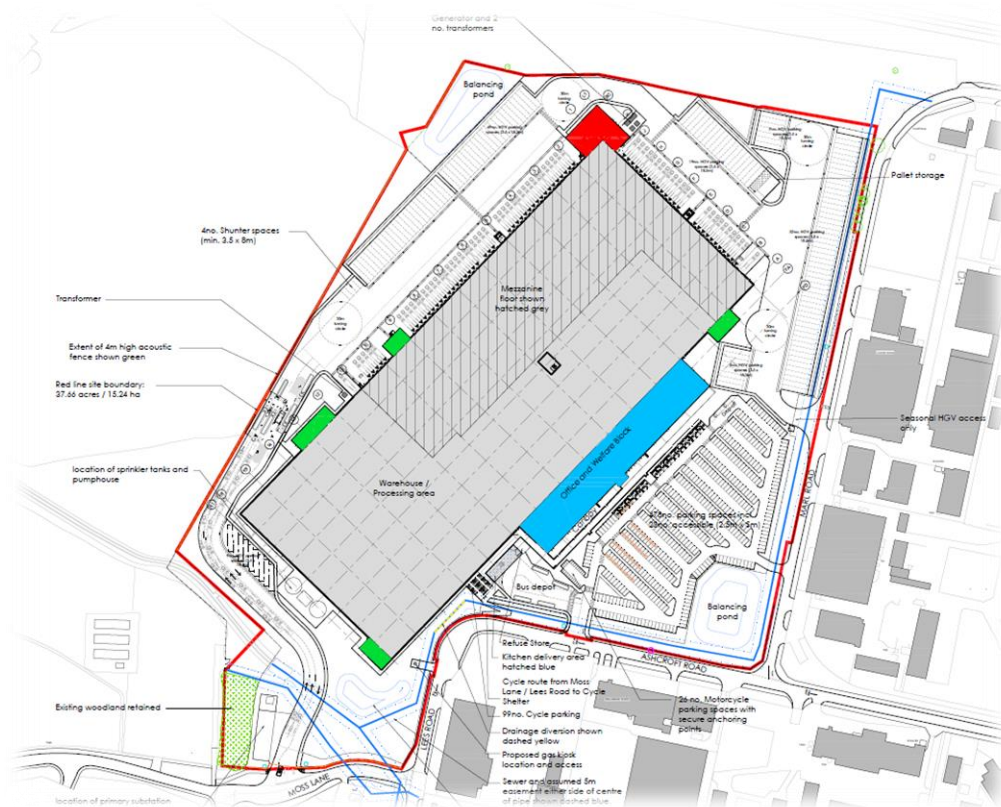


PLP Knowlsey

Noise Assessment

784-A116561



Planning Application for Proposed Distribution Centre

Prepared on Behalf of Knowlsey Unit Trust

May 2021

NALO.UK@tetrattech.com

Tetra Tech Leeds, 3 Sovereign Square, Sovereign Street, Leeds, United Kingdom, LS1 4ER
Tetra Tech Limited. Registered in England number: 01959704
Registered Office: 3 Sovereign Square, Sovereign Street, Leeds, United Kingdom, LS1 4ER

Document control

Document:	Noise Assessment
Project:	PLP Knowlsey
Client:	Knowsley Unit Trust
Job Number:	784-A116561
File Origin:	O:\Acoustics Air Quality and Noise\Fee Earning Projects\784-A116561

Revision:	1	Status:	First Issue
Date:	29 th January 2020		
Prepared by: Lewis Kelter Senior Consultant		Checked by: Graham Davis Principal Consultant	Approved By: Nigel Mann Director
Description of revision:			

Revision:	2	Status:	Second Issue
Date:	11 th February 2020		
Prepared by: Lewis Kelter Senior Consultant		Checked by: Graham Davis Principal Consultant	Approved By: Nigel Mann Director
Description of revision: Minor Amendments			

Revision:	3	Status:	Third Issue
Date:	25 th May 2021		
Prepared by: Neil Fletcher Environmental Consultant		Checked by: Ashley Shepherd Principal Consultant	Approved By: Nigel Mann Director
Description of revision: Amendments following new layout			

CONTENTS

Contents	3
1.0 Introduction	1
2.0 Assessment Criteria	5
3.0 Assessment Methodology	6
4.0 Noise Survey	10
5.0 Assessment Of Effects	11
6.0 Conclusions Of Noise Assessment	16
Appendices	17
Appendix A – Acoustic Terminology And Abbreviations	18
Appendix B – report conditions	20

1.0 INTRODUCTION

1.0 Purpose of this Report

This report presents the details of a noise assessment in support of a planning application for a proposed distribution centre in Knowsley. The proposed development comprises the erection of B8 warehouse including ancillary office and welfare floorspace, truckers lounge, gatehouse, access, parking and servicing areas, and associated works and infrastructure. The worst-case potential noise impact of the following noise sources associated with the development have been assessed:

- HGV access around the site, associated parking and docking/loading
- Staff Car-parking
- Building Services Plant

The noise levels from the proposed site have been predicted at local representative receptors using CADNA noise modelling software which incorporates ISO 9613 methodologies and calculations.

