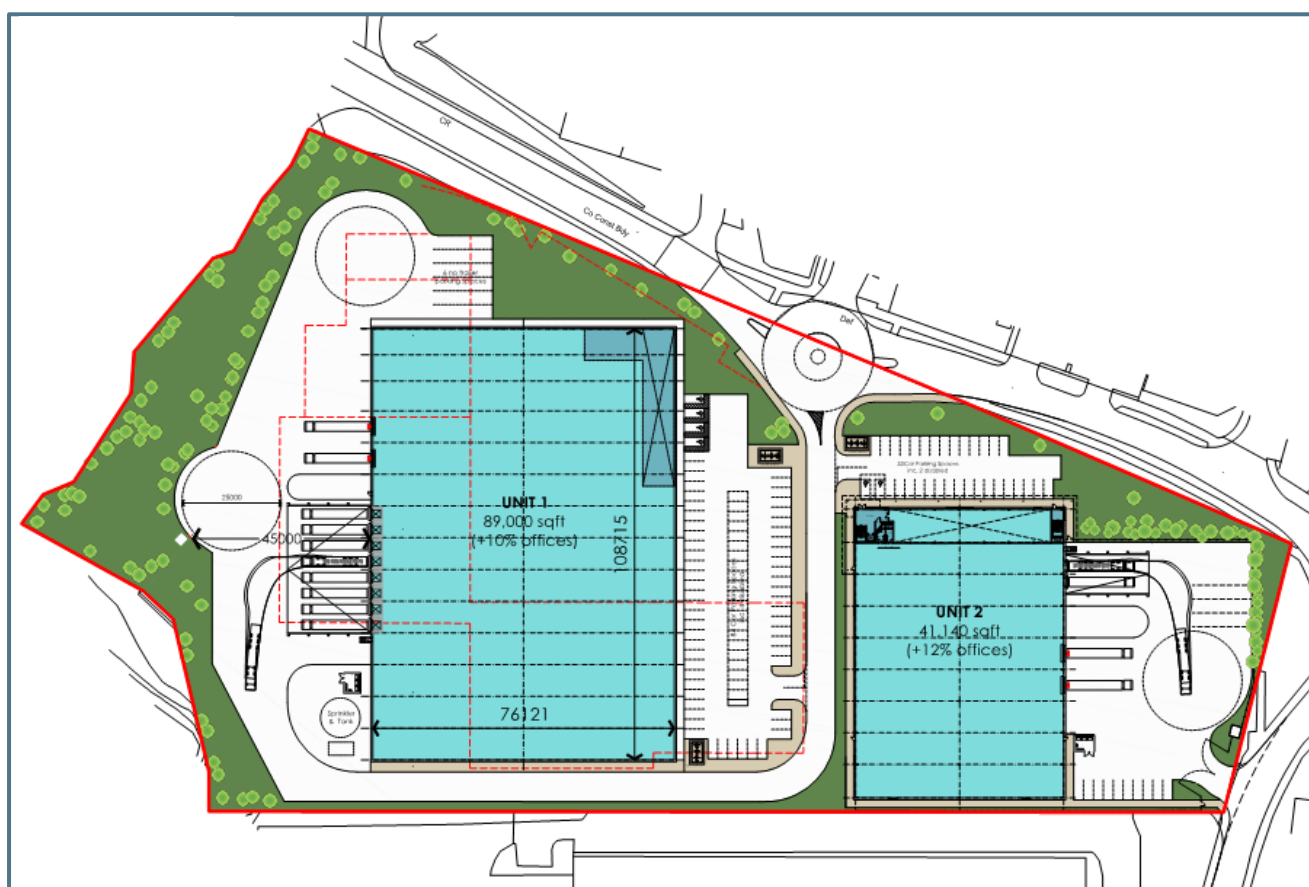


Mayfair Capital Investment Management Limited

Brunei Retail Park, Reading



Noise Assessment

November 2020

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Appendix Contents

Appendix A – Acoustic Terminology and Abbreviations

Appendix B – Report Conditions

1.0 Introduction

1.1 Purpose of this Report

This report presents the findings of a noise assessment for the proposed redevelopment on land at Brunel Retail Park, Rose Kiln Lane, Reading. The proposals include a site-wide redevelopment to provide two industrial units with a total floorspace of 130,140 square feet. The development description is as follows:

