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LAND ADJACENT TO WINDHOVER ROUNDABOUT, BURSLEDON NOISE IMPACT ASSESSMENT

LAND ADJACENT TO WINDHOVER ROUNDABOUT, BURSLEDON

Noise Impact Assessment

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Executive Summary

Ramboll UK Limited has been appointed by Wates Developments Limited to undertake a Noise Impact Assessment with respect to the application for an outline planning application (all matters reserved except for access) for employment development (Use Class B2/B8) of up to 18,580 square metres together with ancillary offices (Use Class E(g)(iii)) and other ancillary buildings, structures, parking, servicing and manoeuvring areas, landscaping and sustainable urban drainage features, following demolition of existing buildings at the Land adjacent to Windhover Roundabout, Bursledon.

This report presents the baseline noise survey results, the relevant planning policy guidance, and considered the suitability of the Site for employment use. In respect of impacts to existing and future noise sensitive receptors within the study area, a noise impact assessment of the Proposed Development has been carried out.

The noise levels on site were typically dominated by road traffic noise from:

- the A3024 Bursledon Road;
- the A27 West End Road;
- the Windhover Roundabout; and
- distant road traffic noise from the M27 motorway.

Plant noise emission limits have been set for existing and future noise sensitive receptors based on the measured background noise levels during both the day and night-time.

The minimum façade, glazing and ventilation requirements to meet BS8233:2014 internal ambient noise level requirements have been determined. In practice, thermal, health and safety and security requirements will mean that the acoustic performance will not be a significant consideration in the design of the façade.

No significant noise and vibration effects are predicted as part of the construction and operational phases of the Proposed Development. As such, additional mitigation is not proposed.

1. Introduction

1.1 Background

Ramboll UK Limited ('Ramboll') has been appointed by Wates Developments Limited (the 'Client') to undertake a Noise Impact Assessment (NIA) with respect to the outline planning application for the development of the Land adjacent to Windhover Roundabout and between Bursledon Road (A3024) and West End Road (A27), Bursledon, Hants, SO31 8BN hereafter referred to as "the Site".

The Proposed Development comprises an outline planning application (all matters reserved except for access) for employment development (Use Class B2/B8) of up to 18,580 square metres together with ancillary offices (Use Class E(g)(iii)) and other ancillary buildings, structures, parking, servicing and manoeuvring areas, landscaping and sustainable urban drainage features, following demolition of existing buildings.

1.2 Objectives and Scope of Work

The purpose of this report is to assess the construction noise and vibration, and operational plant and activity noise associated with the Proposed Development.

The scope of works for this report are:

- Review relevant policy, legislation, and guidance, applicable to the development;
- Predict outline construction noise and vibration levels and assess the likely effects at the nearest sensitive receptors to BS 5228:2009+A1:2014;
- Build a 3D noise prediction model of the Site to inform the assessments;
- Based on the results of the baseline survey, set plant/activity noise limits to the methodology of BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*;
- Assess the predicted site and activity noise levels to BS 4142:2014+A1:2019;
- Assess the impact of road traffic accessing the Site to CRTN (1988) and LA 111 (2020);
- Outline mitigation requirements to reduce potential impacts at the nearest sensitive receptors; and
- Determine residual impacts.

1.3 Limitations and Constraints

This report has been prepared by Ramboll exclusively for the intended use by the Client in accordance with the agreement between Ramboll and the client defining, among others, the purpose, the scope and the terms and conditions for the services. No other warranty, expressed or implied, is made as to the professional advice included in this report or in respect of any matters outside the agreed scope of the services or the purpose for which the report and the associated agreed scope were intended, or any other services provided by Ramboll.

In preparation of the report and performance of any other services, Ramboll has relied upon publicly available information, information provided by the client and information provided by third parties. Accordingly, the conclusions in this report are valid only to the extent that the information provided to Ramboll was accurate, complete, and available to Ramboll within the reporting schedule.

Ramboll's services are not intended as legal advice, nor an exhaustive review of site conditions and/or compliance. This report and accompanying documents are intended solely for the use and benefit of the client for this purpose only and may not be used by or disclosed to, in whole or in

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2. Site Details

2.1 Site Location and Description

The Site is located adjacent to Windhover roundabout in Bursledon, which is at the intersection of two arterial routes in Southampton where the A3024 Bursledon Road and A27 West End Road converge. The Site is located close to Junction 8 of the M27 motorway, which is approximately 450m to the northeast of the Site, connected to Windhover Roundabout via the A3024.

The Site is located at the Land adjacent to Windhover Roundabout and between Bursledon Road (A3024) and West End Road (A27), Bursledon, Hants, SO31 8BN. The Site is located approximately 5.5km east of Southampton City Centre. The built-up edge of the settlement of Bursledon is located to the south and south-west of the Site on the opposite side of the Windhover roundabout.

The Site is circa 4.63 ha (11.4 acres) and comprises predominantly undeveloped agricultural pasture land, but with potential for some Made Ground to be present in limited areas of the Site. The Site takes the form of two connected grassland fields with a patch of tall ruderals and a wet flush along its eastern edge. The Site also includes a small collection of agricultural-type buildings sited on an area of hard standing within its south eastern part. Topographically the Site falls to its south-west towards Bursledon Road, and rises north-east towards West End Road.

The Site location is shown in Figure 2.1 below.

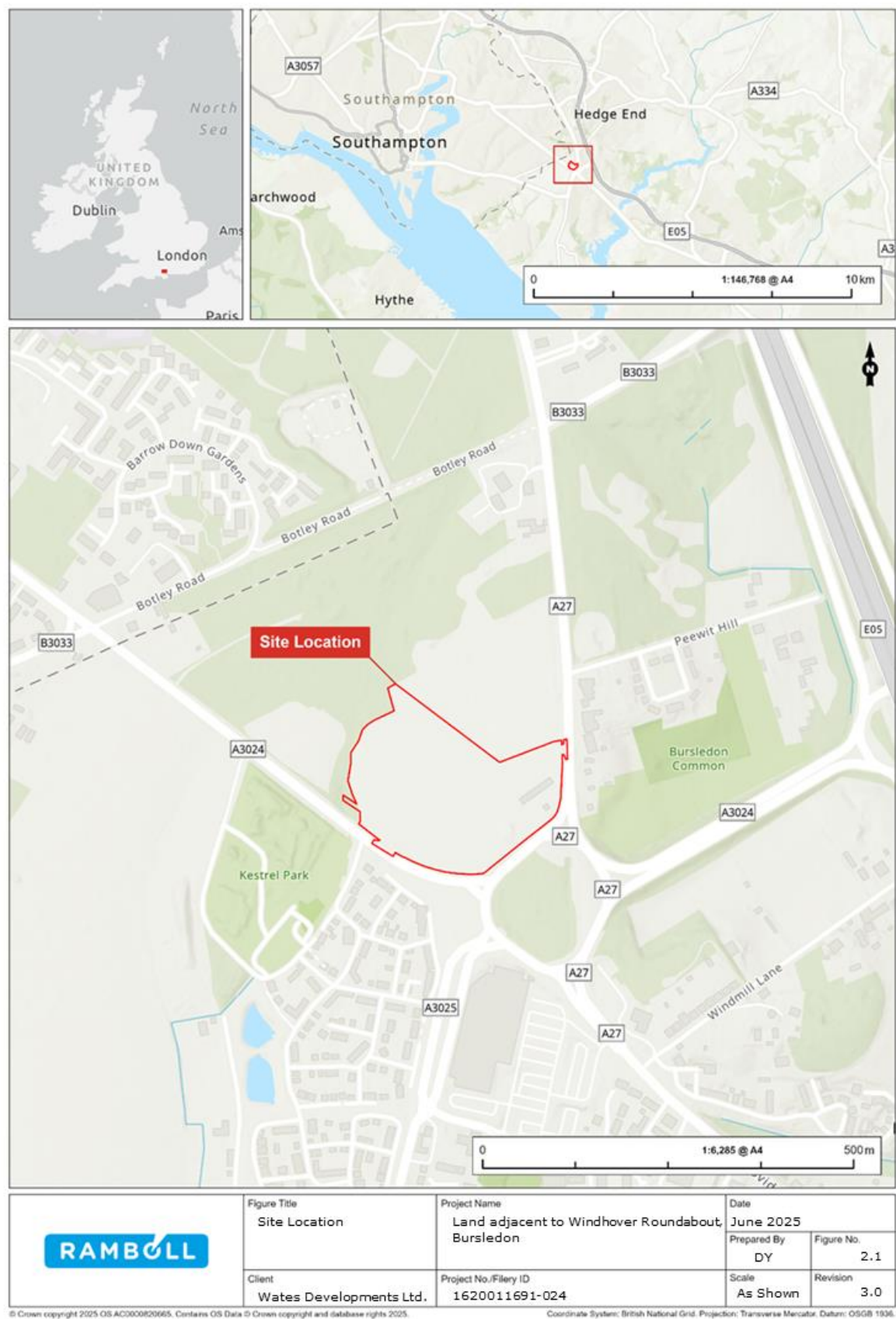


Figure 2.1: Site Location

2.2 Proposed Development

The Proposed Development comprises an outline planning application (all matters reserved except for access) for employment development (Use Class B2/B8) of up to 18,580 square metres together with ancillary offices (Use Class E(g)(iii)) and other ancillary buildings, structures, parking, servicing and manoeuvring areas, landscaping and sustainable urban drainage features, following demolition of existing buildings

In accordance with this description of development, an illustrative masterplan has been prepared which shows the following elements:

- (Unit 1) Warehousing unit totalling 9,586 SqM (103,188 SqFt) comprising Use Class B2/B8 space and ancillary Use Class E office space;
- (Unit 2) Warehousing unit totalling 7,209 SqM (77,599 SqFt) comprising Use Class B2/B8 space and ancillary Use Class E office space;
- Provision of up to circa 175 car parking spaces and up to circa 41 HGV spaces, together with service yards and HGV loading spaces;
- Provision of ancillary external structures such as sprinkler tanks;
- Creation of site access from A3024 Bursledon Road and A27 West End Road, together with provision of signals and other works to the existing highway; and
- Provision of site landscaping, including new planting and provision of swales and other sustainable urban drainage features.



Figure 2.2: Land adjacent to Windhover Roundabout, Bursledon Illustrative Masterplan (credit: Terence O'Rourke 2025 – 276504-TOR-XX-ZZ-DR-A-P102_Illustrative Masterplan-D)

3. Legislation, Policy and Guidance

3.1 National Legislation

3.1.1 Control of Pollution Act, 1974, Part III – Noise

The Control of Pollution Act, 1974¹ (CPA) is a combination and refinement of earlier Acts including: The Public Health Act, 1936 (replaced by the Public Health Act 1990, Part III) and the Noise Abatement Act 1960.

Section 60 enables a Local Authority to serve a notice on a person (this includes a company) who is carrying out, or who is planning to carry out, works of construction, demolition, road-works, railway maintenance etc. in order to control the noise from those operations.

Section 61 also enables such a person to apply to the Local Authority for consent in respect of such works. The Act introduces the concept of using 'Best Practicable Means' (BPM) to control the impact of noise, where significant impacts are likely to occur. BPM refers to the selection of plant, techniques, and equipment to reduce noise whilst considering local conditions, current state of technical knowledge and the financial implications. Factors such as timing, duration, location and opportunities for acoustic screening or separation are employed; to ensure that impacts are controlled in so far as is reasonably practicable. The demonstrable use of BPM can also be used as a defence to enforcement action under nuisance legislation.

3.1.2 The Environmental Protection Act, 1990 (As amended)

Section 79 of the Environmental Protection Act 1990² (EPA) declares that a number of matters, including noise, are to be statutory nuisances. Under the provisions of the Environmental Protection Act, the Local Authority is required to inspect its area periodically to detect any nuisance and, where a complaint of a statutory nuisance is made by a person living within its area, to take such steps as are reasonably practicable to investigate the complaint.

3.1.3 National Planning Policy Framework (NPPF), 2024 with minor updates in 2025

For commercial development, no specific noise criteria are set out in the National Planning Policy Framework (NPPF)³ or in the Noise Policy Statement for England (NPSE)⁴ to which it refers. NPPF states that the planning system should contribute to and enhance the natural and local environment by preventing 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. NPPF states, as a document, it:

'sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally prepared plans for housing and other development can be produced.'

Paragraph 198 of the NPPF states that:

¹ Secretary of State, 1974, Control of Pollution Act, HMSO. Available: <http://www.legislation.gov.uk/ukpga/1974/40/contents>

² Secretary of State, 1990. Environmental Protection Act 1990, The Stationary Office. Available: <http://www.legislation.gov.uk/ukpga/1990/43/contents>

³ Ministry of Housing, Communities and Local Government, 2025. National Planning Policy Framework. Available at: <https://www.gov.uk/guidance/national-planning-policy-framework>

⁴ Ministry of Housing, Communities and Local Government, 2017. Planning practice guidance. HMSO. London.

