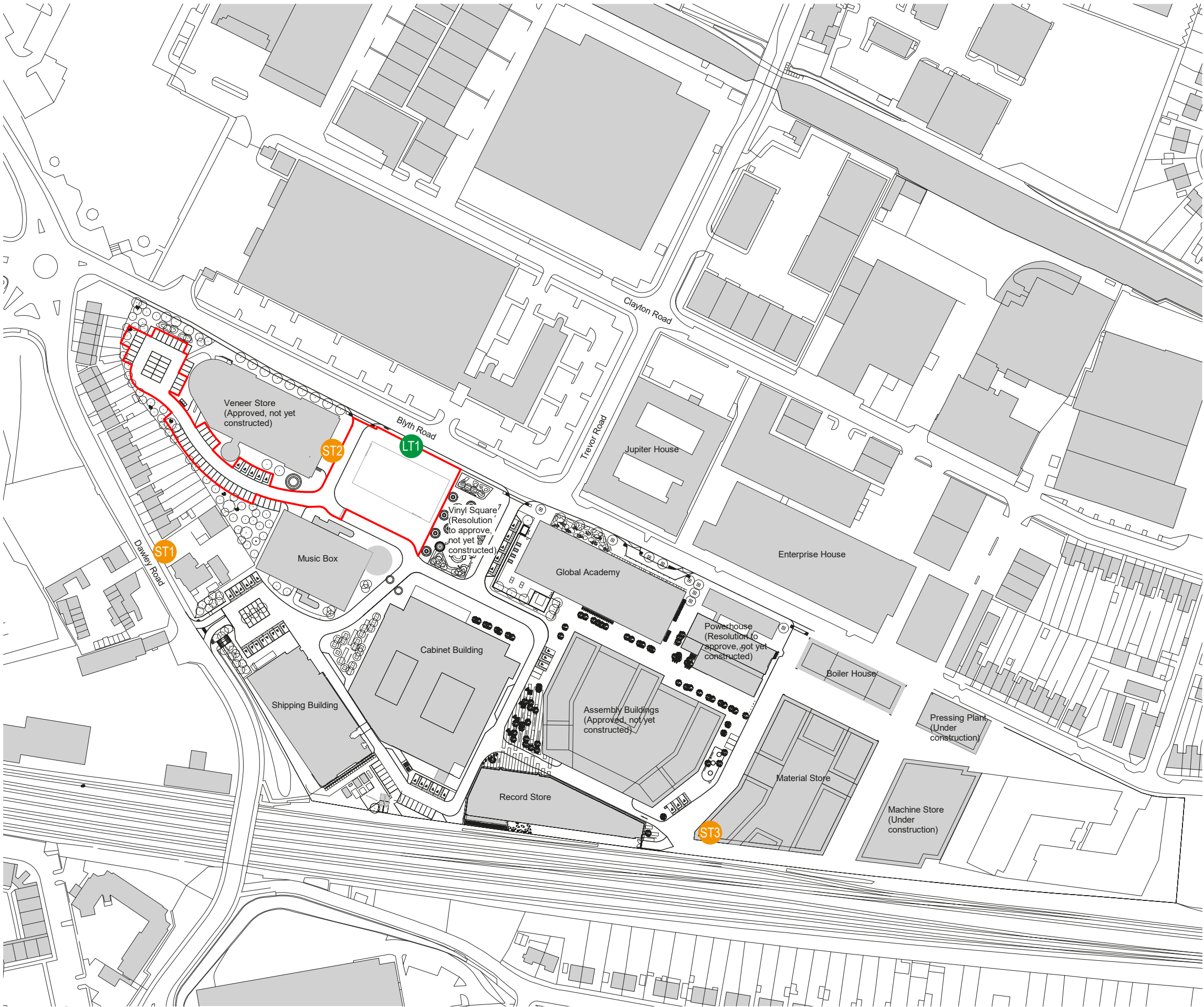
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Figure 1: Noise Monitoring Locations & Site Plan

Figures

1 Vinyl Square, The Old Vinyl Factory, Hayes
Document Reference:
WIE16463-102-R-1.3.2

- Site Boundary
- Existing Sensitive Receptor Locations
- Proposed Sensitive Receptor Locations