A list of acoustic terminology and abbreviations used in this report is provided in Appendix A and Report Conditions are presented in Appendix B.

This version of the report includes amendments to the assessment following changes to the site layout.

1.2 Legislative Context

This report is intended to provide information relevant to the local planning authority and their consultees in support of a planning application for the above proposed development. Policy guidance with respect to noise is found in the National Planning Policy Framework (NPPF), published in February 2019. With regard to noise and planning, the NPPF contains the following statement at paragraph 170:

“170. Planning policies and decisions should contribute to and enhance the natural and local environment by:

- 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*

A further 2 short statements are presented at paragraph 180, which state:

“180. 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.”*

Furthermore, paragraphs 182 and 183 state:

“182. 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.

183. 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.”

Practice Guidance (PPG): Noise provides further guidance with regard to the assessment of noise within the context of Planning Policy. The overall aim of this guidance is, tying in with the principles of the NPPF and the Explanatory Note of the Noise Policy Statement for England (NPSE), is to, *‘identify whether the overall effect of noise exposure is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation.’*

A summary of the effects of noise exposure associated with both noise generating developments and noise sensitive developments is presented within the PPG and repeated as follows:

Table 1.1 NPPG Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not present	No Effect	No Observed Effect	No Specific Measures Required
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 the quality of life.	No Observed Adverse Effect	No Specific Measures Required
Lowest Observed Adverse Effect Level (LOAEL)			
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	Observed Adverse Effect	Mitigate and reduce to a minimum

	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.		
Significant Observed Adverse Effect Level (SOAEL)			
Present and 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

The NPPF, NPSE and PPG do not, however, present absolute noise level criteria which define SOAEL, LOAEL and NOEL which is applicable to all sources of noise in all situations. Therefore, within the context of the Proposed Development, national planning policy and appropriate guidance documents including 'BS 8233 – Guidance on Sound Insulation and Noise Reduction for Buildings' (2014) and 'BS 4142: 2014 Methods for Rating and Assessing Industrial and Commercial Sound'. Section 2.0 presents the noise level criteria used as a basis of this assessment.

The PPG also states that *neither the NPSE nor the NPPF (which reflects the Noise Policy Statement) expects noise to be considered in isolation, separately from the economic, social and other environmental dimensions of the proposed development.*

1.3 Acoustic Consultants' Qualifications, Professional Memberships

The lead project Acoustic Consultant is Neil Fletcher. The report has been checked by Ashley Shepherd and verified by Nigel Mann. Relevant qualifications, membership and experience are summarised below.

Table 1.2 Acoustic Consultants' Qualifications & Experience

Name	Education	Institute of Acoustics Post Graduate Diploma in Acoustic and Noise Control (Pass Date)	Experience in Undertaking Noise Assessments (Start date of working in noise & acoustics)	Attained Associate Membership of the Institute of Acoustics (date)	Attained Membership of the Institute of Acoustics (date)
Neil Fletcher	BSc 1996 MSc 2005	-	Mar 2020	Mar 2020	-
Ashley Shepherd	BSc 2013	-	Feb 2014	Feb 2014	Nov 2017
Nigel Mann	BSc 1997 MSc 1999	Nov 2001	Nov 1998	Nov 2001	Jul 2005

2.0 ASSESSMENT CRITERIA

2.1 National Planning Practice Guidance – Assessment Criteria

In order to enable the assessment of the proposed development in terms of LOAEL and SOAEL, Table 2.1 presents equivalent noise levels and associated actions with the target noise level criteria identified. The noise level criteria detailed below have been derived from standards and design guidance:

BS 4142:2014, 'Methods for rating and assessing industrial and commercial sound'

BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings – Code of practice'

IEMA 'Guidelines for Environmental Noise Impact Assessment' (2014)

