Noise & Vibration Consultants Ltd.

Suite 2717
37 Westminster Buildings
Theatre Square
Nottingham
NG1 6LG
No: 01773 603331

E-mail: nvc.acoustics@btinternet.com

Environmental Noise Assessment Relating to Proposed Change of Use To Incorporate a Waste Transfer Station (WTS)

At

2546 Pennine View
Birstall
Batley
WF17 9NF

for

Veolia ES (UK) Ltd

Consultant: D.R. Kettlewell MSc MIOA MAE I.Eng
Ref No.: R24.0205/DRK
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Noise & Vibration Consultants Ltd

Member of Institute of Acoustics
Member of Association of Noise Consultants
Member of Academy of Experts

Report prepared by:
D R Kettlewell MSc MIOA MAE I.Eng – Principal Consultant:

Date: 21st February 2024

Summary

1. The assessment is being carried out as a result of a proposed Planning Application for the proposed change of use to incorporate a Waste Transfer Station ("WTS"). In order to provide supporting information to the application document submission, Veolia ES (UK) Ltd has requested a noise impact assessment of the operation of the Proposed Development facility to ensure noise levels meet appropriate guidance and standards for noise.

2. The site is located on land on a well-established Industrial Estate located off Pennine View in Birstall, Batley. The site is currently used as a Paper/Card Recycling (B2) Facility with permitted industrial and commercial development on adjacent plots.

3. The study benefits from a background noise survey adjacent to the nearest sensitive receptor (NSR) off Pennine View (i.e. The Pheasant Public House) over a weekday and Saturday morning period to establish typical representative background sound levels.

4. Measurements undertaken at similar Veolia sites in the UK have been referred to for information on the highest likely site operational noise levels during general activities and noise events.

5. The most relevant noise criteria for this type of facility is BS4142:2014+A1:2019. For a low impact the `rating' noise level from Site would not exceed the representative background sound level and an adverse impact would occur when the `rating' level exceeds the representative background sound level by 5dB.

6. Measurements of typical WTS and waste treatment facilities in operation have enabled us to determine the noise contribution from the proposed site at the nearest residential properties for comparison with representative background sound measurements in accordance with BS4142: 2014+A1:2019.

Existing Noise Climate:

7. The results of the investigations into the existing noise climate have established the following:

Representative background sound levels based on the methodology and guidance found in BS4142: 2014+A1:2019 were established. The representative background sound at the NSR was shown to be 63dB to 64dB L_{A90} during the weekday operating period and between 51dB to 62dB L_{A90} during Saturday operating hours.

Conclusions

8. The results of analysis of measured baseline data, detailed calculations and consideration of appropriate and relevant noise guidance and standards, we have concluded the following:

a) Predicted noise levels from the operation of the WTS and Paper Processing Building, HGV movements, mobile plant movement, waste shredder and bulking activity operations show that the site rating noise level would not exceed representative background sound levels and therefore likely to result in a **low** impact according to BS4142: 2014+A1:2019.

b) The results of noise predictions for occasional noise events, such as glass loading into Bulker vehicles inside the WTS and HGV reversing alarms (including noise character penalties) also show a **low impact** according to BS4142:2014+A1:2019.

c) The predicted noise contribution at the NSR from the operation of the Site during the highest likely operational noise levels show a range between 48dB(A) to 51dB(A) $Leq_{1hr/15mins}$. During occasional noise events, the highest short-term noise levels are shown to be between 48dB(A) to 58dB(A) $Leq_{1hr/15mins}$. These levels are well below typical residual sound levels at the NSR (i.e. more than 10dB below), which would also provide good masking of any site attributable noise.

9. This assessment concludes that the proposed operation of the Site would generate noise levels within relevant noise standards and guidelines at nearest sensitive receptors and therefore noise would be **not significant**.

CONTENTS

1.0 INTRODUCTION

1.1 At the request of Veolia ES (UK) Ltd, Noise & Vibration Consultants Ltd ("NVC") was commissioned to assess the noise impact relating to the proposed change of use to incorporate a Waste Transfer Station ("WTS") located off Pennine View in Birstall, Batley.

1.2 The site is currently used as a Paper/Card Recycling (B2) Facility with permitted industrial and commercial development on adjacent plots.

1.3 The study benefits from a background noise survey adjacent to the nearest sensitive receptor ("NSR") off Pennine View (i.e. The Pheasant Public House) over a weekday and Saturday morning period to establish typical representative background sound levels.

1.4 The development includes a WTS and would consist of a transfer and RDF building containing a shredder in an existing industrial insulated clad building. The proposed Paper Building would incorporate a paper/card baler and bales would be stored either internal to the building or under two separate external fabric canopies.

1.5 Noise levels have been considered and assessed during the operational phase of the proposed development. Relevant and appropriate noise guidance and standards have been used to determine the noise impact and where appropriate amelioration measures provided to mitigate noise sources to acceptable and reasonable levels.

Sources of Information

1.7 Information used in this assessment has been obtained from the following sources:

- Ordnance Survey maps of the local area;
- Information relating to the general layout of the proposed site was provided by Veolia Environmental Service (UK) Ltd (drg.no. VES TD LEDHS_100_001, VES TD LEDHS_100_002 & VES TD LEDHS_100_003);
- Noise Policy Statement for England (NPSE) – March 2010;
- Department for Communities and Local Government: National Planning Policy Framework: December 2023;
- National Planning Policy Guidance: June 2021;
- BS4142: 2014+A1:2019 `Methods for rating and assessing industrial and commercial sound';
- BS 7445: 2003 Description and measurement of environmental noise;
- BS8233: 2014 `Guidance on sound insulation and noise reduction for buildings';
- Department of Transport `Calculation of Road Traffic Noise': 1988;
- ISO 9613-2: 1996 `Acoustics – Attenuation of Sound During Propagation Outdoors'.

Assessment Methodology

1.8 The aim of the survey and assessment was to provide information and advice on the following:

- identify plant equipment and its location;
- identify the nearest NSRs or sites;
- determine likely source noise levels;
- provide information on existing background sound levels and specific site noise levels at the NSRs;
- provide predictions of resultant noise levels at the NSRs; and
- advice on any appropriate amelioration measures to reduce noise for the proposed development by applying Best Available Techniques.

1.9 Where new noise sources have been identified as being significant or has the potential of causing a significant increase in existing noise levels, we would provide (where practicable) recommendations for noise amelioration using Best Available Techniques (BAT).

1.10 Appendix 1 provides details of technical terms within the chapter, for ease of reference. There is also a chart showing typical everyday noise levels to assist in understanding the subjective level of noise in terms of decibels.

1.11 The potential noise generated by the above plant is considered in the context of the existing background sound at the site, which is generally influenced by local road traffic and other industrial noise sources.

2.0 SITE DESCRIPTION

2.1 Location

2.1.1 The site is located on land on the well-established Oakwell Industrial Estate located off Pennine View in Birstall, Batley. The site is currently used as a Paper/Card Recycling (B2) Facility with permitted industrial and commercial development on adjacent plots.

2.1.2 The site location has industrial or commercial development to the south, west, north and east boundaries of the site.

2.1.3 The industrial estate is located northeast of Birstall and Batley town centre lies approximately 1.8 kilometres to the southeast.

2.1.4 The development includes a Waste Transfer Station ("WTS") and would consist of a transfer/refuse derived fuel ("RDF") building containing a shredder in an existing industrial portal frame building fitted with insulated cladding to the walls and roof. Concrete push walls would be incorporated to the lower wall sections.

2.1.5 The transfer building would contain bulking storage bays for dry mixed recyclables (DMR), glass and food waste and for residual commercial waste for the production of RDF. The shredder would be brought onto site when the demand is there to process waste and stored into the internal RDF output bulking bay prior to onward transfer from site.

2.1.5 The proposed paper building would incorporate a paper/card baler and bales would be stored either internal to the building or under two separate external fabric canopies.

2.1.6 Additional features include an office and welfare building, emergency fire water tank and pump house, weighbridge, car parking, workshop, storage building and service yard area.

2.2 Waste Material Flow & Processing Activities

2.2.1 The incoming loads of commercial and industrial waste will be weighed in at the weighbridge and the incoming waste will be delivered, tipped and stored in the input bays located within the WTS building or paper/card within the separate Paper Building.

2.2.2 A visual inspection of the input loads will be carried out with manual removal of non-suitable material. When suitable stockpile of RDF waste is present this would be then fed into the inlet hopper of the mobile shredder by loading shovel or similar. This will be done at a rate in order to match the shredding machine nominal capacity. The waste will be shredded and the shredded material pass under an over band magnet to remove any metals. The shredded material will pass into the output bunker ready for loading directly into bulk vehicles for off-site recovery. The RDF is processed and loaded within the building.

2.2.3 Once the RDF has been processed it will be loaded by mobile plant directly into bulk articulated vehicles.

2.2.4 Incoming collected glass and DMR and food waste would be offloaded into the internal bulking bays ready for onward shipment. The food waste would be immediately transferred into a sealed stand trailer fitted with a cover.

2.3 Site Access

2.3.1 Access to the application site would be via the existing access along Pheasant Drive and onto Gelderd Road (A62).

2.4 Site Operation Noise Sources

2.4.1 The WTS Facility noise sources would include the following:

- Delivery, tipping and storage in the bulking bays within the WTS building;
- Loading of RDF waste into hopper and waste shredder operation (on an `as and when required' basis) for processing of waste inside the WTS building;
- Loading of RDF and waste into bulker vehicles within the building;
- Bulking of RDF inside WTS building;
- Baling of paper/card in the Paper Building and storage of bales internal to building and under two external fabric canopies;
- Noise from the movement of HGVs on site and the cumulative effect of mobile plant movement, WTS, Baling and RDF processing in operation.

2.5 Operating Hours

2.5.1 The site is proposed to operate under the following times:

- WTS/RDF production/bulking & baling: Monday to Friday 0600 to 1700 hours & Saturday 0600 to 1400 hours.
- Vehicle times for deliveries/collections /servicing (except glass): Monday to Friday 0600 to 1630 hours & Saturday 0600 to 1400 hours.
- Glass tipping: Monday to Friday 0700-1700 hours and Saturday 0800-1400 hours.
- Glass loading onto Bulker: Monday to Friday 0900 to 1700 hours.
- Shredding Monday to Friday: 0600-1700 hours & Saturday 0700 to 1400 hours.

