

**PROPOSED RESIDENTIAL DEVELOPMENT
ON LAND NORTHWEST OF DUMERS LANE, RADCLIFFE**

NOISE IMPACT ASSESSMENT

On behalf of:
Westchurch Homes Ltd

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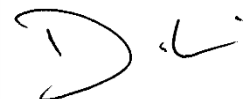
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1.0 INTRODUCTION

- 1.1 Hepworth Acoustics Ltd was commissioned by Westchurch Homes Ltd to carry out a noise impact assessment in connection with a proposed planning application for a residential development on land northwest of Dumers Lane, Radcliffe.
- 1.2 The location of the proposed residential development is shown in Figure 1. The site is bounded by existing dwellings to the north, east and southeast. Dumers Lane runs to the east/southeast with existing dwellings in between, except for the southern corner of the site where Dumers Lane passes the boundary. Bealey Industrial Estate adjoins the site to southwest and west, Eton Hill Industrial Estate is to the west of the site but is at least 100 metres from the closest point of the proposed site boundary in the northern part of the development land.
- 1.3 The development land includes some of Bealey Industrial Estate and that it is still in active use e.g. the bus company and the car wash. It was observed during site visits that activities at the industrial estate were daytime only.
- 1.4 It is proposed to develop the site for residential use with plans showing 77 dwellings consisting of a mixture of semi-detached and terrace houses. Vehicular access to the development will be via Dumers Lane to the south. Following some preliminary feedback, the initial site layout has been slightly revised to orientate dwellings away from the most significant sources of noise at the industrial estate and benefit from screening by the existing landscape. The assessment has been based on the layout shown on drawing provided by Westchurch Homes Ltd. The proposed layout of the development is shown in Figure 2.
- 1.5 The noise assessment has included:
- An inspection of the site and surrounding area;
 - Measurement of noise from the road traffic on Dumers Lane;
 - Measurement of any noise from nearby industrial/commercial premises;
 - Assessment of potential noise impact on the proposed development;
 - Recommendation of appropriate mitigation measures.
- 1.6 The various noise units and indices referred to in this report are described in Appendix I. All noise levels mentioned in the text have been rounded to the nearest decibel, as fractions of decibels are imperceptible.

2.0 GUIDANCE AND ACOUSTIC DESIGN CRITERIA

NPPF:2024

- 2.1 Paragraph 198 of the National Planning Policy Framework (NPPF), December 2023, states that *“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;”*
- 2.2 A requirement of Paragraph 200 of the NPPF is that new development can be integrated effectively with existing businesses. Existing businesses should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business 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. Thus, for this development, if it is found that there is adverse noise impact from the existing commercial/industrial premises it is incumbent on the housing developer to incorporate adequate noise mitigation into the residential developer to protect the amenity of the new residents but also to safeguard the business interests of the commercial/industrial operator.

NPSE:2010

- 2.3 The Noise Policy Statement for England (NPSE) 2010, which is referred to in the NPPF, includes three aims:
- i. Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
 - ii. Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

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

Local Policy

- 2.4 Policy EN7/2 of Bury Metropolitan Borough Council's Unitary Development Plan relates to pollution control and refers to a requirement to restrict development that would lead to an unacceptable noise nuisance in terms of amenity. However, as set out in supplementary guidance and strategy documents *"there may be opportunities to prescribe forms of screening, mounding and landscaping to reduce the impact of noise, which will benefit the quality of life for people living and working close to areas where there is noise generation"*.

BS 4142:2014+A1:2019

- 2.5 BS 4142 requires a 'rating' level ($L_{Ar,Tr}$) calculated from the operation of the noise source to be compared with the background sound level ($L_{A90,T}$) which is measured in the absence of the noise source. The noise is evaluated over a 1-hour period for daytime operations (i.e. 07:00 - 23:00 hours) and 15-minute period for night-time operations (i.e. 23:00 - 07:00 hours).
- 2.6 The rating level ($L_{Ar,Tr}$) is based on the 'specific' sound level ($L_{Aeq,Tr}$) attributed to the operating noise source, with 'character corrections' added for sound sources where *"certain acoustic features can increase the significance of impact"* when present at residential locations.
- 2.7 The acoustic character correction, where necessary, is applied to the specific sound level in order to obtain the rating level and can take into account tonality, intermittency, impulsivity and characteristics otherwise distinctive against the prevailing noise climate in the area.
- 2.8 An initial estimate of the potential noise impact from the operating noise source is determined by comparing the difference between the rating level and the background sound level.
- 2.9 Regarding the outcome of the initial estimate, BS 4142 states that:
- Typically, the greater this difference, the greater the magnitude of impact;
 - A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context;

- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context; and,
- The lower the rating level is relative to the measured background level, the less likely it is that the operation 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 low impact, depending on the context.

2.10 BS 4142 also states in respect of background sound levels that *“it is important to ensure that values are reliable and suitably represent the particular circumstances and periods of interest... the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods”*.

2.11 BS 4142 states that all pertinent factors must be taken into account regarding the context in which the noise occurs, including but not limited to:

- The absolute level of sound.
- The character and level of the residual sound compared to the character of the specific sound; and,
- The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will incorporate design measures that ensure good internal and/or outdoor acoustic conditions such as acoustic screening.

2.12 The initial numerical assessment and the context are then both taken into account when determining the potential noise impact.

BS 8233:2014

2.13 No specific guidance is given in the NPPF or Policy LPD02 on acoustic design criteria, therefore, the guidance discussed below has been used for acoustic design purposes.

2.14 Guidance on acceptable noise levels in habitable rooms and private gardens is set out in British Standard 8233: 2014, ‘Guidance on sound insulation and noise reduction for buildings’. BS 8233 recommends that it is desirable that noise from external sources does not exceed the guidelines values that are shown in Table 1 inside habitable rooms for daytime (07:00 – 23:00 hours) and night-time (23:00 – 07:00 hours) periods.

