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TAKELEY STREET ACTION GROUP

LAND TO THE NORTH OF TAYLORS FARM TAKELEY STREET, TAKELEY

DESKTOP REVIEW OF NOISE AND VIBRATION ES CHAPTER

TECHNICAL REPORT: RFE-0688-25-01-02

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PROJECT TITLE: LAND TO THE NORTH OF TAYLORS FARM, TAKELEY STREET, TAKELEY

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LAND TO THE NORTH OF TAYLORS FARM, TAKELEY STREET, TAKELEY
DESKTOP REVIEW OF NOISE AND VIBRATION ES CHAPTER

CONTENTS

1 INTRODUCTION

1.1 Background

RF Environmental Ltd (RFE) was commissioned by Takeley Street Action Group in December 2025 to undertake a summary review of the acoustic ES chapter[1] submitted in support of planning application UTT/25/2786/OP, for the '*Outline application with all matters reserved except access for commercial development of mixed employment including offices and/or industrial processes and/or general industrial and/or storage and distribution (Use Classes E(g)(i) and/or E(g)(iii) and/or B2 and/or B8 with any ancillary office floorspace) and/or a Mobility and Amenity Hub comprising retail food/beverage use (Use Class E(b)) and/or office (Use Class E(g)(i)) and/or a public transport interchange (Sui Generis), and access works, strategic landscaping, infrastructure and other associated works'*, at Land North of Taylors Farm, Takeley Street, Takeley.

The scope of the review is set out below. The authors qualifications and experience are discussed in the following section of this report, whilst the Standards and Guidance documents considered as part of this review are detailed in Section 3. A review of the evidence is presented in section 4 and finally, the summary and conclusions are presented in Section 5. A description of useful acoustic terms can be found in Appendix A.

1.2 Scope

The review is limited to a desk-top assessment and does not extend to an undertaking of independent calculations and detailed predictions of noise levels.

The review shall systematically provide comment upon highlighted sections of the ES Chapter.

The structure will aim to follow the existing format of the ES Chapter, with comments and observations provided in direct reference to specific sub-sections and /or paragraphs.

Sections of text from the ES Chapter may be copied into the review for ease of reference and will be presented in italics.

Consideration of relevant national and local planning policies and guidance documents is also included, where appropriate.

[1] Professional Consult. 2025. Environmental Statement. Noise and Vibration. P24-2134_10_Noise

2 QUALIFICATIONS AND EXPERIENCE

2.1 Authors Qualifications and Experience

Richard Fenton BSc (Hons) MSc MCIEH MIOA

Position Held:	Director
Qualifications:	BSc (Hons) Environmental Science.
	MSc Environmental Health.
	Institute of Acoustics Diploma in Acoustics and Noise Control.
Affiliations:	Corporate Member of the Institute of Acoustics.
	Corporate Member of the Chartered Institute of Environmental Health.
Acoustics Experience:	>15 years.
Core Competences:	Environmental noise and vibration; transportation, construction, industry/commerce, leisure, mineral extraction and the waste industry. Entertainment, statutory nuisance assessment and enforcement.

My name is Richard James Fenton. I am a Director at RF Environmental Limited (RFE), a specialist noise, vibration and air quality consultancy.

I am a qualified Environmental Health Practitioner and hold a Bachelor of Science (Honours) degree in Environmental Science and a Master of Science degree in Environmental Health. I have also completed a Post Graduate Diploma in Acoustics and Noise Control. I am a member of the Chartered Institute of Environmental Health and the Institute of Acoustics.

RF Environmental Ltd was formed in April 2016. Prior to this I worked as a Senior Acoustic Consultant for Southdowns Environmental Ltd, one of the largest independent environmental consultancies in England. I have also worked at several Local Authorities and have over 20 years' experience in Acoustics and Environmental Protection work.

My last Local Authority position was Pollution Control Team Manager for Wealden District Council.

My experience in acoustics and environmental protection has included the role of Noise and Vibration Specialist on the Crossrail, Thames Tideway Tunnel and HS2 projects. I have prepared technical evidence and provided expert witness support services for projects in both the public and private sectors.

3 LEGISLATION AND GUIDANCE

3.1 Noise Policy Statement for England (NPSE)

The Noise Policy Statement for England (March 2010)[2] sets out 'the long term vision of Government noise policy.'