2.5.2 Doors into the WTS & Paper Building would be formed by rapid opening/closing automatic roller shutter doors to allow entry into and exit of vehicles for movement of material or for emergency or maintenance.

2.6 Nearest Receptors

2.6.1 The nearest residential receptors are located to the north off Pennine View (i.e. Public House opposite to the Site). Grid reference: 423212 (easting) 427228 (northing).

2.6.2 Figures 1 and 2 attached, shows site position relative to the nearest residential receptor and the layout of the site.

3.0 NOISE POLICY, STANDARDS AND CRITERIA

3.1 Introduction

3.1 Noise has been defined as sound that is unwanted by the recipient. The effects of noise on the neighbourhood are varied and complicated, including such things as interference with speech communication, disturbance of work, leisure or sleep. A further complicating factor is that in any one neighbourhood some individuals will be more sensitive to noise than others.

3.2 General Planning Guidance

National Planning Policy Framework – December 2023 (NPPF)

3.2.1 Chapter 15 of the National Planning Policy Framework (NPPF) relates to 'Conserving and enhancing the natural environment'.

3.2.2 Paragraph 180 e) refers directly to noise and states that: *"e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;"*

3.2.3 Paragraph 191 also states: *"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;
b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and
c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation."

3.2.4 The Noise Policy Statement for England (NPSE) was published in March 2010. It specifies the following long-term vision in policy aims:

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

- *Avoid significant adverse impacts on health and quality of life;*
- *Mitigate and minimise adverse impacts on health and quality of life; and*
- *Where possible, contribute to the improvement of health and quality of life."*

3.2.5 The NPSE introduced three concepts to the assessment of noise, which includes:

NOEL – No Observed Effect Level
This is the level below which no effect can be detected and below which there is no detectable effect on health and quality of life due to noise.

LOAEL – Lowest Observable 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.

3.2.6 The above categories are however, undefined in terms of noise levels and for the SOAEL the NPSE indicates that the noise level will vary depending upon the noise source, the receptor and the time of day/day of the week, etc. The need for more research is therefore required to establish what may represent an SOAEL. It is acknowledged in the NPSE that not stating specific SOAEL levels provides policy flexibility until there is further evidence and guidance.

3.2.7 The NPSE indicates how the LOAEL and SOAEL relate to the three aims listed above. The first aim of NPSE requires that:

"significant adverse effects on health and quality of life should be avoided while also taking into account the guiding principles of sustainable development."

3.2.8 The second aim of the NPSE (mitigating and minimising adverse impacts on health and quality of life) refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate adverse effects on health and quality of life whilst also taking into account the guiding principles of sustainable development. This does not mean that such adverse effects cannot occur.

3.2.9 The third aim envisages pro-active management of noise to improve health and quality of life, again taking into account the guiding principles of sustainable development.

Planning Practice Guidance – June 2021

3.2.10 In October 2014, the Ministry of Housing, Communities & Local Government updated the Planning Practice Guidance ("PPG") on noise associated with Minerals, which provides guidance on the planning process. The main section of PPG was also updated in July 2019 and consultation and pre-decision matters updated in June 2021.

3.2.11 The PPG refers to the NPSE documents and under the heading 'How can noise impacts be determined?' it states:

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

- *whether or not a significant adverse effect is occurring or likely to occur;*
- *whether or not an adverse effect is occurring or likely to occur; and*
- *whether or not a good standard of amenity can be achieved."*

3.2.12 At paragraph 004 the PPG includes a table summarising the noise exposure hierarchy, based on the likely response. Under the heading of 'example of outcome' the '*present and not intrusive*' assessment of noise is defined as '*noise can be heard, but does not cause any change in behaviour, attitude or physiological response. Can slight affect the acoustic character of the area but not such that there is a change in the quality of life*'. The increasing effect level under these conditions is deemed to be '*no observed adverse effect*' and '*no specific measures are required'.*

3.2.13 The PPG explains this by stating:

"At the lowest extreme, when noise is not perceived to be present, there is by definition no effect. As the noise exposure increases, it will cross the 'no observed effect' level. However, the noise has no adverse effect so long as the exposure does not cause any change in behaviour, attitude or other physiological responses of those affected by it. The noise may slightly affect the acoustic character of an area but not to the extent there is a change in quality of life. If the noise exposure is at this level no specific measures are required to manage the acoustic environment.

As the exposure increases further, it crosses the 'lowest observed adverse effect' level boundary above which the noise starts to cause small changes in behaviour and attitude, for example, having to turn up the volume on the television or needing to speak more loudly to be heard. The noise therefore starts to have an adverse effect and consideration needs to be given to mitigating and minimising those effects (taking account of the economic and social benefits being derived from the activity causing the noise).

Increasing noise exposure will at some point cause the 'significant observed adverse effect' level boundary to be crossed. Above this level the noise causes a material change in behaviour such as keeping windows closed for most of the time or avoiding certain activities during periods when the noise is present. If the exposure is predicted to be above this level the planning process should be used to avoid this effect occurring, for example through the choice of sites at the plan-making stage, or by use of appropriate mitigation such as by altering the design and layout. While such decisions must be made taking account of the economic and social benefit of the activity causing or affected by the noise, it is undesirable for such exposure to be caused.

At the highest extreme, noise exposure would cause extensive and sustained adverse changes in behaviour and / or health without an ability to mitigate the effect of the noise. The impacts on health and quality of life are such that regardless of the benefits of the activity causing the noise, this situation should be avoided."

3.2.14 The PPG includes a table summarising the noise exposure hierarchy, based on the likely average response. Table 3.1 below provides the perception, example of outcome, effect and action required relative to noise.

Table 3.1: Noise Exposure Hierarchy

Response	Examples of Outcomes	Increasing Effect Level	Action
Not present	No Effect	No Observed Effect (NOEL)	No Specific Measures Required
Present and not intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect (NOAEL)	No Specific Measures Required
Lowest Observed Adverse Effect Level (LOAEL)			
Present and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows for some of the time because of the noise. Potential for non-awakening sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			
Present and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. having to keep windows closed most of the time, avoiding certain activities during periods of intrusion. 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 and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/ awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Observed Adverse Effect	Prevent

BS4142: 2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'

3.2.15 BS4142: 2014+A1:2019 'Methods for rating and assessing industrial and commercial sound' is based on the measurement of background sound using L_{A90} noise measurements, compared to source noise levels measured in L_{Aeq} units. Once any corrections have been applied for source noise tonality, distinct impulses etc., the difference between these two measurements (i.e. known as the 'rating' level) determines the impact magnitude.

- Typically, the greater the difference, the greater the magnitude of the impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact (although this can be dependent on the context).
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is, relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact (although this can be dependent on the context).

3.2.16 In order to establish the rating level, corrections for the noise character need to be taken into consideration. The Standard states that when considering the perceptibility:

"Consider the subjective prominence of the character of the specific sound at the noise-sensitive locations and the extent to which such acoustically distinguishing characteristics will attract attention."

3.2.17 The subjective method adopted includes the following character corrections:

Table 3.2: BS4142:2014+A1:2019 Character Corrections

Level of Perceptibility	Correction for Tonal Character dB	Correction for Impulsivity dB	Correction for Intermittency dB	Correction for other character dB
Not Perceptible	0	0	0	0
Just perceptible	+2	+3	0	0
Clearly perceptible	+4	+6	+3*	+3*
Highly perceptible	+6	+9	+3*	+3*

*Standard defines this should be readily distinctive against the residual acoustic environment, it is interpreted therefore to be either clearly or highly perceptible as a character. If characteristics likely to affect perception and response are present in the specific sound, within the same reference period, then the applicable corrections ought normally to be added arithmetically. However, if any single feature is dominant to the exclusion of the others, then it might be appropriate to apply a reduced or even zero correction for the minor characteristics.

3.2.18 The assessment of noise from the WTS facility at the NSRs is considered and our expert opinion is provided below:

a) In terms of tonality, given the type of plant in operation, predicted noise levels, residual sound levels and proposed mitigation measures any tonal noise from fixed or mobile plant are unlikely to be perceptible at the NSRs. The only potential `just perceptible' occasional reversing alarm may occur although there is a very large screen at the northern boundary of the service yard area between the two processing buildings. For robustness, for this occasional event we have allowed +2dB penalty for `tonality'.

b) In terms of impulsivity, the offloading and loading of glass will take place within the buildings during weekdays between 0900-1700 hours. The building also includes insulated double skinned cladding and with residual levels being relatively high at NSRs we do not expect this to be perceptible. However, for robustness during occasional glass loading into bulker vehicles (i.e. event noise) we have allowed for +3dB penalty for noise character and applied operating hour restrictions for glass movement to avoid sensitive operating periods.

c) In terms of intermittency, whilst operations will vary over time, in view of the relatively high residual sound levels at the NSR and regular movement of vehicles along Pennine View, we conclude that the intermittency character would be highly unlikely to be distinctive.

3.2.19 In conclusion, in view of the noise contribution from the site, residual sound levels and provision of suitable mitigation measures, we would advise that a noise character penalty is not appropriate to add to the calculated noise contribution from general operations on site. For noise events such as occasional reversing alarms and glass loading into bulking vehicles within the building we would allow for +2dB for alarms and +3dB for glass loading.

BS8233:2014 'Guidance on sound insulation and noise reduction for buildings'

3.2.20 The British Standard BS8233 provides additional guidance on noise levels within buildings. These are based on the WHO recommendations and the criteria given in BS8233 for unoccupied spaces within residential properties.

3.2.21 The guidance provided in section 7.7 of BS8233 provides recommended internal ambient noise levels for resting, dining and sleeping within residential dwellings. Table 3.3 provides detail of the levels given in the standard.

Table 3.3: BS8233: 2014 Indoor ambient noise levels for dwellings

Activity	*Location*	*07:00 to 23:00*	*23:00 to 07:00*
Resting	Living Room	35 dB $L_{Aeq,16hours}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hours}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hours}$	30 dB $L_{Aeq,8hours}$

3.2.22 For external amenity, the advice provided in BS8233: 2014 for residential properties is that the design should aim at a level range between of 50dB $LAeq_{16hours}$ and 55dB $LAeq_{16hours}$ within private garden areas.