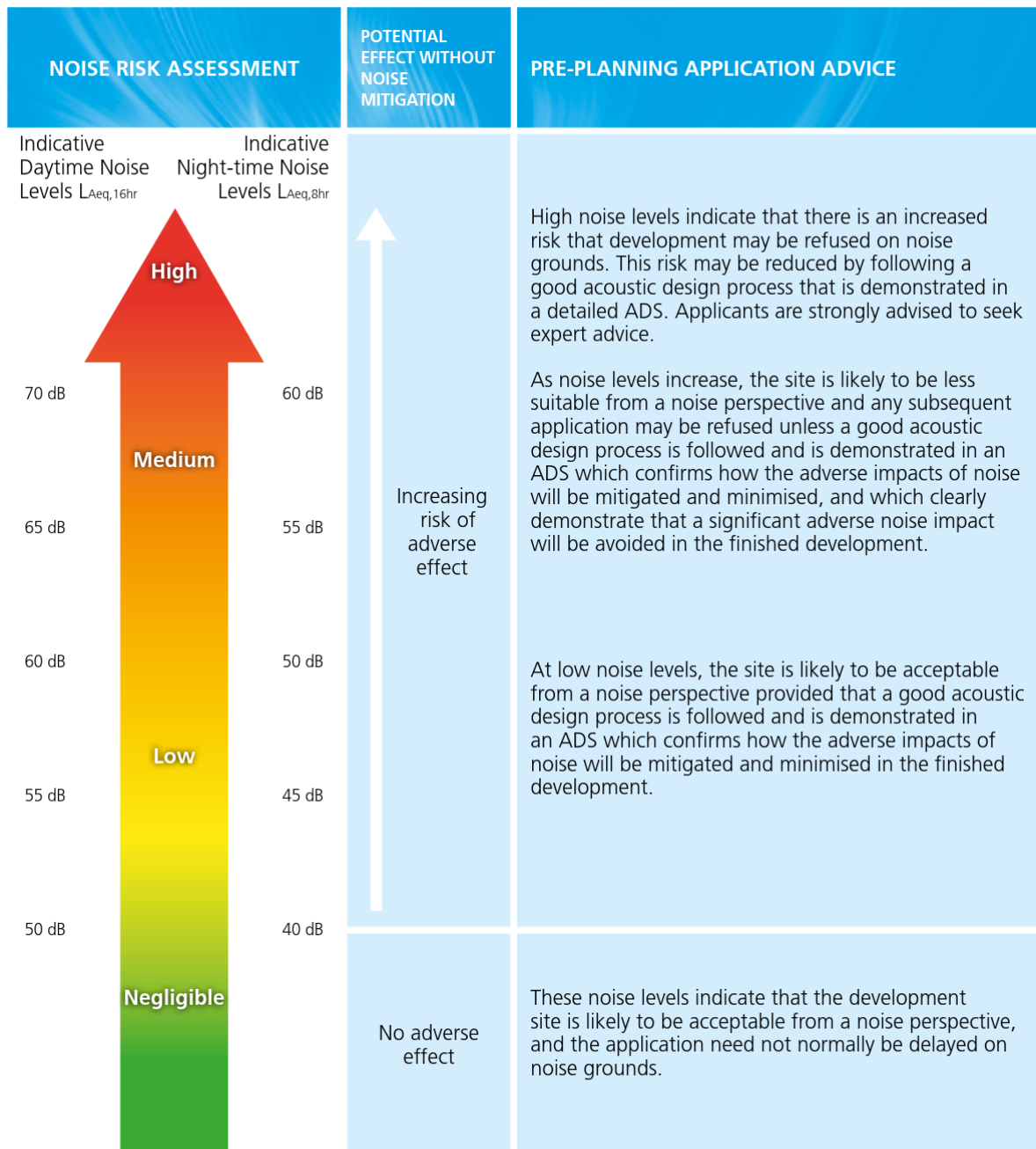
Table 1: BS 8233:2014 recommended acoustic design criteria (dB $L_{Aeq,T}$)

Activity	Location	Daytime 07:00 – 23:00 hours	Night-time 23:00 – 07:00 hours
Resting	Living room	35	-
Dining	Dining room/area	40	-
Sleeping (daytime resting)	Bedroom	35	30

- 2.15 BS 8233 also recognises that regular individual noise events at night can cause sleep disturbance. Peaks of noise from individual events are usually described in terms of L_{AFmax} values and these can be highly variable.
- 2.16 For private outdoor amenity spaces of the new houses (e.g. rear gardens) BS 8233 states that *'it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,16hr}$ with an upper guideline value of 55 dB $L_{Aeq,16hr}$ which would be acceptable in noisier environments'*. It is the experience of Hepworth Acoustics that, most local planning authorities have traditionally adopted, or accepted, the 55 dB(A) guideline value for rear gardens of proposed new residential developments near busy roads or railway lines. However, the standard also recognises that these guideline values are not achievable in all circumstances where development might be desirable and in such cases, for sites near to the 'strategic transport network' higher noise levels than 55 dB $L_{Aeq,16hr}$ in gardens may be acceptable.

ProPG

- 2.17 There is also guidance in 'ProPG: Planning & Noise – New Residential Development' (2017), although this guidance does not constitute official government guidance and has no legal standing. The ProPG describes a staged approach to the assessment of noise impact on proposed new residential development sites. Stage 1 is an initial site noise risk assessment, indicating whether the proposed site is considered to pose a negligible, low, medium or high risk from a noise perspective.
- 2.18 The ProPG initial site noise risk assessment criteria are shown in Chart 1.

Chart 1: ProPG Stage 1: Initial Site Noise Risk Assessment Criteria**Figure 1 Notes:**

- Indicative noise levels should be assessed without inclusion of the acoustic effect of any scheme specific noise mitigation measures.
- Indicative noise levels are the combined free-field noise level from all sources of transport noise and may also include industrial/commercial noise where this is present but is "not dominant".
- $L_{Aeq,16hr}$ is for daytime 0700 – 2300, $L_{Aeq,8hr}$ is for night-time 2300 – 0700.
- An indication that there may be more than 10 noise events at night (2300 – 0700) with $L_{Amax,F} > 60$ dB means the site should not be regarded as negligible risk.