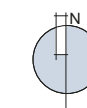
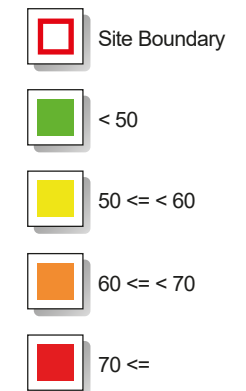
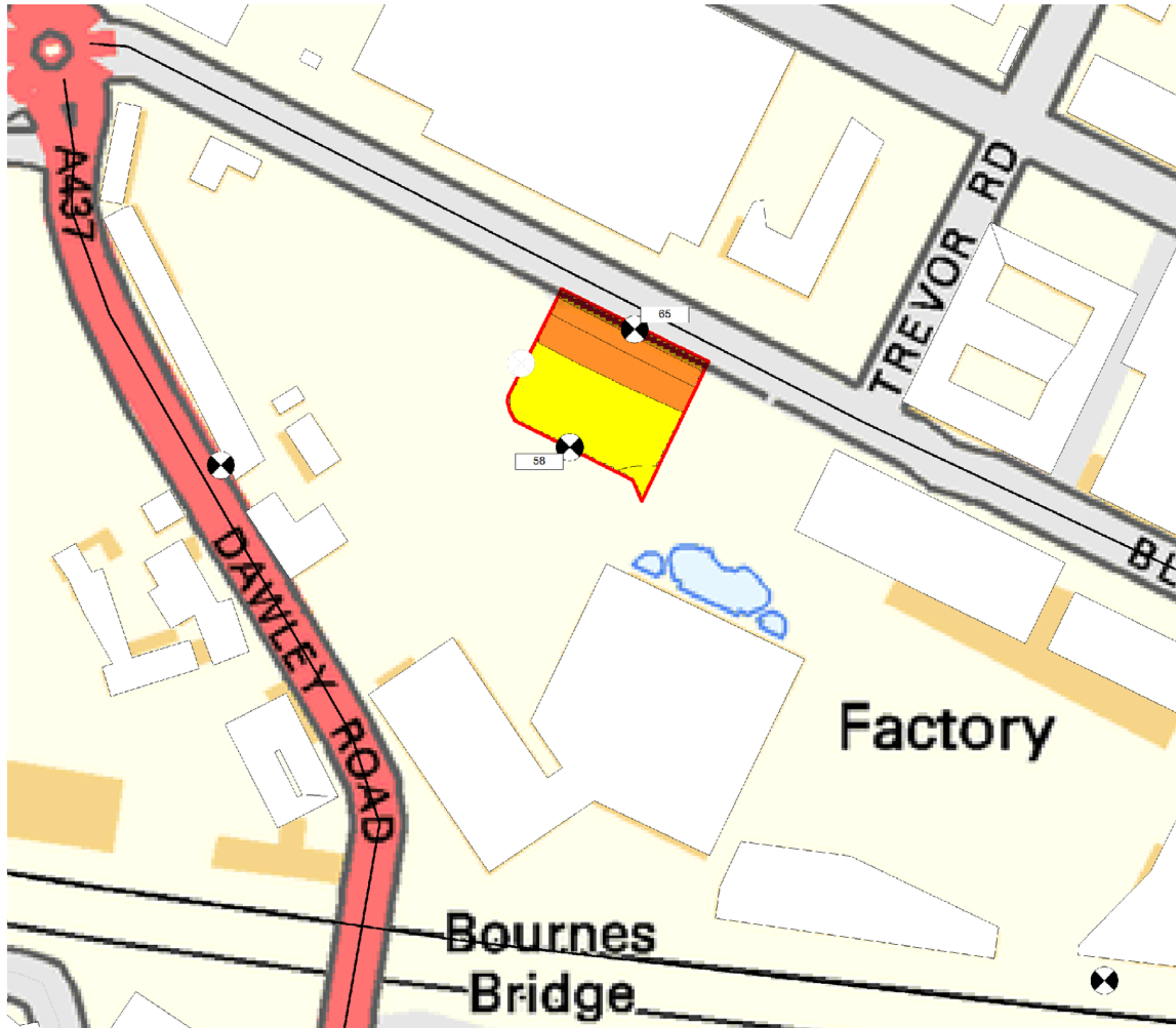


Project Details	WIE16463-100: 1 Vinyl Square
Figure Title	Figure 1: Noise Monitoring Locations
Figure Ref	WIE16463-100_GR_NM_1B
Date	October 2019
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Figure 2: Daytime Noise Contour Plot

Figures

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Document Reference:
WIE16463-102-R-1.2.3



Project Details

WIE16463-100: 1 Vinyl Square

Figure Title

Figure 2: Daytime Noise Contour Plots (dB LAeq,16h)