3.3 Survey Techniques

3.3.1 The background sound survey monitoring has been carried out in accordance with appropriate measurement conditions as defined in BS4142: 2014+A1:2019.

3.4 Relevant Noise Criteria

3.4.1 In respect of noise from the Proposed Development, the relevant guidance would be BS4142:2014+A1:2019. This is appropriate to apply in general terms to any plant operational noise generated by the Site. To achieve a low impact the site rating level would not exceed the established representative background sound level. Where rating levels exceed background sound levels by around 5dB(A) then this would indicate an adverse impact.

4.0 SURVEY METHODOLOGY & RESULTS

4.1 Baseline Sound Survey

4.1.1 An environmental sound survey was carried out at the nearest residential areas to the site to determine typical baseline levels.

4.1.2 The sound monitoring exercise was carried out over a typical weekday and weekend period during appropriate weather conditions as defined by BS7445-1: 2003.

4.1.3 See attached plan of site (Figure 1) which shows the location of the static noise measurement positions.

4.2 Instrumentation

4.2.1 For sound in the vicinity of nearest sensitive property boundary positions to the site, the following instrumentation was used:

Table 4.1: Detail of Noise Instrumentation

Manufacturer	Description	Type	Serial No.	Calibration Due Date
Cirrus	Real Time Analyser	CR:1710	April 2024	G066350
Cirrus	Acoustic Calibrator	CR: 531A	April 2024	031523

4.2.2 The following set-up parameters were used on the sound level meters during sound measurements:

Time Weighting: Fast
Frequency Weighting: `A'
Measurement Period: 15 minutes

4.3 Calibration

4.3.1 The noise meter was calibrated with the electronic calibrator prior to commencement and on completion of the survey. No significant drift in calibration was observed.

4.4 Survey Dates and Personnel

4.4.1 Sound pressure levels were taken at one fixed position on land opposite to (at same distance from Pennine View) nearest property boundary to establish typical background sound data during a Friday daytime, Saturday morning to early afternoon and early morning on the following Monday. The survey was set up at site on Friday 19th and collected on Monday 22nd January 2024 by Mr D. R. Kettlewell of Noise & Vibration Consultants Ltd at the position shown on Figure 1. Data logging of L_{Aeq}, L_{A10}, L_{A90} and L_{Amax} were recorded over 15-minute intervals.

4.4.2 Observations at site indicated that the noise climate is dominated by local road traffic noise.

4.5 Meteorological Conditions

4.5.1 Weather conditions were recorded during the period of the survey and are detailed below:

Friday 19th January 2024

4.5.2 During daytime periods conditions were dry, variable cloud with sunny intervals, light southwest to west-south-west winds (1-2m/s), temperature 1-4degC. During night-time the conditions were dry, light cloud cover, light southwest winds (1-2m/s) and temperature 3degC to 4degC.

Saturday 20th January 2024

4.5.3 Saturday morning and early afternoon period remained dry with light cloud cover and a light southwest wind (2-4m/s) and temperature between 5degC and 6degC.

Monday 22nd January 2024

4.5.4 Dry, variable cloud, light west to west-south-west winds (2-3m/s), temperature 8degC.

4.5.5 The above climatic conditions were suitable for monitoring environmental noise levels in accordance with advice given in BS7445: 2003 `Description and measurement of environmental noise'.

4.6 Noise Survey Results

4.6.1 The results of background sound analysis taken at the fixed monitoring position is presented below in Table 4.2 and detailed measurements in Appendix 2.

Baseline Levels:

4.6.2 The background sound levels have been analysed for the monitoring period and the most common values or average (whichever is the lowest) determined for establishing the `representative' background sound level.

4.6.3 The above results show that in accordance with BS4142: 2014+A1:2019 the established representative background sound levels are as follows:

Table 4.2: Representative Background Sound Levels

Time Period	Representative background sound level (Position A) off Pennine View LA90 dB [LAeq dB]
Weekday Daytime: 0700-1700 hours	64 [71]
Weekday Early morning: 0600-0700 hours	63 [70]
Saturday: 0600-0700 hours	51 [66]
0600-1400 hours	61 [69]
0700-0900 hours	55 [68]
0900-1400 hours	62 [70]

4.7 Waste Transfer Station Noise Measurements

4.7.1 Noise surveys have been undertaken at similar Waste Transfer Station facilities operating in the UK during peak operating activities. Additional surveys at 3 Veolia sites have been undertaken with a Waste Shredder in operation and the data obtained from these surveys have been used to inform the noise model.

Fieldwork Details:

Sites: Manchester, Derbyshire and Nottinghamshire.

Survey Description and Procedure:

4.7.2 The noise meter was calibrated before and after measurements to ensure accuracy of results. Broadband noise measurements of the mobile plant working within the waste transfer building and fixed plant noise sources were recorded inside and external to the building at different distances. Monitoring of the Waste Shredder and Baler proposed for the development has been carried out at various Veolia sites within WTS buildings to obtain source data to determine empirical sound power levels during its operation.

Results:

4.7.3 Noise measurements taken at close range (i.e. reverberant noise inside a typical WTS building) has shown that impact noise from the loading, movement and processing of material produces a noise level varying from around 79dB to 82dB L_{Aeq}. The corresponding maximum levels are typically between 84dB to 92dB L_{Amax}.

4.7.4 Monitoring of the waste shredder has shown noise levels at near field positions shows levels to be around 80-82dB L_{Aeq} @ 1m (under load) with L_{Amax} levels between 87dB to 92dB. The reverberant sound pressure level with the Shredder operating (no mobile plant) was shown to be around 74-75dB L_{Aeq} (78-84dB L_{Amax}). The conclusion of the surveys undertaken of the waste shredder was that mobile plant noise produces higher noise levels and dominates the reverberant noise levels within the WTS building.

4.7.5 The offloading of waste and bulking activities relating to glass and other waste streams measured at other similar sites in the UK indicate noise levels vary typically between 74dB to 78dB L_{Aeq30s} at 10m offloading of non-glass waste and 80dB to 83dB L_{Aeq30s} at 10m for glass offloading from vehicles and 85dB to 90dB L_{Aeq30s} at 10m during loading glass into bulker vehicles.

5.0 NOISE LEVEL PREDICTIONS

5.1 Introduction

5.1.1 Noise has been defined as sound, which is undesired by the recipient. The effects of noise on the neighbourhood are varied and complicated, including such things as interference with speech communication, disturbance of work, leisure or sleep. A further complicating factor is that in any one neighbourhood some individuals will be more sensitive to noise than others.

5.1.2 A measure that is in general use and is recommended internationally for the description of environmental noise is the equivalent continuous noise level or L_{Aeq} parameter.

5.1.3 In general, the level of noise in the local environs that arises from a development site will depend on a number of factors. The more significant of which are:-

(a) The sound power levels (SWL's) of the plant or equipment used on site.
(b) The periods of operation of the plant on site.
(c) The distance between the source noise and the receiving position.
(d) The presence or absence of screening effects due to barriers, or ground absorption.
(e) Any reflection effects due to the facades of buildings etc.
(f) Noise character

5.2 Prediction Methodology

Operational Noise

5.2.1 For site operational noise we have used ISO9613-2 prediction modelling and CadnaA software for producing noise maps of the highest likely generated noise.

5.2.2 The methodology takes into account source position, distance, duration of activity in relation to site activities and the nearest sensitive receptors. The noise modelling assumes that all plant is operating. The prediction calculations therefore provide an indication of the highest likely noise level.

5.2.3 Predictions for mobile plant movements on site have also been based on the calculation methodology provided under BS5228. We have used CadnaA software prediction modelling for the calculations (refer to Appendix 4 for noise maps). The noise model uses empirical data and reasonable settings to give an accurate prediction of noise from site.

5.3 Plant Complement

5.3.1 A list of plant sound pressure levels from which the noise predictions were made are presented in Appendix 3. The plant complement is based on empirical data from site measurements recorded by NVC at other similar sites in the UK.

5.4 Results of Noise Predictions

Site Plant Noise Assessment

Daytime Period

5.4.1 Noise levels from fixed and mobile plant operating at the development site would be assessed against BS4142: 2014+A1:2019. The cumulative effect of all plant operating during the daytime i.e. HGV movement and offload, WTS facility, Paper Baling, mobile plant, shredding and bulking, as indicated in Table 5.1. Refer to noise maps in Appendix 4.

Table 5.1: Predicted Cumulative Noise Rating Level from General Activities on Site with proposed noise mitigation measures

Receptor Position (Refer to Figure 1)	Period	Activity	Background sound level LA90 (dB) [Residual LAeq dB]	Rating[1&2] noise level $LAeq_{1hr/15mins}$ (dB)	Level Difference[3] dB(A)
R1. The Pheasant Public House	Monday-Friday (0600-0700)	WTS ops/Baler & bale ops/HGV /mobile plant /bulking/ shredding & offload inside.	63 [70]	52[1&2]	-11
R1. The Pheasant Public House	Monday-Friday (0700-1700)	WTS ops/Baler & bale ops/HGV /mobile plant /bulking /shredding & offload inside.	64 [71]	54[1& 2]	-10
R1. The Pheasant Public House	Saturday (0600-0700)	WTS ops/Baler & bale ops/HGV /mobile plant /bulking & offload inside.	51 [66]	51[1&2]	0
R1. The Pheasant Public House	Saturday (0700-0900)	WTS ops/Baler & bale ops/HGV /mobile plant /bulking / shredding & offload inside.	55 [68]	54[1&2]	-1
R1. The Pheasant Public House	Saturday (0900-1400)	WTS ops/Baler & bale ops/HGV /mobile plant /bulking / shredding & offload inside.	62 [70]	54[1&2]	-8

[1]The rating level includes a +3dB penalty for noise character.

[2]The height at NSR taken as 4m above ground due to night-time period between 0600-0700 hours and 1.5m above ground for daytime period 0700-1700 hours.

[3]Level difference relates to predicted rating noise or noise contribution in column 5 compared with background sound or noise limit in column 4.

5.4.2 The above tables show the range of predicted highest likely noise levels from site operation which would occur during the daytime and early morning periods.