- 2.19 Chart 1 broadly sets out indicative noise levels that define the element of risk of noise impact on proposed residential development land, ranging from 'Negligible' to 'High'.
- 2.20 The guidance states that these noise levels *"should be interpreted flexibly having regard to the locality, the project and the wider context"*.
- 2.21 Stage 2 of the ProPG approach is a more detailed assessment in the form of an Acoustic Design Statement (ADS). However, the acoustic design criteria that are specified in ProPG, and which form the basis of the ADS, are essentially the same as those recommended in BS 8233, as summarised previously in Table 1 of this report.
- 2.22 Similarly to BS 8233, ProPG recognises that regular individual noise events at night can cause sleep disturbance. The ProPG guidance suggests that for design purposes, wherever practicable, peaks of noise inside bedrooms from external sources should not exceed 45 dB L_{AFmax} more than 10 times per night.

Acoustic Design Criteria

- 2.23 For this development therefore it is recommended the following noise criteria be adopted in respect of road traffic noise with windows closed and trickle ventilation provided:
- Daytime noise below 35 dB $L_{Aeq,16hr}$ inside living rooms and bedrooms, 40 dB $L_{Aeq,16hr}$ inside dining rooms; and
 - Night-time noise levels not exceeding 30 dB $L_{Aeq,8hr}$ and generally not exceeding 45 dB L_{AFmax} in bedrooms (i.e. no more than 10 times per night).
- 2.24 For this development, a criterion of 55 dB $L_{Aeq,16hr}$ for gardens has been adopted as far as is practicable.
- 2.25 Outline noise mitigation recommendations to achieve the design criteria adopted above are described in Section 5.0.

3.0 NOISE SURVEY

- 3.1 Noise measurements were carried out at seven locations on the development land that are representative of the proposed dwellings at relevant points around the boundary of the site which will be closest to noise sources. The noise measurement locations were also chosen to exclude as far as possible noise from existing commercial operations that will be removed upon redevelopment of the land.
- 3.2 The measurement locations are indicated in Figure 1 and are described below:
- Location A: Northeastern corner, near telecommunications mast;
 - Location B: Central position;
 - Location 1: 30m from northeastern boundary;
 - Location 2: 10m from main eastern yard area and access road;
 - Location 3: Boundary with Borough Avenue; and
 - Location 4: 6m from Dumers Lane to the north of the site entrance, away from the car wash.
- 3.3 Automated noise measurements were undertaken at Locations A and B in terms of a series of consecutive 15-minute measurements from approximately 09:00 on Thursday 12 to 09:00 on Friday 13 September 2024. Attended noise surveys were also carried out at Locations 1 to 4 during the daytime on the Thursday and at the end of the night/early morning on the Friday. Night-time measurements at Location 4 were undertaken in consecutive 1 minute periods.
- 3.4 The purpose of the noise surveys was to determine the prevailing noise levels and hence the potential noise impact from Dumers Lane to the east and the commercial/industrial premises west of the development site (i.e. Glosta Engineering and various warehousing operations).
- 3.5 The noise measurements were taken at a microphone height of approximately 1.4m above the ground. Calibration checks were carried out both before and after the measurement periods with no variance in levels noted. Frequency analysis was also carried out.
- 3.6 The weather conditions during the noise survey were suitable for the purposes of the survey and subsequent assessment.

- 3.7 The results of the noise surveys are summarised in Table 2, and the full results along with details of the equipment used, and the weather conditions during the survey periods, are shown in Appendix II.

Table 2: Summary of Noise Levels Measured (dB)

Location	$L_{Aeq,15\text{ min}}$	$L_{A90,15\text{ min}}$
A. North eastern corner (07:00-17:00 hours)	44 – 67	41 – 54
B. Central position (07:00-17:00 hours)	41 – 54	35 – 45
1. 30m from northeastern boundary	51 – 52	49 – 50
2. 10m from main eastern yard area	46 – 49	42 – 45
3. Boundary with Borough Avenue	44 – 45	40 – 41
4. 6m from Dumers Lane (including night)	62 – 64	N/A

- 3.8 Noise measurements at Locations A and 1 were influenced by equipment/operations at Glosta Engineering in the northern part of the development site. The noise sources included extract plant located on the roof of a building at the boundary of the site (which was observed to operate all day), forklift truck (FLT) movements and occasional noisy impacts from movement of containers including large skips.
- 3.9 At Location 2 noise levels were influenced by distant road traffic and very occasional activities within the main yard area of the industrial estate, these included occasional heavy goods vehicle (HGV) movements, and loading/unloading activities at warehouses. Noise levels were generally low to moderate and ranged between 46 and 49 dB $L_{Aeq,15\text{ mins}}$.
- 3.10 Locations B and 3 were more screened from activities on Bealey Industrial Estate although occasional low level plant/impact noise was audible at times. Location 3 was on the boundary of the site and the results of the noise measurements at this location are considered representative of typical daytime background sound levels at the existing dwellings on Borough Avenue to the west.
- 3.11 Road traffic noise levels at Location 4 are considered to be representative of those that will prevail outside the proposed dwellings at the south of the development site closest to Dumers Lane, the position was chosen to reduce the influence of the existing car wash operations which are currently in place on the southern part of the site.
- 3.12 Other sources of noise noted were birdsong, distant road traffic and occasional aircraft.
- 3.13 Representative background sound levels were taken at Locations A and B during periods when no significant noise from the industrial estate was influencing the measurements.

- 3.14 The periods of interest considered for this assessment are the afternoon (i.e. 16:30-18:30 hours) and the potential start of operations on the site during the last hour of the night (i.e. 06:00-07:00 hours). However, it was noted that no operations were observed occurring on the estate during the early morning noise survey.
- 3.15 BS4142 states that a representative background noise level should be obtained for the period of interest and that *“the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods.”*
- 3.16 BS4142 also shows an example of *“statistical analysis of the results of all the measurement periods in order to determine a background sound level”*. This involves consideration of the mode, mean or even the median, selecting the lowest or the most apparent values over the periods of interest.

Table 3: Representative Background Sound Levels (dB $L_{A90,T}$)

Period of Interest	Location	
	A. North eastern corner	B. Central position
16:30 – 18:30	43	39
06:00 – 07:00	43	43

- 3.17 The values selected tended to show a good correlation between all statistical indices (i.e. mode, mean and median). The predominant influence on the noise climate is road traffic which varies due to its diurnal nature, i.e. road traffic tends to build up from the early morning into rush hour reducing again in the late morning starting to rise again around the second evening rush hour period. Noise levels then tend to reduce again throughout the evening and night-time periods.