'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...'

To achieve these aims the NPPF refers to the Noise Policy Statement for England 2010.

3.1.4 Noise Policy Statement for England, 2010

The Noise Policy Statement for England (NPSE) sets out the long-term vision of Government noise policy: 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 NPSE outlines the following three aims for the effective management and control of environmental, neighbour and neighbourhood noise:

- "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."

The guidance defines two concepts applied to noise impacts. These are:

- No Observed Effect Level (NOEL) is defined as: "This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.";
- Lowest Observed Adverse Effect Level (LOAEL) which is defined as: "This is the level above which adverse effects on health and quality of life can be detected."; and
- Significant Observed Adverse Effect Level (SOAEL) which is defined as 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 NPSE recognises that it is not possible to have single objective noise-based measures that define the SOAEL, LOAEL and NOEL that are applicable to all sources of noise in all situations. The levels are likely to be different for different noise sources, receptors and at different times of the day.

3.1.5 Planning Practice Guidance, 2018

The Government's Planning Practice Guidance⁵ (PPG) on noise provides guidance on the effects of noise exposure, relating these to people's perception of noise, and linking the effects to the NOEL and, as exposure increases, the LOAEL and SOAEL.

As exposure increases above the LOAEL, noise begins to have an adverse effect and consideration needs to be given to mitigating and minimising those effects, taking account of the economic and social benefits being derived from the activity causing the noise. As the noise exposure increases, it will at some point cross the SOAEL boundary.

The LOAEL is described in PPG as the level above which "noise starts to cause small changes in behaviour and/or attitude e.g., turning up the volume of the television, speaking more loudly, or, 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 perceived change in the quality of life."

PPG identifies the SOAEL as the level above which "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."

For the purposes of this assessment, the magnitude of effect is assigned by reference to the guidance in PPG-Noise, as summarised in Table 3.1.

Table 3.1: PPG Guidance

Perception	Examples of outcome	Increasing effect level	Action
No Observed Effect Level (NOEL)			
Not noticeable	No effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level (NOAEL)			
Noticeable and not intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level (LOAEL)			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; 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 perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			

⁵ GOV.UK. 2018. Noise. [ONLINE] Available at: <https://www.gov.uk/guidance/noise--2>. [Accessed 01 April 2019].

Perception	Examples of outcome	Increasing effect level	Action
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 change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

Factors to be considered in determining if noise is a concern are identified, including the absolute noise level of the source, the existing ambient noise climate, time of day, frequency of occurrence, duration, character of the noise and cumulative impacts.

3.2 Local Policy

3.2.1 Eastleigh Borough Local Plan (2016-2036)

The Eastleigh Borough Local Plan (2016-2036) was adopted in April 2022 and sets out the policies and plans to guide future development within Eastleigh to 2036.

Policy DM8, Pollution is the only policy relevant to noise within the Local Plan. Although it does not provide any quantitative noise limits relevant to this scheme it does stress that development proposals should ensure that they mitigate and minimise adverse noise impacts and, where possible, contribute to the improvement of health and quality of life.

Where necessary, the Council will require a noise assessment which will be expected to:

- Identify all significant sources of noise;
- Assess the likely short and long term impacts of noise generated or exposure to noise; and
- Propose noise protection measures.

3.3 Guidance

3.3.1 BS 5228: 2009+A1: 2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2

BS 5228:2009⁶ gives recommendations for basic methods of noise and vibration control relating to construction work. It also provides guidance concerning methods of predicting and measuring noise and vibration and assessing their impacts on those exposed to it. The prediction method considers the noise emission level of proposed plant, the separation distance between the source and the receiver and the effect of the intervening topography and structures.

Part 2 of the standard gives recommendations for basic methods of vibration control relating to construction and open sites where work activities/operations generate significant vibration.

⁶ British Standards Institution, 2009 and 2014. British Standard 5228: 2009 +A1 2014 Code of practice for noise and vibration control on construction and open sites. BSI.

The legislative background to vibration control is described and recommendations are given regarding procedures for the establishment of effective liaison between developers, site operators and local authorities. The standard also provides guidance on measuring vibration and assessing its effects on the environment.

3.3.2 BS 4142:2014+A1:2019 'Methods for Rating and Assessing Industrial and Commercial Sound'

BS 4142:2014+A1:2019⁷ (BS 4142) Method for rating and assessing industrial and commercial sound provides a method for assessing the significance of noise emissions from industrial and/or commercial sound source.

The significance of industrial and commercial sound is assessed based on the difference between the rating level resulting from plant operation measured or predicted at the nearest noise sensitive premises, and the existing background noise level in the area, as determined by a noise survey. BS 4142 states:

- a. *'Typically, the greater this difference, 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.'*
- e. *'A representative level ought to account for the range of background sound levels and ought not automatically to be assumed to be either the minimum or modal value.'*

BS 4142 also sets out the following rating penalties based on the characteristics of the noise source:

- Tonality: up to 6 dB rating penalty applicable depending on its perception;
- Impulsivity: up to 9 dB rating penalty applicable depending on its perception;
- Intermittency: a 3 dB penalty applicable for specific sound that has identifiable on/off conditions; and
- *Other sound characteristics*: a 3 dB penalty applicable for readily distinctive sound feature characteristics that are neither tonal or impulsive.

3.3.3 BS 8233:2014– 'Guidance on sound insulation and noise reduction for buildings'

Guidance on the acceptable noise levels within residential and commercial buildings is given in British Standard BS 8233:2014⁸. The internal noise levels depend on the use of each room and the sensitivity to noise of the activities expected to be conducted in the rooms.

⁷ British Standards Institute, 2014. British Standard BS 4142: Methods for rating and assessing industrial and commercial sound. BSI.

⁸ British Standards Institute, 2014. British Standard 8233: Guidance on sound insulation and noise reduction for buildings. BSI.

3.3.4 Calculation of Road Traffic (1988)

Calculation of Road Traffic Noise⁹ (CRTN) sets out standard procedures for calculating noise levels from road traffic. The calculation method uses a number of input variables, including traffic flow volume, average vehicle speed and percentage of heavy goods vehicles (HGVs), to predict the $L_{A10,18\text{hour}}$ or $L_{A10,1\text{hour}}$ noise level for any receptor point at a given distance from the road.

3.3.5 Design Manual for Roads and Bridges – Sustainability & Environment Appraisal – LA111 Noise and Vibration

The Design Manual for Roads and Bridges¹⁰ (DMRB) provides advice on the assessment of noise and vibration impacts due to road traffic. The guidance provides a classification of magnitude of impacts related to changes in road traffic noise levels. As people are less sensitive to noise level changes over time, the classification of impacts is provided in the short term and in the long term. Receptors typically acclimatise to road traffic noise over time, so that the effects are reduced in the long-term.

4. Assessment Methodology

The following section outlines the methodology applied to identify and assess the potential noise and vibration impacts likely to result from the Proposed Development.

4.1 Consultation with the Local Authority

The proposed noise survey and assessment methodology for this scheme was sent via email and associated memo (memo no. RUK2021N00014-RAM-ME-00022) to the Eastleigh Borough Council Environmental Health Department on 10 June 2025 for review. Pollution Control Manager, Andre Pires, replied via email on 10 June 2025 and endorsed the proposal as appropriate.

Specific request was made to carry out an assessment which includes noise from HGV movements during the worst proposed hour (hour with the most HGV movements). The assessment in this document considers a typical and peak hour during both the day and night-time periods.

4.2 Study Area

The study area incorporates the application site and any existing noise sensitive receptors (NSRs) within 300m of the Site boundary. The NSRs were identified by reviewing OS mapping data and satellite imagery, and are detailed in Table 4.1 and Figure 4.1 below.

Table 4.1: Identified Receptors

Receptor	Receptor Type	Description
R1	Residential	150 Le Marechal Avenue
R2	Residential	Stoney Croft, West End Road
R3	Residential	32 Mosaic Close

Receptor locations R1-R3 have been chosen for assessment as these present a worst case assessment, as these receptors are closest to the Site boundaries.

⁹ Department of Environment, 1988. Calculation of Road Traffic Noise, HMSO.

¹⁰ Design Manual for Roads and Bridges – Sustainability & Environment Appraisal LA111 Noise and vibration Revision 1 (2020)

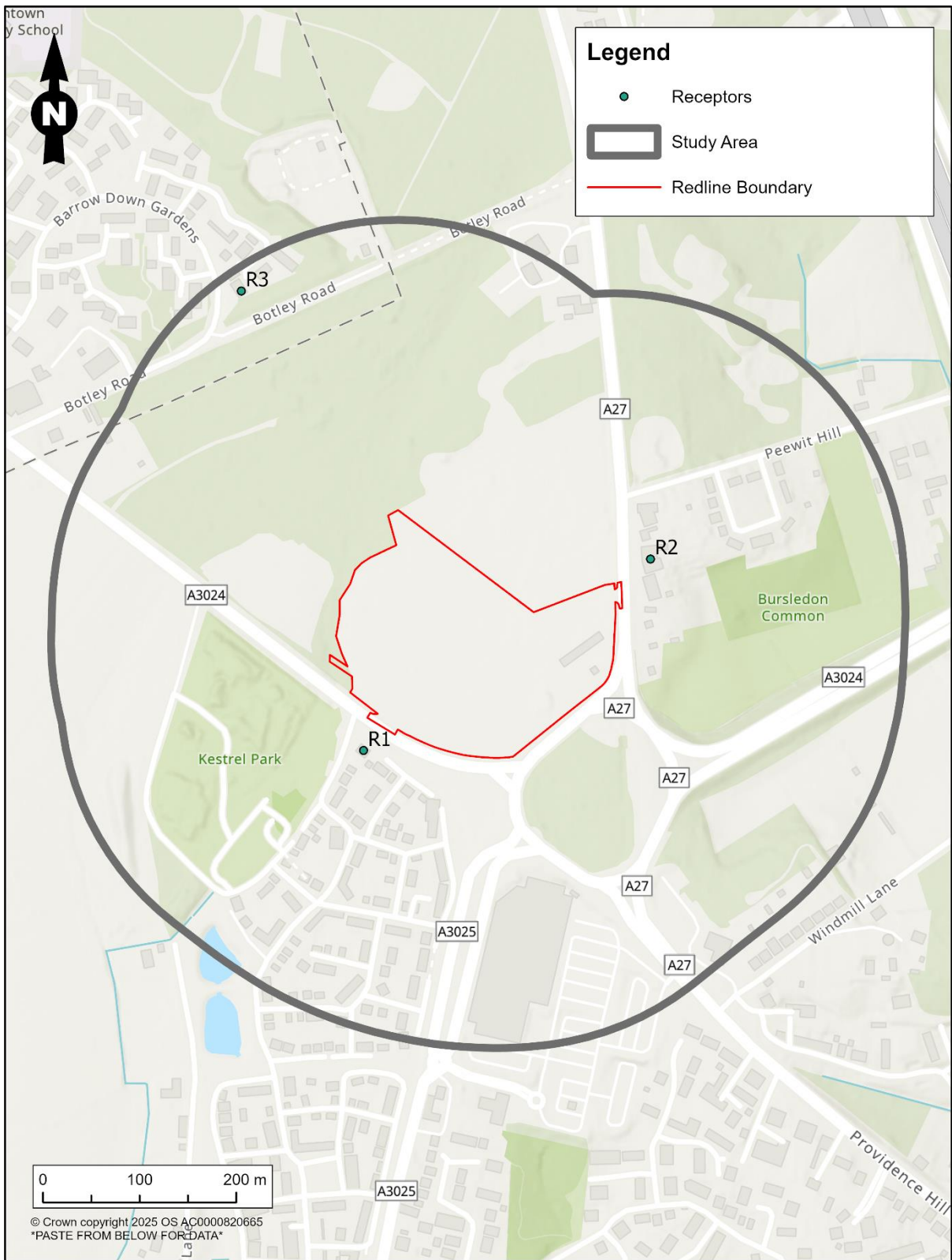


Figure 4.1: Study area and identified receptors

4.3 Baseline Characterisation

The existing noise environment was characterised by a baseline noise survey undertaken in February 2025. The survey was undertaken in and around the application site to quantify the prevailing ambient, background and maximum noise levels during daytime and night-time periods.

The ambient and background noise levels will be used to inform the assessment criteria for construction noise effects, building envelope and ventilation strategies, and plant noise emissions.

4.4 Construction Noise Assessment

4.4.1 Construction Activity Noise

The construction works associated with the Proposed Development will involve the use of a variety of working methods which will change throughout the construction period. Therefore, noise levels from the works are likely to vary significantly over time as the type of activities change.

The exact working methodologies and plant to be employed during construction phases has not been established at this stage in the design. However, following best practice, an estimate of the expected noise levels over a representative period will be undertaken using assumed plant items and the associated noise emission data from BS 5228:2009+A1:2014.