The vision of the NPSE is to 'Promote good health and a good quality of life through the effective management and control of noise within the context of Government policy on sustainable development.' This vision is supported by three "Noise Policy Aims':

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

- *avoid significant adverse impacts on health and quality of life;*
- *mitigate and reduce to a minimum, other adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life."*

The NPSE 1.5, 2.5 says that the policy should apply to all types of noise including "environmental noise," "neighbour noise" and "neighbourhood noise" but does not apply to noise in the workplace ("occupational noise"). And NPSE 2.7 says, importantly:

"In addition, the application of the NSPE should enable noise to be considered alongside other relevant issues and not to be considered in isolation. In the past, the wider benefits of a particular policy, development or other activity may not have been given adequate weight when assessing the noise implications."[3]

The NPSE 2.19-2.20 had adopted the following "key phrases", to help the assessment of noise impacts:

"NOEL – No Observed Effect Level

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 noise.

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur."

[2] Department for Environment, Food and Rural Affairs (DEFRA). Noise Policy Statement for England (NPSE), 2010.

[3] See also NPSE 2.19

However, the NPSE explains these three "key phrases" are not associated in the guidance with specific noise levels or measurements. As NPSE 2.22[4] recognises:

'*It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.*'

3.2 National Planning Policy Framework

The NPPF 2024[5] does not include specific noise criteria to be applied in planning decisions. It contains the following relevant guidance relating to noise and development:

"15.Conserving and enhancing the natural environment

198. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and

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

199. Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan.

[4] See also NSPE 2.15.

[5] Department of Communities and Local Government. National Planning Policy Framework, 2024

200. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.

201. The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities."

The Noise Policy Statement for England is referred to in the footnote of the NPPF.

3.3 Planning Practice Guidance - Noise

Planning Practice Guidance (PPG) on noise[6] was issued in March 2014 and updated in July 2019. This web-based guidance advises local planning authorities that "Noise needs to be considered when new developments may create additional noise (including any anticipated changers to that environment from activities that are permitted but not yet commenced)..." It states that…

"noise can override other concerns, where justified, although it is important to look at noise in the context of the wider characteristics of a development proposal, its likely users and its surroundings, as these can have an important effect on whether noise is likely to pose a concern"

As regards planning decisions, the PPG advises that the decision taker 'should take into account the acoustic environment, and in doing so consider the following:

"*whether or not a significant adverse effect is occurring or likely to occur;*

whether or not an adverse effect is occurring or likely to occur; and

whether or not a good standard of amenity can be achieved."

"In line with the explanatory note of the noise policy statement for England, this would include identifying whether the overall effect of the noise exposure (including the impact during the construction phase wherever applicable) is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation." (paragraph 003)

[6] Department for Communities and Local Government: Planning Practice Guidance – Noise paragraph 001 Ref. ID: 30-001-20190722. Revision date July 2019.

The PPG paragraph 004 refers to the NSPE 'observed effect levels' but states that *'while the word 'level' is used, this does not mean that the effects can only be defined in terms of a single value of noise exposure.*

Paragraph 005 includes a noise exposure hierarchy table which is set out in 0 below. It is based on the 'likely average response,' and gives example outcomes.

The hierarchy table provides guidance regarding how the concept of SOAELs and LOAELs, introduced through the NPSE, can be applied; and allows for informed subjective perceptions to be made in respect of the noticeability of noise in the context of potential effect levels. The PPG states that *"Although the word 'level' is used here, this does not mean that the effects can only be defined in terms of a single value of noise exposure. In some circumstances adverse effects are defined in terms of a combination of more that one factor such as noise exposure, the number of occurrences of the noise in a given time period, the duration of the noise and the time of the day the noise occurs".*

Response	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not Present	No Effect	No Observed Adverse Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present of disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

TABLE 3.1: PPG NOISE EXPOSURE HIERARCHY

(Source –Planning Practice Guidance)

The PPG paragraph 006 advises that:

“The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation. These factors include:

- the source and absolute level of the noise together with the time of day it occurs…
- for a new noise making source, how the noise from it relates to the existing sound environment;
- for non-continuous sources of noise, the number of noise events, and the frequency and pattern of occurrence of the noise;
- the spectral content of the noise…”
- the local arrangement of buildings…”

4 DETAILED REVIEW

4.1 ES Chapter Section 10.2 – Assessment Approach

Paragraph 10.2.4 – Desk Study

A total of 4 no. residential receptor locations has been selected for the assessment. The locations provide a reasonable spatial coverage of potential affected locations. Review of the night-time noise contours[7] indicate that the worst affected dwellings are covered by the selected assessment locations.

Paragraph 10.2.5 - Noise Surveys

The baseline sound survey comprised 2no. unattended survey locations. Both locations are described as being adjacent to residential receptor positions. However, as identified in Figure 10.3 of the ES Chapter, the unattended monitoring locations are both nearer to the main noise sources (A120 and Stansted airport) compared to the residential dwellings.