"Demolition of existing retail park (Class E); erection of 2no. commercial buildings for use within Classes E (light industrial), Class B2 and Class B8 along with access and servicing arrangements, car parking, landscaping and associated works"

This report considers the potential noise impact by assessing the following sources:

- HGV activity (manoeuvring, docking events and trailer parking)
- Building services plant
- Staff car parking

Noise surveys have been undertaken and the results used to verify predictions of the short-term and long-term effects of noise. The noise levels from all proposed noise sources associated with site have been predicted at local representative receptors using CADNA noise modelling software which incorporates ISO 9613 and CRTN methodologies and calculations.

A list of acoustic terminology and abbreviations used in this report is provided in Appendix A. Location plans and noise contour plots are presented in Appendix B.

1.2 Legislative Context (England)

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 NPPF, published on 19th February 2019. With regard to noise and planning, 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."

Planning 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, tying in with the principles of the NPPF and the Explanatory Note of the Noise Policy Statement for England, 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			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present 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 NPPG 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 4142: 2014 + A1:2019 *Methods for Rating and Assessing Industrial and Commercial Sound*' and BS8233:2013 *Guidance on sound insulation and noise reduction for buildings.*' Section 2.0 presents the noise level criteria used as a basis of this assessment.

The NPPG 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 project Acoustic Consultant is Graham Davis. The report has been checked by Graham Davis and verified by Nigel Mann. Relevant qualifications, membership and experience are summarised below.

Table 1.2 Acoustic Consultants' 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)
Emma Aspinall	MGeol 2017	Exp. Dec 2020	Jul 2020	Exp. Dec 2020	-
Lewis Kelter	BSc 2016	Dec 2019	June 2016	Dec 2019	-
Graham Davis	BA 2008	Nov 2013	Sept 2011	Jan 2014	-
Nigel Mann	BSc 1997 MSc 1999	Nov 2001	Nov 1998	Nov 2001	Jul 2005

2.0 Assessment Criteria

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

World Health Organisation – Guidelines for Community Noise (1999)

BS 4142:2014 + A1:2019 'Methods for rating and assessing industrial and commercial sound'

IEMA (Institute for Environmental Management and Assessment) 'Guidelines for Environmental Noise Impact Assessment October 2014'

Table 2.1 Noise Level Criteria and Actions (Site Operations)

Effect Level	Assessment	Noise Level Criteria	Action / Justification
No Observed Adverse Effect Level (NOAEL)	Goods Deliveries/Service Yard Activities/Car Parking	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 levels less than: Bedrooms (night-time) – 30 dB $L_{Aeq,8hours}$ / 45 dB L_{Amax} Living Rooms (daytime) – 35 dB $L_{Aeq,16hours}$	No Action Required Within BS8233 / WHO
	Assessment of Overall Change in Noise Levels	Up to 3.0 dB Change or a Reduction in Noise Levels	No Action Required – Change in noise levels unlikely to be perceptible
Lowest Observed Adverse Effect Level (LOAEL)	Goods Deliveries/Service Yard Activities/Car Parking	BS4142 Score of around +5	No Action Required Difference of around +5 dB likely to be an indication of an adverse effect, depending on context
		Noise levels exceed: Bedrooms (night-time) – 30 dB $L_{Aeq,8hours}$ / 45 dB L_{Amax} Living Rooms (daytime) – 35 dB $L_{Aeq,16hours}$	Mitigate to achieve: Bedrooms – 30 dB $L_{Aeq,8hours}$ / 45 dB L_{Amax} Living Rooms – 35 dB $L_{Aeq,16hours}$ Within BS8233 / WHO
	Assessment of Overall Change in Noise Levels	Up to 4.9 dB Increase in Noise Levels	No Action Required Slight Impact at Receptor of Some Sensitivity