5.4.3 The results show no exceedance of background sound (which includes a +3dB penalty applied to the rating level for noise character) based on a representative background level and highest likely site noise contribution according to BS4142: 2014+A1:2019.

5.4.4 We have used empirical data of the fixed and mobile plant to be used to maintain the accuracy of the calculations at the nearest property boundary locations during site operations.

Event Noise

5.4.5 During WTS site operations, the following events are considered, which represent occasional peak noise events:

a) The loading of glass from the bulking bay into bulker vehicles within the WTS building between 0900 to 1700 hours (Monday to Friday).

b) The reversing of HGVs into the main building could potentially occur between 0600 to 1700 hours during weekdays and Saturdays.

5.4.6 The assessment of the above event noise is provided below in Table 5.2 and noise maps in Appendix 4.

Table 5.2: Predicted Noise Rating from Noise Events at Site with proposed noise mitigation measures

Receptor Position (Refer to Figure 1)	Period	Activity	Background sound level LA90 (dB) [Residual LAeq dB]	Rating noise level $LAeq_{1hr/15mins}$ (dB)	Level Difference dB(A)
Glass Loading onto Bulker					
R1. The Pheasant Public House	Monday-Friday (0900-1700)	Glass Loading into Bulker within WTS building	63 [71]	61[1]	-2
HGV Reversing into WTS Building					
R1. The Pheasant Public House	Monday-Friday (0600-0700)	HGV Reversing Alarm with WTS operating	63 [70]	50[2]	-13
R1. The Pheasant Public House	Monday-Friday (0700-1700)	HGV Reversing Alarm with WTS operating	64 [71]	50[2]	-14
R1. The Pheasant Public House	Saturday (0600-0700)	HGV Reversing with WTS operating	51 [66]	50[2]	-1
R1. The Pheasant Public House	Saturday (0700-0900)	HGV Reversing with WTS operating	55 [68]	50[2]	-5
R1. The Pheasant Public House	Saturday (0900-1400)	HGV Reversing with WTS operating	62 [70]	50[2]	-12

[1] Glass loading activities and include for a +3dB for impulse noise character.

[2] HGV reversing activities and include for a +2dB for tonality noise character.

5.4.7 The above noise predictions of noise events (including a +3dB allowance for impulsivity during glass loading and +2dB allowance for tonality during reversing alarms for robustness) show a **low impact** according to BS4142:2014+A1:2019.

LAmax Predicted Levels

5.4.8 The predicted L_{Amax} levels at NSRs during early morning periods from WTS activities are likely to be between 5dB and 10dB higher than the L_{Aeq} predictions. For reversing alarm activities, the L_{Amax} levels vary between 9dB to 10dB higher than the L_{Aeq}. This is represented in Table 5.3 below.

Table 5.3: LAmax noise predictions during daytime and night-time periods

Receptor Position	Period	Activity	Typical Existing LAmax dB	Predicted LAmax (dB)
R1. The Pheasant Public House	0600-0700 (Mon-Fri)	WTS ops/Baler & bale ops/HGV /mobile plant /bulking/ shredding & offload inside.	78-87	54-59
R1. The Pheasant Public House	0600-0700 (Saturday)	WTS ops/Baler & bale ops/HGV /mobile plant /bulking & offload inside.	77-79	53-58
R1. The Pheasant Public House	(0600-0700) (Mon-Fri)	HGV Reversing Alarm with WTS operating	78-87	57-58
R1. The Pheasant Public House	0600-0700 (Saturday)	HGV Reversing Alarm with WTS operating	77-79	57-58

*****LAmax levels assumed to be similar to baseline monitoring position at R1.

5.4.9 The above table shows the highest likely L_{Amax} levels to be much lower than the existing ambient noise and below the threshold of significance during night-time periods at residential receptors (i.e. below sleep disturbance criteria of 60dB external to dwellings) and is therefore not considered to be significant.

5.6 Noise Predictions

5.6.1 A noise prediction model of the site has been developed based on the information detailed in the report and Appendix 3 based on library data of similar facilities and plant and information concerning the proposed development and layout. The prediction model used includes the use of ISO9613-2 which is a nationally recognised calculation method to provide good accuracy.

5.6.2 Within BS4142: 2014+A1:2019 section 10.3 deals with `uncertainty in calculation' and states:

"Uncertainty in calculating sound levels can arise from:

a) uncertainty in any measured sound levels used in the calculations;

b) uncertainty in the operation or sound emission characteristics of the specific sound source and any assumed sound power levels;

c) uncertainty in the calculation method;

d) simplifying the real situation to "fit" the model (user influence on modelling); and

e) error in the calculation process.

Where the sound power level is used for calculating sound pressure levels, it ought to be representative of the source and the conditions under which the source is expected to operate.

Where possible, use recognized standards to establish the sound power level and the uncertainty (e.g. BS EN ISO 3740 and BS EN ISO 3747). Where it is not possible to use appropriate standards, describe the method of establishing the sound power level, report the uncertainty and state the reasons for using this method.

Use a validated method of calculating sound levels, e.g. ISO 9613-2 or similar. If an alternative calculation method is used, fully describe the method and state the reasons for using this method.

Check the implementation of the calculation method for errors.

For simple cases, e.g. where the level of variability in sound propagation resulting from changes in meteorological conditions is likely to be small, simple calculation methods might be sufficient."

5.6.3 In terms of the prediction calculations undertaken, the following points are noted:

(i) Baseline survey work has been carried out in vicinity of nearest receptor over most sensitive operating period and to determine representative background sound levels for the assessment.

(ii) A recognised standard for calculation has been used with appropriate settings to give an accurate prediction.

(iii) Input data for the WTS and Baler is based on measured plant noise levels within a reverberant environment and external `event' noise at similar sites in the UK.

(iv) Input noise data for the shredder plant has been taken from empirical noise surveys undertaken of similar plant in operation at Veolia sites.

(v) Detailed layout of the site and the surrounding building heights has been used to inform the noise model.

(vi) The noise model assumes a positive wind vector towards the NSR although meteorological conditions are unlikely to be of any significance, due to the proximity to the Site.

5.7 Vibration

5.7.1 Ground-borne vibration has not been considered in this assessment as the type of noise source and separation distance between the NSR and the site is beyond the point at which any vibration is likely to be perceptible.

5.8 Road Traffic

5.8.1 Traffic generated by the Site is expected to be 50-100 HGVs over a typical weekday period (i.e. circa 5-10 HGVs visiting per hour). Access to the application site would be via the existing access onto Pheasant Drive with egress onto Pennine View (A62) which forms part of the Industrial Estate.

5.8.2 In view of the location and connection to the industrial estate and subjective observation of local road network baseline flows, we would not expect this level of traffic demand to generate any significant noise increase in road traffic noise.

6.0 CONCLUSIONS & MITIGATION MEASURES

6.1 General

6.1.1 Background sound measurements have been recorded in the vicinity of the NSR during daytime and early morning periods over a weekday and the Saturday site operating period, to establish representative background and residual sound levels.

6.1.2 Calculations have been carried out to determine the highest likely noise contribution at the nearest residential property boundary positions for comparison with ambient and background sound levels.

6.1.3 The noise assessment has considered the effect of noise `break-out' from the WTS building and Paper building (site layout shown on Figure 2). The assessment has also considered the effect of on-site vehicle movements, mobile plant movements, bulking activities, shredder operation within the WTS and the Baler to assess impacts. Event noise from glass loading onto bulker vehicles within the WTS building and reversing alarms on vehicles has also been assessed.

6.1.4 In order to calculate the likely noise `break-out' from the proposed WTS and Paper Building and mobile plant and HGV movements, we have used empirical data from other Veolia sites operating in the UK. We have produced noise models of the Site using CadnaA noise prediction software to determine noise levels at the NSR. The calculations are based on ISO9813-2 methodology and take into account spectral corrections for building attenuation, directivity, distance, area factors and plant operation times.

6.2 Existing Noise Climate

6.2.1 Representative background sound levels based on the methodology and guidance found in BS4142: 2014+A1:2019 were established. The representative background sound at the NSR was shown to be 63dB to 64dB L_{A90} during the weekday operating period and between 51dB to 62dB L_{A90} during Saturday operating hours.

6.3 Conclusions

6.3.1 The results of analysis of measured baseline data, detailed calculations and consideration of appropriate and relevant noise guidance and standards, we have concluded the following:

a) Predicted noise levels from the operation of the WTS and Paper Processing Building, HGV movements, mobile plant movement, waste shredder and bulking activity operations show that the site rating noise level would not exceed representative background sound levels and therefore likely to result in a **low** impact according to BS4142: 2014+A1:2019.

b) The results of noise predictions for occasional noise events, such as glass loading into Bulker vehicles inside the WTS and HGV reversing alarms (including noise character penalties) also show a **low impact** according to BS4142:2014+A1:2019.

c) The predicted noise contribution at the NSR from the operation of the Site during the highest likely operational noise levels show a range between 48dB(A) to 51dB(A) $Leq_{1hr/15mins}$. During occasional noise events, the highest short-term noise levels are shown to be between 48dB(A) to 58dB(A) $Leq_{1hr/15mins}$. These levels are well below typical residual sound levels at the NSR (i.e. more than 10dB below), which would also provide good masking of any site attributable noise.

6.3.2 This assessment concludes that the proposed operation of the Site would generate noise levels within relevant noise standards and guidelines at nearest sensitive receptors and therefore noise would be **not significant**.

6.4 Mitigation Measures

Operational Noise

6.4.1 The control of noise from site has been based on the following control measures which will ensure that site operations achieve reasonable and relevant noise criteria. Further advice on applying management controls based on good practice is provided to minimise noise levels although these are not required to meet reasonable and appropriate noise level criteria:

Noise mitigation measures

(i) Existing wall and roof insulated double skin cladding and any existing concrete block or brickwork with insulating board to remain in place (for WTS and Paper Building) except where any new door openings are created.

(ii) WTS building to include additional low-level concrete `push' walls within the building (see attached Figure 3) to form new bulking bays (i.e. food, glass, DMR and RDF input and output).

(iii) Doorways that require infilling to be formed by either brickwork/concrete blockwork or insulated double skin cladding.