In these circumstances, it would usually be expected that supplementary attended noise measurements were undertaken close to the residential receptors, to fully understand the difference in noise levels between the unattended survey locations and the residential dwellings. This level difference could impact the final assessment, as the determination of background sound level is critical to assessing the potential risk of adverse noise impact.

Further comments on the baseline survey are presented later in the review.

Construction Phase Significance Criteria

Paragraph 10.2.9 – Following the fixed noise level limits presented in BS 5228-1 for urban areas and regions close to main road traffic, BS5228-1 states that an acceptable noise criteria limit is 75dB $L_{Aeq,10hr}$ at a residential dwelling.

The above statement is misleading. BS 5228-1 does not state that 75dB $L_{Aeq,\ 10hr}$ is an acceptable noise criteria limit at a residential dwelling.

The fixed limits provided in Annexe E of BS 5228-1 are intended to assist in determining the potential for significance. It does not mean that any noise level under these limits can be automatically considered acceptable. In practice, a number of other determining factors must be considered when assessing construction noise, such as duration or works and hours of operation.

Furthermore, the description given in BS 5228-1 of areas where the 75dB limit could be used to determine significance is '*urban, near main roads in heavy industrial areas'*. This does not describe the area in which the residential dwellings of interest are located.

It is generally accepted that the most appropriate and widely used method for determining the potential for significance is to adopt the ABC method presented in Annexe E of BS 5228-

[7] EIA – VOL 1 10 FIG.10.2 Night time Grid Noise Map 4.5m above ground level

1, which is based on noise change and uses the existing ambient sound levels to determine the appropriate threshold value.

The ambient $L_{Aeq,T}$ values are not presented within the ES chapter and therefore the thresholds cannot be determined, however, it is likely that the threshold for significance would be lower than those current presented.

The criteria for magnitude of effect for construction noise, presented in Table 10.2, are therefore not acceptable and are likely to underestimate the likelihood of significant effects. In particular, to suggest that construction noise levels between 75dB and 77.9dB would result in low significance or magnitude of impact is not supported by current guidance.

An exceedance of 75dB $L_{Aeq,10hr}$ for daytime construction work could, if certain temporal criteria are met (if the exceedance occurs for a period of 10 or more days of working in any 15 consecutive days or for a total number of days exceeding 40 in any 6 consecutive months), trigger the requirement to offer noise insulation to affected properties.

A noise level that may prompt noise insulation cannot therefore be considered as low significance impact. It is therefore recommended that the thresholds are re-established using the ABC method and that the risk of significance is re-evaluated accordingly.

The criteria for magnitude of effects for construction vibration (Table 10.3) looks reasonable, and in line with best practice.

Change in Road Traffic Noise Effect upon Existing Receptors

The use of the DMRB methodology for assessing the magnitude of traffic noise effects by assessing the changes in road traffic flows on existing roads is commonly used in ES chapters and the short term and long-term magnitude of change thresholds presented in Table 10.4 and 10.5 are considered reasonable.

However, this approach alone does not allow for the potential noise impacts from HGV movements associated with the development to be fully assessed. In particular, it does not account for the night-time impacts of individual HGV movements entering and exiting the site.

This is a significant omission and is discussed later in this review.

Commercial Noise Impact upon Existing Residential Receptors

Paragraph 10.2.15 - Section 11 of BS4142:2014 provides a commentary on the assessment of noise impacts, from commercial and industrial noise sources, upon noise-sensitive residential dwellings and states:

The use of British Standard BS4142: 2014+A1 2019 is the appropriate method for assessing the impact of noise from commercial and industrial sound sources.

The criteria set out in Table 10.6 is accepted as being appropriate for determining significance.

Paragraph 10.2.28 - More specific factors to consider when relevant:

- *Consideration should also be given to whether adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time. In both cases a suitable alternative means of ventilation is likely to be necessary. Further information on ventilation can be found in the Building Regulations;*

The above is not relevant to this development and assessment. It could be a consideration for new residential developments, which may be able to introduce mitigation into the final facade design.

However, the existing residential receptors cannot be expected to keep windows closed to tackle potential adverse noise effects, which could be introduced as a result of the proposed development.

It is also worth noting that some of the properties which line the road opposite the development site are older properties, which may not have modern double-glazed units, and therefore, may not benefit from the typical level of noise attenuation afforded by modern window units.

Paragraph 10.2.42 - Whilst the amended 2019 Standard does make various references to it not being intended to assess noise impacts at indoor locations, section 1.1 does state 'The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident'. Example 6 in the Standard states 'In addition to the rating/background sound level comparison shown in Table A.6, the primary concern is the potential for disturbance of residents who could be sleeping with open bedroom windows. Other guidance, such as BS 8233, might also be applicable in this instance'.