Road Traffic Noise

- 3.18 Daytime noise levels at Location 4 have been evaluated in accordance with the ‘shortened measurement method’ described in the Department of Transport document ‘*Calculation of Road Traffic Noise*’ (CRTN), 1988. The memorandum was prepared to enable entitlement under the *Noise Insulation Regulations* 1975 to be determined, but as is stated in the document, the guidance is equally appropriate to the calculation of traffic noise for land use planning purposes.
- 3.19 The CRTN shortened measurement method involves taking noise measurements ($L_{A10,T}$) over representative sample time periods within any three consecutive hours between 10:00 and 17:00. By using the $L_{A10,3hr}$ as the arithmetic mean of the measured $L_{A10,T}$ values, the $L_{A10,18hr}$ value can then be calculated. The correction to obtain the $L_{A10,18hr}$ value from the $L_{A10,3hr}$ level is -1 dB.

- 3.20 The $L_{A10,18hr}$ values have then been converted into the equivalent $L_{Aeq,16hr}$ values by applying a correction of -2 dB in accordance with para. 6.2.2 of British Standard 8233.
- 3.21 The measured night-time $L_{Aeq,T}$ values have been averaged logarithmically to obtain a $L_{Aeq,2hr}$ value which has been taken as a conservative estimate of the night-time $L_{Aeq,8hr}$ value. Therefore, the '16 hour' daytime and '8 hour' night-time road traffic noise exposure levels are shown in Table 4.

Table 4: Summary of road traffic noise exposure values (dB)

Location	Daytime	Night-time	
	$L_{Aeq,16hr}$	10 th highest $L_{Amax,F}$	$L_{Aeq,8hr}$
4. 6m from Dumers Lane	64	76	61

- 3.22 Noise levels measured at Location 4 were due to road traffic on Dumers Lane.
- 3.23 The implications of the noise survey results are set out in Section 4.0 and have been used to determine the type and extent of any noise mitigation measures necessary to achieve the adopted noise design criteria.

4.0 NOISE ASSESSMENT

Acoustic Bund/Fence

- 4.1 Following completion of the noise surveys the initial outcome of the assessment of potential noise impact from the industrial estate helped inform the layout and orientation of the site particularly, in the northwest corner. The changes to the layout also take advantage of an existing earth bund which together with acoustic fencing proposed on top will create a six metre high acoustic bund/fence in this area of the site (as indicated in Figure 2).
- 4.2 Therefore, assessments below consider the screening provided by the acoustic bund/fence in the calculated noise levels.

Glosta Engineering

- 4.3 It is understood that Glosta Engineering operate between 08:30 to 16:30 hours Monday to Friday. Although, there are one or two vehicle movements on the site from 07:00 hours onwards. It is understood that Glosta Engineering does not operate during the night. From observations on site, the potential noise impact assessment must consider the combined noise from external plant and yard activities associated with the business.
- 4.4 An 'ambient sound level' of 61 dB $L_{Aeq,1hr}$ was measured at a distance which is representative of the nearest proposed dwellings from these combined sources (i.e. fixed plant and yard activities). The 'residual sound level' (when the plant and yard activities were not operating) was 45 dB $L_{Aeq,1hr}$ and as such the residual noise was not influencing the measured ambient noise level. Considering the barrier attenuation provided by the proposed acoustic bund/fence, the 'specific sound level' associated with Glosta Engineering operations is calculated to be 42 dB $L_{Aeq,1hr}$ outside the nearest proposed dwelling.
- 4.5 Forklift Truck movements of containers/skips are sporadic; however these movements of large empty metal containers result in some highly impulsive sounds although the audibility and hence character of these sounds will be reduced by the proposed acoustic bund/fence. Therefore, a 3 dB 'acoustic feature penalty' for impulsivity has been applied. On this basis, the BS 4142 initial numerical assessment is shown in Table 5.

Table 5: Initial Numerical BS4142 Assessment of Glosta Engineering Operations (dB)

Description	Daytime
Calculated Specific sound level outside dwelling	42
Character correction	+3
Rating level at proposed dwelling ($L_{Ar,Tr}$)	45
Background sound level ($L_{A90,T}$)	43
Difference	+2
Initial estimate	'Low Impact'

- 4.6 The 'rating sound level' from activities at Glosta Engineering is 2 dB above the representative background sound level measured outside the nearest proposed dwellings. In terms of a BS 4142 assessment the conclusion is of low impact during the daytime period, in the absence of any additional noise mitigation measures.

Access Road and Eastern Yard Area

- 4.7 It is not clear what the hours of operation are for the access road or the eastern yard area, however from observations during the daytime and night-time/early morning surveys the majority of operations take place in the daytime. Nevertheless, given the ad hoc nature of the businesses on the estate it is likely that occasional yard activities could occur during night-time periods (i.e. 23:00 to 07:00 hours), specifically in the early morning period (i.e. before 07:00 hours). Therefore, the potential noise impact associated with yard activities (including access into the industrial park via Wild Street) needs to be considered, including at night/early morning period.
- 4.8 As set out above, the yard is used sporadically for loading/unloading activities which tend to be in daytime hours and consist of the handling of goods to/from warehouses to small vans. There are however occasional HGV movements through the yard which serves as an access route to some units on the estate.
- 4.9 A noise level of 77 dB L_{AE} was measured at 20 metres from a HGV pass-by, at a distance that is representative of the nearest proposed dwellings.
- 4.10 The likely levels of noise at the nearest dwellings generated by HGVs in the yard have been calculated on the basis of two HGVs arriving (via Wild Street), unloading and leaving (via Wild Street) in a one-

hour period during the daytime. Also, noise levels have been calculated outside a first floor window of the nearest dwellings on the basis of one HGV arriving/leaving in a 15 minute period at night. The calculations consider corrections for the number of operations and distance attenuation only.