Figure Ref

WIE16463-100_GR_NM_2A

Date

October 2019

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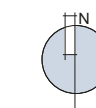
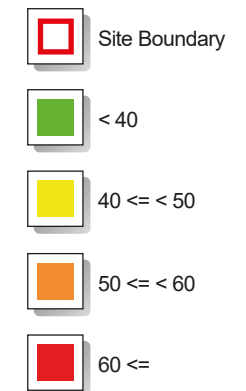
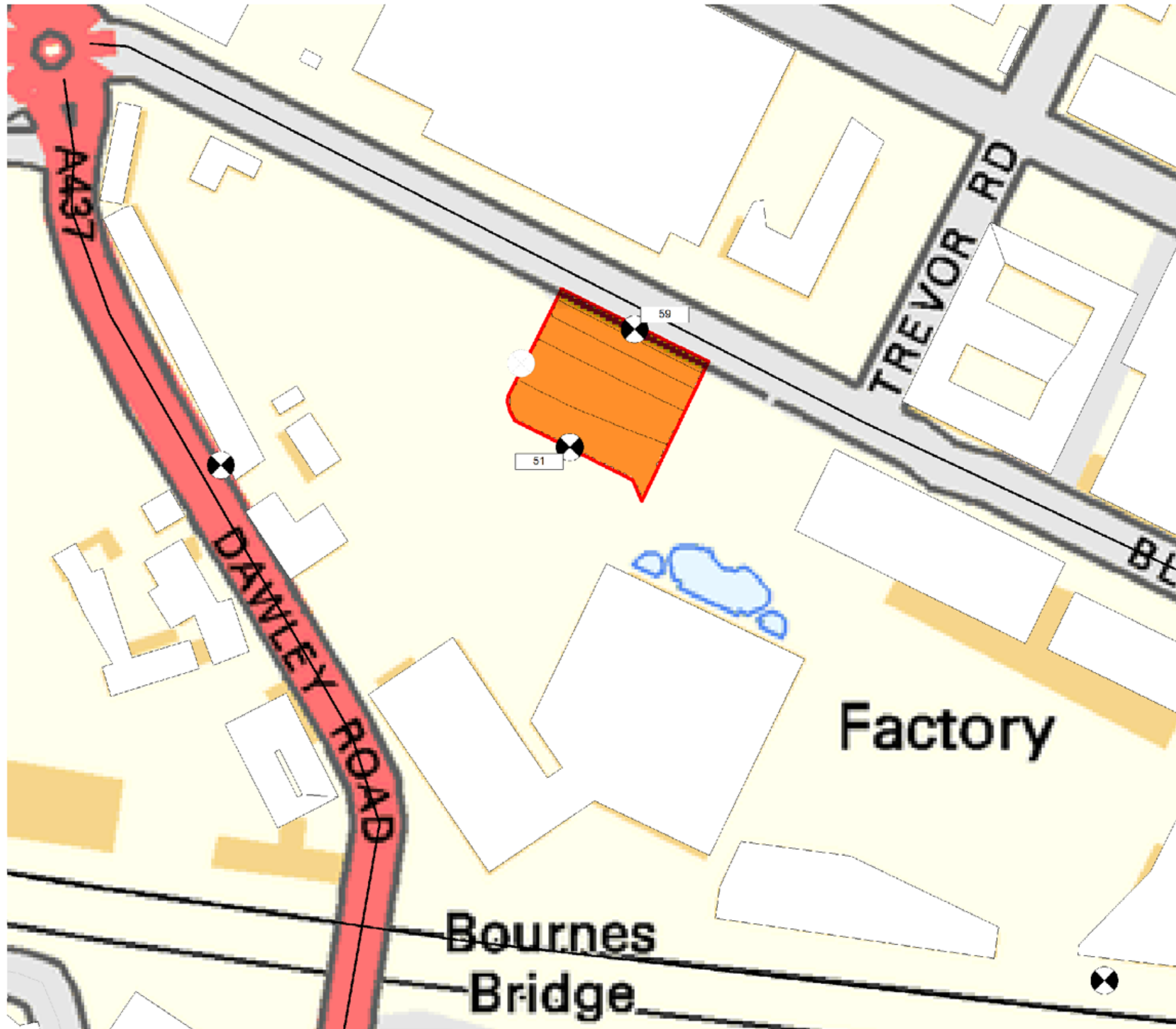
Figure 3: Night-Time Noise Contour Plot

Figures

1 Vinyl Square, The Old Vinyl Factory, Hayes

Document Reference:

WIE16463-102-R-1.2.3



Project Details

WIE16463-100: 1 Vinyl Square

Figure Title

Figure 3: Daytime Noise Contour Plots (dB LAeq,16h)

Figure Ref

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Date

October 2019

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Figure 4: Daytime Façade Noise Levels