Paragraph 10.2.43 - With the above in mind, and for a clear need to ensure that any potential commercial or industrial noise impacts at the building façade do not give rise to internal noise level which causes sleep disturbance in bedrooms, this Assessment will ensure that the predicted rating level (specific sound level including any character corrections) does not exceed 30dB in bedrooms.

The above paragraphs (10.2.42 and 10.2.43) provide important information regarding the direction from BS4142 in considering the context in which the noise impact is occurring and the appropriate use of other standards or criteria in assessing the overall impact from the commercial noise.

The noise levels from HGV's entering and exiting the site, inside residential dwellings, have not been considered in this context and it is shown later in the review that there is potential for a serious risk of sleep disturbance at the residential receptors closest to the site entrance.

4.2 ES Chapter Section 10.3 – Baseline Conditions

Paragraph 10.3.3

The noise measurement position 1 is 122m from the nearside kerbstone of the B1256. The closest receptors to measurement position 1 (NMP1) are set back a minimum of 25m from the kerbside on the B1256. Therefore, the receptors will be c. 145m further away from the road traffic on the A120, which could result in a receptor noise level 2-3dB lower than the noise level measured at the unattended monitoring position.

Table 10.14 presents the range of background sound levels ($L_{A90,\ 15mins}$) measured at measurement positions NMP 1 and NMP2 and gives the modal average, however, no additional baseline data is included. As a minimum, the report should clearly state which measurement parameters were recorded, and it would usually be appropriate to present the daytime and night-time ambient $L_{Aeq,\ T}$ levels, along with typical $L_{Amax,F}$ levels, to allow a full understanding of the ambient sound environment.

It would also be expected to see the unattended data set out in graphical form, to illustrate diurnal fluctuations and identify patterns in sound levels. This information, along with the raw data, should have been provided in an appendix.

The derivation of the adopted background sound levels needs further clarification and should be illustrated graphically. While, the modal average can be used, it may not always be the most appropriate representation.

In this case, the use of the modal values has resulted in a night-time background sound level at NMP1 which is higher than the daytime level. Unless there is an additional noise source which occurs during the night-time period, but absent during the daytime period, this is highly unlikely to be representative, and it is possible that the night-time $L_{A90,\ T}$ value has been heavily overestimated. This could have a significant impact on the final noise assessment.

There is an 8dB difference between the lowest measured $L_{A90,\ 15\ minute}$ value for the daytime and night-time periods (43dB and 35dB respectively) at NMP1.

It is possible that, as the local sound environment is dominated by road traffic on the A120, the $L_{A90,T}$ increases sharply between the hours of 05:00 and 07:00hrs and this is where the most frequently occurring figure of 50dB comes from. However, this will not be representative of the most sensitive periods of the night-time.

If the commercial development is likely to operate, and deliveries to/from the site are expected throughout the night, then is important that the adopted background sound level is representative of the whole night-time period, and not just the last few hours where ambient levels are rising.

4.3 ES Chapter Section 10.4 – Assessment of Likely Significant Effects

Construction Noise

Paragraph 10.4.2 - The predictions assume all plant being located at the approximate centre of the Application Site, to represent an average case scenario.

It is reasonable to present an average case scenario using a centrally located position on the site, however, owing to the scale of the site and amount of construction work to be undertaken, some receptors will be exposed to construction works at much closer distances, potentially for prolonged periods of time. For example, Units 100, 410 and 420 are all near to the Stane Cottages and the construction noise from this area is likely to exceed the average levels presented in Table 10.18 for those receptors.

It would have been useful to present a 'worst day' level alongside the average level, to provide a broader understanding of the potential impacts.

The predicted outcome of the construction phase categorises noise as negligible and not significant. However, if the construction noise thresholds are re-established using the ABC method, it is possible, depending on the existing ambient noise levels, that this could indicate a higher magnitude of impact, which could be significant.

Construction Vibration

Paragraph 10.4.14 - During road construction with regards to receptors R1 and R2, the sensitivity of the receptors is categorised as high and the magnitude of effect is categorized as low. Accordingly, there is predicted to be a moderate temporary short-term effect and 'Significant' in EIA terms for receptors R1 and R2 in relation to construction vibration during road construction. Accordingly, mitigation measures will be considered in this Chapter.

In respect to the overall assessment of construction vibration, the conclusions appear to be reasonable. However, the above paragraph, and the results presented in Table 10.20, highlight that during the road construction, vibration from HGVs are predicted to be a moderate temporary short-term effect and 'significant' in EIA terms.