Table 2.1 Noise Level Criteria and Actions

Effect Level	Assessment	Noise Level Criteria	Action / Justification
No Observed Effect Level	Background Comparison	BS4142 Score of zero or lower	No Action Required Score of zero or lower is an indication of the sound source having a low impact, depending on context
	Noise Intrusion Assessment	Noise levels are below: Bedrooms: 30 dB $L_{Aeq,8hours}$ / 45 dB L_{Amax} Bedrooms: 45 dB L_{Amax}	Action: No Action Required
Lowest Observed Adverse Effect Level (LOAEL)	Background Comparison	BS4142 Score of +5 or lower	No Action Required Difference of +5 dB likely to be an indication of an adverse effect, depending on context BS4142 Score of plus 5 or lower
	Noise Intrusion Assessment	Noise levels are above: Bedrooms: 30 dB $L_{Aeq,8hours}$ / 45 dB L_{Amax} Living Rooms: 35 dB $L_{Aeq,16hours}$	Within BS8233 guideline criteria
Significant Observed Adverse Effect Level (SOAEL)	Background Comparison	BS4142 Score greater than +5	Difference of up to +10 dB likely to be an indication of a significant adverse effect, depending on context Mitigate to achieve: BS4142 Score of + 5 or lower
	Noise Intrusion Assessment	Noise levels are exceeded: Bedrooms: 35 dB $L_{Aeq,8hours}$ / 45 dB L_{Amax} Living Rooms: 40 dB $L_{Aeq,16hours}$	Mitigate and reduce to a achieve: Bedrooms: 35 dB $L_{Aeq,8hours}$ Living Rooms: 40 dB $L_{Aeq,16hours}$
Unacceptable Observed Adverse Effect Level (UOAEL)	Background Comparison	BS4142 Score of + 10 or higher	Avoid, depending on context Mitigate to achieve: BS4142 Score of 5 dB or lower
	Noise Intrusion Assessment	Noise levels are exceeded: Bedrooms: 40 dB $L_{Aeq,8hours}$ / 50 dB L_{Amax} Living Rooms: 45 dB $L_{Aeq,16hours}$	Mitigate and reduce to a achieve: Bedrooms: 35 dB $L_{Aeq,8hours}$ Living Rooms: 40 dB $L_{Aeq,16hours}$

3.0 ASSESSMENT METHODOLOGY

3.1 Noise Modelling Methodology

The development has been assessed using three-dimensional noise modelling of source noise levels at a large number of locations both horizontally and vertically. CADNA noise modelling software has been used. This model is based on ISO 9613 noise propagation methodology and allows for detailed prediction of noise levels to be undertaken for large numbers of receptor points and different noise emission scenarios both horizontally and vertically. The modelling software calculates noise levels based on the emission parameters and spatial settings that are entered. Input data, assumptions and model settings as given in the table below have been used.

Table 3.2 Modelling Parameters Sources and Assumptions

Parameter	Source	Details
Horizontal distances – around site	Ordnance Survey	Ordnance Survey
Ground levels – around site	Ordnance Survey	Ordnance Survey
Ground levels – other areas	Site Observations and Ordnance Survey	OS 1:25,000 contours and OS 1:10,000 spot heights.
Building heights – around site	Tt Observations	8 m height for two storey residential properties, with 3 m per additional storey and 4 m for Bungalows.
Receptor positions	Tt	1 m from façade, height of 1.5 m for ground floor, 4 m for first floor properties. 4.0 m height for model grid.
Proposed Plans	AEW	Ref: B8391-AEW-XX-XX-DR-A-0503 rev P7 Dated: 10/02/20 Roof Plan: B8391-AEW-XX-XX-DR-A-0509 rev P2 Dated: 05/02/20

It is acknowledged that a number of these assumptions will affect the overall noise levels presented in this report. However, it should be noted that certain assumptions made, as identified above, are worst-case.

3.3 Model Input Data

Delivery Noise Data

Noise of a delivery event has been known to vary from site to site by as much as 22 dB L_{Aeq} at 5m distance even with the same vehicle type. Similarly, individual events using the same vehicle and at the same location have been recorded to vary by as much as 14 dB.

As such, the following worst-case calculations have been based on measurements of HGVs delivering goods. All measurements were undertaken in free-field conditions. In addition to noise from the unloading process, the levels used in the assessment include noise from the vehicle pulling up to the unloading bay, manoeuvring into position and then pulling away once unloading/loading is complete, together with other sources such as trolleys and reversing beepers. Events are modelled as point sources.

HGV Unloading Event Noise Data

- *Daytime Specific Noise Level*

1 x 4 minute at L_p 69 dB at 3 m distance (vehicle arriving and manoeuvring)
 1 x 30 minutes at L_p 67 dB at 3 m distance (vehicle unloading)
 1 x 4 minute at L_p 69 dB at 3 m distance (vehicle leaving)

$$L_{Aeq}(60 \text{ mins}) = 10\log(1/60)(4 \text{ mins} \times 10^{0.1 \times 69\text{dB}} + 30 \text{ mins} \times 10^{0.1 \times 67\text{dB}} + 4 \text{ mins} \times 10^{0.1 \times 69\text{dB}})$$

$$= 65.5 \text{ dB at 3 m distance}$$

- *Night-time Specific Noise Level*

1 x 4 minute at L_p 69 dB at 3 m distance (vehicle arriving and manoeuvring)
 1 x 11 minutes at L_p 67 dB at 3 m distance (vehicle unloading)

$$L_{Aeq}(15 \text{ mins}) = 10\log(1/15)(4 \text{ mins} \times 10^{0.1 \times 69\text{dB}} + 11 \text{ mins} \times 10^{0.1 \times 67\text{dB}})$$

$$= 67.6 \text{ dB at 3 m distance}$$

- *Maximum Noise Level*

$L_{A\text{Max}}$ = 85.4 dB at 3m distance

HGV Parking Event Noise Level

- *Daytime Specific Noise Level*

1 x 4 minute at L_p 69 dB at 3 m distance (vehicle arriving and manoeuvring)

$$L_{Aeq}(60 \text{ mins}) = 10\log(1/60)(2 \text{ mins} \times 10^{0.1 \times 69\text{dB}})$$