The significance criteria for construction noise levels at the NSRs have been established by reference to ABC method described in BS 5228:2009+A1:2014. The thresholds are made relative to the existing ambient noise levels at assessment locations, as shown in Table 4.2.

Table 4.2: BS 5228 'ABC' method for construction noise

Assessment Period	Threshold Values, $L_{Aeq,T}$ dB		
	Category A	Category B	Category C
Daytime (07:00 – 19:00)	65	70	75
Saturday (07:00 – 13:00)			
Evening (19:00 – 23:00)	55	60	65
Night time (23:00-07:00)	45	50	55

A potential significant noise effect is indicated when the construction noise exceeds the threshold level for the category appropriate to the ambient noise level:

- Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than the Category A values.
- Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as the Category A values.
- Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than the Category A values.
- Note that these levels are not absolute limits but instead are thresholds above which significant effects may occur.

With reference the receptor locations shown in Figure 4.1, the thresholds in Table 4.3 are proposed.

Table 4.3: Construction noise thresholds

Receptor Location	R1	R2	R3
BS5228 threshold (dB $L_{Aeq,T}$)	70	70	65
BS5228 ABC Category	B	B	A

Noisy construction work would only be undertaken within daytime hours, between 07:30 and 18:00, Monday to Friday and 08:00 and 13:00 on Saturdays. No work should be undertaken on Sundays or Bank Holidays. If work is required to extend into other periods beyond the core daytime hours, reduced threshold noise levels would apply and separate authorisation would be secured with Eastleigh BC.

Construction noise predictions will be based on the methodology contained within BS 5228:2009+A1:2014. This enables predictions to be made of the noise emissions from the construction activities for given distances from the application Site boundary.

4.4.2 Construction Activity Vibration

It is assumed that the buildings in the Proposed Development will be constructed with pad foundations, which means piling techniques will not be necessary. Depending on the technique, piling can be perceptible in residential environments within 100m from the source. As no such techniques are anticipated, construction vibration from piling has not been considered further.

Vibratory compaction of new internal roads and carparks is expected as part of the Proposed Development and has the potential to cause adverse impact at nearby residential dwellings. Construction vibration predictions of compaction will be based on the methodology contained within BS 5228:2009+A1:2014. This enables predictions to be made of the vibration levels from the construction activities for given distances from the application site boundary.

4.5 Operational Noise Assessment

A noise model was developed using CadnaA® version 2025. This is a proprietary noise modelling software that implements the standard noise prediction methodology detailed in ISO 9613-2:2024. The software utilises standard acoustic principles in conjunction with approved prediction methodologies and is a tried and tested method for accurately predicting and assessing the impact of noise from a variety of sources.

Open-source LiDAR data from the National LiDAR Programme and building locations and road alignments from Open Street Map were used to inform the model.

The Site layout was informed by the development drawings provided by tor&co. Building heights were provided by the project architect.

The noise model was used to predict the noise impacts on the Proposed Development and also at the NSRs.

4.5.1 Internal Noise Levels

Façade, glazing and ventilation strategies will be recommended to reduce noise levels to acceptable levels for commercial use. The guideline criteria in BS 8233:2014 will aim to be achieved as shown in Table 4.4.

Table 4.4: BS 8233 internal ambient noise level limits

Space	Internal ambient noise level limit $L_{Aeq,T}$ dB
Open Place Office	50
Staff/meeting room, training room	45
Executive office	40

BS 8233:2014 does not provide any guideline internal noise levels for distribution / working areas. Therefore, an internal noise level of 50dB $L_{Aeq,T}$ will be targeted for the remainder of the development.

4.5.2 Road Traffic Noise Levels

Noise from road traffic generated by the Proposed Development during the operational phase of the development will be predicted using the methodology contained in CRTN. The significance of predicted noise changes will be determined using relevant guidance, such as that contained in LA 111. The change in road traffic noise levels will be assessed for the road links closest to the Site.

4.5.3 Plant Noise Emissions

Noise from fixed plant associated with the Proposed Development will be assessed in accordance with BS 4142 Methods for rating and assessing industrial and commercial sound.

Rating levels will be equal to or lower than the representative (and necessarily not lowest) background noise levels. Penalties will be suggested for the likely acoustic features of the noise, as per the methodology of BS 4142.

4.6 Significance Criteria

In all cases impacts of 'Medium' or 'High' significance would constitute a 'significant' effect, and 'Low' and 'Negligible' would be 'not significant'.

4.6.1 Construction Activity Noise

Table 4.5 details the thresholds above which significant effects due to construction noise may occur.

Table 4.5: Construction noise significance criteria

Description	Magnitude of impact	Adverse effect level
Predicted construction noise levels are less than the baseline noise level	Negligible	NOEL
Predicted construction noise levels are great than or equal to the baseline but below the construction threshold	Low	LOAEL
Predicted construction noise levels equal to or up to 5dB above the construction threshold	Medium	SOAEL
Predicted construction noise levels are greater than 5dB above the construction threshold	High	SOAEL

4.6.2 Construction Activity Vibration

Table 4.6 details the thresholds above which significant effects due to construction vibration may occur.

Table 4.6: Construction noise significance criteria

Description	Magnitude of impact	Adverse effect level
Predicted construction vibrations levels are less than 0.3mm/s PPV	Negligible	NOEL
Predicted construction vibration levels are greater than 0.3mm/s but less than 1.0mm/s PPV	Low	LOAEL
Predicted construction vibration levels are greater than 1.0mm/s but less than 10.0mm/s PPV	Medium	SOAEL
Predicted construction vibrations levels are greater than 10.0mm/s PPV	High	SOAEL

4.6.3 Operational Plant Noise

Table 4.7 details the significance criteria for the operational noise based on the numerical difference between predicted Rating Level and the prevailing Background Level at a receptor and the criteria from BS 4142.

Table 4.7: Operational plant noise significance criteria

Description	Magnitude of impact	Adverse effect level
Predicted Plant Rating Level >10 dB below the prevailing Background Level at the receptor.	No Effect	NOEL
Predicted Plant Rating Level ≤10 dB and >0 dB below the prevailing Background Level at the receptor.	Negligible	NOAEL
Predicted Plant Rating Level ≥0 dB and ≤5 dB above the prevailing Background Level at the receptor.	Low	LOAEL
Predicted Plant Rating Level is >5 dB and ≤10 dB above the prevailing Background Level at the receptor.	Medium	SOAEL
Predicted Plant Rating Level is >10 dB or more above the prevailing Background Level at the receptor.	High	SOAEL

4.6.4 Operational Road Traffic Noise

Table 4.8 details the significance criteria for the operational noise generated by the Proposed Development affecting existing receptors. These are based on the difference in the baseline and predicted $L_{A10,18\text{hour}}$ daytime or L_{night} night-time road traffic noise level for the Site access roads and the LA 111 short-term criteria.

Table 4.8: Short-term operational traffic noise significance criteria

Short-term noise change (dB $L_{A10,18\text{hour}}$ or L_{night})	Magnitude of impact	Adverse effect level
There is no change in the predicted short-term noise level change (dB $L_{A10,18\text{hour}}$ or L_{night})	No Effect	NOEL

Short-term noise change (dB $L_{A10,18\text{hour}}$ or L_{night})	Magnitude of impact	Adverse effect level
The predicted change in short-term noise level change (dB $L_{A10,18\text{hour}}$ or L_{night}) is less than 1.0	Negligible	NOAEL
The predicted change in short-term noise level change (dB $L_{A10,18\text{hour}}$ or L_{night}) is between 1.0 and 2.9	Low	LOAEL
The predicted change in short-term noise level change (dB $L_{A10,18\text{hour}}$ or L_{night}) is between 3.0 and 4.9	Medium	SOAEL
The predicted change in short-term noise level change (dB $L_{A10,18\text{hour}}$ or L_{night}) is greater than or equal to 5.0	High	SOAEL

5. Baseline Noise Survey

5.1 Methodology

A noise survey was completed between Friday 7 February and Wednesday 12 February 2025. The survey comprised three unattended noise loggers measuring continuously throughout the survey period.

All measurements were taken at a height of 1.5m and at least 3m from reflecting surfaces in accordance with BS 7445-1¹¹. Measurements were in free-field conditions.

5.2 Measurement Locations

The locations of noise measurements are shown in Figure 5.1. Prefix LT denotes unattended measurements.

Positions LT1 and LT2 were positioned at approximately equal distance back from the road as the nearest residential dwellings along the A3024 Bursledon Road and the A27 West End Road, respectively. These positions were selected to obtain the typical background noise levels at locations that were representative of the nearest noise sensitive receptors. Measurements were not possible at the nearest noise sensitive receptors to the north. Therefore, LT3 was selected to determine the typical background noise levels at the northern boundary of the site.

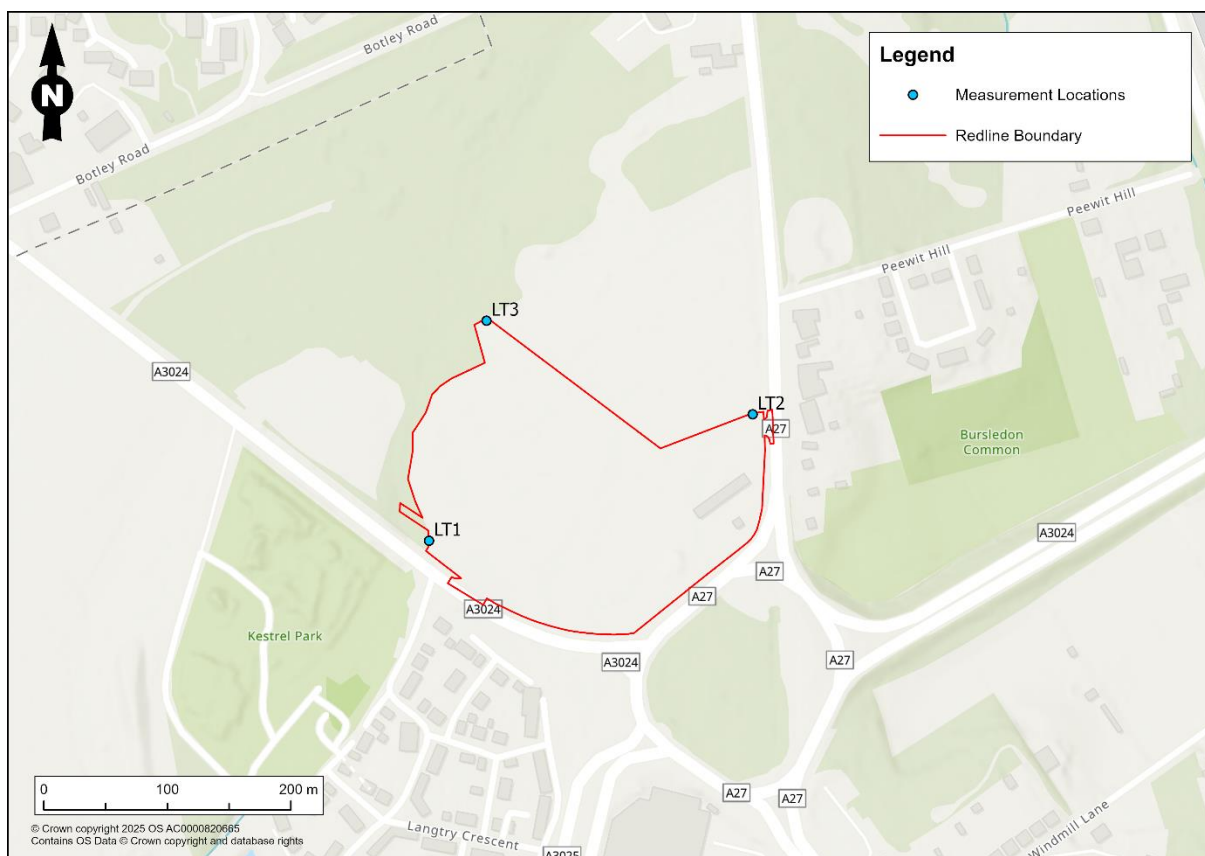


Figure 5.1: Measurement Locations

¹¹ British Standards Institution, 2013. British Standard 7445-1:2013 Description and measurement of environmental noise Guide to quantities and procedures . BSI

5.3 Equipment

The following equipment was used for the survey.

Table 5.1: Survey equipment

Instrument Type	Instrument Name	Serial No.	Measurement used for
Sound level analyser	01dB FUSION	12079	LT1
Sound level analyser	01dB FUSION	14152	LT2
Sound level analyser	01dB FUSION	12076	LT3
Acoustic calibrator	CIRRUS CR515	96168	LT1, 2 & 3

All equipment was calibrated before and after measurements and no significant drift in calibration was observed.

All equipment owned or hired by Ramboll is subject to regular calibration checks traceable to national standards. Calibration certificates are available upon request.

5.4 Weather

Weather data measured by a station located at Southampton Airport approximately 6.5km northwest of the Site confirmed that meteorological conditions throughout the survey period were favourable. A summary of the conditions throughout the week are detailed in Table 5.2 below. Full time histories of recorded weather data is provided in Appendix 2.