Effect Level	Assessment	Noise Level Criteria	Action / Justification
Significant Observed Adverse Effect Level (SOAEL)	Goods Deliveries/Service Yard Activities/Car Parking	BS4142 Score of around +10	Difference of around +10 dB likely to be an indication of a significant adverse effect, depending on context Mitigate to achieve: BS4142 Score of around + 5 dB, depending on context
		Noise levels exceed: Bedrooms (night-time)– 35 dB $L_{Aeq,8hours}$ / 45 dB L_{Amax} Living Rooms (daytime)– 45 dB $L_{Aeq,16hours}$	Mitigate to achieve: Bedrooms – 30 dB $L_{Aeq,8hours}$ / 45 dB L_{Amax} Living Rooms – 35 dB $L_{Aeq,16hours}$ Within BS8233 / WHO
	Assessment of Overall Change in Noise Levels	3.0 to 5.0 dB Change in Noise Levels at receptor of high sensitivity or Up to 5.0 dB Increase in Noise Levels	Mitigate to achieve: Increase in Noise Levels of less than 3.0 dB (high sensitivity) or Increase in Noise Levels of less than 5.0 dB (receptor of some sensitivity)
Unacceptable Observed Adverse Effect Level (UOAEL)	Goods Deliveries/Service Yard Activities/Car Parking	BS4142 Score of + 10 or higher	Avoid Mitigate to achieve: BS4142 Score of around 5 dB , depending on context
		Noise levels exceed: Bedrooms (night-time) – 51 dB $L_{Aeq,8hours}$ / 67 dB L_{Amax} Living Rooms (daytime) – 57 dB $L_{Aeq,16hours}$	Avoid
	Assessment of Overall Change in Noise Levels	Greater than 5.0 dB Increase in Noise Levels	Mitigate to achieve: Increase in Noise Levels of less than 5.0 dB

3.0 Assessment Methodology

3.1 Noise Modelling Methodology

The details of the scheme have 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 the Department of Transport Calculation of Road Traffic Noise (CRTN) and 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 3.1 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.
Traffic data – main surrounding roads	Vectos	Traffic flows for local roads based on WYG observations and experience.
Traffic data – local roads	Vectos	Traffic flows for local roads based on WYG observations and experience.
Building heights – around site	WYGE Observations	8 m height for two storey residential properties and 3m per additional storey, 4 m for Bungalows
Barrier heights	WYGE Observations	All existing barriers at 1.8 m with the exception of hedges and trees which are assumed to offer no noise protection.
Receptor positions	WYGE	1 m from façade, height of 1.5 m for ground floor, 4 m for first floor properties. 1.5 m height for model grid.
Proposed Plans	Fletcher Rae	Drawing Title: Proposed Site Plan Option 13 Drawing Number: 19032-SK25 Rev D Dated: 12/08/2020

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.

3.2 Model Input Data - Operational Phase

3.2.1 Summary of Noise Levels

A summary of the operational phase noise levels, used within the model, for daytime and night-time L_{Aeq} and night-time L_{Amax} , are presented in Table 3.2 below. Further explanation on how each noise level was calculated, for each noise source, can be found in the sub-sections below.

Table 3.2 Summary of Noise Source, Noise levels during Daytime & Night-time

Noise Source	Noise Level (dB) at 3m distance		
	Daytime L_{Aeq}	Night-time L_{Aeq}	Night-time L_{Amax}
HGV Docking	73.8	76.3	89.4
HGV Parking	52.7	58.7	89.4
HGV Movements	58.0	61.9	73.0
Car Parking	53.0	53.0	71.9

3.2.2 HGV Docking Event Noise Data

Noise of a docking delivery event has been known to vary from site to site by as much as 22 dB L_{Aeq} at 5 m distance even with the same vehicle type. Similarly, individual events using the same vehicle and at the same store 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 at an existing distribution depot. 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.

- Specific Noise Level*

2 minutes at L_p 67.5 dB at 3 m distance	(vehicle arriving and manoeuvring)
30 minutes at L_p 76.8 dB at 3 m distance	(vehicle unloading)
1 minute at L_p 67.5 dB at 3 m distance	(vehicle leaving)
27 Minutes of quiet with engine off	

$$\text{Daytime } L_{Aeq} (1\text{hour}) = 10\log(1/60)(2 \text{ mins} \times 10^{0.1 \times 67.5\text{dB}} + 30 \text{ mins} \times 10^{0.1 \times 76.8\text{dB}} + 1 \text{ mins} \times 10^{0.1 \times 67.5\text{dB}})$$