- 4.11 The equivalent continuous one-hour or 15-minute periods noise levels have been calculated from the L_{AE} values as follows:

$$L_{Aeq,T} = L_{AE} + 10 \log N - 10 \log T$$

where $L_{Aeq,T} = L_{Aeq}$ over time period T

L_{AE} = 'Sound Exposure Level'

N = Number of events in time period T

T = Time period in seconds, (i.e. 3600s for a 1 hour period)

- 4.12 Due to the intermittent nature of the vehicle movements a 3 dB penalty has been applied. An initial assessment of the potential delivery noise levels is set out in Table 6:

Table 6: Initial Numerical BS4142 Assessment of Eastern Yard Activities (dB)

Description	Daytime	Night-time/Early Morning
Calculated Specific sound level outside dwelling	43	46
Character correction	+3	+3
Rating level at proposed dwelling ($L_{Ar,T}$)	46	49
Background sound level ($L_{A90,T}$)	43	43
Difference	+3	+6
Initial estimate	'Low to Adverse Impact'	'Adverse Impact'

- 4.13 The 'rated sound levels' from yard activities including vehicle movements via Wild Street are above the representative background sound levels measured outside the nearest proposed dwellings in the daytime and night-time/early morning. In terms of BS 4142, the conclusion is a low to adverse impact in the daytime and an adverse but not amounting to significant adverse impact during the night-time period, in the absence of any noise mitigation measures.

Outcome of the Initial BS 4142 Assessments

- 4.1 The outcome of the initial BS 4142 assessments for commercial/industrial premises surrounding the development site indicate low to adverse impacts including some mitigation measures.

- 4.2 However, the context in which the sound occurs must also be considered and, where necessary/appropriate, the assessment modified accordingly. BS 4142 states that all pertinent factors are taken into consideration.
- 4.3 In particular, there is an opportunity to implement further noise mitigation measures at the nearest proposed dwellings to reduce potential noise impact as far as is practicable, this includes further acoustic fencing and enhanced glazing and/or ventilation. BS 4142 states that any such noise mitigation should be taken into account as part of the context.

Initial Road Traffic Noise Risk Assessment

- 4.4 The road traffic noise exposure levels across the site fall into the 'Medium' risk category of ProPG in the daytime and between the 'Medium' to 'High' risk categories at night. It is considered that that the site is suitable for residential development, provided that traffic noise levels for proposed dwellings are mitigated adequately.
- 4.5 A noise mitigation scheme to protect the amenity of the new residents from both road traffic noise and noise from industrial estate (therefore safeguarding the interests of the businesses) is described in Section 5.

5.0 RECOMMENDED NOISE MITIGATION SCHEME & CONCLUSION

Noise Mitigation Scheme

- 5.1 The purpose of the noise mitigation measures in respect of commercial/industrial noise is twofold; firstly to adequately protect the amenity of the new residents from the noise of the nearby commercial/industrial premises (in terms of potential noise break out, yard activities and vehicle movements on Wild Street), and secondly, in so doing, to safeguard the current and future business interests of these premises. In this way the development would comply fully with the requirements of para. 200 of the National Planning Policy Framework (NPPF).
- 5.2 As noted above, the proposed site layout incorporates a six metre high acoustic bund/fence along the northern boundary. A further three metre high acoustic fence along the western boundary of the site (as indicated in Figure 2) is also recommended.
- 5.3 The acoustic fencing must be imperforate (i.e. have no holes or gaps), have a surface mass no less than 10 kg/m² and be at least 20mm thick.
- 5.4 Suppliers of proprietary acoustic fences include GRAMM Barrier Systems Ltd (www.grammbarriers.com) Jacksons Fencing (www.jacksons-fencing.co.uk), Guardian Fencing (www.guardianfencing.com) and Ransfords (www.ransfords.co.uk).

Gardens

- 5.5 The rear gardens on the proposed development are located away from Dumers Lane and would be screened adequately from noise from the industrial estate by the recommended acoustic bunding/fencing or the houses themselves, such that noise levels will be below 55 dB $L_{Aeq16hr}$.

Glazing

- 5.6 It is recommended that living rooms and bedrooms of the dwellings indicated in Figure 2 are fitted with the following enhanced specification of glazing (minimum 29 dB $R_w + C_{tr}$):
- 6.4mm Solaglas 'Stadip Silence' laminated glass - nominal (8-20mm) cavity - 4mm glass; or
 - 8mm glass - nominal (8-20mm) cavity - 4mm glass.

- 5.7 For all other living rooms and bedrooms, on the development, it is recommended that standard double glazing of 4mm glass - nominal (10-16mm) cavity - 4mm glass (25 dB $R_w + C_{tr}$).
- 5.8 Due care and attention must be taken to ensure that all glazing is well-fitted.

Ventilation

- 5.9 All living rooms and bedrooms as indicated in Figure 2, will require an acoustically treated means of ventilation, instead of standard window frame slot vents, to achieve the internal noise criteria. The following acoustically treated means of ventilation are recommended:
- Aereco EHA2 Acoustic Trickle Ventilator with acoustic canopy and sleeve (44 dB $D_{n,e,w}$); or
 - Rytons AAC125HP Super Acoustic Controllable LookRyt AirCore Ventilator (43 dB $D_{n,e,w}$); or
 - Another ventilation system with a good acoustic performance (i.e. above 40 dB $D_{n,e,w}$).
- 5.10 Ventilation proposals will need to be agreed with the Council at an early stage.

Rooms in Roof Spaces & External Walls

- 5.11 It is understood that there are no rooms in roof spaces for the dwellings which are proposed close to sources of noise (i.e. road traffic or the industrial estate). The exact construction of the external walls of dwellings is not known at this stage however it is assumed that the sound insulation performance of the wall construction will not be less than 50 dB R_w .

Planning Condition

- 5.12 The need to ensure that an adequate scheme of noise mitigation is implemented can be formalised by an appropriately worded planning condition that requires a scheme of noise mitigation measures as described in this report to be implemented prior to occupation of relevant dwellings.