Wind speeds were monitored on Site with a handheld anemometer throughout the setup and collection of the unattended monitoring equipment. Wind speeds were <5m/s and therefore deemed suitable for noise measurements.

Table 5.2: Summary of weather conditions during survey period. Source: Wunderground.com weather station ID: IEASTL16

Date	Average Temperature (°C)	Highest Wind Speeds (m/s)	Precipitation Accumulation (mm)
07/02/2025	3.6	3.6	0.5
08/02/2025	4.4	2.6	0.5
09/02/2025	4.1	3.3	2.8
10/02/2025	3.9	4.1	5.3
11/02/2025	4.2	2.3	0
12/02/2025	4.5	2.2	0

5.5 Noise Survey Summary

The unattended survey results are summarised below in Table 5.3. Full time histories of the survey can be found in Appendix 2.

Table 5.3: Summary of measured noise levels

Position	Period	Typical Ambient Noise Level $L_{Aeq,T}$ dB*	Typical Background Noise Level $L_{A90,T}$ dB**
LT1	Daytime (07:00-23:00)	64	56
	Night-time (23:00-07:00)	58	41
LT2	Daytime (07:00-23:00)	65	57
	Night-time (23:00-07:00)	58	39
LT3	Daytime (07:00-23:00)	52	44
	Night-time (23:00-07:00)	45	40

*Typical ambient noise level determined by taking a logarithmic average of the measured noise levels

**Typical background noise levels determined through statistical analysis and taking the lowest modal value. T=1hr during the daytime and T=15min during the night-time.

5.6 Noise Climate

The noise levels on site were typically dominated by road traffic noise from:

- the A3024 Bursledon Road;
- the A27 West End Road;
- the Windhover Roundabout; and
- distant road traffic noise from the M27 motorway.

Other noise sources included birdsong.

6. Construction Noise Assessment

6.1 Noise Level Criteria

Threshold noise levels for significant impacts were determined based on the ABC method described in Section 4.4, and based on measured prevailing baseline noise levels at locations representative of the identified receptors and assessment locations.

6.2 Construction Activity Noise

Noise levels associated with construction work from the Proposed Development have been predicted using a CadnaA noise model. Calculations include allowances for a variety of plant working within an area within the redline boundary. In the absence of an appointed contractor, typical construction plant items associated with commercial construction have been assumed. Exact plant details including BS 5228-1 references and assumed on-times are provided in Appendix 3. The assessment is based on a 10-hour working day.

In line with best practice, 3 dB attenuation has been applied to the predicted levels, as not all site plant will be operating simultaneously. An additional 2 dB has been assumed using low noise plant, techniques, and plant attenuation. Therefore, 5 dB attenuation has been applied to the predicted levels for the assessment of residual effects. It is assumed 2.4m site hoarding will be installed along the Site perimeter. No more than 10 dB has been applied overall through the combination of site hoarding screening and the application of BPM, which is considered acceptable based on the recommendations of BS 5228:2009+A1:2014.

Standard BPM will be adopted on-site to ensure that noise management forms an integral part of the contractors' scope of works. A range of mitigation measures are presented below. The reduction in noise levels provided through the implementation of BPM varies depending on the nature of the works but is expected to be at least 5 dB, through the combination of the following:

- Restrict working hours for noisy activities;
- Plan working hours to take account of the effects of noise and vibration upon persons in areas surrounding the Site and upon persons working on-site;
- Where reasonably practicable, adopt quiet working methods, using plant which generate lower noise and vibration levels;
- Locate plant away from noise and vibration sensitive receptors, where feasible;
- Use silenced and well-maintained plant conforming with the relevant directives relating to noise and vibration;
- Avoid unnecessary revving of engines and switch off equipment when not required;
- Keep internal haul routes well maintained;
- Use rubber linings for chutes and dumpers to reduce impact noise;
- Minimise drop height of materials;
- Start-up plant and vehicles sequentially rather than all together;
- Carry out regular inspections of noise mitigation measures to ensure integrity is maintained at all times;
- Provide briefings for all site-based personnel so that noise and vibration issues are understood and mitigation measures are adhered to;
- Manage plant movement to take account of surrounding noise sensitive receptors, as far as is reasonably practicable;
- Use of acoustic enclosures for static items of plant that could cause a disturbance; and
- Control the opening of site gates/hoarding.

Predicted noise levels including BPM mitigation and façade correction where applicable, are shown in Table 6.1. Noise levels were predicted at both the ground and first floor of each receptor. The highest predicted noise level per receptor has been presented.

Any numbers shown in grey are in exceedance of the BS 5228 thresholds and are therefore considered significant. The results show that no construction activities will breach the BS 5228 noise thresholds and therefore, no significant effects are predicted.

Table 6.1: Predicted construction activity noise levels

Construction Stage	Predicted construction noise levels dB $L_{Aeq,10hr}$ at assessment receptors		
	R1	R2	R3
BS 5228 Limit (Category)	70 (B)	70 (B)	65 (A)
Enabling Works	65	59	55
Substructure	69	63	58
Superstructure	67	61	57
External Works	63	57	52

These predictions are subject to change through a reserved matters planning application with an updated Site layout and known construction plant.

6.3 Construction Activity Vibration

The highest levels of vibration associated with the construction of the Proposed Development are expected to be from compaction works. The ground would be subject to compaction via vibratory compactors, which can introduce high levels of vibration into the ground.

BS 5228-2 provides source data for various vibratory construction activities as well as empirical predictors for ground-borne vibration due to construction works. Annex E, Table E.1 of BS 5228-2 sets out these empirical calculations for each type of construction activity.

To understand the potential impact of vibration from a tandem vibratory compactor, the following inputs have been used based on a Bomag BW 202 AD-4 Asphalt Roller:

- Drum width: 1236mm;
- Maximum amplitude: 0.81mm;
- Number of vibrating drums: 2; and
- Scaling factor: 5%

Due to their proximity to the Site, receptors R1 and R2 are the most likely to be affected by construction vibration during the construction of the Proposed Development. This would include the formation and compaction of the internal roads and carparks. All other receptors are over 100m from proposed vibratory compaction and fall outside the scope of this assessment.

Table 6.2 presents the predicted vibration levels from vibratory compaction during start up and run down. Predictions have been made at the nearest possible point to each receptor and at a “typical”

distance where the majority of the works will occur. All levels are based on a scaling factor of 5% as to represent a worst-case scenario. Any predicted levels exceeding the LOAEL are presented in bold and any levels that exceed the SOAEL are highlighted in grey.

Table 6.2: Predicted construction vibration levels

Receptor	Nearest Distance (m)	Predicted level of vibration (PPV mm/s)	Typical Distance (m)	Predicted level of vibration (PPV mm/s)
R1	30	2.1	70	0.7
R2	25	2.6	60	0.9

Table 6.2 shows that when the vibratory compaction start up and run down procedure occurs at the edge of the Site (i.e. the nearest point to the receptors), predicted vibration levels exceed the SOAEL. It is likely that the vibration of this level in residential environments will cause complaint but can be tolerated if prior warning and explanation is given to residents. However, when the procedure (and any steady state compaction) occurs further into the Site (i.e. further away from the receptors), the predicted vibration levels fall below the SOAEL and would therefore not be considered significant.

The predicted vibration level at the nearest point to each receptor is not representative of the general level that will be experienced over the entire construction period. Effects from construction vibration are therefore considered to be not significant.

7. Operational Noise Assessment

7.1 Internal Ambient Noise Levels

Existing noise levels on site range between 52-64 dB $L_{Aeq,16hr}$. Any standard 23-25 dB R_w composite metal cladding and standard double glazing will suitably control noise levels to within the internal ambient noise level criteria in Table 4.4. It is assumed that background ventilation will be provided through means of mechanical ventilation and not via openable windows.

It is expected that the internal noise generated within the distribution and working areas of the facility will be approximately 70-75 dB $L_{Aeq,T}$. This working level is in excess of 10 dB over the existing noise levels on site, therefore external noise break-in is not a material consideration within these spaces.

7.2 Daytime Operational Traffic Noise

Based on the data provided by the traffic consultant, the predicted change in daytime road traffic noise levels during the operational phase of the development, in accordance with CTRN and DMRB LA111, are provided in Table 7.1. Full CRTN calculations are provided in Appendix 4.

Table 7.1: Change in daytime operational road traffic noise

Road Link	Change in road traffic noise level $L_{A10,18hr}$ dB	
	2030 Baseline (Do Minimum) to 2030 Baseline with Development (Do Something) – Short-term	
1	A3024 Bursledon Road (West)	±0.0
2	Botley Road (South)	±0.0
3	A3024 Bursledon Road (Immediately West of Site Access)	±0.0
4	A3024 Bursledon Road (Immediately East of Site Access)	+0.7
5	Le Marechal Avenue	±0.0
6	A27 West End Road (North of Site Access)	±0.0
7	A27 West End Road (Site of Site Access)	+0.1
8	A3024 Bert Betts Way	+0.3
9	Dodwell Lane	+0.1
10	A27 Providence Hill	±0.0
11	Hamble Lane	±0.0
12	M27 South East - Off Slip	+0.3
13	M27 South East - On Slip	+0.2
14	M27 North West - Off Slip	+0.2
15	M27 North West - On Slip	+0.3

The increase in noise level due to daytime operational road traffic across all assessed links, within the short-term is <1.0 dB. Assessed against the short-term traffic noise level criteria in Table 4.8, this is considered a NOEL and therefore not significant.

7.3 Night-time Operational Traffic Noise

Based on the data provided by the traffic consultant, the night-time road traffic noise levels, L_{night} , have been calculated following the methodology of Method 3 within the TRL document "Converting the UK traffic noise index $L_{A10,18h}$ to EU noise indices for noise mapping"¹². The predicted change in night-time road traffic noise levels during the operational phase of the development in accordance with CRTN and DMRB LA111 are provided in Table 7.2.

Table 7.2: Change in night-time operational road traffic noise

Road Link		Change in road traffic noise level L_{night} dB
		2030 Baseline (Do Minimum) to 2030 Baseline with Development (Do Something) – Short-term
1	A3024 Bursledon Road (West)	±0.0
2	Botley Road (South)	±0.0
3	A3024 Bursledon Road (Immediately West of Site Access)	±0.0
4	A3024 Bursledon Road (Immediately East of Site Access)	+0.7
5	Le Marechal Avenue	±0.0
6	A27 West End Road (North of Site Access)	±0.0
7	A27 West End Road (South of Site Access)	+0.1
8	A3024 Bert Betts Way	+0.2
9	Dodwell Lane	+0.1
10	A27 Providence Hill	±0.0
11	Hamble Lane	±0.0
12	M27 South East - Off Slip	+0.2
13	M27 South East - On Slip	+0.2
14	M27 North West - Off Slip	+0.1
15	M27 North West - On Slip	+0.2

The increase in noise level due to night-time operational road traffic across all assessed links, within the short-term is <1.0 dB. Assessed against the short-term traffic noise level criteria in Table 4.8, this is considered a NOEL and therefore not significant.

¹² P G Abbott and P M Nelson. "Converting the UK traffic noise index $L_{A10,18h}$ to EU noise indices for noise mapping". Project Report PR/SE/451/02. TRL Ltd. Crowthorne. 2002.

7.4 Operational Plant Noise Emissions

7.4.1 BS 4142 Limits

Noise emissions from fixed plant installations associated with the Proposed Development need to be controlled to within guideline criteria.

Based on current guidance in BS 4142, the measured or calculated rating level of the cumulative effect of the noise emitted from all mobile and fixed plant installations will be required to be equal to or lower than the background noise level (L_{A90}) throughout the day and night. Rating level penalties may apply if there is a particular tonal, impulsive, intermittent, or distinct acoustic feature to the noise.

BS 4142 states that a representative background noise level should be used for assessment, and in this case, to set appropriate rating noise levels. A representative level should account for the range of background sound levels and should not be assumed to be the lowest measured value.

Statistical analysis of the background noise levels measured at all locations has been carried out and can be found in Appendix 2. The representative levels were generally selected by taking the lowest modal value. The background noise levels measured at locations LT1, LT2 and LT3 are considered representative of receptors R1, R2 and R3 respectively.

If designed to the rating levels in Table 7.3 below, plant noise is expected to constitute a LOAEL when assessed to BS 4142.

Table 7.3: Plant noise emission limits

Receptor	Period	Representative background noise level dB L_{A90}	Plant noise rating level limit at nearest receptor dB L_{Ar}
R1	Daytime (07:00 – 23:00)	56	56
	Night-time (23:00 – 07:00)	41	41
R2	Daytime (07:00 – 23:00)	57	57
	Night-time (23:00 – 07:00)	39	39
R3	Daytime (07:00 – 23:00)	44	44
	Night-time (23:00 – 07:00)	40	40

7.4.2 Operational Plant Noise Assessment

A 3D computer noise model was prepared to calculate the plant and activity noise emissions from the Proposed Development at the nearest noise sensitive receptor. The noise model was created using the proprietary software Cadna-A. The software implements the common European methods of noise prediction. The noise predictions have been undertaken in accordance with ISO 9613-2:2024¹³.