$$= 73.8 \text{ dB at 3 m distance}$$

2 minutes at L_p 67.5 dB at 3 m distance	(vehicle arriving and manoeuvring)
13 minutes at L_p 76.8 dB at 3 m distance	(vehicle unloading)

$$\text{Night-time } L_{Aeq} (15\text{mins}) = 10\log(1/15)(2 \text{ mins} \times 10^{0.1 \times 67.5\text{dB}} + 13 \text{ mins} \times 10^{0.1 \times 76.8\text{dB}})$$

$$= 76.3 \text{ dB at 3 m distance}$$

- *Maximum Noise Level*

$$\text{Night-time } L_{Amax} = 89.4 \text{ dB at 3 m distance}$$

3.2.3 HGV Parking Event Noise Data

The following worst-case calculations have been based on measurements of HGVs at an existing distribution depot. All measurements were undertaken in free-field conditions. The levels used in the assessment include noise from the vehicle pulling up to a parking bay, manoeuvring into position (30 seconds) and then turning the engine off, maintaining a period of quiet ('no noise' emanating from the particular vehicle) for 56 minutes and then the vehicle will start its engine, idle and pull away (30 seconds). Events are modelled as point sources.

- *Specific Noise Level*

$$2 \text{ minutes at } L_p 67.5 \text{ dB at 3 m distance} \quad (\text{vehicle arriving and manoeuvring})$$

$$\text{Daytime } L_{Aeq} (1\text{hour}) = 10\log(1/60)(2 \text{ mins} \times 10^{0.1 \times 67.5\text{dB}})$$

$$= 52.7 \text{ dB at 3 m distance}$$

$$\text{Night-time } L_{Aeq} (15\text{mins}) = 10\log(1/15)(2 \text{ mins} \times 10^{0.1 \times 67.5\text{dB}})$$

$$= 58.7 \text{ dB at 3 m distance}$$

Maximum Noise Level

$$\text{Night-time } L_{Amax} = 89.4\text{dB at 3 m distance}$$

3.2.4 HGV Movements Noise Data

The following calculations have been used to represent HGVs arriving/exiting along the access road. For the purposes of this assessment, a worst-case daytime hour period of 40 HGVs are predicted to arrive/leave along the access road during the daytime with 25 predicted during the night-time period. Worst-case noise-levels have been calculated using this data to represent a worst-case in any 1-hour daytime (07:00 – 23:00) period and 15-minute period during the night-time (23:00 – 07:00). This has been included as a line source in the model.

$$40 \times 10 \text{ seconds at } L_p 67.5 \text{ dB at 3m distance (Single HGV vehicle arriving and leaving)}$$

$$\text{Daytime } L_{Aeq} (1\text{hour}) = 10\log(1/60)(400 \text{ seconds} \times 10^{0.1 \times 67.5\text{dB}})$$

$$= 58.0 \text{ dB at 3 m distance}$$

25 x 10 seconds at L_p 67.5 dB at 3m distance (Single HGV vehicle arriving and leaving)

$$\text{Night-time } L_{Aeq} (15\text{mins}) = 10\log(1/15)(250 \text{ seconds} \times 10^{0.1 \times 67.5\text{dB}})$$

$$= 61.9 \text{ dB at 3 m distance}$$

Maximum Noise Level

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

3.2.5 Building Services Plant; Noise Data

Point sources have been used in the model to represent the proposed plant 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 existing night-time background noise levels

3.2.6 Car Park Noise Data

Worst case noise levels from car parking at the distribution centre have been based upon observations and measurements taken at a similar sized distribution centre car park during a shift change. L_{Amax} noise levels account for impulsive events such as car-door slams. The noise data has been included in the model as an area source at 1.5m height. The noise levels used are presented in Table 3.2 above.