Conclusion

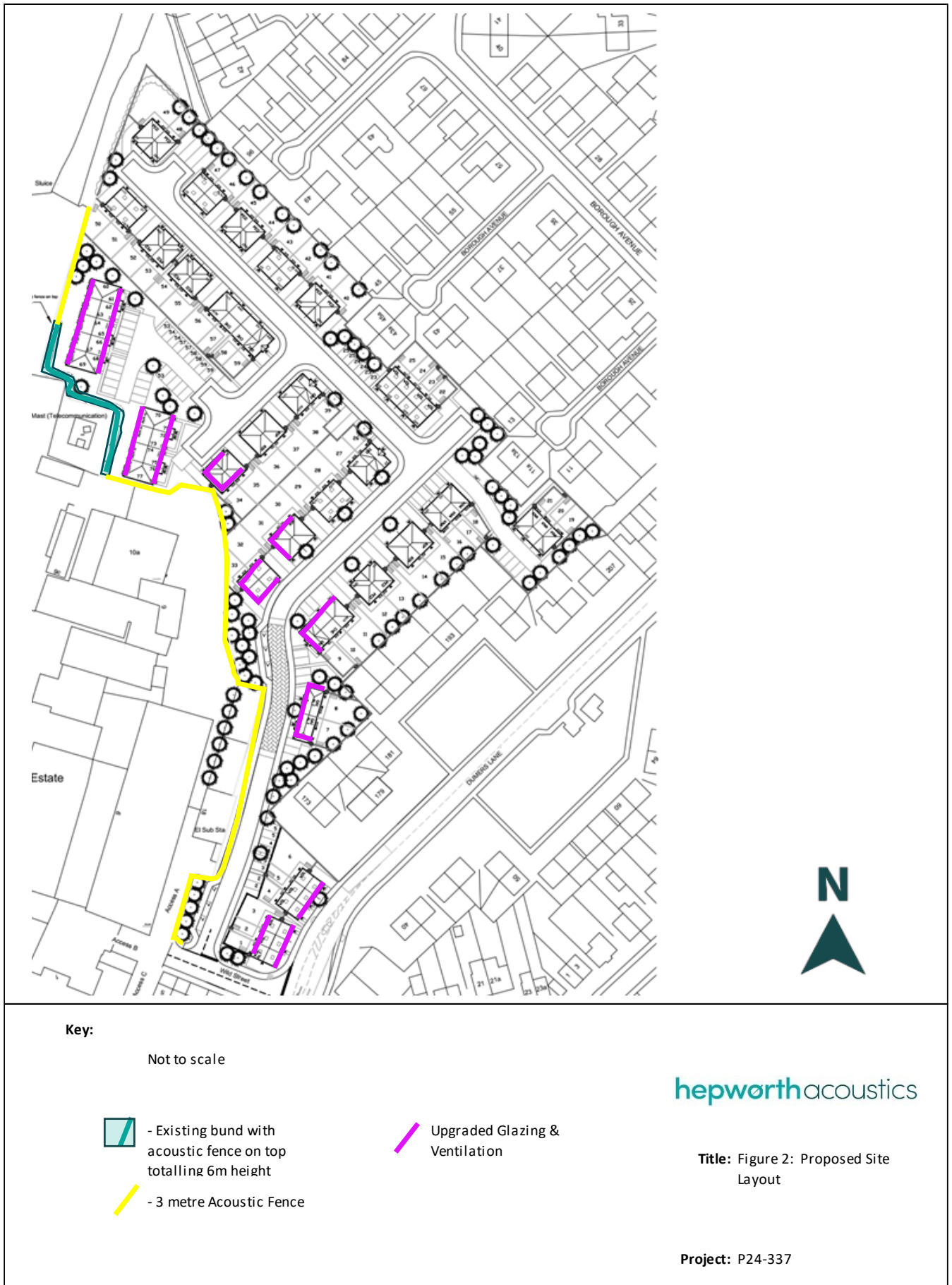
- 5.13 Subject to the recommendations for mitigation measures made above we conclude that potential noise impact from the road traffic and the commercial/industrial premises would not result in any unacceptable harm to residential amenity by reason of noise disturbance. Also, the proposed noise mitigation measures would safeguard the business interests of the commercial/industrial premises and thus comply fully with para. 200 of the NPPF.

- 5.14 Furthermore, 'significant adverse impacts' would be avoided and 'adverse impacts' would be mitigated/minimised, bringing the development in line with the aims of the Noise Policy Statement for England (NPSE) 2010 and local policy.

6.0 SUMMARY

- 6.1 The impact of noise has been assessed for a proposed residential development on land to the northwest of Dumers Lane, Radcliffe.
- 6.2 The assessment has included the measurement of noise levels at appropriate locations on the site.
- 6.3 The assessment has concluded that there would be potential noise impact on the proposed residential development from nearby commercial/industrial premises (including use of the access road), in the absence of adequate noise mitigation measures.
- 6.4 It is recommended that an appropriate scheme of noise mitigation and sound insulation measures is implemented for the new houses that will protect the amenity of the new residents and also safeguard the business interests of the nearby commercial/industrial premises, both now and in the future.
- 6.5 The implementation of an adequate scheme of noise mitigation measures can be ensured by the use of an appropriately worded planning condition.





Appendix I: Noise Units & Indices

Sound and the decibel

A sound wave is a small fluctuation of atmospheric pressure. The human ear responds to these variations in pressure, producing the sensation of hearing. The ear can detect a very wide range of pressure variations. In order to cope with this wide range of pressure variations, a logarithmic scale is used to convert the values into manageable numbers. Although it might seem unusual to use a logarithmic scale to measure a physical phenomenon, it has been found that human hearing also responds to sound in an approximately logarithmic fashion. The dB (decibel) is the logarithmic unit used to describe sound (or noise) levels. The usual range of sound pressure levels is from 0 dB (threshold of hearing) to 120dB (threshold of pain).

Due to the logarithmic nature of decibels, when two noises of the same level are combined together, the total noise level is (under normal circumstances) 3 dB(A) higher than each of the individual noise levels e.g. 60 dB(A) plus 60 dB(A) = 63 dB(A). In terms of perceived 'loudness', a 3 dB(A) variation in noise level is a relatively small (but nevertheless just noticeable) change. An increase in noise level of 10 dB(A) generally corresponds to a doubling of perceived loudness. Likewise, a reduction in noise level of 10 dB(A) generally corresponds to a halving of perceived loudness.

The ear is not equally sensitive to sound at all frequencies. It is less sensitive to sound at low and very high frequencies, compared with the frequencies in between. Therefore, when measuring a sound made up of different frequencies, it is often useful to 'weight' each frequency appropriately, so that the measurement correlates better with what a person would actually hear. This is usually achieved by using an electronic filter called the 'A' weighting, which is built into sound level meters. Noise levels measured using the 'A' weighting are denoted dB(A) or dBA.

Frequency and Hertz (Hz)

As well as the loudness of a sound, the frequency content of a sound is also very important. Frequency is a measure of the rate of fluctuation of a sound wave. The unit used is cycles per second, or hertz (Hz). Sometimes large frequency values are written as kiloHertz (kHz), where 1 kHz = 1000 Hz.