Within the 'Mitigation Enhancement and Residual effects' Chapter, these effects are discussed further, and it is proposed that Best Practice construction methods are adopted and presented within a detailed CEMP. It is also suggested that consultation is undertaken with the residents to minimise the possibility of vibration-related complaints. Both options are appropriate but the provision of appropriate monitoring of vibration should be included within a final CEMP, to aid the control and management of vibration levels.

What the above assessment does also highlight is the risk of adverse noise and vibration impact which could be introduced to the nearest receptors, through the use of HGV's. While vibration impacts are likely to be short-term during the construction phase, if HGV's are expected to regularly access the site during the operational phase, there is a potential for long-term vibration effects at the closest properties, from HGV,s entering and exiting the site, which would be considered significant in EIA terms. This is discussed further within the section on operational road traffic.

Construction Generated Road Traffic

Paragraph 10.4.17 - It should be noted that relatively large increases in road traffic movements would need to prevail in order for noticeable increases in road traffic noise levels to occur as a result of construction generated road traffic. As a general guide, although not

accounting for changes in the percentage of HGV's, a 25% increase in traffic movements will only result in a 1dB increase in noise levels. Similarly, a 58% increase would be required for 2dB and 100% increase for a 3dB increase. It should be noted that a 3dB increase in noise levels is generally barely perceptible to the average human.

While the above statement is true with respect the changes in road traffic, the omission of changes in HGV movements undermines the assessment. While this may not be significant for the short-term construction phase, the failure to properly consider HGV movements during the operational phase could have underestimated the magnitude of impact and therefore the overall significance of effects. Further information is presented later in the review.

Operational Phase

The calculation procedure used to estimate the breakout noise from the commercial units and the modelling of the specific sound levels at the receptors is appropriate, however, some of the calculation and modelling input assumptions do not appear to provide a reasonable worse-case scenario and will have under-estimated the impact at the receptor locations. These assumptions are set out below:

- The internal reverberant noise level used for the breakout calculations is 71.5dB $L_{Aeq,T}$. Many industrial processes, including manufacturing processes, will generate higher noise levels. A level at or just below the lower action level of the Noise at Work Regulations (80dB $L_{Aeq,T}$) would be more representative of a reasonable worst-case;

- The given sound reduction value of 29dB R_w for the TATA Steel Trimapanel and Trisomet is at the high end of materials commonly used for warehouses such as these. An alternative material is the Kingspan Quadcore KS1000 RW, which has a lower sound reduction index of 25dB R_w. Unless a condition was imposed to require a minimum sound reduction value for the construction of each unit, there is a risk the final materials may not match the value used for the calculation.

- It appears that no reduction has been applied to allow for flanking loss. It is unlikely that the on-site performance of the panels would achieve the laboratory rating. A reduction to the overall sound insulation rating of the panel, to allow for this, would be appropriate;

- The doors to the units do not appear to have been included in the breakout calculations. Roller shutter doors would typically have a lower sound reduction performance than the solid façade panels and can significantly reduce the overall sound reduction performance of a façade. These should have been included in the calculations;

- No consideration appears to have been given to breakout noise when doors to the units are open, during loading/unloading operations. This could lead to a significant increase in noise breakout.

- The HGV movements have only been modelled in areas directly in front of each unit. Should the line source in the model not have covered the access road leading into the site?;

- The external operations should also have included forklift trucks and/or loaders. Not only would this introduce an additional noise source into the assessment, but the tonal reversing alarms usually associated with this plant would require additional character corrections to be applied to the BS4142 Rating levels. The character corrections applied to the assessment, as displayed in Table 10.25 of the ES Chapter, allow for a +3dB for intermittency only. Depending on how audible the reversing alarms would be at the receptor, the additional correction for tonality could be up to 6dB.

- There could also be impulsive noise character from doors opening and closing, pallets being dropped, metallic impacts from loading forks and clatter from forklift movements. Additional corrections of up to 9dB may also need to be considered for impulsive character.

When considered cumulatively, all of the above could have a marked effect on the outcome of the Rating levels at the receptor locations.

This, along with the potential overestimation of the background sound level, particularly at night, means that the assessment cannot represent a reasonable worst case and it should be revised to fully understand the potential risk of adverse impacts at the closest noise sensitive receptors.

Changes in Road Traffic Noise

The road traffic noise calculations set out in Calculation of Road Traffic Noise (CTRN) are based on an assessment of noise level change due to changes in the traffic flows with and without the development.

While this is an accepted method for determining noise level change on established roads, it is not appropriate for fully determining the risk of adverse impacts from HGV movements on the B1256, at the nearest noise sensitive receptors.

The CTRN assessment is based on 18-hour average annual weekday traffic (AAWT) flows. However, the calculations should include adjusted for % changes in HGV movements, which can increase the noise level change. This does not appear to have been included, as it is not referenced in the text or the results Table 10.27.