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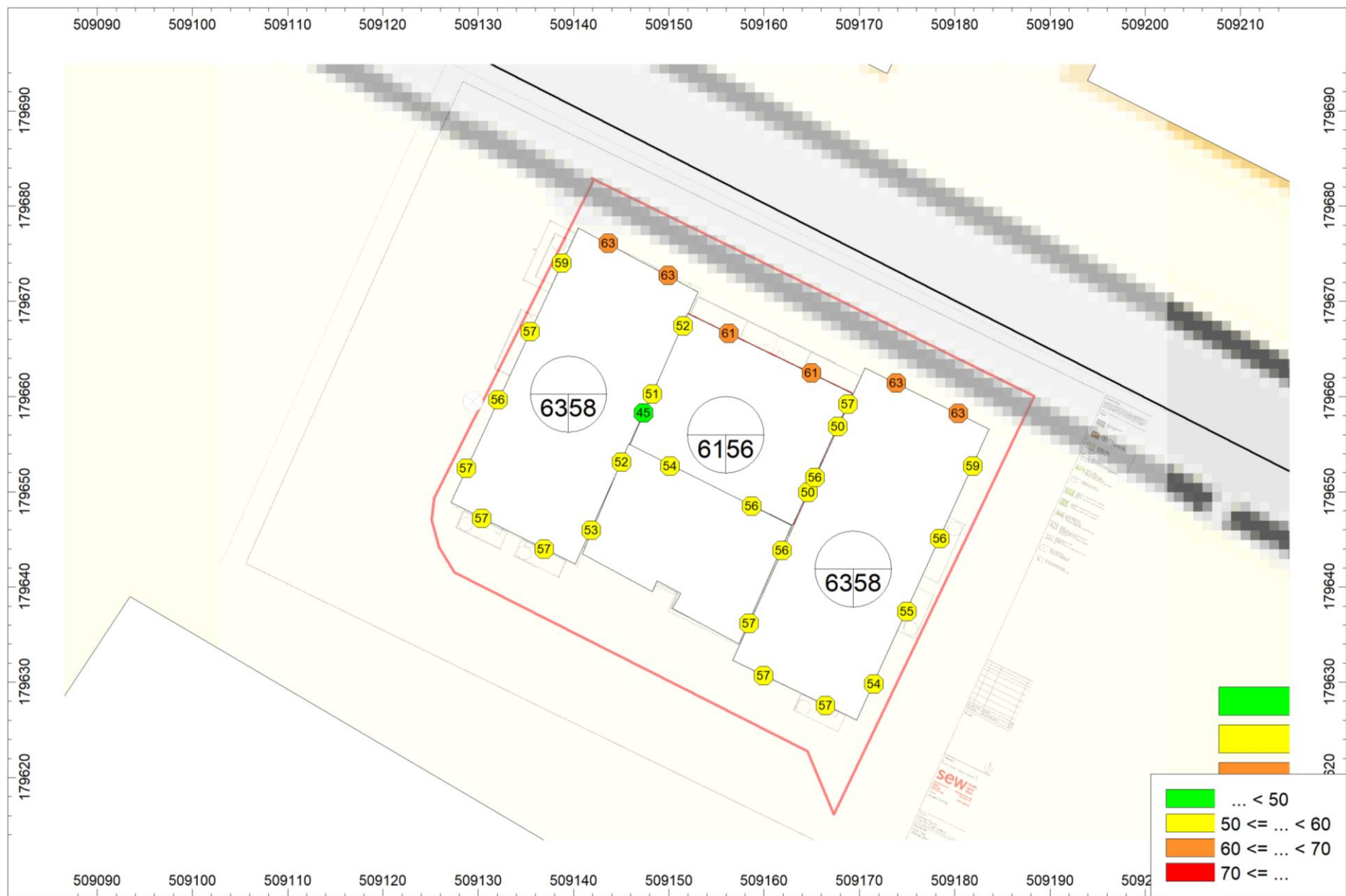
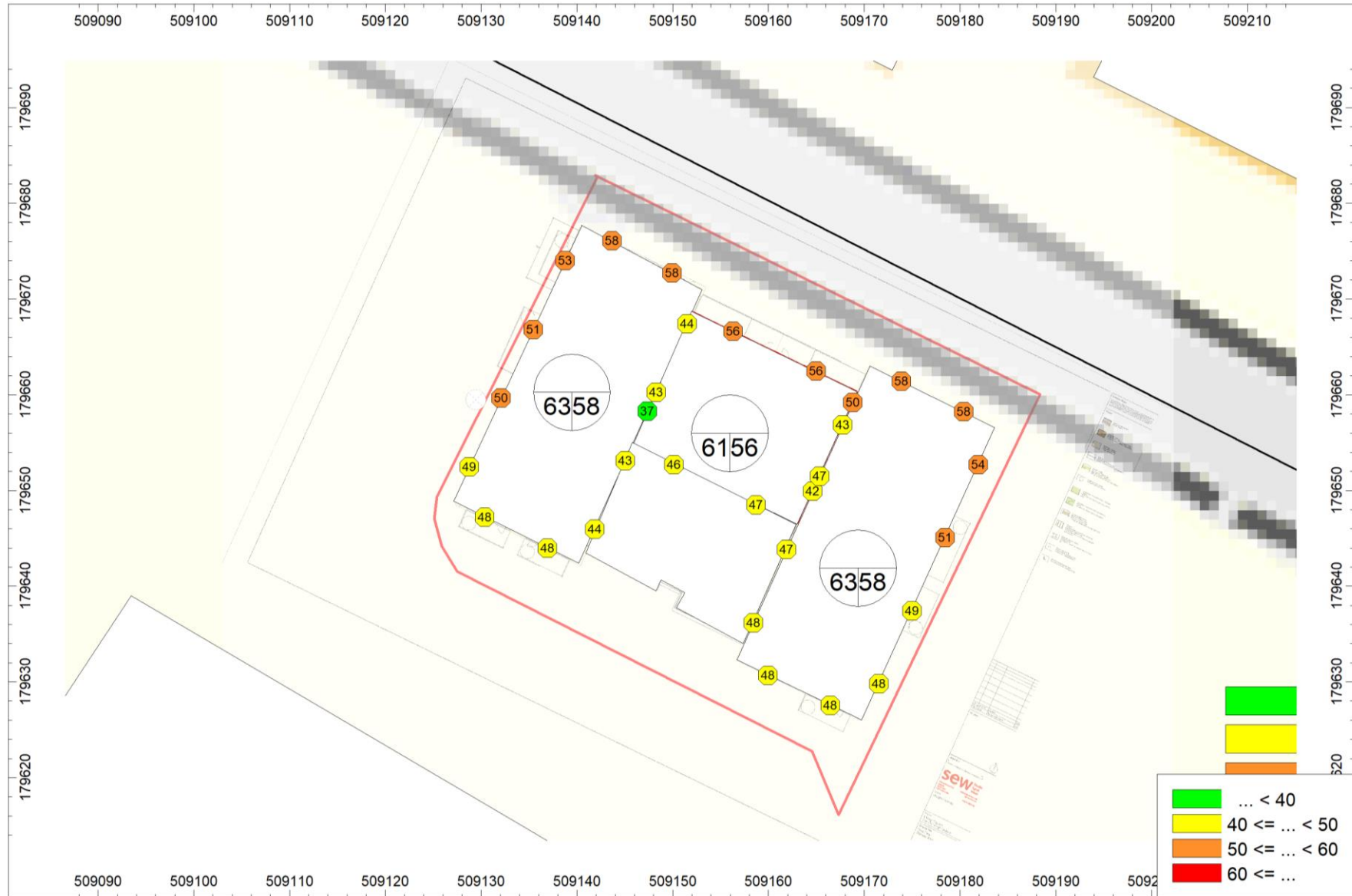