$$= 54.2 \text{ dB at 3 m distance}$$

- *Night-time Specific Noise Level*

$L_{Aeq}(15 \text{ mins}) = 10\log(1/15)(2 \text{ mins} \times 10^{0.1 \times 69\text{dB}})$

$$= 60.2 \text{ dB at 3 m distance}$$

- *Maximum Noise Level*

$L_{A\text{Max}}$ = 85.4 dB at 3m distance

HGV Movement Noise Data

The following calculations have been used to represent HGVs arriving/existing along the access road. According to the traffic data provided by Hydrock, over a 24-hour a total of 250 HGVs arrive / leave from the unit. Therefore, during a worst-case daytime / night-time hour period, 12 HGVs arriving / leaving the site have been assumed during a worst-case one-hour daytime (07:00 – 23:00) period and 50% of the HGVs arriving or departing during a given 15-minute night-time period (23:00 – 07:00). This has included as a line source in the model.

- *Daytime Specific Noise Level*

12 x 10 seconds at L_p 69.0 dB at 3m distance (Single HGV vehicle arriving and leaving)

$$L_{Aeq} (60 \text{ mins}) = 10\log(1/60)(120 \text{ seconds} \times 10^{0.1 \times 69\text{dB}}) \\ = 54.2 \text{ dB at 3 m distance}$$

- *Night-time Specific Noise Level*

6 x 10 seconds at L_p 69.0 dB at 3m distance (Single HGV vehicle arriving and leaving)

$$L_{Aeq} (15\text{mins}) = 10\log(1/15)(60 \text{ seconds} \times 10^{0.1 \times 69\text{dB}}) \\ = 57.2 \text{ dB at 3 m distance}$$

- *Maximum Noise Level*

$$L_{Amax} = 73.0 \text{ dB at 3m distance}$$

Car Park Noise Data

Noise levels within the proposed car parks have been based on measurements of a distribution centre during a shift change at the centre of the car park to represent a worst-case scenario.

$$L_{Aeq,1\text{hour}} = 54.0 \text{ dB @ 1.5m height}$$

Building Services Plant Noise Data

Although specific manufacturer details are unavailable, point sources have been used in the model to represent the worst-case plant locations associated with the scheme. The maximum sound pressure levels of the point sources at 1 and 3 metres were estimated in the model as a conditional maximum level that the noise levels at nearby receptors were predicted to meet the BS 4142 assessment criteria. Noise emission limits have been specified to ensure that plant noise rating levels are at least 10 dB below the existing night-time background noise level at all surrounding receptors.

3.3 Sensitive Receptors

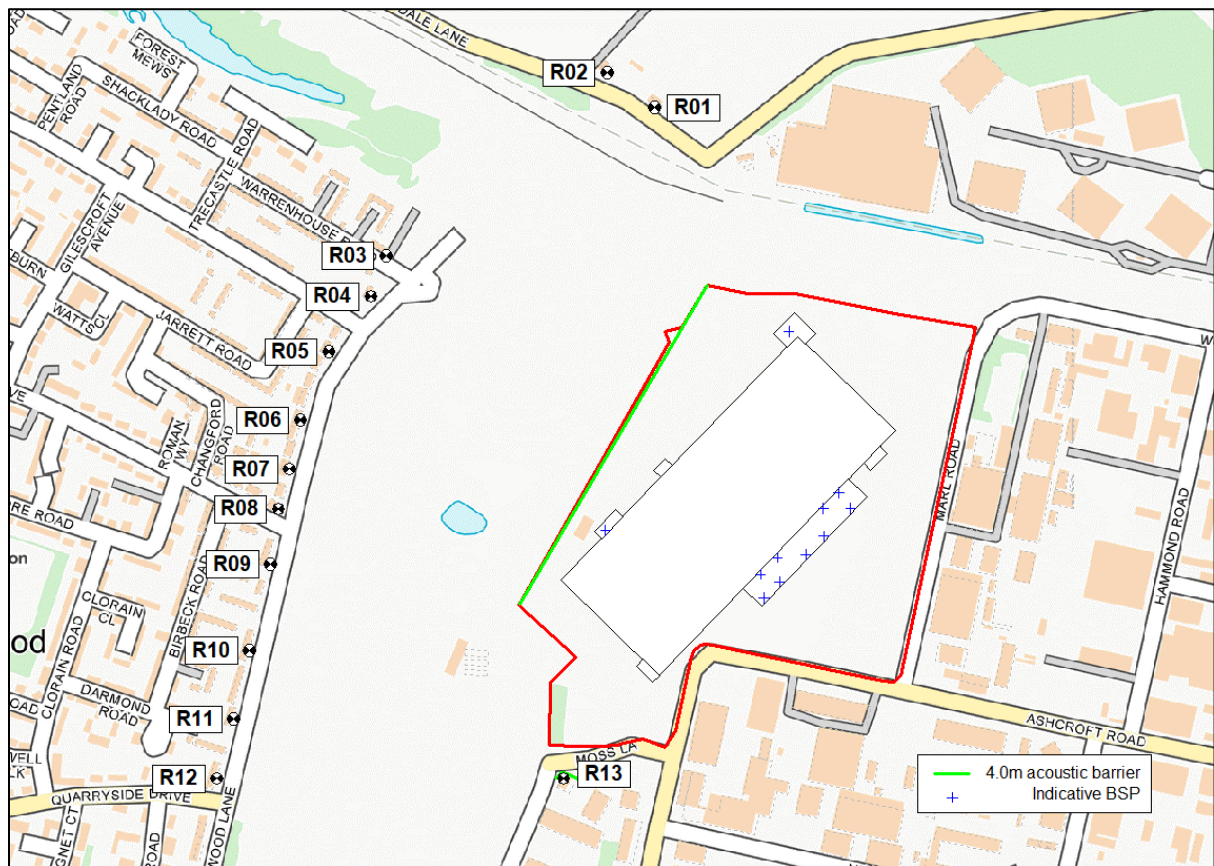
Table 3.2 below summarises receptor locations that have been selected to represent worst-case residential receptors with respect to direct noise from the site. The receptor positions are shown illustratively on Figure 3.1 below.