Notwithstanding the potential change to the CTRN assessment outcome, the calculation method itself is not suitable for assessing the risk of adverse impact from HGV's entering and exiting the site.

The AAWT time period covers 06:00 to 24:00hrs. If HGV's are to access the site throughout the night-time period, the AAWT traffic flows will not be relevant.

A direct comparison of average traffic flows does not allow for a consideration of specific noise from individual HGV's on the receptors directly opposite the site entrance.

The World Health Organisation 'Guidelines for Community Noise'[8] presents specific guidelines for critical health effects, which include single event noise indicators used to protect against sleep disturbance. It recommends that, for a good sleep, indoor sound pressure levels should not exceed approximately 45dB L_{Amax} more than 10-15 times per night.

The Night Noise Guidelines (NNG) for Europe[9] is described as an extension of the WHO Guidelines for Community Noise publication. The threshold levels of noise exposure presented in the document are described as milestones in the process of evaluating the health consequences of environmental exposure. The health-based guideline values for the assessment and control of night noise exposure were derived from a review of available scientific evidence on the health effects of night noise. These include the effects and threshold levels for night-time $L_{Amax,F}$, which are lower than those presented in the WHO community noise guidelines, with a threshold of 42dB prescribed as a threshold not to be exceeded.

The ES Chapter does not mention how many HGV movements are anticipated over a 24-hour period, or, more importantly, during a night-time period but if night-time operations are planned, which the assessment indicates they will be, it is possible that regular HGV movements could occur throughout the night-time period. The expected number of HGV movements should have been established via communication with the transport assessor to determine the expected movement and allow for a more detailed assessment.

BS5228-1 2009[10] provides a reference sound level for a lorry drive-by as 80dB L_{Amax} at 10m.

The closest receptors are approximately 30m away from the road and proposed entrance to the site. By applying a distance correction (20*log(r1/r2), where r1 is the reference distance given above and r2 is the distance from the HGVs to the receptor, the noise level from the HGVs at the closest receptor is estimated at 70dB $L_{Amax,F}$.

Assuming a 10dB difference between an external free-field noise level and internal noise level[11] the estimated internal noise levels within the closest bedrooms could be 60dB $L_{Amax,F}$. This exceeds the WHO guideline value for sleep disturbance by 18dB.

The estimated internal noise level would also exceed the more relaxed criteria set out in Building Regulations Approved Document O[12] which have been derived to help determine the risk of overheating during warmer periods, if windows need to be kept closed due to noise. It

[8] World Health Organisation. 1999. Guidelines for Community Noise

[9] World Health Organisation. Night Noise Guidelines for Europe. 2009.

[10] British Standard BS 5228-1: 2009+A1: 2014. Code of practice for noise and vibration control on construction and open sites. Part 1: Noise

[11] Approved Document O: Noise Guide. November 2024.

[12] Building Regulations 2010. Approved Document O.

is stated in the document that windows are likely to be closed during sleeping hours, if noise within bedrooms exceeds 55dB L_{AFmax} more than 10 times a night (23:00 to 07:00hrs).

The above provides an indication that regular HGV movement on the B1256 associated with the use of the proposed development, could lead to sleep disturbance or a requirement to keep windows closed, leading to potential issues with overheating during warmer periods.

According to the Planning Practice Guidance, a Significant Observed Adverse Effect (SOAEL) from noise can be described as '*The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion, where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty getting to sleep, premature awakening and difficulty getting back to sleep. Quality of life diminished due to change in acoustic character of the area'.*

There is a risk that the impact of regular HGV movements to and from the site could result in sleep disturbance, fitting the description presented above (underlined) and could therefore be considered SOAEL.

The stated action presented in the NPPF is to avoid noise giving rise to significant adverse impacts on health and quality of life.

Vibration from Operational HGV Movements

The construction vibration assessment determines that that during the road construction, vibration from HGVs is predicted to be a moderate temporary short-term effect and 'significant' in EIA terms but with appropriate use of best practice and by liaison with the local residents, the effects can be reduce to 'Not significant'

However, while the risk of vibration may only be short-term through the construction phase, if HGV's are to regularly access the site during the operational phase, it stands that the risk of vibration at the closest properties, from HGV,s entering and exiting the site, could result in a moderate long-term effect, which would be considered significant in EIA terms. It is not clear how this effect could be mitigated to 'Not Significant' if the occurrence were to be continuous throughout the long-term use of the site.

4.4 ES Chapter Section 10.5 – Mitigation, Enhancement and Residual Effects

The residual effects presented in Table 10.29 indicate that the operational phase of the development will, after consideration of mitigation, result in a negligible effect, which is not significant in EIA terms.