3.3 Sensitive Receptors

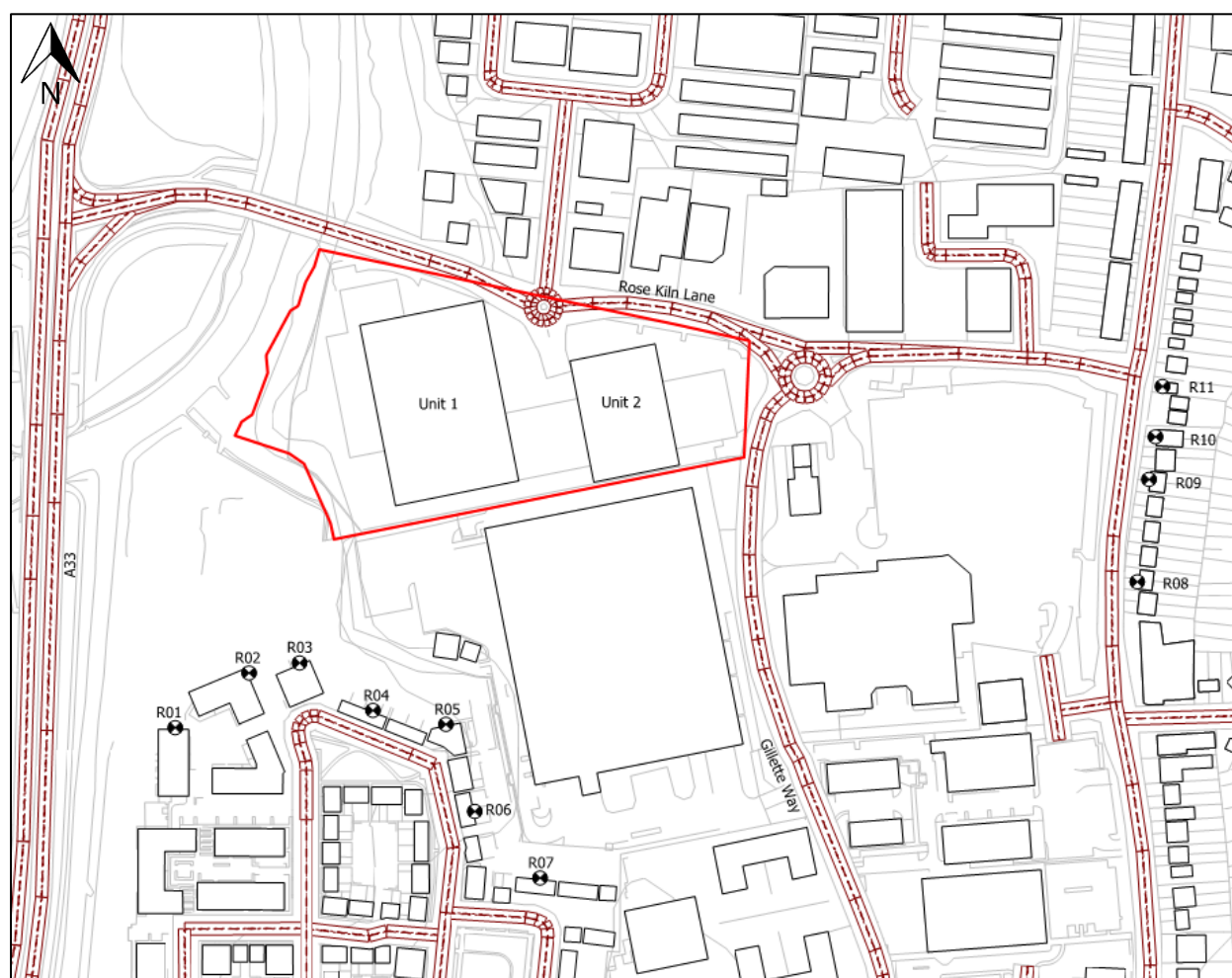
The table below summarises receptor locations that have been selected to represent worst-case residential receptors with respect to direct noise from the site. Ground and first floor facades (adjacent and facing the proposed development) and upper floors of multi-storey flats of the nearest properties have been represented. The locations of the receptors are shown on Figure 3.1.

Table 3.3 Sensitive Receptor Locations

Ref.	Description	Approximate Distance from Red-line Boundary (m)	Height (m) Daytime/Night-time
R01	Flats, Osprey House, Bedwyn Mews	155.0	16.5
R02	Flats, Montagu House, Padworth Avenue	97.0	16.5
R03	Flats, Harlequin House, Padworth Avenue	78.0	16.5
R04	53 Greenham Avenue	109.0	1.5 / 4.0
R05	Flats, 39 Greenham Avenue	124.0	1.5 / 4.0