Figure 5: Night-time Façade Noise Levels

Figures

1 Vinyl Square, The Old Vinyl Factory, Hayes
Document Reference:
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APPENDICES

A. Acoustic Glossary

Ambient sound	The totally encompassing sound in a given situation at a given time, usually composed of sound from all sources near and far.																		
Assessment period	The period in a day over which assessments are made.																		
A-weighting	A frequency weighting applied to measured or predicted sounds levels in order to compensate for the non-linearity of human hearing.																		
Background noise	Background noise is the term used to describe the noise measured in the absence of the noise under investigation. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the L_{90} noise level (see below).																		
Broadband	Containing the full range of frequencies.																		
Decibel [dB]	The level of noise is measured objectively using a Sound Level Meter. This instrument has been specifically developed to mimic the operation of the human ear. The human ear responds to minute pressure variations in the air. These pressure variations can be likened to the ripples on the surface of water but of course cannot be seen. The pressure variations in the air cause the eardrum to vibrate and this is heard as sound in the brain. The stronger the pressure variations, the louder the sound that is heard. The range of pressure variations associated with everyday living may span over a range of a million to one. On the top range may be the sound of a jet engine and on the bottom of the range may be the sound of a pin dropping. Instead of expressing pressure in units ranging from a million to one, it is found convenient to condense this range to a scale 0 to 120 and give it the units of decibels. The following are examples of the decibel readings of every day sounds: <table> <tr> <td>Four engine jet aircraft at 100 m</td><td>120 dB</td></tr> <tr> <td>Riveting of steel plate at 10 m</td><td>105 dB</td></tr> <tr> <td>Pneumatic drill at 10 m</td><td>90 dB</td></tr> <tr> <td>Circular wood saw at 10 m</td><td>80 dB</td></tr> <tr> <td>Heavy road traffic at 10 m</td><td>75 dB</td></tr> <tr> <td>Telephone bell at 10 m</td><td>65 dB</td></tr> <tr> <td>Male speech, average at 10 m</td><td>50 dB</td></tr> <tr> <td>Whisper at 10 m</td><td>25 dB</td></tr> <tr> <td>Threshold of hearing, 1000 Hz</td><td>0 dB</td></tr> </table>	Four engine jet aircraft at 100 m	120 dB	Riveting of steel plate at 10 m	105 dB	Pneumatic drill at 10 m	90 dB	Circular wood saw at 10 m	80 dB	Heavy road traffic at 10 m	75 dB	Telephone bell at 10 m	65 dB	Male speech, average at 10 m	50 dB	Whisper at 10 m	25 dB	Threshold of hearing, 1000 Hz	0 dB
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Telephone bell at 10 m	65 dB																		
Male speech, average at 10 m	50 dB																		
Whisper at 10 m	25 dB																		
Threshold of hearing, 1000 Hz	0 dB																		
dB(A): A-weighted decibels	The ear is not as effective in hearing low frequency sounds as it is hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the 'A' filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter. The sound pressure level in dB(A) gives a close indication of the subjective loudness of the noise.																		
Façade Noise Level	A noise level measured or predicted at the façade of a building, typically at a distance of 1m, containing a contribution made up of reflections from the façade itself (+3 dB).																		
L_{Amax} noise level	This is the maximum noise level recorded over the measurement period.																		
$L_{Aeq,T}$ noise level	This is the 'equivalent continuous A-weighted sound pressure level, in decibels' and is defined in British Standard 7445 as the 'value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval, T, has the same mean square sound pressure as a sound under consideration whose level varies with time'. It is a unit commonly used to describe construction noise, noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise.																		
L_{A90} noise level	This is the noise level that is exceeded for 90% of the measurement period and gives an indication of the noise level during quieter periods. It is often referred to as the background noise level and is used in the assessment of disturbance from industrial noise.																		

Appendices

Sound Reduction Index (R)	The sound reduction index is a single-number rating of the sound reduction through a wall or other building element. Since the sound reduction may be different at different frequencies, test measurements are subjected to a standard procedure which yields a single number that is about equal to the average sound reduction in the middle of the human hearing range.
Weighted Sound Reduction Index (R_w)	Single number rating used to describe the laboratory airborne sound insulation properties of a material or building element over a range of frequencies, typically 100-3150 Hz.
C_{tr}	An adjustment to the R_w scale to take account of the lower performance against a typical spectrum of road traffic noise dominated by low frequencies (100-315 Hz).
$D_{n,e,w}$	Weighted element normalised level difference and is the laboratory sound insulation of a ventilator.

Appendices

B. Legislation, Policy & Guidance

National Planning Policy Framework (NPPF)

The NPPF was first published on 27th March 2012 and updated on 24th July 2018 and 19th February 2019. With regard to noise, the NPPF still promotes ‘good design’ as part of ‘sustainable development’ and advocates ‘preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of noise pollution...’

Paragraph 180 of 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;’

Paragraph 182 of the NPPF introduces the ‘Agent of change principle’. ‘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.’

The NPPF reflects advice within NPSE in that they promote the avoidance of significant adverse impacts and reduction of other adverse impacts on health and quality of life; set within the context of the Government’s policy on sustainable development.