(iv) New doorways to be formed by standard electric rapid action doors.

(v) Mobile plant fitted with broadband type noise reverse alarms (i.e. non-beeper type).

(vi) DMR bulking bay to have new full height partition formed by concrete blockwork/brickwork or double skinned insulated cladding. Any existing side walls and roof of DMR bay above push walls to be insulated on inside with secondary skin.

(vii) Existing clad screen between WTS and Paper Building (i.e. adjacent to Pennine View) to be retained.

(viii) Operating hours limited to the following:

- WTS/RDF production/bulking & baling: Monday to Friday 0600 to 1700 hours & Saturday 0600 to 1400 hours.
- Vehicle times for deliveries/collections /servicing (except glass): Monday to Friday 0600 to 1630 hours & Saturday 0600 to 1400 hours.
- Glass tipping: Monday to Friday 0700-1700 hours and Saturday 0800-1400 hours.
- Glass loading onto Bulker: Monday to Friday 0900 to 1700 hours.
- Shredding Monday to Friday: 0600-1700 hours & Saturday 0700 to 1400 hours.

Management Control Applying Best Practice

(ix) Drivers of mobile plant instructed to avoid un-necessary banging of loading `buckets' onto WTS floor areas (i.e. bucket placed on floor), avoid un-necessary scraping of floor areas and excessive revving of engines.

(x) Vehicles arriving or exiting site (particularly prior to 0700 hours) should consider the following general management procedures in accordance with the `quiet deliveries demonstration scheme':

- Consideration to noise and the neighbours is shown as an approach is made to the site and manoeuvring in the service yard;
- The vehicle horn is not to be used to alert the site on arrival or waiting;
- Engines are switched off when you are not manoeuvring;
- Radios are switched off and doors not slammed when alighting the cab;
- Load retaining straps/bars are carefully placed in stowage points, not dropped onto the floor;
- Minimise excessive air braking noise;
- Switch off engines for prolonged stops, but minimise unnecessary start-ups and engine revving;
- Always unload or load in the designated delivery/loading area, unless instructed by the site management to do otherwise;
- Report any circumstances to management where adherence to these instructions cannot be fulfilled.

REFERENCES

BS4142: 2014+A1:2019 `Method for rating industrial noise affecting mixed residential and industrial areas';

BS8233: 2014 `Sound insulation and Noise Reduction for Buildings – Code of Practice';

Department for Communities and Local Government: National Planning Policy Framework: December 2023

National Planning Policy Guidance: June 2021

BS 7445: 2003 Description and measurement of environmental noise;

Department of Transport `Calculation of Road Traffic Noise': 1988.

ISO 9613-2: 1996 `Acoustics – Attenuation of Sound During Propagation Outdoors'.