Young people with normal hearing can hear frequencies in the range 20 Hz to 20 kHz. However, the upper frequency limit gradually reduces as a person gets older.

Glossary of Terms

When a noise level is constant and does not fluctuate, it can be described adequately by measuring the dB(A) level. However, when the noise level varies with time, the measured dB(A) level will vary as well. In this case it is therefore not possible to represent the noise climate with a simple dB(A) value. In order to describe noise where the level is continuously varying, a number of other indices can be used. The indices used in this report are described below.

- C_{tr} This is an A-weighted urban traffic noise spectrum, which can be added to $D_{nT,w}$ or R_w in some standards to take into account different source spectra such as low frequency sound.
- R This is the 'Sound Reduction Index' as measured in a laboratory, and is a measure of the sound insulation properties of an building element in a stated frequency band.
- R_w This is the 'Weighted Sound Reduction Index', and is a single figure quantity of R , the laboratory measured Sound Reduction Index.
- $D_{n,e,w}$ This is the weighted element normalized level difference as measured in a laboratory, and is a measure of the sound insulation properties of small building elements such as ventilators.
- $L_{Aeq,T}$ This is the A-weighted 'equivalent continuous noise level' which is an average of the total sound energy measured over a specified time period. In other words, $L_{Aeq,T}$ is the level of a continuous noise which has the same total (A-weighted) energy as the real fluctuating noise, measured over the same time period. It is increasingly being used as the preferred parameter for all forms of environmental noise.
- L_{AFmax} This is the maximum A-weighted noise level that was recorded during the measurement period in terms of 'Fast' time weighting.
- $L_{A10,T}$ This is the A-weighted noise level exceeded for 10% of the time period. $L_{A10,T}$ is usually used as a measure of traffic noise.
- $L_{A90,T}$ This is the A-weighted noise level exceeded for 90% of the time period. $L_{A90,T}$ is used as a measure of background noise.

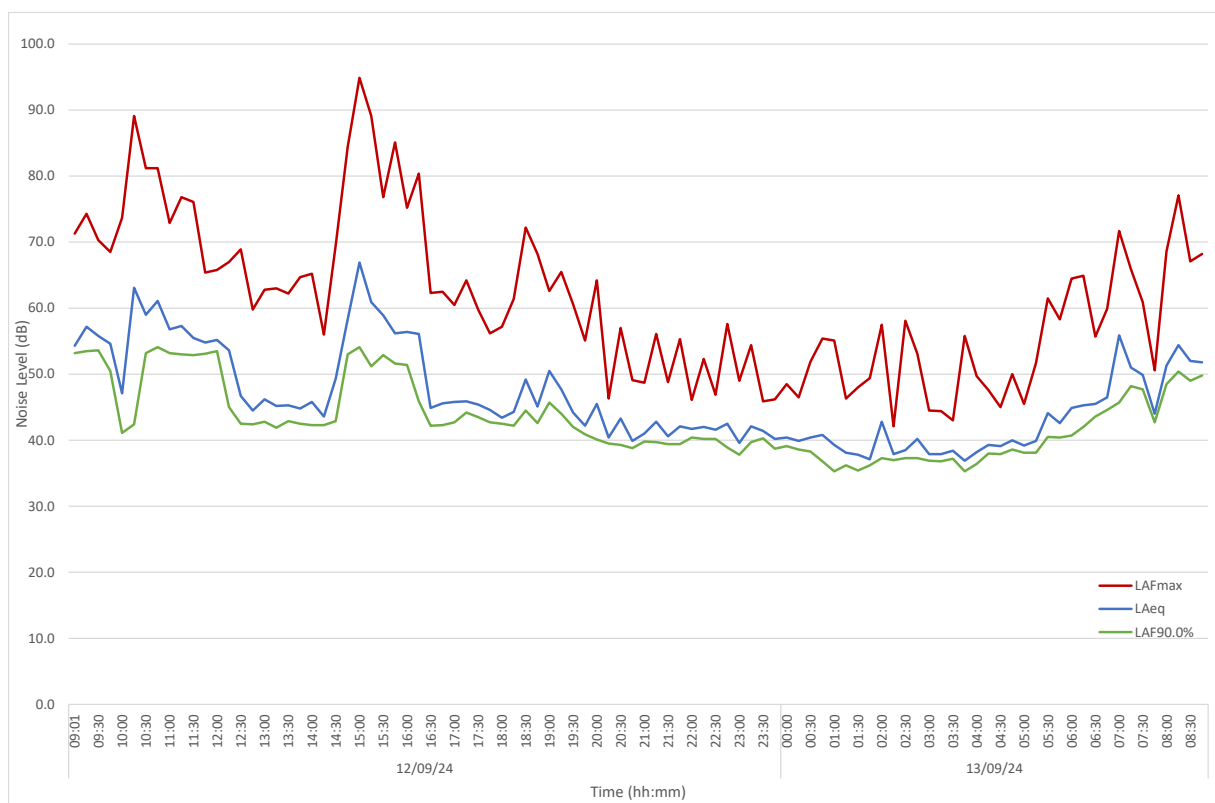
L_{AE} This is the A-weighted 'Sound Exposure Level' which is used for measuring discrete noise events. Essentially it is a measure of the sound energy of the whole noise event normalised to a period of 1 second. The SEL value can be used to calculate the actual L_{Aeq} value for a given time period if the number of noise events is known.