The National Planning Policy Guidance is a web-based resource on the NPPF but given the recent revision it is currently being updated to reflect the changes to the NPPF.

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

The NPPF states that 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 impact on quality of life arising from noise from new development, including through the use of conditions;
- Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established (subject to the provisions of the Environmental Protection Act 1990 and other relevant law); 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 ‘adverse effects’ and ‘significant adverse effects’ the NPPF refers to the Noise Policy Statement for England (NPSE) Explanatory Note.

Appendices

Noise Policy Statement for England (NPSE)

Published in 2010 by the Department for Environment, Food and Rural Affairs, the NPSE lists three noise policy aims:

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 sets out the long-term vision of government noise policy as to “*Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.*”

The ‘Explanatory Note’ within the NPSE provides further guidance on defining ‘significant adverse effects’ and ‘adverse effects’ using the concepts:

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

The three aims can therefore be interpreted as follows:

- The first aim is to avoid noise levels above the SOAEL;
- The second aim considers situations where noise levels are between the LOAEL and SOAEL. In such circumstances, all reasonable steps should be taken to mitigate and minimise the effects. However, this does not mean that such adverse effects cannot occur; and
- The third aim considers situations where noise levels are between the LOAEL and NOEL. In these circumstances, where possible, reductions in noise levels should be sought through the pro-active management of noise.

The NPPF and the NPSE provide the concepts for defining various levels of effect, but do not translate these into actual noise levels against which a proposed development can be assessed as acceptable, acceptable with various degrees of mitigation, or unacceptable. It is for individual Local Authorities to interpret the concepts in the NPPF and NPSE and translate them into noise level criteria to be applied in their area.

ProPG - Planning and Noise

The most recent guidance regarding new residential development within England is contained within ProPG ‘*Planning and Noise New Residential Development*’. The primary goal of ProPG is to assist the delivery of sustainable development by promoting good health and well-being through the effective management of noise. The emphasis of the ProPG is consideration of good acoustic design, thereby creating places that are both comfortable and attractive to live in, where acoustics is considered integral to the living environment. ProPG is only applicable where industrial / commercial noise affecting a site is not dominant, with the emphasis on transportation noise, and is therefore applicable to the Site.

The ProPG advocates a systematic proportionate, risk based, 2-stage approach.

Appendices

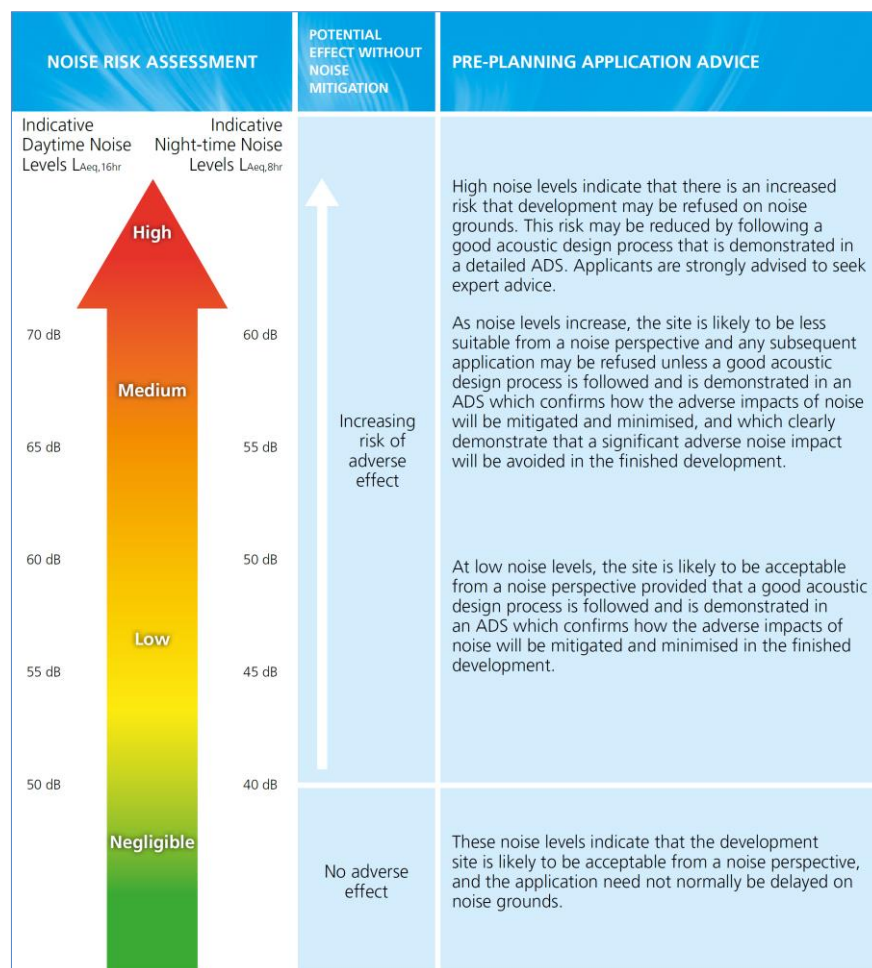
- **Stage 1:** an initial noise risk assessment of the proposed development site; and
- **Stage 2:** a systematic consideration of four key elements:
 - Element 1 – demonstrating a “Good Acoustic Design Process”;
 - Element 2 – observing internal “Noise Level Guidelines”;
 - Element 3 – undertaking an “External Amenity Area Noise Assessment”; and
 - Element 4 – consideration of “Other Relevant Issues”.