Table 3.2 Sensitive Receptor Locations

Ref.	Description	Height (m) Daytime / Night-time
R01	1 Gateland Cottages, Dale Lane	1.5 / 4.0
R02	The Cottage, Dale Lane	1.5 / 4.0
R03	2 Warrenhouse Road	1.5 / 4.0
R04	185 Simonswood Lane	1.5 / 4.0
R05	177 Simonswood Lane	1.5 / 4.0
R06	161 Simonswood Lane	1.5 / 4.0
R07	149 Simonswood Lane	1.5 / 4.0
R08	147a Simonswood Lane	1.5 / 4.0
R09	141a Simonswood Lane	1.5 / 4.0
R10	133 Simonswood Lane	1.5 / 4.0

Ref.	Description	Height (m) Daytime / Night-time
R11	111 Simonswood Lane	1.5 / 4.0
R12	101 Simonswood Lane	1.5 / 4.0
R13	172 Arbour Lane	1.5 / 4.0

Figure 3.1 Sensitive Receptor Locations



Not to scale
OS Licence No. AL553611

4.0 NOISE SURVEY

A noise survey was undertaken by Wardell Armstrong in October 2018 (reference LE12862) for a previous application of the same site. This noise survey is considered to be relevant and representative and therefore the background noise levels as measured during this survey have been sources from this survey. A summary of results is shown in the table below. The monitoring locations are shown on Figure 4.1 below. Full details of the noise monitoring are found in the report produced by Wardell Armstrong.

Table 4.1 Noise Survey Results

Monitoring Location	Period	Measured Noise Levels (dBA)	
		L _{Aeq}	L _{A90}
1	Daytime (07:00 – 23:00)	51	41
	Night-time (23:00 – 07:00)	44	38
2	Daytime (07:00 – 23:00)	45	37
	Night-time (23:00 – 07:00)	41	39

Figure 4.1 Noise Monitoring Locations



Not to scale
OS Licence No. AL553611

5.0 ASSESSMENT OF EFFECTS

It should be noted that all of the assessments below are inclusive of intrinsic mitigation in the form of a 4.0m acoustic barrier along the western boundary of the site. This barrier has been included as part of design phase which is required to meet relevant noise criteria and achieve the Lowest Observed Adverse Effect Level. The location of the barrier is shown illustratively on Figure 3.1.

5.1 BS 4142:2014 Assessment (Building Services Plant)

This assessment has been undertaken to establish the maximum external noise levels from the proposed development. The assessment compares the predicted worst-case breakout noise levels from potential plant with the typical measured average background noise L_{A90} at the closest existing residential receptors.

A series of predictions were made by defining different sound power levels at point sources. When the sound pressure levels are set as shown in Tables 5.1 (which are considered to be achievable), the noise levels at all the existing receptors are predicted to be at least 10 dB below existing background levels during worst-case daytime ,or night-time as shown in Tables 5.2. All predicted rating noise levels fall within the No Observed Adverse Effect Level; specific noise levels at proposed receptors are predicted to be below the measured background noise levels.

In accordance with section 9.2 of BS4142:2014 an overall +2 dB character correction has been applied to account for any tonal characteristics of noise from the plant units which may be perceptible at the closest sensitive receptors. The assessment presented below has been undertaken with plant for each unit operating at full capacity, simultaneously. The plant has been located as marked on the 'roof plan' and as indicated on Figure 3.1.