Ref.	Description	Approximate Distance from Red-line Boundary (m)	Height (m) Daytime/Night-time
R06	25 Greenham Avenue	80.0	1.5 / 4.0
R07	47 Woolhampton Way	228.0	1.5 / 4.0
R08	255 Basingstoke Road	253.0	1.5 / 4.0
R09	239 Basingstoke Road	248.0	1.5 / 4.0
R10	229 Basingstoke Road	250.0	1.5 / 4.0
R11	219 Basingstoke Road	252.0	1.5 / 4.0

Figure 3.1 Existing Sensitive Receptor Locations



3.4 Tranquillity Rating

An assessment of the existing tranquillity level of the site has been based on the mapping data published by Campaign to Protect Rural England (CPRE). This uses a colour coded system and a 500m assessment grid for the whole of England, and a tranquillity rating of between 1 and 10 is assigned (1 being least tranquil and 10 being most). By reference to these maps the development is assessed as falling into Zones 2-3.

4.0 Noise Monitoring Data

4.1 Noise Survey Methodology

A monitoring survey was undertaken to characterise baseline ambient noise levels currently experienced on the site and to establish the relative local background and traffic noise levels. Equipment used during the survey included:

Norsonic 140	Environmental Noise Analyser	s/n	1402987
Norsonic 1251	Sound Calibrator	s/n	31043
Rion NL-52	Environmental Noise Analyser	s/n	1221576
Rion NL-52	Environmental Noise Analyser	s/n	264488
Rion NL-52	Environmental Noise Analyser	s/n	264490
Rion NC-75	Sound Calibrator	s/n	35270131

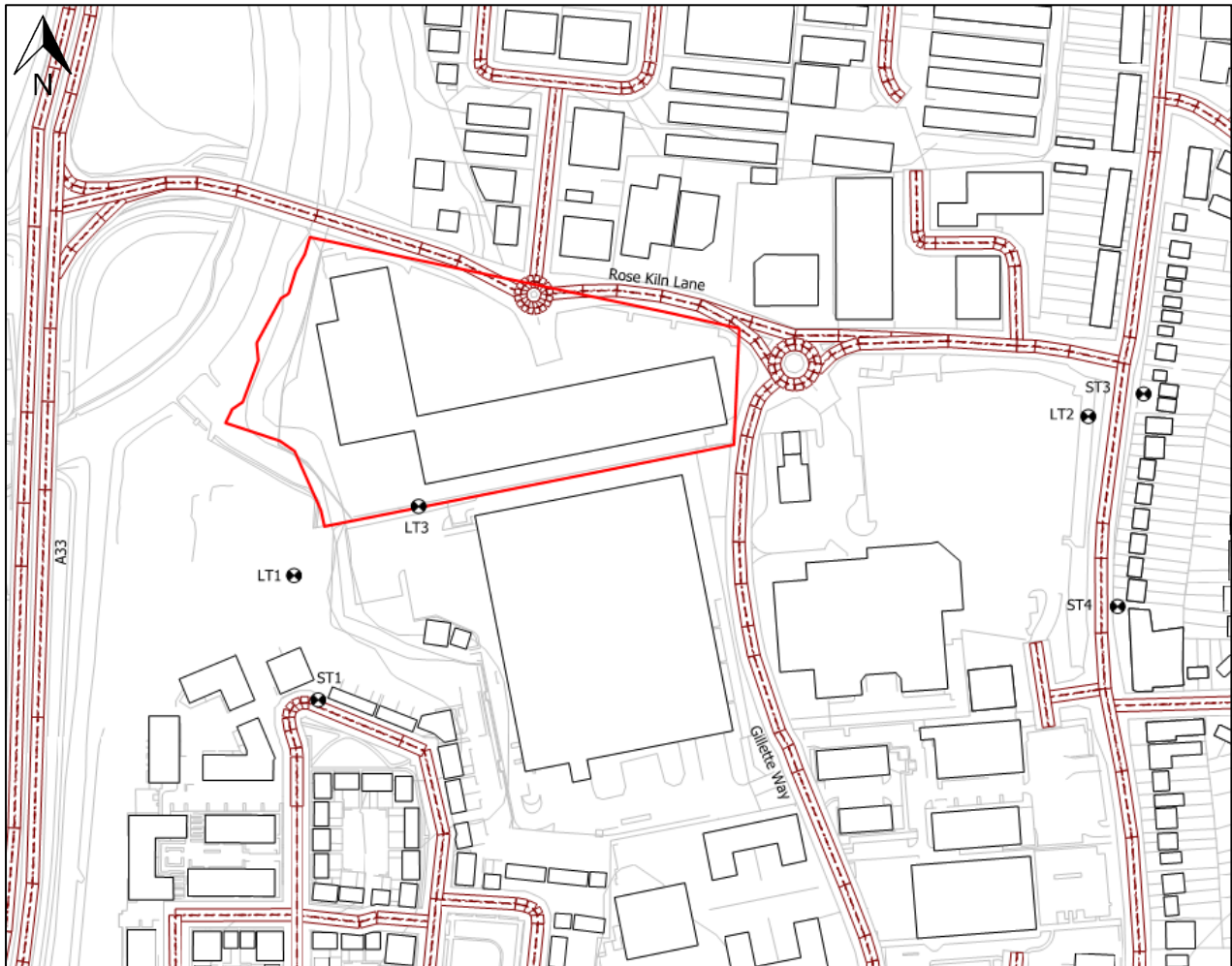
The measurement equipment was checked against the appropriate calibrator at the beginning and end of the measurements, in accordance with recommended practice, a drift of 0.2 dB was observed. The accuracy of the calibrators can be traced to National Physical Laboratory Standards, calibration certificates for which are available on request.