The above approach is underpinned by the preparation and delivery of an Acoustic Design Statement (ADS). The ADS for a site assessed as high risk should be more detailed than a site assessed as low risk. An ADS should not be necessary for a site assessed as negligible risk.

Stage 1 - Initial Noise Risk Assessment

The initial noise risk assessment is based on the prevailing day (07:00-23:00) and night-time (23:00-07:00) noise levels at the site, established through either measurement or prediction, without any new or additional mitigation. This provides an indication of the likely risk of adverse effects from noise were no subsequent mitigation be included as part of the development proposals. It should indicate whether the proposed site is considered to pose a negligible, low, medium or high risk from a noise perspective. Figure B.1 presents the associated noise risks based on the prevailing noise levels and corresponding site suitability.

Figure B1: Noise risk assessment reproduced from ProPG.



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Stage 2 – Consideration of Four Key Elements

Element 1 – Good Acoustic Design

It is imperative acoustic design is considered at an early stage of the development control process. It is not just compliance with recommended internal and external noise exposure standards but is a multi-faceted and integrated approach to achieve optimal acoustic conditions. This may include strategic design layouts with set-backs, maximisation of screening effects, inclusion of soundscapes (e.g. water features for masking transport noise within communal external amenity areas).

Element 2 – Internal Noise Level Guidelines

Internal ambient noise level guidance is referenced from BS8233⁸:2014 'Guidance on sound insulation and noise reduction for buildings' and ProPG and presented in Table C.1.

Table B-1: WHO and BS8233:2014 Internal noise level guideline values.

Activity	Location	Internal noise levels	
		07:00 - 23:00	23:00 - 07:00
Resting	Living room	35 dB $L_{Aeq,16h}$	-
Dining	Dining room / area	40 dB $L_{eq,16h}$	-
Sleeping (daytime resting)	Bedrooms	35 dB $L_{Aeq,16h}$	30 dB $L_{Aeq,8h}$ 45 dB $L_{Amax,F}$ (note 4)

Note 1: The Table provides recommended internal L_{Aeq} target levels for overall noise in the design of a building. These are the sum total of structure-borne and airborne noise sources. Ground-borne noise is assessed separately and is not included as part of these targets, as human response to ground-borne noise varies with many factors such as level, character, timing, occupant expectation and sensitivity.

Note 2: The internal L_{Aeq} target levels shown in the Table are based on the existing guidelines issued by the WHO and assume normal diurnal fluctuations in external noise. In cases where local conditions do not follow a typical diurnal pattern, for example, on a road serving a port with high levels of traffic at certain times of the night, an appropriate alternative period, e.g. 1 hour, may be used, but the level should be selected to ensure consistency with the internal L_{Aeq} target levels in the Table.

Note 3: These internal L_{Aeq} target levels are based on annual average data and do not have to be achieved in all circumstances. For example, it is normal to excluded occasional events, such as fireworks night or New Year's Eve.

Note 4: 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. In most circumstances in noise sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45 dB $L_{Amax,F}$ more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events.

Note 5: Designing the site layout and the dwellings so that the internal target levels can be achieved with open windows in as many properties as possible demonstrates good acoustic. Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however any façade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the 'open' position and, in this scenario, the internal L_{Aeq} target levels should not normally be exceeded, subject to the further advice in Note 7.

Note 6: Attention is drawn to the requirements of the Building Regulations.

Note 7: Where development is considered necessary or desirable, despite external noise levels above WHO guideline, the internal L_{Aeq} target levels may be relaxed by up to 5dB and reasonable internal conditions still achieved. The more often internal L_{Aeq} levels start to exceed the internal L_{Aeq} target levels by more than 5dB, the more that most people are likely to regard them as "unreasonable". Where such exceedances are predicted, applicants should be required to show how the relevant number of rooms affected has been kept to a minimum. Once internal L_{Aeq} levels exceed the target levels by more than 10dB, they are highly likely to be regarded as "unacceptable" by most people, particularly if such levels occur more than occasionally. Every effort should be made to avoid relevant rooms experiencing "unacceptable" noise levels at all and where such levels are likely to occur frequently, the development should be prevented in its proposed form.

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Element 3 – External Amenity Area Noise Assessment

The ProPG guidance on external amenity area noise assessment reflects and extends the advice contained within BS8233:2014 and the current Government guidance in NPPF-Noise.

3(i) “If external amenity spaces are an intrinsic part of the overall design, the acoustic environment of those spaces should be considered so that they can be enjoyed as intended.”

3(ii) “The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50-55 dB $L_{Aeq,16h}$.”

3(iii) “These guideline values may not be achievable in all circumstances where development might be desirable. In such a situation, development should be designed to achieve the lowest practicable noise levels in these external amenity spaces.”

3(iv) Whether or not external amenity spaces are an intrinsic part of the overall design, consideration of the need to provide access to a quiet or relatively quiet external amenity space forms part of a good acoustic design process.”