Table 5.1 Proposed Emission Limits for BSP as Modelled

BSP Location	Noise Emission Limit - Sound Pressure Level per Unit
11 x Building Services Plant	75.5 dB(A) at 1 m OR 65.9 dB(A) at 3 m

Table 5.2 BS4142 Assessment for Proposed Plant

Reference	Measured Background L_{A90}	Rating level from plant	BS 4142 Score
	Daytime	Daytime	Daytime
R01	37	23	-14
R02	37	21	-16
R03	37	22	-15
R04	37	23	-14
R05	37	23	-14
R06	37	23	-14
R07	37	23	-14
R08	37	23	-15

Reference	Measured Background L_{A90}	Rating level from plant	BS 4142 Score
	Daytime	Daytime	Daytime
R09	37	22	-15
R10	37	22	-15
R11	37	21	-16
R12	37	21	-16
R13	38	29	-10

5.2 Noise Intrusion Assessment (Combined Operations)

A combined noise intrusion assessment (including all HGV operations, staff car parking and building services plant) has been undertaken which considers the effects of noise with respect to sleep disturbance and internal noise levels.

Internal noise levels, at nearby sensitive receptors have been assessed both with windows open, where a reduction from a partially open window of 10 dB has been used, and with windows closed where an assumption of single glazing with a sound reduction of 30 dB has been used.

Table 5.3 Noise Intrusion Levels Daytime L_{Aeq}

Location	External L_{Aeq}	Internal L_{Aeq} with windows open	Internal L_{Aeq} with windows closed	Criteria Internal L_{Aeq}
R01	31.1	21.1	1.1	35
R02	30.6	20.6	0.6	35
R03	31.3	21.3	1.3	35
R04	31.3	21.3	1.3	35
R05	30.7	20.7	0.7	35
R06	30.2	20.2	0.2	35
R07	30.0	20.0	0.0	35
R08	29.7	19.7	0.0	35
R09	29.3	19.3	0.0	35
R10	28.3	18.3	0.0	35
R11	27.6	17.6	0.0	35
R12	26.9	16.9	0.0	35
R13	29.5	19.5	0.0	35

All values are sound pressure levels in dB re: 2×10^{-5} Pa.

Table 5.4 Noise Intrusion Levels Night-Time L_{Aeq}

Location	External L_{Aeq}	Internal L_{Aeq} with windows open	Internal L_{Aeq} with windows closed	Criteria Internal L_{Aeq}
R01	34.2	24.2	4.2	30
R02	33.6	23.6	3.6	30
R03	33.9	23.9	3.9	30
R04	33.9	23.9	3.9	30
R05	33.3	23.3	3.3	30
R06	33.0	23.0	3.0	30
R07	32.9	22.9	2.9	30
R08	32.5	22.5	2.5	30

Location	External L_{Aeq}	Internal L_{Aeq} with windows open	Internal L_{Aeq} with windows closed	Criteria Internal L_{Aeq}
R09	32.5	22.5	2.5	30
R10	32.2	22.2	2.2	30
R11	31.5	21.5	1.5	30
R12	29.9	19.9	0.0	30
R13	35.1	25.1	5.1	30

All values are sound pressure levels in dB re: 2×10^{-5} Pa.

Table 5.5 Noise Intrusion Levels Night-Time L_{Amax}

Location	External L_{Amax}	Internal L_{Amax} with windows open	Internal L_{Amax} with windows closed	Criteria Internal L_{Amax}
R01	38.9	28.9	8.9	45
R02	38.0	28.0	8.0	45
R03	39.3	29.3	9.3	45
R04	39.6	29.6	9.6	45
R05	40.2	30.2	10.2	45
R06	41.8	31.8	11.8	45
R07	43.3	33.3	13.3	45
R08	41.4	31.4	11.4	45
R09	44.8	34.8	14.8	45
R10	44.5	34.5	14.5	45
R11	43.7	33.7	13.7	45
R12	42.8	32.8	12.8	45
R13	50.1	40.1	20.1	45

All values are sound pressure levels in dB re: 2×10^{-5} Pa.

The assessment presented in the tables above show that internal daytime L_{Aeq} , night-time L_{Aeq} and L_{Amax} noise levels from potential sources of operational noise would be below BS8233:2014 / WHO guidelines, at all receptors. Therefore, noise levels are considered to be within the No Observable Adverse Effect Level.

5.3 BS 4142:2014 Assessment (Deliveries)

This assessment has been undertaken to establish the noise from the proposed operations associated with the proposed development (including HGVs manoeuvring and unloading). The assessment compares operational noise with the typical existing background L_{A90} noise levels (assuming 24-hour operation) at nearby sensitive receptor locations. In order to account for any potential impulsivity of the noise that may be perceptible at nearby receptors, a + 3 dB correction has been added before comparison with background levels to create the noise rating level.

For the purposes of this worst-case assessment, all docking bays and HGV parking spaces are considered to be occupied during the daytime and night-time periods.