However, as set out above, the assessment of operational noise, both from on-site noise sources and operational traffic, have been under-estimated and it is recommended that both aspects are re-assessed to incorporate the considerations set out above, to fully understand the potential risk of adverse impact, before any decision is made on the suitability of the site for development.

5 SUMMARY AND CONCLUSIONS

RF Environmental Ltd has undertaken a summary review of the acoustic ES chapter submitted in support of planning application UTT/25/2786/OP, for the '*Outline application with all matters reserved except access for commercial development of mixed employment including offices and/or industrial processes and/or general industrial and/or storage and distribution (Use Classes E(g)(i) and/or E(g)(iii) and/or B2 and/or B8 with any ancillary office floorspace) and/or a Mobility and Amenity Hub comprising retail food/beverage use (Use Class E(b)) and/or office (Use Class E(g)(i)) and/or a public transport interchange (Sui Generis), and access works, strategic landscaping, infrastructure and other associated works'*, at Land North of Taylors Farm, Takeley Street, Takeley.

Comments and observations have been provided and are summarised below:

- The baseline noise survey is too reliant on unattended monitoring data at locations which may not be fully representative of the closest residential receptors. Additional supplementary attended measurements should have been undertaken.

- The baseline survey results do not provide enough information to fully understand the ambient sound climate. As a minimum, it should be stated what measurement parameters were recorded, and the daytime and night-time ambient $L_{Aeq,\ T}$ levels should be presented, along with typical $L_{Amax,F}$ levels, so the ambient sound environment could be better understood. Graphical and tabulated data should be provided in an Appendix.

- The derivation of the adopted background sound levels needs further clarification and should be shown graphically. The use of a modal average to determine the background sound level does not appear to be appropriate, with the derived night-time background sound level at NMP1 being higher than the daytime. This indicates that the representative night-time background sound level has been overestimated, which could have a significant impact on the final noise assessment.

- The criteria for magnitude of effect for construction noise, presented in Table 10.2 are not acceptable and will underestimate the likelihood of significant effects. An exceedance of 75dB $L_{Aeq,10hr}$ for daytime construction work could, if certain temporal criteria are met (if the exceedance occurs for a period of 10 or more days of working in any 15 consecutive days or for a total number of days exceeding 40 in any 6 consecutive months), lead to an offer of noise insulation being made to affected properties. This noise level cannot therefore be considered as low significance. It is recommended that the thresholds are re-established using the ABC method and the risk of significance is re-evaluated.

- Construction noise levels have been based on an average case scenario, using a centrally located position on the site, however owing to the scale of the site and amount of construction work to be undertaken, some receptors will be exposed to construction works at much closer distances and potentially for prolonged periods of

time. Therefore, it would have been useful to present a 'worst day' level alongside the average level, to enable a broader picture of the overall impact to have been drawn.

- The predicted outcome of the construction phase is that noise would be categorised as negligible and not significant. However, if the construction noise thresholds are re-established using the ABC method, it is possible, depending on the existing ambient noise levels, that this could indicate a higher magnitude of impact, which could be significant.

- Some of the calculation and modelling input assumptions used to assess the impact of operational noise, are likely to have underestimated the final outcome. These include:

    - The internal reverberant noise level used for the breakout calculations is 71.5dB $L_{Aeq,T}$. Many industrial processes, including manufacturing processes, will generate higher noise levels. A level at or just below the lower action level of the Noise at Work Regulations (80dB $L_{Aeq,T}$) would be more representative of a reasonable worst case;

    - The given sound reduction value of 29dB R_w for the TATA Steel Trimapanel and Trisomet is at the high end of materials commonly used for warehouses such as these. An alternative material is the Kingspan Quadcore KS1000 R_W, which has a lower sound reduction index of 25dB R_w. Unless a condition was imposed to require a minimum sound reduction value for the construction of each unit, there is a risk the final materials may not match the value used for the calculation;

    - It appears that no reduction has been applied to allow for flanking loss from the unit construction. It is unlikely that the on-site performance of the panels would achieve the laboratory rating. A reduction to the overall sound insulation rating of the panels to allow for this would be appropriate;

    - The doors to the units do not appear to have been included in the breakout calculations. Roller shutter doors would typically have a lower sound reduction performance that the solid façade panels and can significantly reduce the overall sound reduction performance of a façade. These should be included in the calculations;

    - No consideration has been given to breakout noise when doors to the units are open during loading/unloading operations. This could lead to a significant increase in noise breakout.