Noise levels used in the model are based on Ramboll measurement data from similar facilities. These are summarised below in Table 7.4.

¹³ International Standards Organisation, 2024. Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation. ISO

Table 7.4: Operational noise assessment input levels

Area / Plant Item	Noise Level	Reference
Internal noise level of facility	75 dB LAeq reverberant level	Measurement at similar logistics facility
On-site HGVs	95 dB LAFmax	Measurement at similar logistics facility of HGV passing by at approximately 5m distance and 10mph

7.4.3 Assumptions and Limitations

All reasonable measures have been undertaken to reduce uncertainty in the baseline noise survey data and the calculations detailed in this report.

Uncertainty has been minimised by completing unattended measurements over daytime, evening, weekend and night-time periods.

Results have been rounded to the nearest A-weighted decibel.

The noise prediction models account for topography and existing building massing. The operational model uses the calculation method of ISO 9613-2:2024. The construction model uses the calculation method of BS 5228:2009+A1:2014. Ground contours have been calculated from OpenSource LIDAR data¹⁴.

The plant noise emission levels are based on measurements taken by Ramboll at similar logistic sites. Any changes in these noise levels would require a re-evaluation of the noise models, their results and associated conclusions.

The assessments and calculations undertaken in this report are based on data and plans of the Proposed Development provided by the client and consultees. Should any of this change, the results of the assessments may not be valid and would need to be updated.

The following assumptions and inputs have been used in the model:

- HGVs have been modelled as moving point sources at 10 mph (16 kmh) on site, at 2m above local ground level.
- The noise prediction model is based on on-site HGV movement data provided by the Project Transport Consultant.
- On-site HGV routing is based on the Access Strategy provided by tor&co (drawing no. 276504-TOR-XX-ZZ-DR-A-SK023-Access Strategy-C)
- The noise prediction model allows for 24 2-way HGV movements per hour during the daytime 23:00 – 07:00 and 12 2-way HGV movements per hour during the night-time 23:00 – 07:00.
- The noise prediction model also allows for 32 2-way HGV movements per hour during the peak daytime hour 11:00 – 12:00 (as a worst-case peak hour scenario) and 46 2-way HGV movements per hour during the peak night-time 06:00 – 07:00.
- Background noise levels used for comparison during the peak hours were selected by taking the lowest modal value of background sound levels measured during that time period only (i.e. does not include background noise levels measured outside of the peak hours).

¹⁴ <https://data.gov.uk/dataset/3fc40781-7980-42fc-83d9-0498785c600c/lidar-composite-dtm-2019-1m>

- The sound power levels for HGVs are based on the measured sound pressure levels from a similar logistics facility and have been corrected for the distance to the source over hard/reflective ground.
- The noise emissions from the proposed facility in the model use the measured spectra from a similar logistics centre.
- The reverberant internal noise levels break-out of each building façade and roof in the model. The façade of the main facility building has been assumed to be trapezoidal steel sheet with a sound insulation performance of R_{w+Ctr} 25 dB (CadnaA library reference R26). This is deemed to be a worst-case assumption as the building façade is likely to have a greater sound insulation performance.
- The roller shutter doors with direct line of sight to the nearest noise sensitive receptors have been modelled as being open, providing no attenuation of internal noise levels. All other shutter doors on the facility have been modelled as being closed. However, it is considered unlikely that roller shutter doors would be left open and so this is considered to be a worst case assessment.

The measured noise levels used in the model were not considered tonal and as such, no penalty has been applied for tonality.

7.4.4 Results

The results of the noise model are summarised below. As previously discussed, background noise levels have been determined from statistical analysis of the unattended survey results where the lowest modal value was selected.

Daytime and night-time rating noise levels were predicted at the nearest sensitive receptors, at a height of both 1.5m and 4m above local ground level. These represent ground and first floor levels respectively. The highest predicted noise level for each receptor has been reported.

Rating noise levels have been predicted for both a typical and a peak day and night-time scenario. Typical levels were determined by taking the mode of the HGV movements both in and out of the Site across the day and night-time periods individually. The peak levels were determined by the hour/s were the Site had the most total HGV movements.

The specific and rating levels are in terms of daytime 1-hour periods and night-time 15-minute periods. Any predicted levels exceeding the LOAEL are presented in bold and any levels that exceed the SOAEL are highlighted in grey.

Table 7.5: Daytime operational plant noise assessment

Receptor	Background noise level, $L_{A90,T}$ (dB)	Predicted specific noise level, $L_{Aeq,T}$ (dB)	Resulting rating level, $L_{ar,T}$ (dB)	Excess of rating level over background level (dB)	Effect level
Typical Hour					
R1	56	43	43	-13	NOEL
R2	57	36	36	-21	NOEL
R3	44	28	28	-16	NOEL
Peak Hour					

R1	57	44	44	-13	NOEL
R2	56	36	36	-20	NOEL
R3	45	28	28	-12	NOEL

Table 7.6: Night-time operational plant noise assessment

Receptor	Background noise level, $L_{A90,T}$ (dB)	Predicted specific noise level, $L_{Aeq,T}$ (dB)	Resulting rating level, $L_{ar,T}$ (dB)	Excess of rating level over background level (dB)	Effect level
Typical Hour					
R1	41	41	41	0	LOAEL
R2	39	35	35	-4	NOAEL
R3	40	28	28	-12	NOEL
Peak Hour					
R1	42	46	46	+4	LOAEL
R2	46	37	37	-9	NOAEL
R3	45	29	29	-16	NOEL

Table 7.5 and Table 7.6 show that the predicted operational plant noise from the Proposed Development is below the LOAEL at all times with the exception of R1 during typical and peak night-time hour.

The excess of rating level over background sound level at R1 during typical night-time hours (23:00-06:00) is +0dB. This difference is equal to the onset of a LOAEL.

The excess of rating level over background sound level at R1 during the peak night-time hour (06:00–07:00) is +4dB. This difference exceeds the LOAEL but does not exceed the SOAEL. The exceedance is due to a higher volume of HGVs arriving and departing the Site, the entry point of which is directly opposite R1. The noise context surrounding R1 is typical of HGVs accelerating and decelerating as they approach and depart the signalled junction between the A3032 Bursledon Road and Le Marechal Avenue, and the Windhover Roundabout. This characteristic of noise is already experienced at this receptor and the addition of more HGVs to the sound environment is unlikely to be distinguishable or represent an incongruous sound. Additional mitigation measures have been considered but none are deemed practicable in this case. Significant effects are therefore not predicted due to the operation of the Proposed Development at receptor R1.

The following effect levels are predicted at every other noise sensitive receptor during every modelled time period (typical/peak day and night-time periods):

- NOEL during the daytime; and
- NOEL-NOAEL during the night-time.

Significant effects are not predicted due to the operation of the Proposed Development at the nearest noise-sensitive receptors. As such, no further receptors have been considered and additional mitigation is not proposed.

7.4.5 Noise Contours

Noise contours for the day and night-time assessment scenarios of the Proposed Development are provided below in Figure 7.1 to Figure 7.4 inclusive.

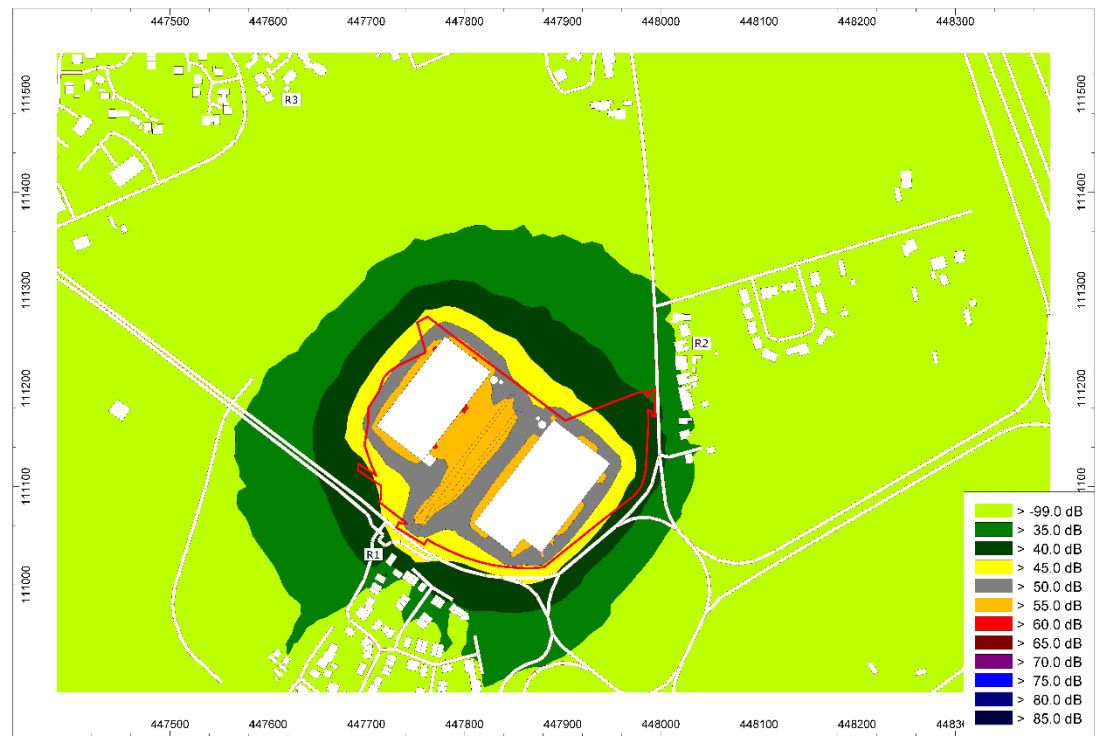


Figure 7.1: Predicted operational noise levels during the daytime (07:00 - 23:00) at a height of 4m (first floor level)



Figure 7.2: Predicted operational noise levels during the night-time (23:00 - 07:00) at a height of 4m (first floor level)

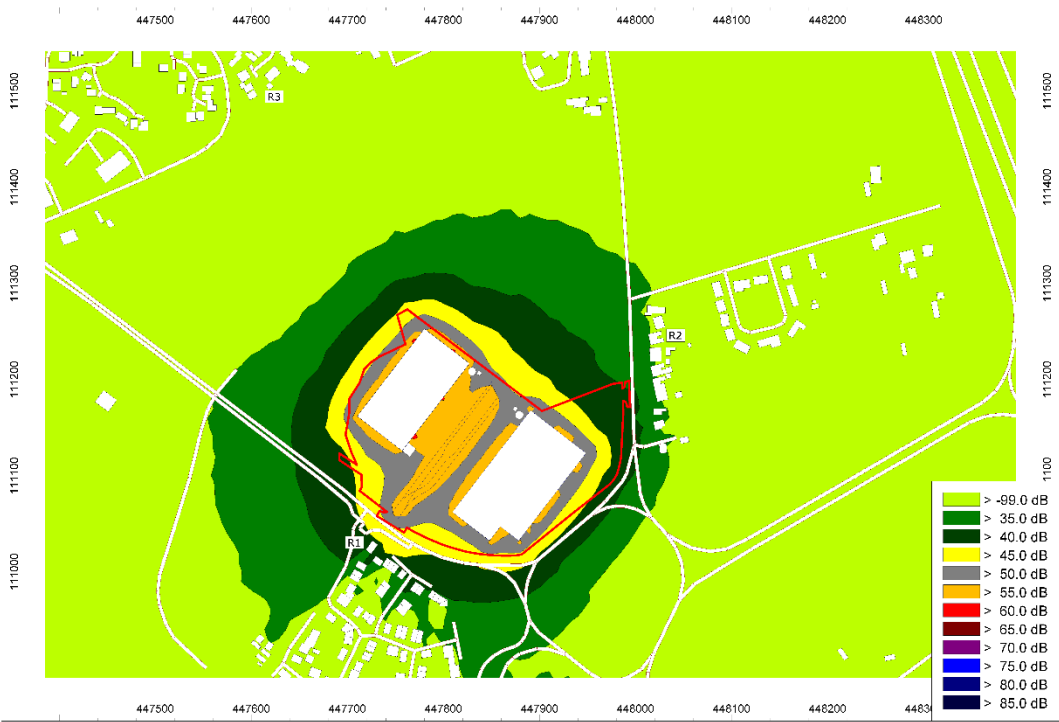


Figure 7.3: Predicted operational noise levels during the peak daytime hour (11:00 - 12:00) at a height of 4m (first floor level)