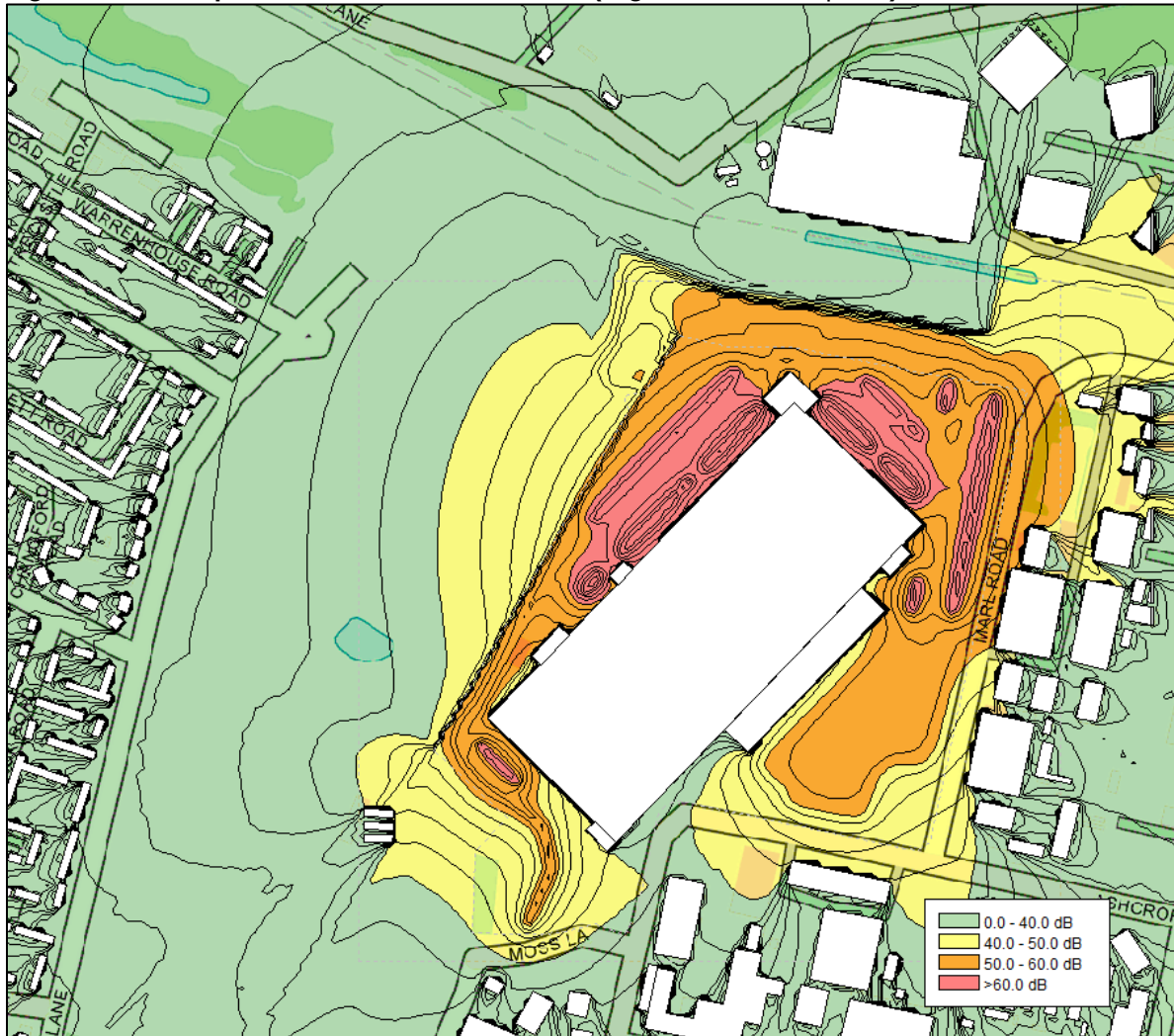
Table 5.6 BS4142 Assessment for Proposed HGV Operations

Location	Measured Background L_{A90}		Rating Level from operations (inclusive of +3 dB Correction)		BS 4142 Score	
	Daytime	Night-time	Daytime	Night-time	Daytime	Night-time
R01	37	39	34	37	-3	-2
R02	37	39	34	37	-3	-2
R03	37	39	34	37	-3	-2
R04	37	39	34	37	-3	-2
R05	37	39	34	36	-3	-3
R06	37	39	33	36	-4	-3
R07	37	39	33	36	-4	-3
R08	37	39	33	36	-4	-4
R09	37	39	32	36	-5	-4
R10	37	39	31	35	-6	-4
R11	37	39	31	34	-7	-5
R12	37	39	30	33	-7	-6
R13	41	38	33	39	-8	1

All values are sound pressure levels in dB re: 2×10^{-5} Pa.

Worst-case noise rating levels from the proposed HGV operations are predicted to be up to 1 dB above background levels during both the daytime and night-time period which is an indication of a low impact at all sensitive receptors. Noise levels from the operations are within the No Observed Adverse Effect Level.

Figure 5.2 Operational Noise Contour Plot (Night-time dB LAeq15mins)



Not to scale
OS Licence No. AL553611
Cross section at 4.0m above ground level

6.0 CONCLUSIONS OF NOISE ASSESSMENT

This report presents the details of a noise assessment in support of a planning application for a proposed distribution centre in Knowsley; the NPPF provides points against which the proposed development has been assessed. Considering these points, the following conclusions can be drawn:

NPPF paragraphs 170 (e) and 180 (a)

In considering paragraphs 170 and 180a, a worst-case cumulative noise intrusion assessment has shown that the BS 8233/WHO noise intrusion criteria will be achieved at all of the closest sensitive receptors during both the daytime and night-time with windows open or closed. Therefore, the proposed development is not expected to have a 'significant adverse impact' on health or quality of life.