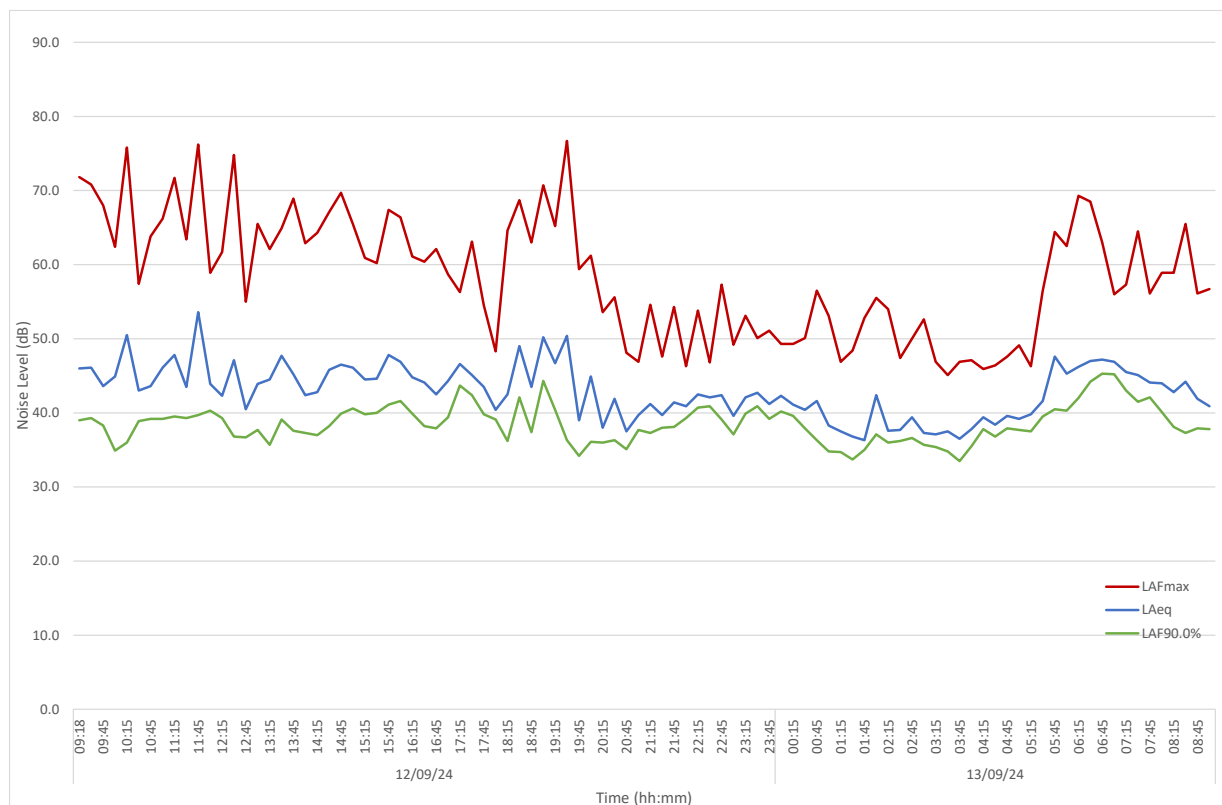
Appendix II: Noise Survey Results

Date(s):	Daytime – Thursday 12 September 2024
	Night-time/early morning – Friday 13 September 2024
Equipment	B&K 2260/2250 'Type/Class 1' sound analyser (serial no. 2467016/3011706) with tripod and associated calibrator
	NTi XL2 'Class 1' sound level meters (s/n: A2A-20361-E0 & A2A-20228-E0) with associated calibrator and environmental outdoor monitoring kit
Weather	Daytime – Dry, ~9-13°C, cloudy and calm <2 m/s Night-time – Dry, ~1-9°C, cloudy and calm <2 m/s

All levels in dB(A)

Location A: Northeastern corner, near telecommunications mast



Location B: Central position**Location 1: 30m from northeastern boundary**

Date	Time		Measured Noise Levels (dB)			Comments
	Start	End	L_{AFmax}	$L_{Aeq,T}$	$L_{A90,T}$	
12/09/24	10:22	10:37	72.6	51.9	49.6	Steady extract plant noise, occasional impacts/thuds from skip handling
12/09/24	10:39	10:54	66.1	51.0	49.8	Steady extract plant noise, occasional FLT movements & low level impacts
12/09/24	11:20	11:35	68.9	51.8	49.2	Faint FLT movements, reversing alarms and impacts to north, faint jet wash to south, distant road traffic

Location 2: 10m from main eastern yard area and access road

Date	Time		Measured Noise Levels (dB)			Comments
	Start	End	L_{AFmax}	$L_{Aeq,T}$	$L_{A90,T}$	
12/09/24	09:31	09:46	66.0	48.9	42.4	Van movement, unloading to southwest
12/09/24	10:04	10:19	72.4	48.2	42.2	distant road traffic, distant jet wash from car wash, distant plant
12/09/24	11:01	11:16	63.7	49.1	42.4	Faint FLT movements and reversing alarms to north, faint jet wash to south, distant road traffic
12/09/24	12:00	12:15	64.1	47.5	43.6	Occasional vehicle movements in yard, faint jet wash to south, distant road traffic
12/09/24	12:18	12:33	65.5	47.3	43.0	Occasional vehicle movements in yard, faint jet wash to south, distant road traffic
13/09/24	07:30	07:45	68.0	49.1	45.0	distant road traffic, birdsong
13/09/24	08:00	08:15	66.0	48.8	44.2	occasional vehicle movements, distant road traffic, birdsong
13/09/24	08:17	08:18	59.9	46.2	43.0	occasional vehicle movements, distant road traffic, birdsong

Location 3: Boundary with Borough Avenue

Date	Time		Measured Noise Levels (dB)			Comments
	Start	End	L_{AFmax}	$L_{Aeq,T}$	$L_{A90,T}$	
12/09/24	09:47	10:02	56.8	44.3	41.4	distant road traffic, birdsong, very faint distant noise from estate
12/09/24	11:37	11:52	65.4	45.5	40.4	distant road traffic, birdsong, very faint distant noise from estate

Location 4: 6m from Dumers Lane**Daytime**

Date	Time		Measured Noise Levels (dB)			Comments
	Start	End	L_{AFmax}	$L_{A10,T}$	$L_{Aeq,T}$	
12/09/24	10:16	10:31	78.99	67.26	63.07	Road traffic on Dumers Lane
12/09/24	10:35	10:45	73.22	67.62	62.79	
12/09/24	10:46	11:01	77.80	67.94	63.68	
12/09/24	11:01	11:16	81.11	68.01	63.74	
12/09/24	11:16	11:31	73.71	67.08	62.44	
12/09/24	11:31	11:46	78.32	67.12	62.76	
12/09/24	11:46	12:01	89.10	67.78	64.45	
12/09/24	12:01	12:16	83.36	67.20	63.00	
12/09/24	12:16	12:31	78.04	67.38	62.58	

Night-time/early morning (13/09/2024)