    - The HGV movements have only been modelled in areas directly in front of each unit. Shouldn't the line source in the model also have covered the access road leading into the site?;

    - The external operations should also have included forklift trucks or loaders. Not only would this introduce an additional noise source into the assessment, but the tonal reversing alarms usually associated with this plant would require

additional character corrections to be applied to the BS4142 Rating levels. The character corrections applied to the assessment, as displayed in Table 10.25 of the ES Chapter, allow for a +3dB for intermittency only. Depending on how audible the reversing alarms would be at the receptor, the additional correction for tonality could be up to 6dB.

    - There could also be impulsive noise character from doors opening and closing, pallets being dropped, metallic impacts from loading forks etc. Additional corrections of up to 9dB may also need to be considered for impulsive noise.

- If considered cumulatively, all of the above could have a marked effect on the outcome of the Rating levels at the receptor locations.

- This, along with the potential overestimation of the background sound level, particularly at night, means that the operational assessment cannot represent a reasonable worst case and it should be revised to fully understand the potential risk of adverse impacts at the closest noise sensitive receptors.

- the CTRN calculation method is not suitable for assessing the risk of adverse impact from HGV's entering and exiting the site.

- No consideration has been given to the impact of noise levels from HGVs inside the closest receptors. It is likely that the noise levels from HGV movements, inside the closest bedrooms, would exceed noise guideline levels for sleep disturbance. This provides a positive indication that regular HGV movements on the B1256, associated with the use of the proposed development, could lead to sleep disturbance or a requirement to keep windows closed, leading to potential issues with overheating during warmer periods.

- The above would indicate that the noise could be at a level which is causing a significant observed adverse effect (SOAEL). The stated action presented in the NPPF is to avoid noise giving rise to significant adverse impacts on health and quality of life.

- The risk of vibration at the closest properties, from HGVs entering and exiting the site during the operational phase, could result in a moderate long-term effect, which would be considered significant in EIA terms. It is not clear how this effect could be mitigated to 'Not Significant' if the occurrence were to be continuous throughout the long-term use of the site.

APPENDIX A: GLOSSARY OF ACOUSTIC TERMS

Noise

Noise is defined as unwanted sound. The range of audible sound is from 0 to 140 dB. The frequency response of the ear is usually taken to be around 18 Hz (number of oscillations per second) to 18000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than the lower and higher frequencies and because of this, the low and high frequency components of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most widely used and which correlates best with subjective response to noise is the dBA weighting. This is an internationally accepted standard for noise measurements.

For variable sources, such as traffic, a difference of 3 dBA is just distinguishable. In addition, a doubling of traffic flow will increase the overall noise by 3 dBA. The 'loudness' of a noise is a purely subjective parameter, but it is generally accepted that an increase/ decrease of 10 dBA corresponds to a doubling/ halving in perceived loudness. Noise is measured on a logarithmic scale in decibels (dB) because of the ears' sensitivity to a wide range of pressure changes. The sound pressure level (SPL) of a signal is denoted by the symbol Lp and defined by the equation Lp = 10 log (p/po)2 where p is the root mean square pressure of the signal and po is the reference sound pressure (2 x 10-5 Pa).

An indication of the range of sound pressure levels commonly found in the environment is given below:

Location	$L_{pAdB}(A)$
Normal threshold of hearing	-10 to 20
Music halls and theatres	20 to 30
Living rooms and offices	30 to 50
Inside motor vehicles	50 to 70
Industrial premises	70 to 100
Burglar alarms at 1 m	100 to 110
Jet aircraft on take-off	110 to 130
Threshold of pain	130 to 140

External noise levels are rarely steady, but rise and fall according to activities within an area. In attempt to produce a figure that relates this variable noise level to subjective response, a number of noise indices have been developed. These include:

i) The L_{Amax} noise level

This is the maximum noise level recorded over the measurement period.

ii) The L_{Aeq} noise level

This is “equivalent continuous A-weighted sound pressure level, in decibels” and is defined in British Standard BS 7445 as the “ value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time internal, T, has the same mean square sound pressure as a sound under consideration whose level varies with time”.

It is a unit commonly used to describe construction noise and noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise. In more straightforward terms, it is a measure of energy within the varying noise.

iii) The L_{A10} noise level

This is the noise level that is exceeded for 10% of the measurement period and gives an indication of the noisier levels. It is a unit that has been used over many years for the measurement and assessment of road traffic noise.

iv) The L_{A90} noise level

This is the noise level that is exceeded for 90% of the measurement period and gives an indication of the noise level during the quieter periods. It is often referred to as the background noise level and is used in the assessment of disturbance from industrial noise.

Community response to environmental noise sources is dependent on both acoustic and non-acoustic factors. The acoustic factors include absolute noise level, changes or exceedances of background and ambient levels as well as the characteristics, time, duration and frequency of noise.