FIGURES

Figure 1: Site Location & Baseline Sound Monitoring Locations

Figure 2: Proposed Site Layout

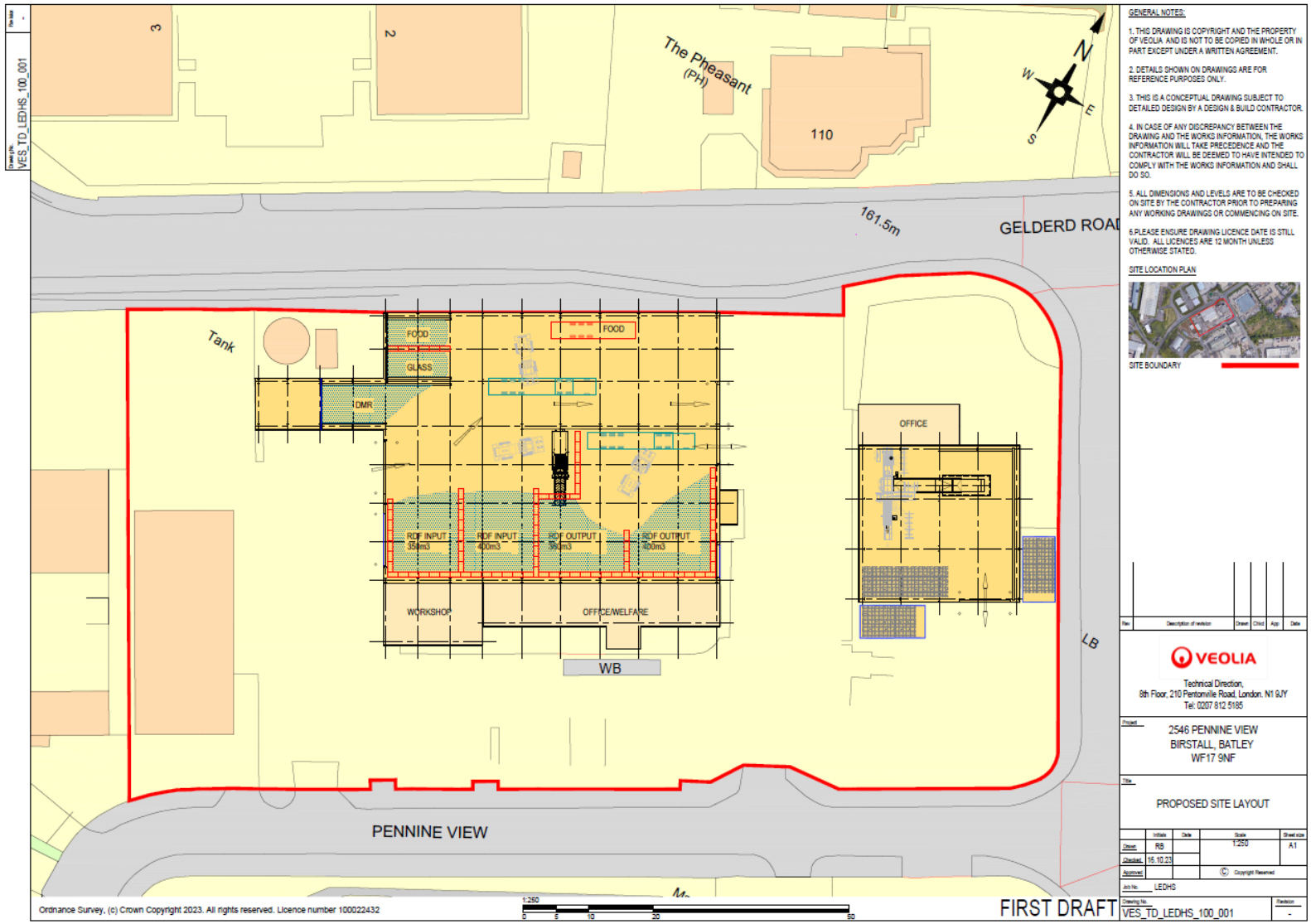


Figure 3: WTS Building Draft Layout Plan

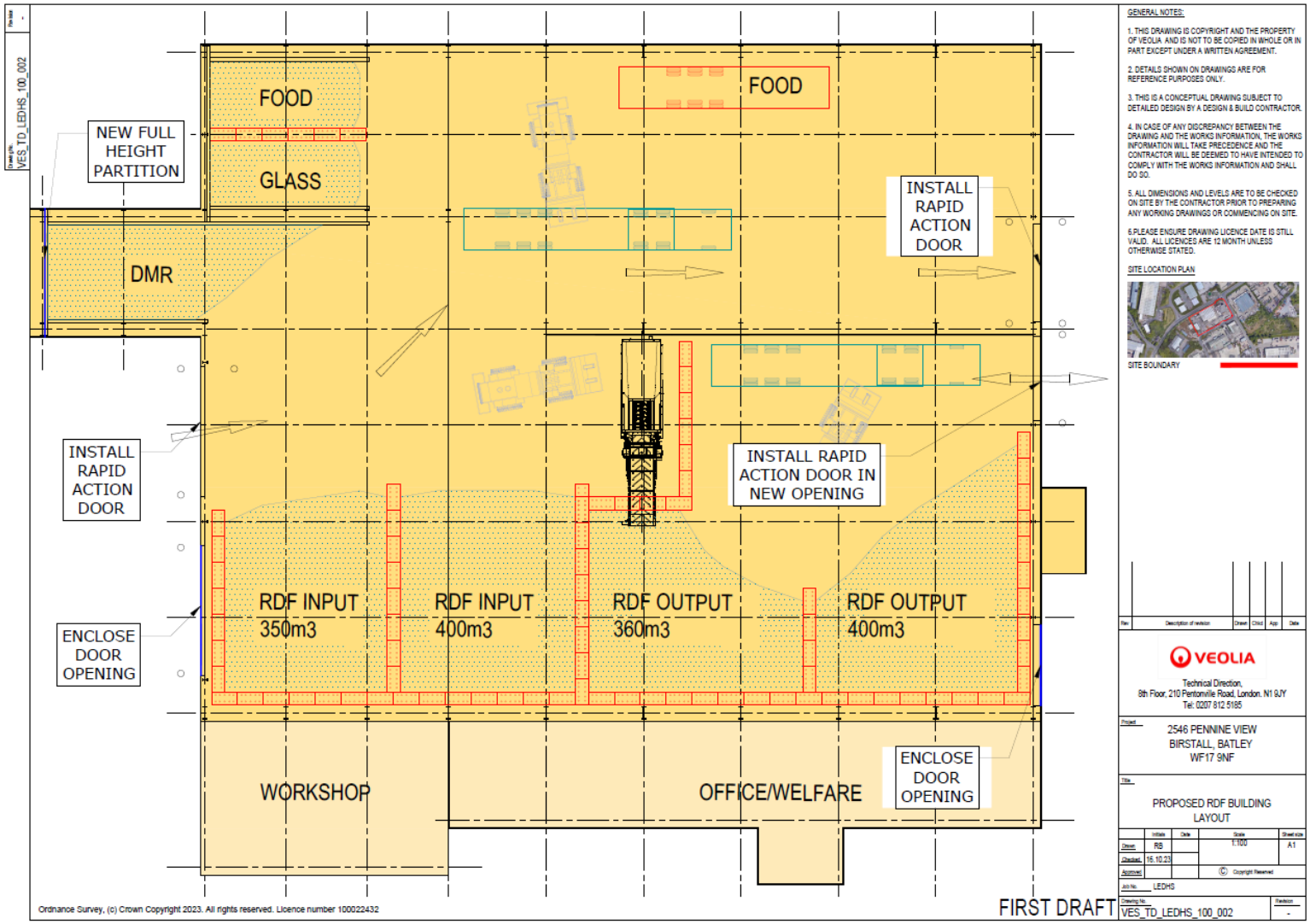
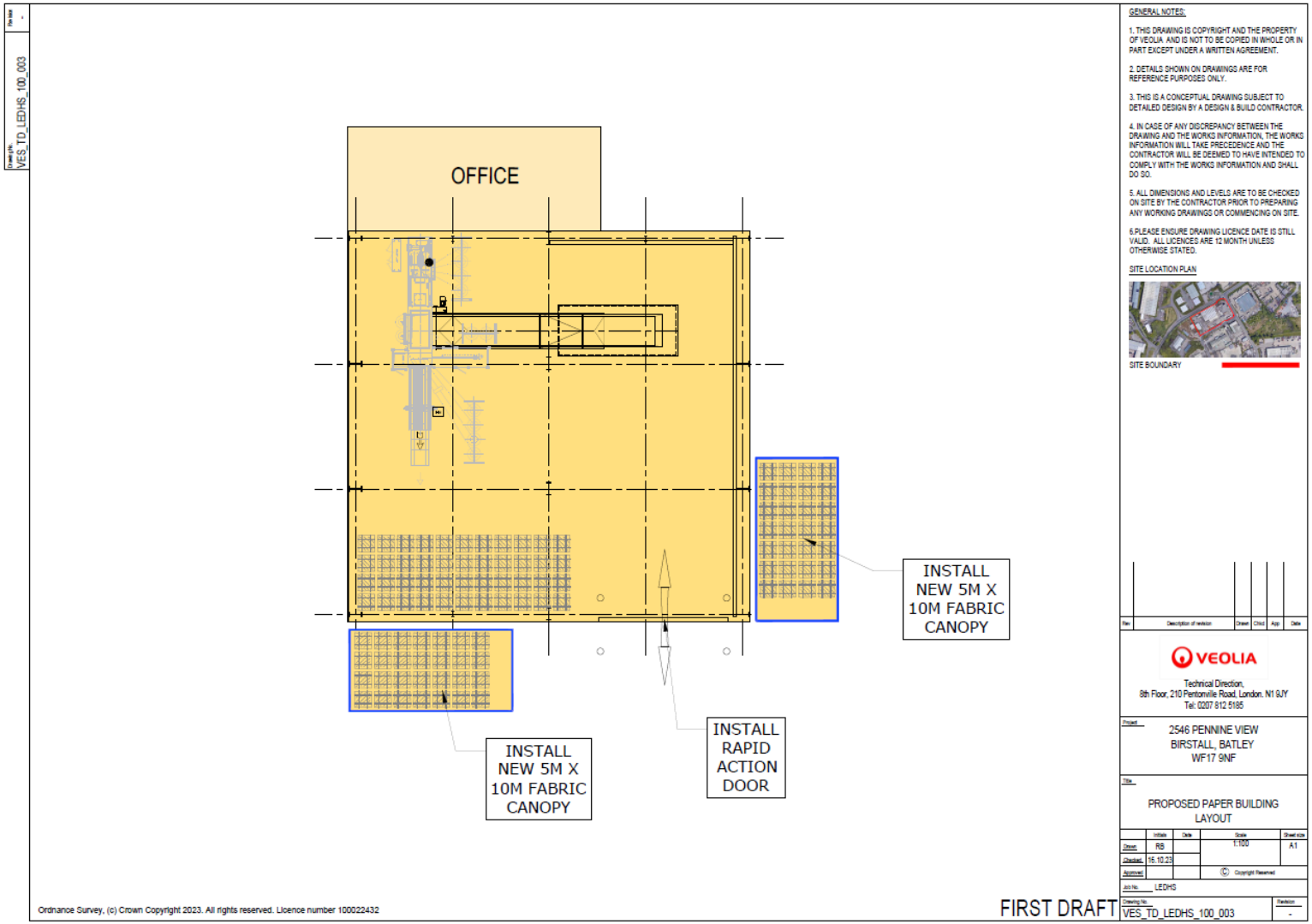


Figure 4: Paper Building Draft Layout Plan



Appendix 1

BASIC ACOUSTIC TERMINOLOGY

Sound is produced by mechanical vibration of a surface, which sets up rapid pressure fluctuations in the surrounding air.

Sound Pressure Level is a measurement of the size of these pressure fluctuations. It is expressed in decibels (dB) on a logarithmic scale. Each 3 dB increase in sound pressure level represents a doubling of the sound energy. The threshold of hearing is approximately 0 dB.

The rate at which the pressure fluctuations occur determines the pitch or frequency of the sound. The frequency is expressed in Hertz (Hz), that is, cycles per second. The human ear is sensitive to sounds from about 20 Hz to 20,000 Hz. Although sound can be of one discrete frequency - a 'pure tone' - most noises are made up of many different frequencies.

The human ear is more sensitive to some frequencies than others, and modern instruments can measure sound in the same 'subjective' way. This is the basis of the A-weighted sound level dB(A), normally used to assess the effect of noise on people. The dB(A) weighting emphasises or reduces the importance of certain frequencies within the audible range.

Noise Measurement

The measurement of sound pressure level is only really meaningful where the level of noise is constant. In the typical industrial environment noise levels can vary widely and sometimes short duration high levels of noise are interspersed with periods of relative quiet. The most widely used means of 'averaging' the noise over a period of time is the Equivalent Continuous Sound Level. Normally written as L_{Aeq} this value takes into account both the level of noise and the length of time over which it occurs. There are many meters available which are capable of measuring L_{Aeq} by electronic integration over the measurement period.

The L_{Aeq} or A-weighted equivalent continuous noise level is a measure of the total noise energy over a stated time period and includes all the varying noise levels and re-expresses as an 'average', allowing for the length of time for which each noise level was presented.

The L_{An} parameters are defined as the noise levels which are exceeded for n% of the monitoring period, thus, for example, the L_{A90} parameter is the noise level exceeded for 90% of the 15 minute period, i.e. 13.5 minutes. The L_{A50} parameter is the noise level exceeded for 50% of the hourly period, i.e. 30 minutes, etc. The L_{max} parameter is the maximum RMS A-weighted noise level occurring during the measurement period.

The definition in layman's terms is given below for terminology used in the measurement and results obtained during the survey work.

A-weighting: Normal hearing covers the frequency (pitch) range from about 20Hz to 20,000 Hz but sensitivity of the ear is greatest between about 500Hz and 5000Hz. The "A-weighting" is an electrical circuit built into noise meters to mimic this characteristic of the human ear.

Ambient noise: The totally encompassing sound in a given situation at a given time usually composed of sound from many sources near and far.

Attenuation: Noise reduction

Background noise: The general quiet periods of ambient noise when the noise source under investigation is not there.

Decibel (dB): The unit of measurement for sound based on a logarithmic scale. 0dB is the threshold of normal hearing; 140dB is the threshold of pain. A change of 1dB is only detectable under controlled laboratory conditions.

dB(A) [decibel A weighted]: Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) serves to distinguish sounds of different frequency (or pitch) in a similar way to how the human ear responds. Measurements in dB(A) broadly agrees with an individual's assessment of loudness. A change of 3dB(A) is the minimum perceptible under normal everyday conditions, and a change of 10dB(A) corresponds roughly to doubling or halving the loudness of sound.

dB(C): [decibel C weighted]: Frequency weighting which does not alter low frequency octave band levels by very much compared to `A' weighting. Similar to linear reading (i.e. linear does not alter frequency spectra at all)

Frequency (Hz): The number of sound waves to pass a point in one second.

L_{Aeq}: This is a noise index used to describe the "average" level of a noise that varies with time (T). It allows for the different sensitivities of the human ear to different frequencies (pitch), and averages fluctuating noise levels in a manner which correlates well with human perceptions of loudness.

$L_{A10,T}$: This noise index gives an indication of the upper limit or peak levels of the fluctuating noise. It is the "A weighted" noise level exceeded for 10 per cent of the specified measurement period (T). e.g. If the measurement period was over 10 hours and the L_{A10} reading was say 60dB, then this means that for 1 hour out of 10 the level went above 60dB.

$L_{A90,T}$: This noise index gives an indication of the lower limit or levels of the fluctuating noise. It is the "A weighted" noise level exceeded for 90 per cent of the specified measurement period (T). e.g. If the measurement period was over 10 hours and the L_{A90} reading was say 50dB, then this means that for 9 hours out of 10 the level went above 50dB.

L_{Amax}: This is the highest `A' weighted noise level recorded during a noise measurement period.

Residual noise: The ambient noise remaining at a given position in a given situation when the noise source under investigation is not there.