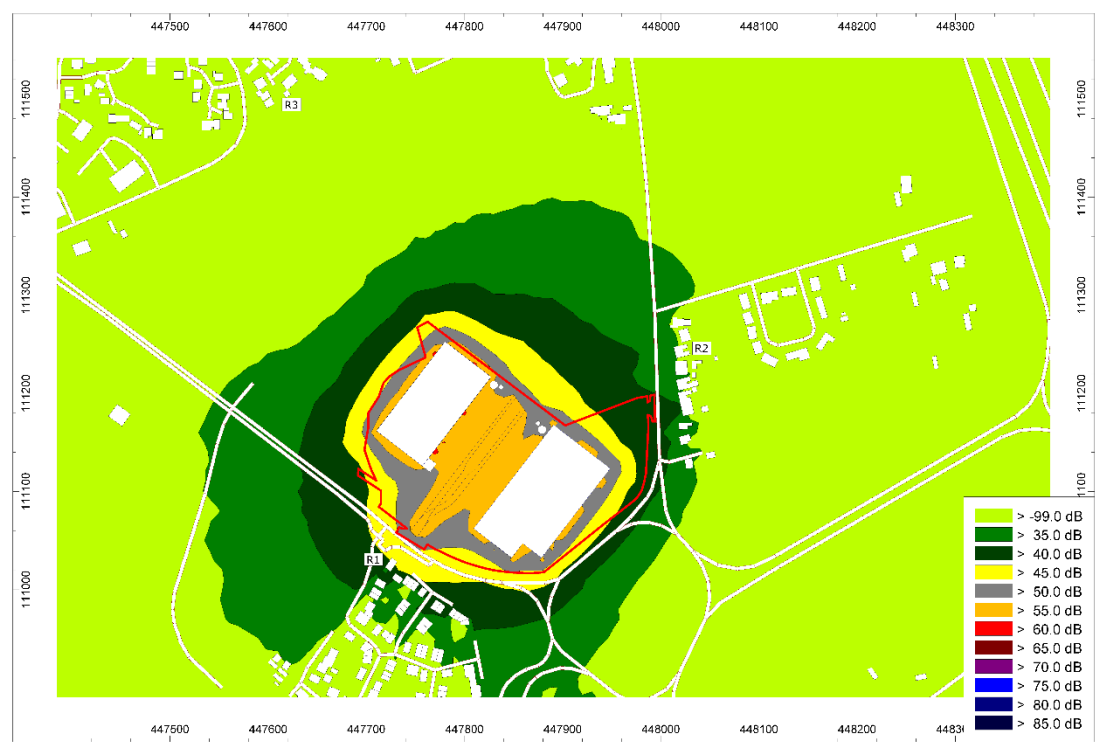


Figure 7.4: Predicted operational noise levels during the peak night-time hour (06:00 - 07:00) at a height of 4m (first floor level)

8. Conclusion

A Noise Impact Assessment of the Proposed Development has been carried out with respect to site suitability for employment use and potential noise and vibration effects at surrounding receptors. The assessment is based on the guidance provided in BS 8233, BS 4142, BS 5228 and the existing baseline noise climate as measured by Ramboll.

The noise climate on site is typically dominated by road traffic noise. Commercial vehicles and HGVs using the local road network are considered typical and form part of the context of the wider site.

The minimum façade, glazing and ventilation requirements to meet BS 8233:2014 internal ambient noise level requirements have been determined. In practice thermal, health and safety and security requirements will mean that the acoustic performance will not be a significant consideration in the design of the façade.

No significant noise and vibration effects are predicted as part of the construction and operational phases of the Proposed Development. As such, additional mitigation is not proposed.

Appendix 1

Acoustic Terminology

L_{Aeq}	The "A" weighted equivalent continuous sound pressure level. A representation of a continuous sound level containing the same amount of sound energy as the measured varying noise, over the measurement period. It can be considered as the "average" noise level.
L_{AFmax}	The Maximum "A" weighted sound pressure level during the measurement period.
L_{A90}	The "A" weighted sound pressure level that is exceeded for 90% of the measurement period. It is commonly used as the "Background Noise Level".
L_{A10}	The "A" weighted sound pressure level that is exceeded for 10% of the measurement period. This is often used for assessing traffic noise.
Specific Level $L_{Aeq,T}$	The equivalent continuous 'A' weighted sound pressure level at the assessment location in the absence of the specific sound source under consideration, over a given time interval, T
Rating Level $L_{Ar,T}$	To BS 4142:2014+A1:2019, the rating level is defined as the equivalent continuous A-weighted sound pressure level produced by the specific sound source over a given reference time interval, T_r plus any adjustment for the characteristic features of the sound (tonality, impulsivity, etc.).
Basic Noise Level	The Basic Noise Level is the road traffic noise at a reference distance of 10 m from the road edge, expressed in terms of the L_{A10} statistical level (18-hour or 1-hour), and calculated according by Calculation of Road Traffic Noise (CRTN) based on the traffic flow.
AAWT	Annual Average Weekday Traffic (AAWT) is the total number of vehicles annually (on Monday – Fridays) divided by the total number of weekdays in this period.
R_w	Weighted Sound Reduction Index (R_w) a single number quantity which characterises the airborne sound insulation of a material or building element over a range of frequencies, based on laboratory measurements.
NSR	A Noise Sensitive Receptor (NSR) is any receptor that is classed as being sensitive to noise sources, (residential properties, churches, music studios etc.)
HGV	Heavy Goods Vehicle