Worst-case noise rating levels from the proposed HGV operations are predicted to be up to 1 dB above background levels during both the daytime and night-time period. In accordance with the guidance presented within BS4142:2014, this is an indication that noise levels will result in a low impact and are within the No Observed Adverse Effect Level (LOAEL).

Maximum permissible noise level limits have been set for potential building services plant which ensures that rated noise levels are at least 10 dB below the existing background noise levels during both the daytime and night-time.

NPPF Paragraphs 180 (b), 182 and 183

Given the favourable results of the assessment described above, no nearby businesses are expected to have unreasonable restrictions put on them as a result of the proposals. In addition, considering the historic commercial/industrial use of the site is not expected to have an adverse effect on the tranquillity of the areas or local access to areas of greater tranquillity.

APPENDICES

APPENDIX A – ACOUSTIC TERMINOLOGY AND ABBREVIATIONS

An explanation of the specific acoustic terminology referred to within this report is provided below.

- dB** Sound levels from any source can be measured in frequency bands in order to provide detailed information about the spectral content of the noise, i.e. whether it is high-pitched, low-pitched, or with no distinct tonal character. These measurements are usually undertaken in octave or third octave frequency bands. If these values are summed logarithmically, a single dB figure is obtained. This is usually not very helpful as it simply describes the total amount of acoustic energy measured and does not take any account of the ear's ability to hear certain frequencies more readily than others.
- dB(A)** Instead, the dBA figure is used, as this is found to relate better to the loudness of the sound heard. The dBA figure is obtained by subtracting an appropriate correction, which represents the variation in the ear's ability to hear different frequencies, from the individual octave or third octave band values, before summing them logarithmically. As a result the single dBA value provides a good representation of how loud a sound is.
- L_{Aeq}** Since almost all sounds vary or fluctuate with time it is helpful, instead of having an instantaneous value to describe the noise event, to have an average of the total acoustic energy experienced over its duration. The L_{Aeq, 07:00 – 23:00} for example, describes the equivalent continuous noise level over the 12 hour period between 7 am and 11 pm. During this time period the L_{pA} at any particular time is likely to have been either greater or lower than the L_{Aeq, 07:00 – 23:00}.
- L_{Amin}** The L_{Amin} is the quietest instantaneous noise level. This is usually the quietest 125 milliseconds measured during any given period of time.
- L_{Amax}** The L_{Amax} is the loudest instantaneous noise level. This is usually the loudest 125 milliseconds measured during any given period of time.
- L_n** Another method of describing, with a single value, a noise level which varies over a given time period is, instead of considering the average amount of acoustic energy, to consider the length of time for which a particular noise level is exceeded. If a level of x dBA is exceeded for say, 6 minutes within one hour, then that level can be described as being exceeded for 10% of the total measurement period. This is denoted as the L_{A10, 1 hr} = x dB.
- The L_{A10} index is often used in the description of road traffic noise, whilst the L_{A90}, the noise level exceeded for 90% of the measurement period, is the usual descriptor for underlying background noise. L_{A1} and L_{Amax} are common descriptors of construction noise.
- R_w** The *weighted sound reduction index* determined using the above *measurement* procedure, but weighted in accordance with the procedures set down in BS EN ISO 717-1. Partitioning and building board manufacturers commonly use this index to describe the inherent sound insulation performance of their products.

An explanation of abbreviations used within this report is provided below.

CADNA – Computer Aided Noise Abatement
DMRB – Design Manual for Roads and Bridges
HGV – Heavy Goods Vehicle
UDP – Unitary Development Plan
UKAS – United Kingdom Accreditation Service

APPENDIX B – REPORT CONDITIONS

This Report has been prepared using reasonable skill and care for the sole benefit of Knowsley Unit Trust (“the Client”) for the proposed uses stated in the report by Tetra Tech Limited. Tetra Tech Limited exclude all liability for any other uses and to any other party. The report must not be relied on or reproduced in whole or in part by any other party without the copyright holder’s permission.

No liability is accepted or warranty given for; unconfirmed data, third party documents and information supplied to Tetra Tech Limited or for the performance, reliability, standing etc of any products, services, organisations or companies referred to in this report. Tetra Tech Limited does not purport to provide specialist legal, tax or accounting advice.

The report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections'. Environmental conditions can vary and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times. No investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal and weather-related conditions. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions. The “shelf life” of the Report will be determined by a number of factors including; its original purpose, the Client’s instructions, passage of time, advances in technology and techniques, changes in legislation etc. and therefore may require future re-assessment.

The whole of the report must be read as other sections of the report may contain information which puts into context the findings in any executive summary.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. Tetra Tech Limited accept no liability for issues with performance arising from such factors.