Specific noise: The noise source under investigation for assessing the likelihood of complaints

Examples of typical noise levels

Source/Activity	**Indicative noise level [dB(A)]**
Threshold of hearing	0
Rural night-time background	20-40
Quiet bedroom	35
Wind farm at 350m	35-45
Busy road at 5km	35-45
Car at 65km/h at 100m	55
Busy general office	60
Conversation	60
Truck at 50km/h at 100m	65
City Traffic at 5m	75-85
Pneumatic drill at 7m	95
Jet aircraft at 250m	105
Threshold of pain	140

Appendix 2

Background Sound Level Results

Noise Survey Results

Date: Friday 19th January 2024
Location: Pennine View, Birstall, Batley **TABLE 1**
Client: Veolia ES
Project: Waste Transfer Station
Data: **Baseline Sound Survey: Position A - Front of Offices (5m Pennine View)**
Instrumentation: Cirrus 171A Real Time Analyser (G066350)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
09:00	15:00	70.8	73.7	63.5	82.2	Local road traffic noise
09:15	15:00	70.5	73.9	61.3	81.9	dominates the noise
09:30	15:00	71.1	74.4	61.1	81.2	climate
09:45	15:00	70.9	74.1	61.0	84.7	
10:00	15:00	70.4	73.6	62.1	82.8	
10:15	15:00	71.0	73.9	63.3	87.3	
10:30	15:00	71.5	74.6	63.9	83.7	
10:45	15:00	71.1	74.1	63.7	82.8	
11:00	15:00	71.7	74.4	63.9	89.2	
11:15	15:00	71.2	74.1	64.2	81.7	
11:30	15:00	71.0	73.8	64.6	83.5	
11:45	15:00	70.9	73.8	63.3	92.2	
12:00	15:00	70.8	73.4	63.8	85.1	
12:15	15:00	71.3	74.1	64.9	81.0	
12:30	15:00	70.8	73.5	64.9	78.5	
12:45	15:00	70.4	73.5	62.4	80.9	
13:00	15:00	70.9	73.6	63.9	87.3	
13:15	15:00	70.3	73.2	63.3	83.1	
13:30	15:00	70.7	73.7	63.3	84.7	
13:45	15:00	70.6	73.4	64.1	81.7	
14:00	15:00	70.4	73.4	63.3	79.8	
14:15	15:00	70.3	73.2	63.5	84.0	
14:30	15:00	70.9	73.7	64.2	82.9	
14:45	15:00	69.9	73.0	63.0	80.1	
15:00	15:00	71.0	73.3	63.9	92.2	
15:15	15:00	69.9	73.1	62.7	81.4	
15:30	15:00	71.0	73.9	64.0	80.2	
15:45	15:00	70.3	73.1	63.8	79.3	
16:00	15:00	70.6	73.5	63.3	78.8	
16:15	15:00	73.1	72.9	64.1	99.8	
16:30	15:00	69.0	71.9	61.4	83.6	
16:45	15:00	69.6	72.4	62.6	78.2	
Average 0900-1700		**70.8**	**73.6**	**63.4**	**78-100**	

Noise Survey Results

Date: Saturday 20th January 2024 **TABLE 2**
Location: Pennine View, Birstall, Batley
Client: Veolia ES
Project: Waste Transfer Station
Data: **Baseline Sound Survey: Position A - Front of Offices (5m Pennine View)**
Instrumentation: Cirrus 171A Real Time Analyser (G066350)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
06:00	15:00	65.7	70.3	51.0	77.4	
06:15	15:00	65.9	70.8	51.3	77.4	
06:30	15:00	66.9	71.2	52.3	78.4	
06:45	15:00	65.9	70.5	50.8	79.0	
07:00	15:00	66.5	71.0	51.5	81.5	
07:15	15:00	66.9	71.3	53.4	78.2	
07:30	15:00	67.2	71.7	54.5	77.6	
07:45	15:00	67.5	71.8	54.6	78.7	
08:00	15:00	68.3	72.6	55.0	79.9	
08:15	15:00	68.3	72.2	55.4	80.0	
08:30	15:00	69.4	72.9	58.3	82.6	
08:45	15:00	70.0	73.6	59.3	80.4	
09:00	15:00	69.7	73.2	58.8	80.9	
09:15	15:00	69.4	73.0	57.3	79.8	
09:30	15:00	69.5	73.0	58.0	78.6	
09:45	15:00	70.1	73.2	59.6	85.8	
10:00	15:00	70.0	73.0	61.2	78.1	
10:15	15:00	70.1	73.5	60.6	79.5	
10:30	15:00	70.5	73.8	61.4	79.2	
10:45	15:00	70.2	73.1	62.3	80.1	
11:00	15:00	70.4	73.5	62.0	79.9	
11:15	15:00	70.5	73.5	62.1	78.5	
11:30	15:00	70.4	73.2	62.8	78.8	
11:45	15:00	70.5	73.4	62.2	83.6	
12:00	15:00	70.7	73.3	63.6	82.9	
12:15	15:00	70.9	73.6	64.9	78.3	
12:30	15:00	70.8	73.7	62.7	79.3	
12:45	15:00	70.8	73.5	64.8	78.7	
13:00	15:00	70.5	73.2	63.5	78.5	
13:15	15:00	70.6	73.1	64.5	88.4	
13:30	15:00	70.5	73.1	64.8	77.8	
13:45	15:00	70.3	73.3	62.2	81.6	
Average 0600-1400		**69.4**	**72.7**	**60.8**	**77-88**	
Average 0600-0700		**66.1**	**70.7**	**51.3**	**77-79**	
Average 0700-0900		**68.1**	**72.2**	**55.9**	**78-81**	
Average 0900-1400		**70.3**	**73.3**	**62.4**	**78-88**	

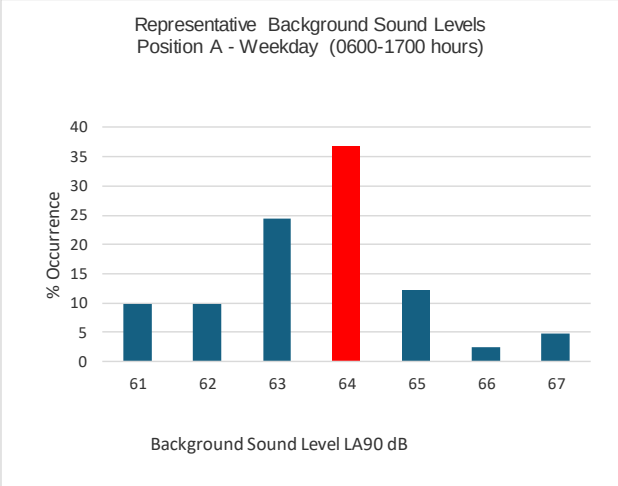
Noise Survey Results

Date: Monday 22nd January 2024 **TABLE 3**
Location: Pennine View, Birstall, Batley
Client: Veolia ES
Project: Waste Transfer Station
Data: **Baseline Sound Survey: Position A - Front of Offices (5m Pennine View)**
Instrumentation: Cirrus 171A Real Time Analyser (G066350)
Calibration: 94dB

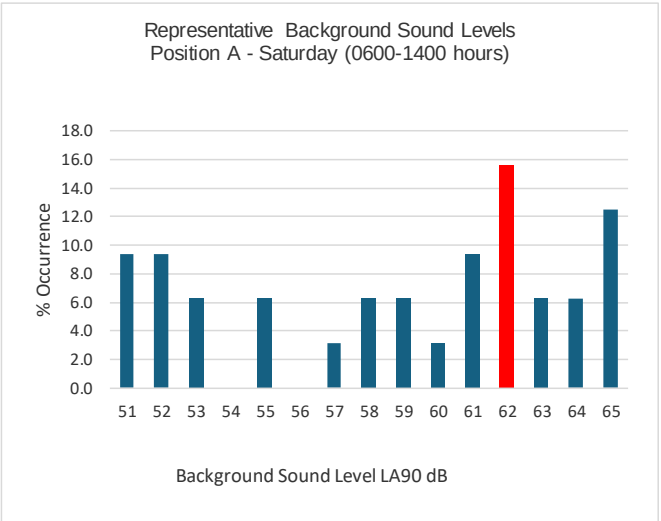
Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
06:00	15:00	69.2	72.6	61.8	79.0	
06:15	15:00	69.7	72.9	61.5	79.5	
06:30	15:00	70.2	72.9	65.2	77.5	
06:45	15:00	70.8	73.6	64.2	87.4	
07:00	15:00	69.5	72.2	62.5	77.8	
07:15	15:00	70.6	73.1	65.6	77.2	
07:30	15:00	70.9	73.3	66.5	78.7	
07:45	15:00	71.1	73.4	66.7	87.0	
08:00	15:00	71.3	73.7	64.9	88.6	
Average 1500-2300		70.4	73.1	64.6	77-89	
Average 0600-0700		**70.0**	**73.0**	**63.4**	**78-87**	
Overall Average		**70.2**	**73.2**	**62.6**	**77-100**	
Overall Average Weekday		**70.7**	**73.4**	**63.7**	**77-100**	

LA90 Representative Levels

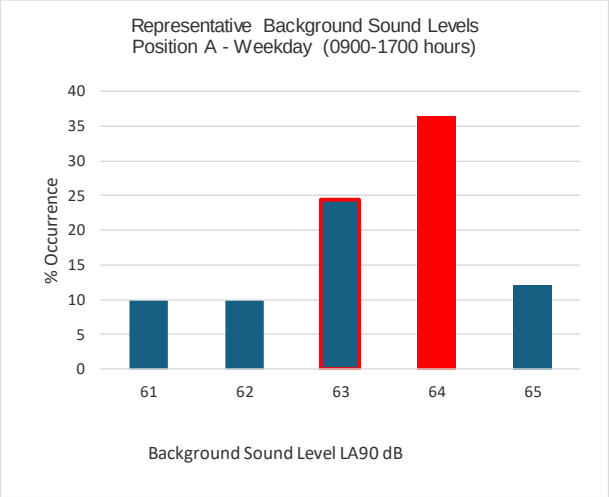
LA90	% Occurrence
61	9.8
62	9.8
63	24.4
64	**36.6**
65	12.2
66	2.4
67	4.9



LA90	% Occurrence
51	9.4
52	9.4
53	6.3
54	0.0
55	6.3
56	0.0
57	3.1
58	6.3
59	6.3
60	3.1
61	9.4
62	**15.6**
63	6.3
64	6.3
65	12.5



LA90	% Occurrence
61	9.8
62	9.8
63	24.4
64	**36.6**
65	12.2



Appendix 3

Typical Site Operational Noise Levels (WTS with Shredder)

Position	LAeq dB	LAmax dB
Reverberant level inside (front shovel loader/ 360 grab/ mobile plant/ offloading)	79-82	84-92
Door opening	79-80	85
1m side wall	67-71	75-79
10m side wall	63-64	71-72
HGV moving away (5m)	68	73
Shredder 1m (inside WTS)	80-82	87-92
Shredder (door opening) reverberant level	74-75	78-84

Typical Offloading and Loading of Glass and Other Materials

Position	$LAeq_{30secs}$ dB	LAmax dB
10m Offloading Glass into bulking bay	80-83	90-93
10m Loading Glass into Bulker	85-90	95-100
10m Offloading plastics, cardboard, timber & green waste	74-78	83-89
10m Loading soil, timber	73-80	78-90