Appendix 2
Noise Survey Data

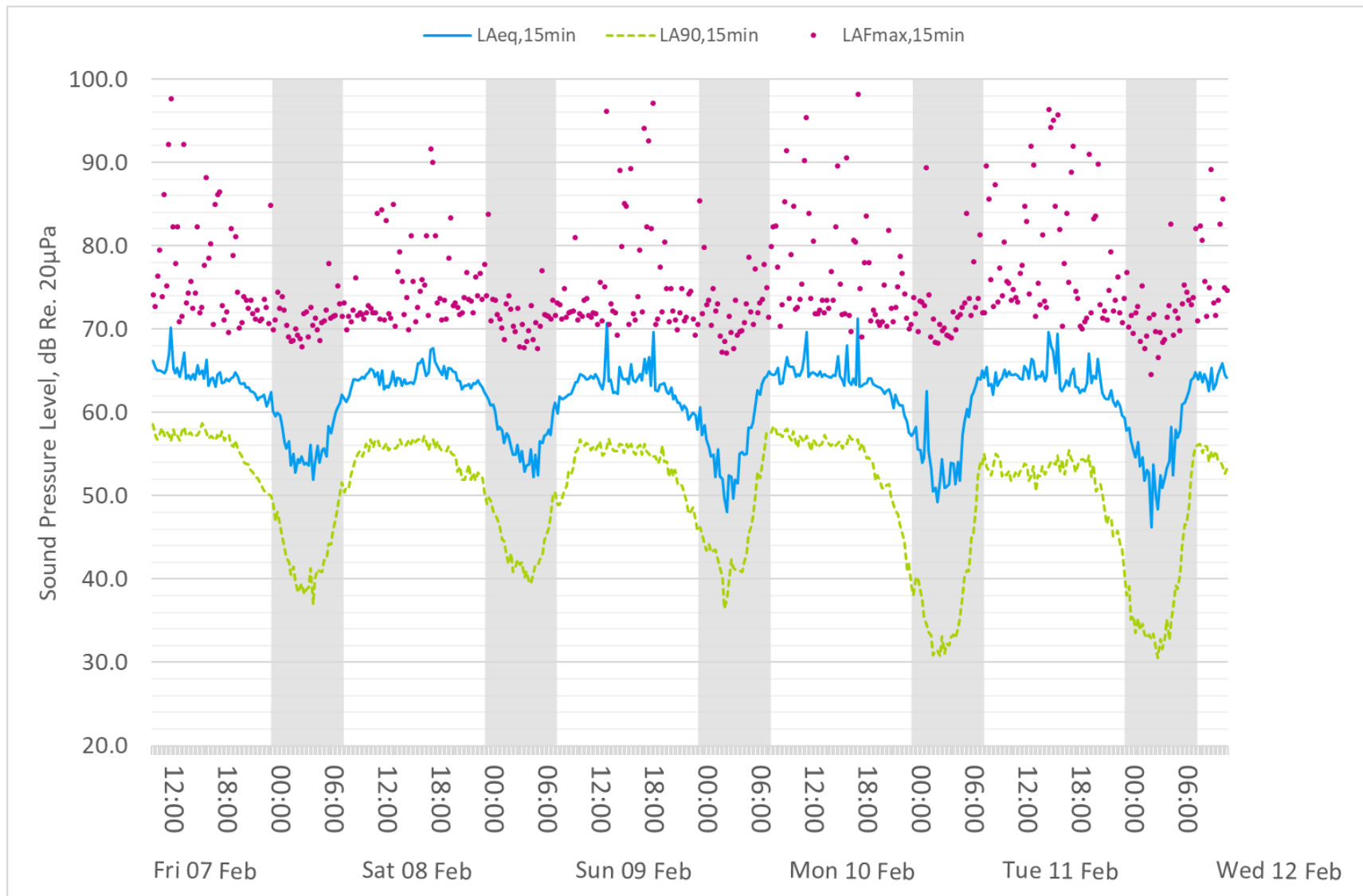


Figure 8.1: Measured noise levels at LT1

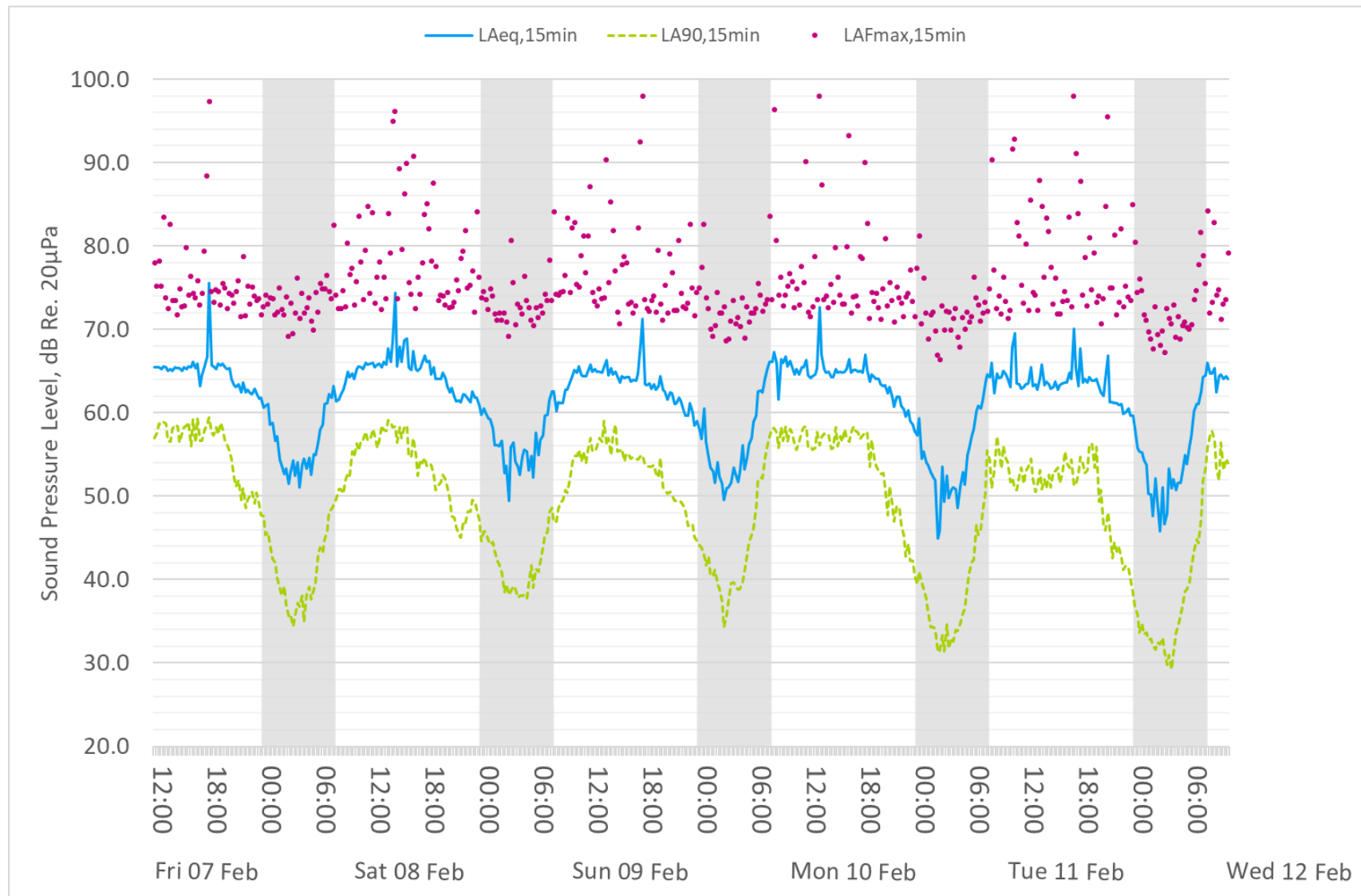


Figure 8.2: Measured noise levels at LT2

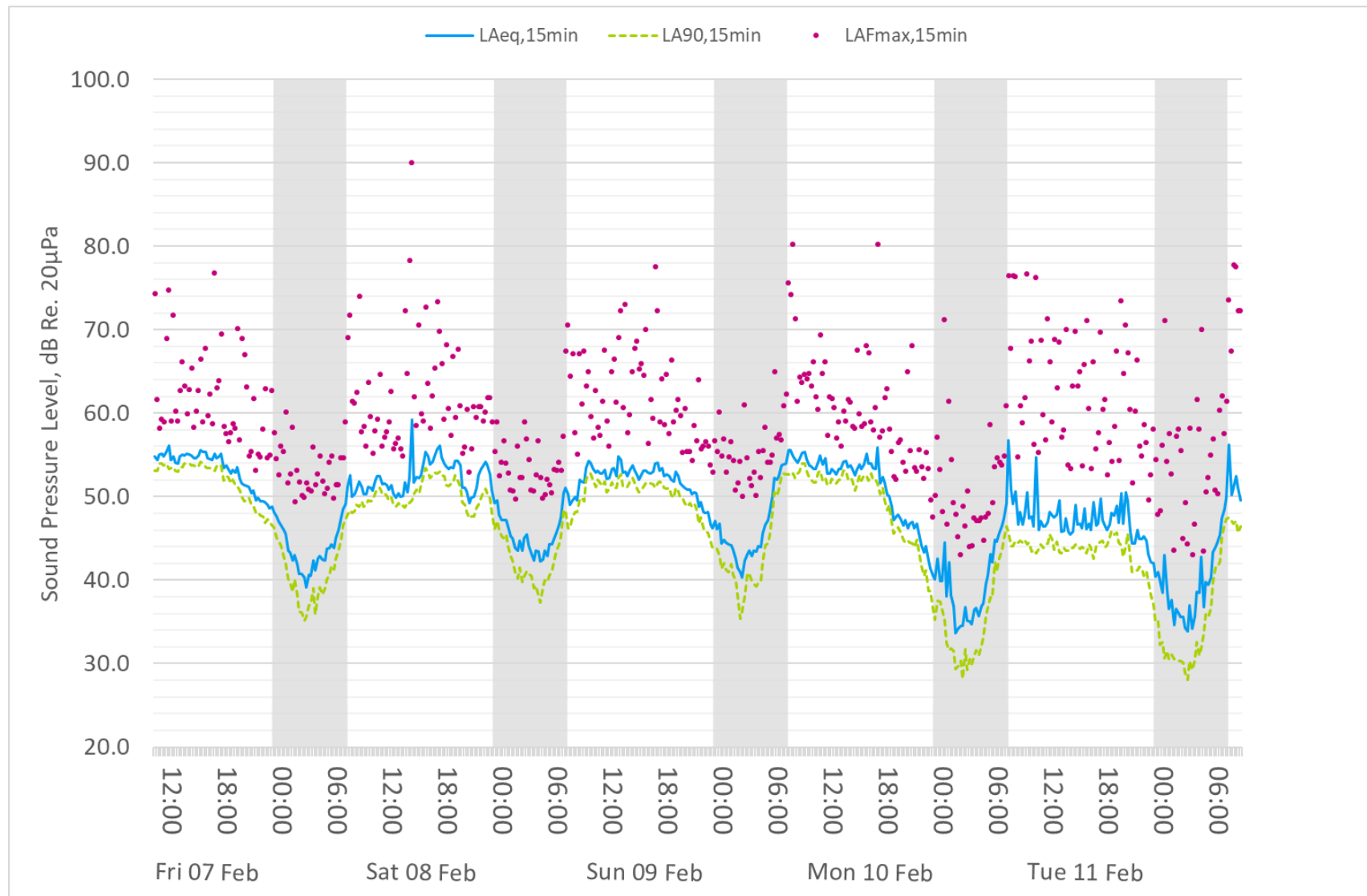


Figure 8.3: Measured noise levels at LT3

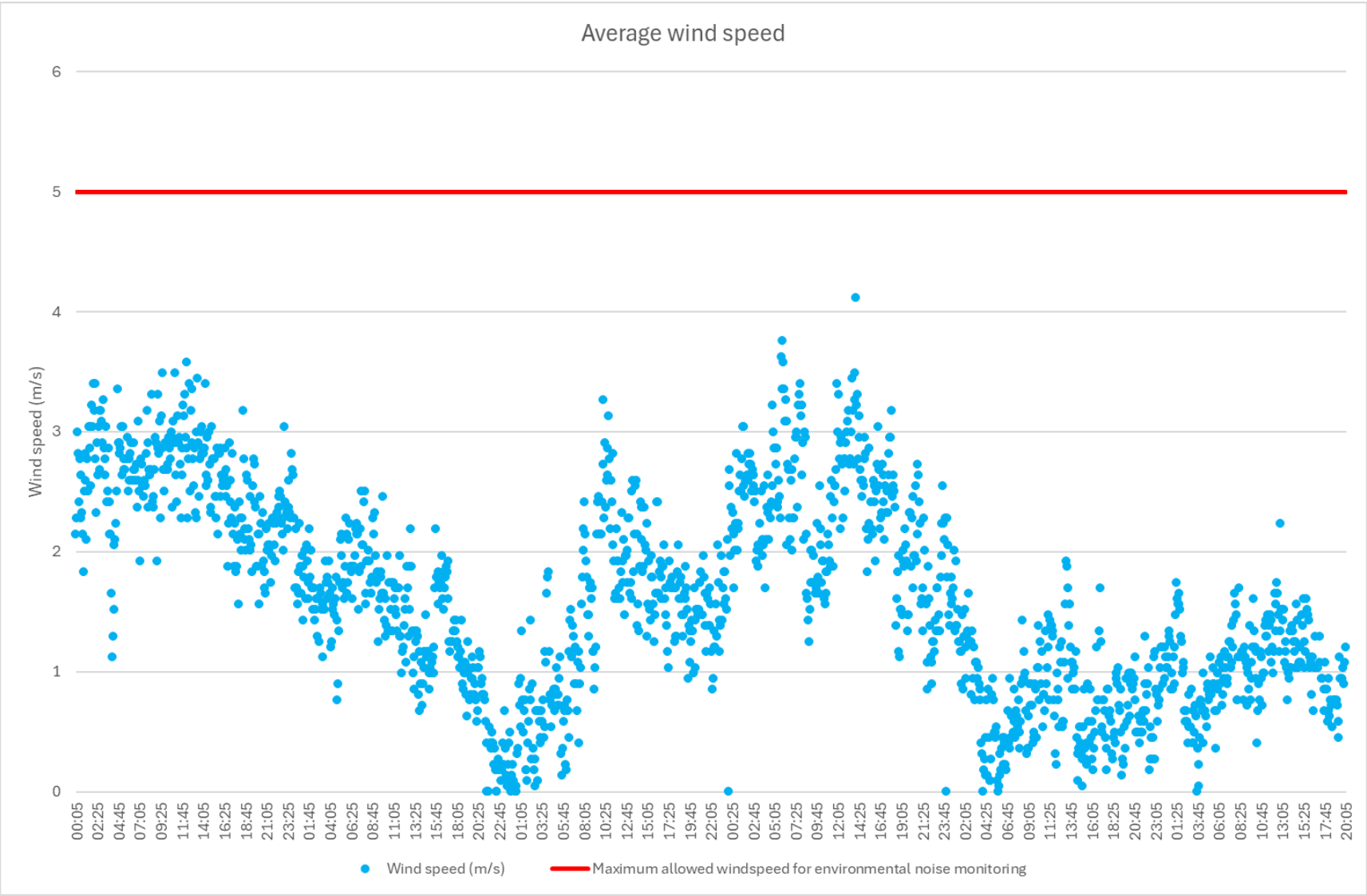


Figure 8.4: Measured windspeeds at local weather station. Wunderground.com Station ID: IEASTL16

Appendix 3

Background Noise Levels

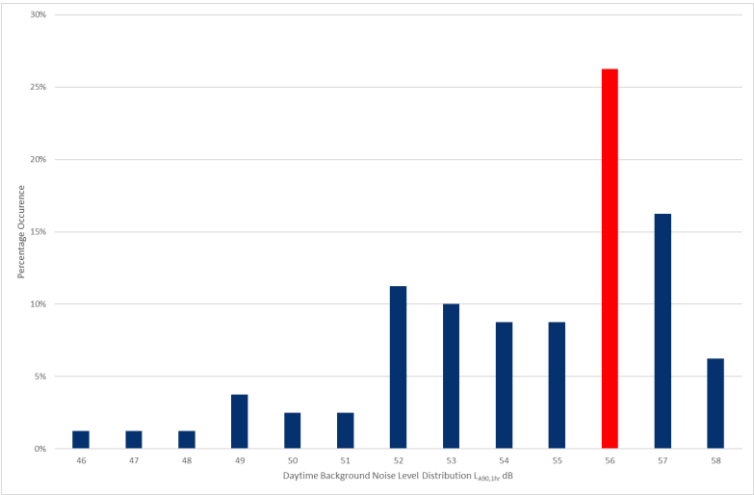


Figure 8.5: LT1 background noise distribution during the daytime (07:00 - 23:00)

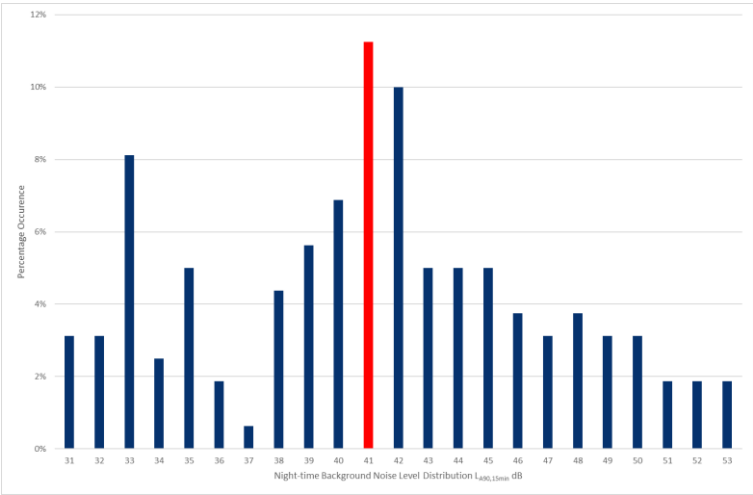


Figure 8.6: LT1 background noise distribution during the night-time (23:00 - 07:00)

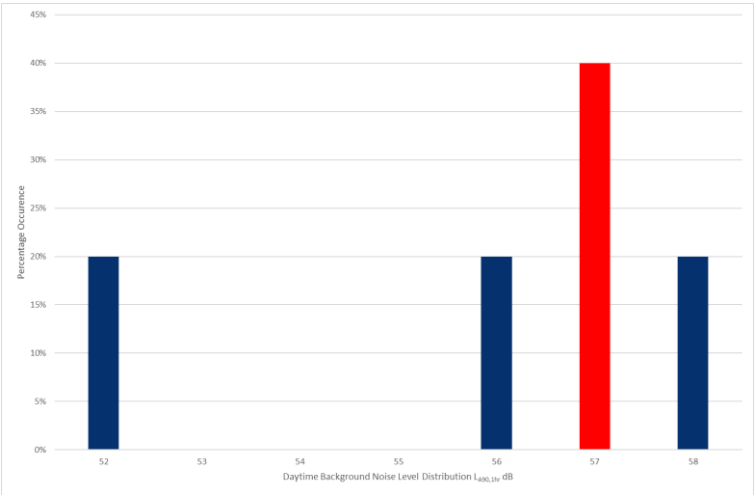


Figure 8.7: LT1 background noise distribution during the peak daytime hour (11:00 - 12:00)

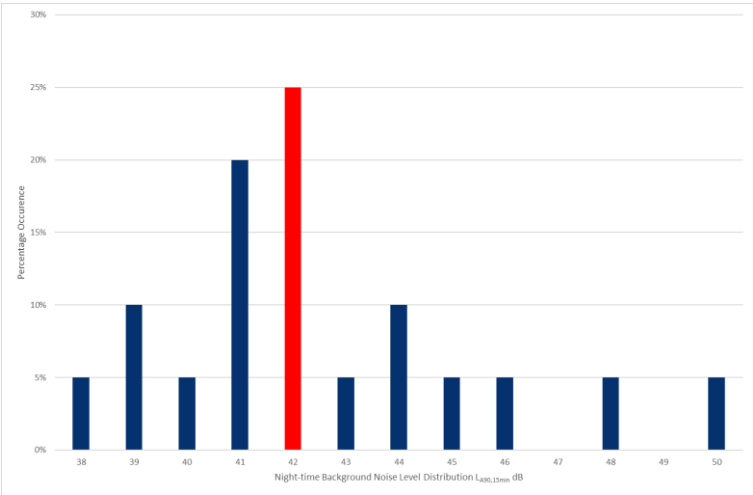


Figure 8.8: LT1 background noise distribution during the peak night-time hour (06:00 - 07:00)