3(v) Where, despite following a good acoustic design process, significant adverse noise impacts remain on any private external amenity space (e.g. garden or balcony) then that impact may be partially off-set if the residents are provided, through the design of the development or the planning process, with access to:

- a relatively quiet façade (containing openable windows to habitable rooms) or a relatively quiet externally ventilated space (i.e. an enclosed balcony) as part of their dwelling; and/or
- a relatively quiet alternative or additional external amenity space for sole use by a household, (e.g. a garden, roof garden or large open balcony in a different protected, location); and/or
- 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, publicly accessible, external 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 minutes walking distance). The local planning authority could link such provision to the definition and management of Quiet Areas under the Environmental Noise Regulations.

Element 4 – Assessment of Other Relevant Issues

This element seeks to build upon relevant national and local planning and noise policies to provide a systematic list of recommendations for the issues that should be considered before making a judgement about the noise aspects of a particular planning proposal for new residential development.

4(i) compliance with relevant national and local policy

4(ii) magnitude and extent of compliance with ProPG

4(iii) likely occupants of the development

4(iv) acoustic design vs. unintended adverse consequences

4(v) acoustic design vs. wider planning objectives

Not all of the issues listed above will arise in every planning application. Some will be inherent to the good acoustic design.

Appendices

1 Vinyl Square, The Old Vinyl Factory, Hayes

Document Reference: WIE16463-102

WIE16463-102-R-1.3.2

Hillingdon Local Plan: Part 1 Strategic policies

Strategic Objective SO10 of the Hillingdon Local Plan aims to reduce adverse impacts from noise, including the safeguarding of quiet areas.

Strategic Policy EM8: Land, Water, Air and Noise states that the Council would “investigate Hillingdon's target areas identified in the Defra Noise Action Plans, promote the maximum possible reduction in noise levels and will minimise the number of people potentially affected”. The policy notes that the Council would identify and protect Quiet Areas in accordance with Government Policy on sustainable development and other Local Plan policies. The policy seeks to ensure that noise sensitive developments and noise-generating developments are only permitted if noise impacts can be adequately controlled and mitigated.

Hillingdon Unitary Development Plan (UDP)

Policy OE3 of the Hillingdon UDP states that buildings with potential to cause noise nuisance would only be granted permission if the noise impacts from the building are mitigated to an acceptable level through the use of engineering, layout or administrative measures.

Hillingdon Noise Supplementary Planning Document (SDP)

The Noise SDP was created to complement the policies set out in the UDP, considering both noise sensitive developments and noise generating developments.

The main points considered in this report include:

- “Key Point 1: Location of Residential Development”, which includes Table 1 which is shown below.
- “Key Point 6: Industrial Use”, which includes the text quoted in Section 5 of this report relating to industrial noise limits.

**TABLE 1: NOISE EXPOSURE CATEGORIES FOR
NEW DWELLINGS NEAR EXISTING NOISE SOURCES**

Noise Exposure Categories	Times (hrs)	L _{Aeq,T} dB Road	L _{Aeq,T} dB Rail	L _{Aeq,T} dB Aircraft	Mixed Sources L _{Aeq,T} dB	Advice
A	07:00 – 23:00	< 55	< 55	< 57	< 55	Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as a desirable level.
	23:00 – 07:00	< 45	< 45	< 48	< 45	
B	07:00 – 23:00	55 – 63	55 – 66	57 – 66	55 – 63	Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection against noise to meet the Council's recommended outdoor and indoor noise levels.
	23:00 – 07:00	45 – 57	45 – 59	48 – 57	45 – 57	
C	07:00 – 23:00	63 – 72	66 – 74	66 – 72	63 – 72	Planning permission should not normally be granted. Where it is considered that permission should be given, for example because there are no alternative quieter sites available, conditions should be imposed to ensure a commensurate level of protection against noise to meet the Council's recommended outdoor and indoor noise levels.
	23:00 – 07:00	57 – 66	59 – 66	57 – 66	57 – 66	
D	07:00 – 23:00	> 72	> 74	> 72	> 72	Planning permission should normally be refused.
	23:00 – 07:00	> 66	> 66	> 66	> 66	

Source: Derived from PPG24, 1994

Appendices

C. Baseline Noise Survey Details

Table C1 presents a list of the equipment used during the noise baseline noise survey. All sound level meters were calibrated before measurement and on completion of the noise survey; no significant drift was observed.

Table C-1: Equipment Details

Measurement Location	Equipment	Model	Serial No.
LT1, ST1 & ST2	Type 1 Sound Level Meter	Rion NL-52	00510142
	Microphone	Rion UC-59	02847
	Pre-amplifier	Rion NH-25	31928
	Calibrator	Cirrus CR:515	84555
ST3	Type 1 Sound Level Meter	Rion NL-52	01143565
	Microphone	Rion UC-59	43591
	Pre-amplifier	Rion NH-25	10129
	Calibrator	Cirrus CR:515	84555

Table C-2: Weather Details During Survey (Station ID: IWESTDRA2)

Date	Average Wind Speed (m/s)	Precipitation (mm) / Time
03/10/2019	0.2	1.0 (20:00 – 23:30)
04/10/2019	0.2	1.3 (00:00 – 01:00)
05/10/2019	0	1.3 (23:00 – 00:00)
06/10/2019	0.1	17 (00:00 – 07:00)
07/10/2019	0.1	2.0 (16:00 – 21:00)

Overall, weather conditions were suitable for the measurement of noise, with wind speeds of <5m/s and low precipitation which, upon assessment of measurement data, had no effect on the survey results.

Appendices

UK and Ireland Office Locations