Appendix 4

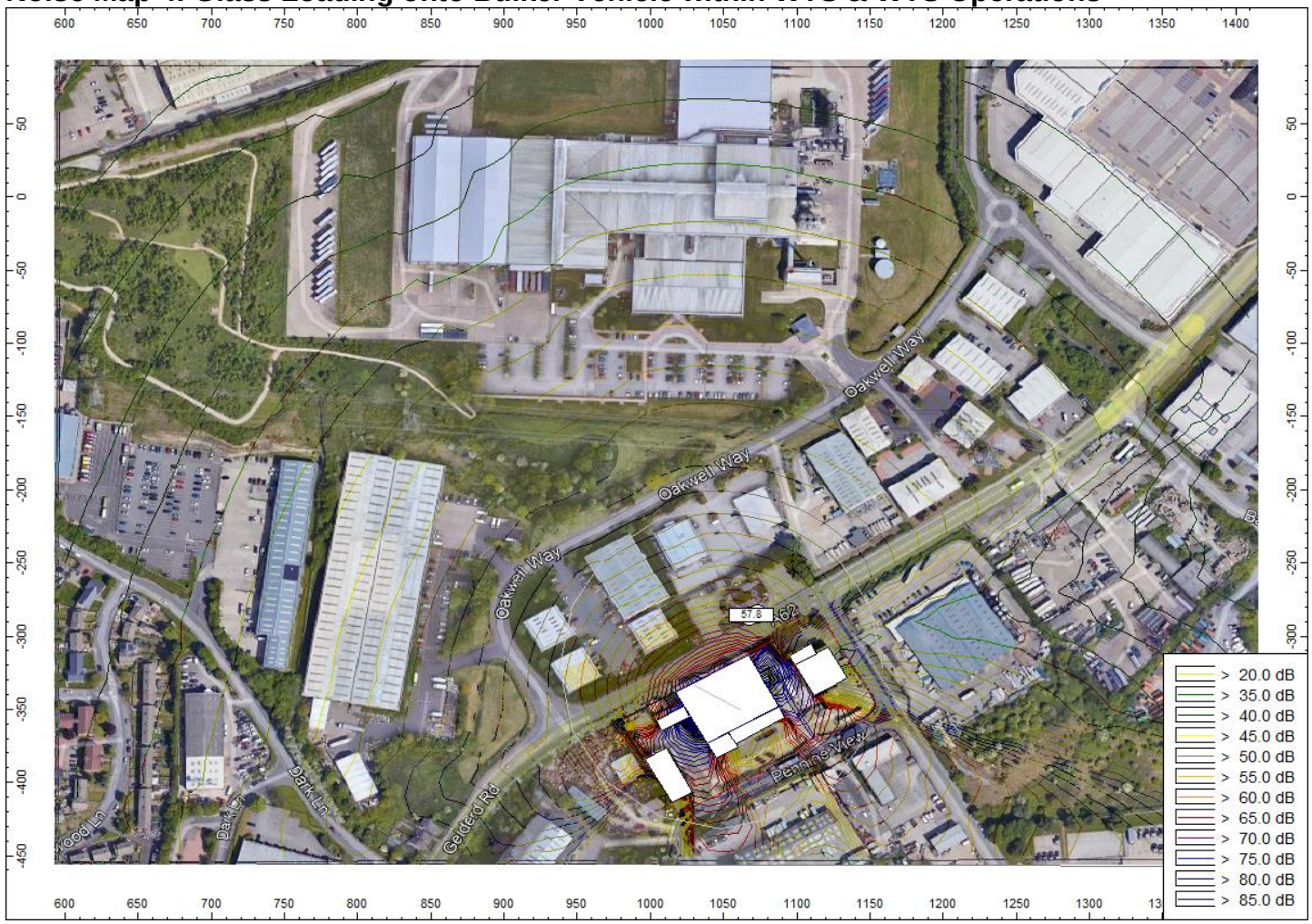
Noise Mapping Results

Noise Map 1: Weekday Operations (HGV movement and offload, WTS facility, Paper Baling, mobile plant, shredding and bulking) 0600-0700 hours

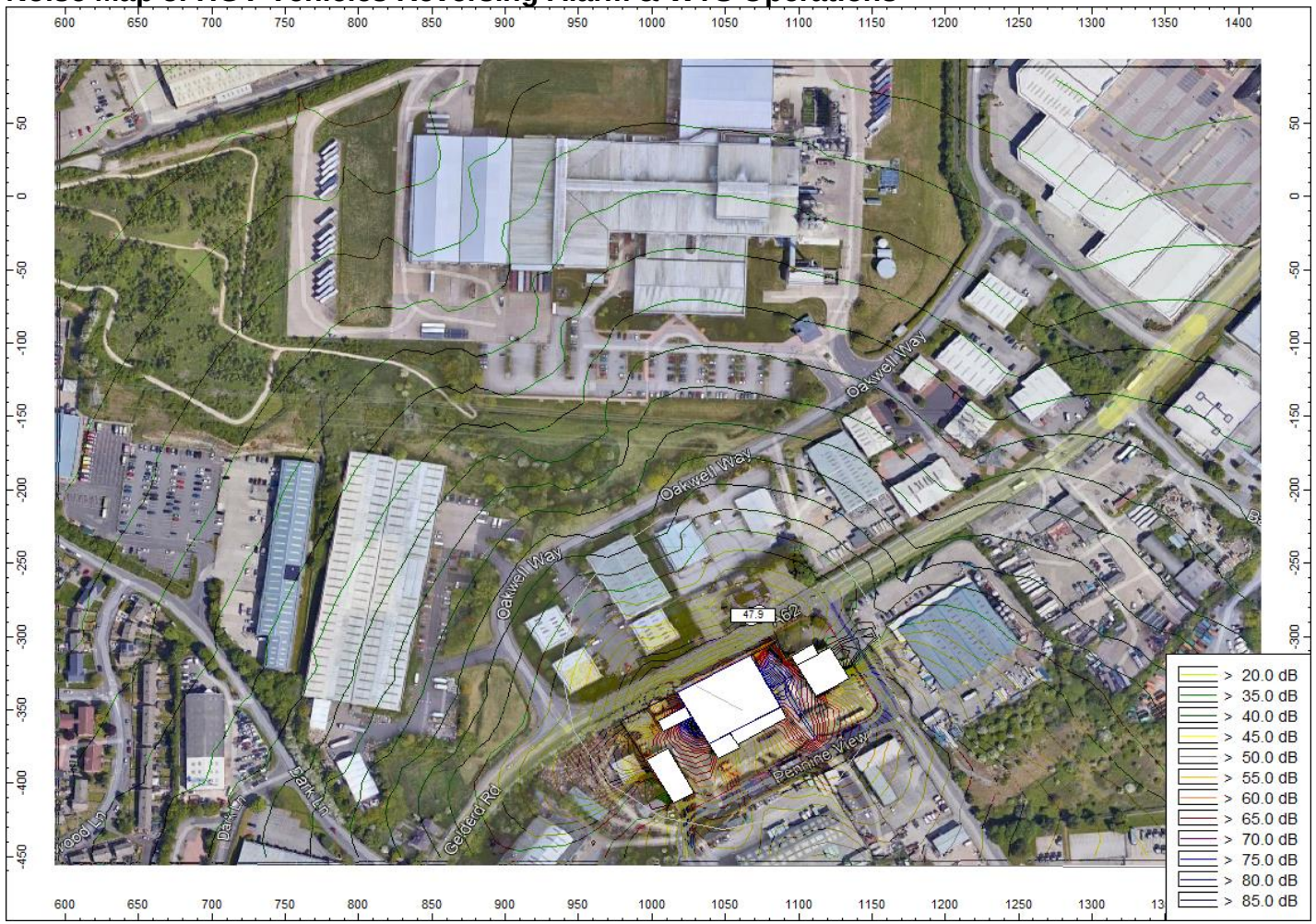
Noise Map 2: Saturday Operations (HGV movement and offload, WTS facility, Paper Baling, mobile plant and bulking) 0600-0700 hours

Noise Map 3: Weekday & Saturday Operations (HGV movement and offload, WTS facility, Paper Baling, mobile plant, shredding and bulking) 0700-1700 hours (weekday) & 0700-1400 hours (Saturday)

Noise Map 4: Glass Loading onto Bulker Vehicle within WTS & WTS Operations



Noise Map 5: HGV Vehicles Reversing Alarm & WTS Operations



Appendix 5

Consultant's Experience & Qualifications

Consultant: Dean Robert Kettlewell - MSc MIOA MAE I.Eng
(Director - Principal Acoustic Consultant)

Précis

As Director and Principal Acoustic Consultant with Noise & Vibration Consultants Ltd, Dean has over 40 years background experience in a wide range of issues relating to environmental, industrial and commercial noise and vibration assessment. He currently manages corporate and unit specific contracts for:

- Assessment of Environmental & Industrial Noise
- Environmental Noise Impact Assessments
- Expert Witness representation for Deafness and `Vibration White Finger' Claims
- Integrated Pollution Prevention and Control (IPPC) Applications
- Industrial Noise Assessment and Control
- Planning Issues for Residential and Commercial Development
- Noise at Work Regulations Assessments
- Building Acoustics and Sound Insulation Tests
- Wind Farm Noise Impact Assessments
- Entertainment Noise Assessment and Control
- Architectural Acoustics
- Specialist knowledge in the Design of Noise Control Systems
- Ground borne vibration measurement and assessment
- Project Management of Noise Control Systems
- Hand-arm Vibration Assessments

Relevant Work Experience

Director & Principal Consultant - Noise & Vibration Consultants Ltd	2001- to date
Senior Acoustic Consultant - Vibrock Limited	1998 - 2001
Associate & Principal Acoustic Consultant - John Savidge & Associates	1994 - 1998
Technical Manager – LBJ Limited (Noise Control Division)	1990 - 1994
Technical Engineer/Technical Manager (1988) - Vibac (Noise Control) Ltd	1982 - 1990

Qualifications and Education

M.Sc. Applied Acoustics (Derby University – Distinction)
HNC Electrical & Electronic Engineering
IOA Diploma in Acoustics & Noise Control
IOA Certificate in Law and Administration
Certificate of Competence in Workplace Noise Assessment
Certificate of Competence in Ground Vibration Monitoring

Affiliations: Member of Institute of Acoustics (MIOA)
Member of Academy of Experts (MAE)
Member of Association of Noise Consultants (ANC)
Incorporated Engineer (I.Eng)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Vibration
Consultants Ltd.