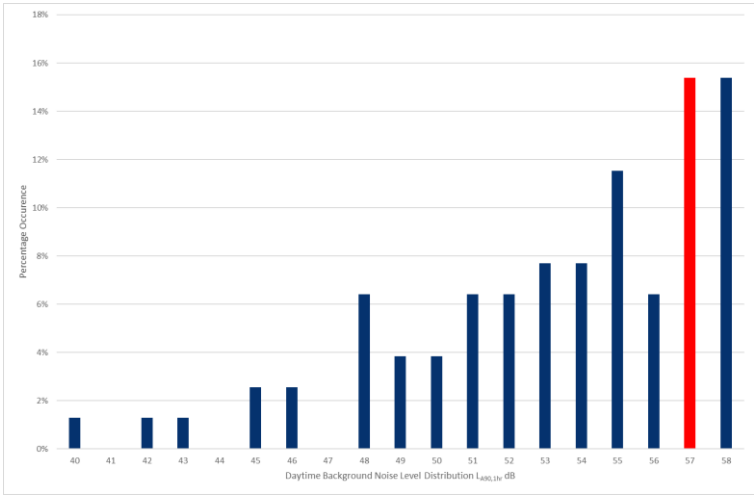


Figure 8.9: LT2 background noise distribution during the daytime (07:00 - 23:00)

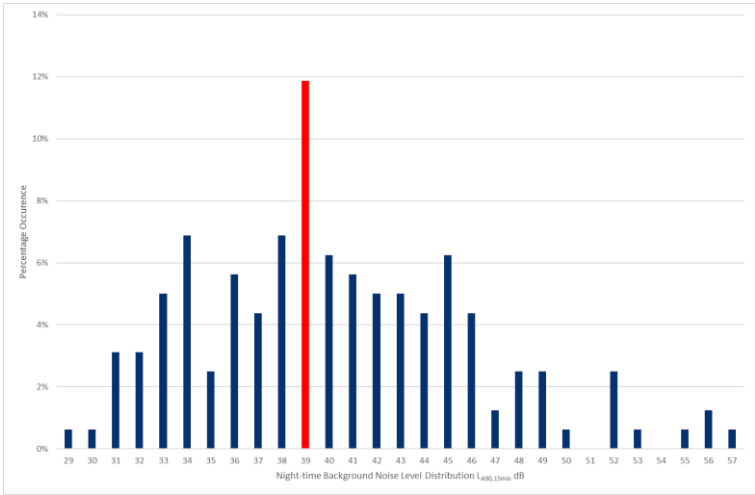


Figure 8.10: LT2 background noise distribution during the night-time (23:00 - 07:00)

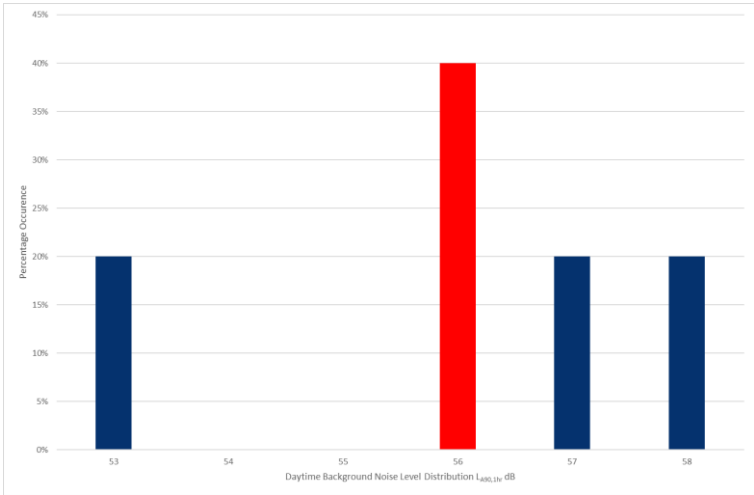


Figure 8.11: LT2 background noise distribution during the peak daytime hour (11:00 - 12:00)

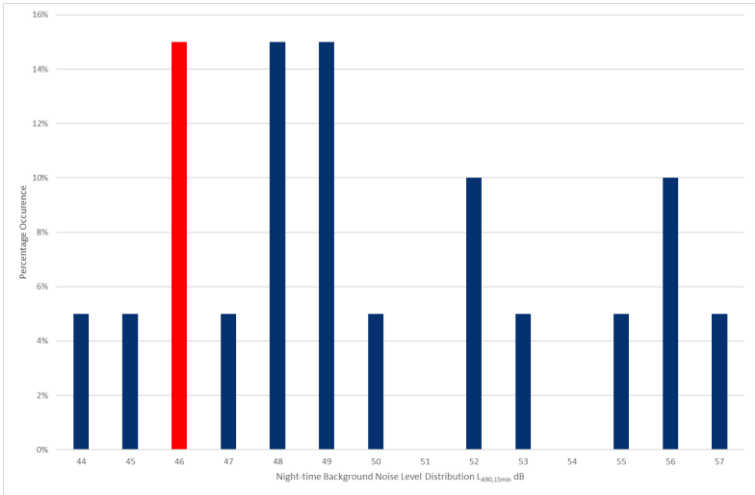


Figure 8.12: LT2 background noise distribution during the peak night-time hour (06:00 - 07:00)

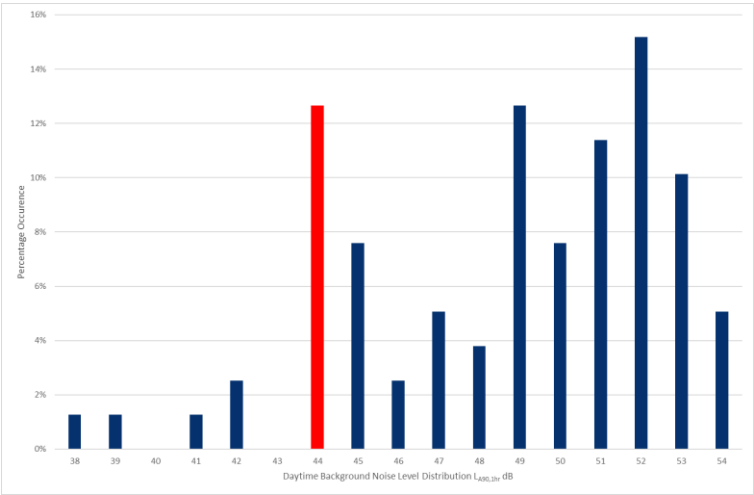


Figure 8.13: LT3 background noise distribution during the daytime (07:00 - 23:00)

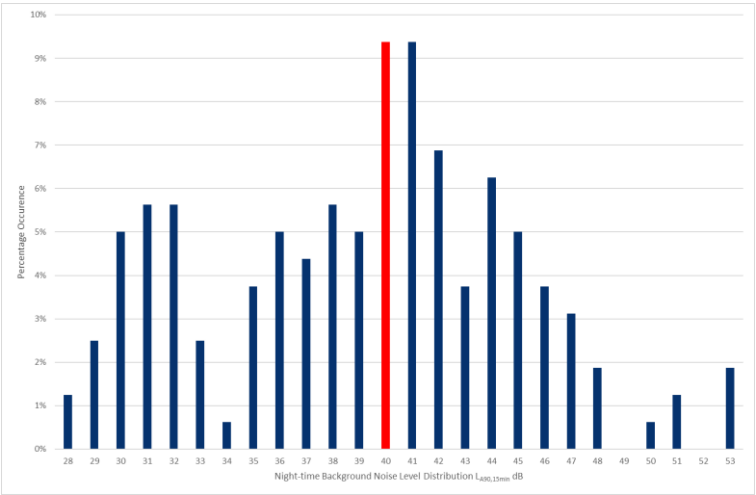


Figure 8.14: LT3 background noise distribution during the night-time (23:00 - 07:00)

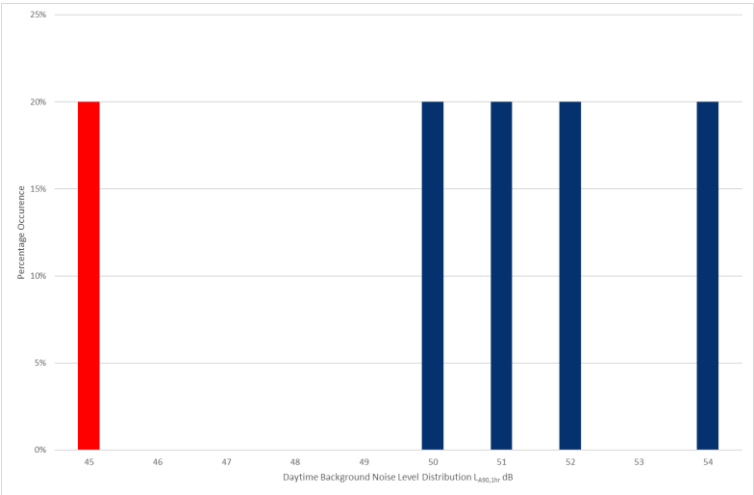


Figure 8.15: LT3 background noise distribution during the peak daytime hour (11:00 - 12:00)

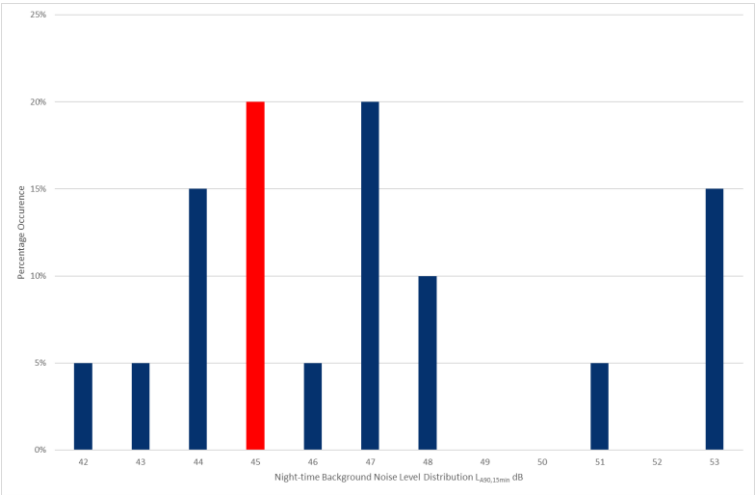


Figure 8.16: LT3 background noise distribution during the peak night-time hour (06:00 - 07:00)

Appendix 4

Calculation of Road Traffic Noise Data

Road	Speed (kph)	Baseline 2023 - 18hr AAWT			2030 Without Development – 18hr AAWT			2030 With Development – 18hr AAWT		
		Flow	% HGV	BNL	Flow	% HGV	BNL	Flow	% HGV	BNL
A3024 Bursledon Road (West)	64	13457	1.70	68.7	14336	1.70	69.0	14430	1.70	69.0
Botley Road (South)	48	9794	1.30	65.5	10434	1.30	65.8	10434	1.30	65.8
A3024 Bursledon Road (Immediately West of Site Access)	64	21201	1.50	70.6	22585	1.50	70.9	22678	1.50	70.9
A3024 Bursledon Road (Immediately East of Site Access)	64	22316	1.40	70.8	23773	1.40	71.1	24641	3.10	71.8
Le Marechal Avenue	48	2355	0.30	58.6*	2509	0.40	59.0*	2509	0.40	59.0*
A27 West End Road (North of Site Access)	64	15615	0.50	69.0	16635	0.50	69.3	16754	0.50	69.3
A27 West End Road (South of Site Access)	64	15615	0.50	69.0	16635	0.50	69.3	16968	0.50	69.4
A3024 Bert Betts Way	113	33264	1.40	78.3	35436	1.40	78.6	36275	2.50	78.9
Dodwell Lane	48	15813	0.70	67.4	16846	0.70	67.6	16916	0.70	67.7
A27 Providence Hill	64	12972	0.90	68.3	13819	0.90	68.6	13888	0.90	68.6
Hamble Lane	64	25526	0.80	71.2	27193	0.80	71.5	27304	0.80	71.5
M27 South East - Off Slip	113	9060	0.90	72.5	9652	0.90	72.8	9818	1.90	73.1
M27 South East - On Slip	113	11214	1.00	73.5	11946	1.00	73.8	12112	1.90	74.0
M27 North West - Off Slip	113	10922	1.20	73.4	11635	1.20	73.7	11856	2.00	73.9
M27 North West - On Slip	113	9146	1.80	72.7	9743	1.80	73.0	9957	2.90	73.3
M27 Eastbound - at Junction 8	113	45824	8.10	80.7	48816	8.10	81.0	-	-	-
M27 Westbound - at Junction 8	113	46364	9.60	81.0	49392	9.60	81.3	-	-	-
*Calculated with low flow correction										