A baseline monitoring survey was undertaken at six locations (as specified in the following table and shown in Figure 4.1) from Thursday 8th October to Tuesday 13th October 2020. Attended short-term measurements were undertaken at three locations during day, evening and night-time periods with three additional locations being measured unattended over a 112-hour period. The raw data collected from the long-term monitoring is available upon request.

Measurements were taken in general accordance with BS 7445-1:2003 *The Description and Measurement of Environmental Noise: Guide to quantities and procedures*. Weather conditions during the survey period were observed as being dry with scattered showers. Anemometer readings confirmed that wind speeds were less than 5 ms⁻¹ at all times during the survey, with a predominant westerly wind direction.

Table 4.1 Noise Monitoring Locations

Ref	Description
LT1	South-west of the site, on land to the north of Greenham Avenue
LT2	East of the site, on land at junction of Rose Kiln Lane and Basingstoke Road
LT3	Southern boundary of the site
ST1	South-west of the site adjacent to property on Greenham Avenue
ST3	East of the site, at junction of Rose Kiln Lane and Basingstoke Road
ST4	South-east of the site, adjacent to property on Basingstoke Road

Figure 4.1 Noise Monitoring Locations

4.2 Noise Survey Results

The ambient noise climate is characterised by road traffic noise from the A33 to the west of the site, with contributions from Rose Kiln Lane to the north and Gillette Way to the east. There are also regular contributions from servicing activities and customer vehicle movements associated with the existing retail park and HGV movements and servicing associated with the adjacent distribution depot.

Table 4.3 Meteorological Conditions during the Survey

Survey Location	Date & Time	Temperature (°C)	Wind Speed (m/s)	Wind Direction	Cloud Cover (Oktas)	Dominant Noise Source
Daytime ST1	12/10/2020 14:51	12	0 – 1	SW	8	Distant road traffic noise, local road traffic noise
Daytime ST3	12/10/2020 15:46	12	1 - 3	SW	8	Road traffic noise Basingstoke Road
Daytime ST4	12/10/2020 15:21	12	2 - 3	SW	8	Road traffic noise Basingstoke Road
Evening ST1	12/10/2020 21:49	10	0 – 1	W	8	Distant road traffic noise, local road traffic noise
Evening ST3	12/10/2020 22:03	10	0 – 1	W	8	Road traffic noise Basingstoke Road
Evening ST4	12/10/2020 21:44	10	1 - 2	W	8	Road traffic noise Basingstoke Road
Night-time ST1	12/10/2020 23:11	10	0 – 1	W	8	Distant road traffic noise, local road traffic noise
Night-time ST3	12/10/2020 23:51	10	0 – 1	W	8	Road traffic noise Basingstoke Road
Night-time ST4	12/10/2020 23:33	10	1 - 2	W	8	Road traffic noise Basingstoke Road

Ambient and background noise levels are usually described using the L_{Aeq} index (a form of energy average) and the L_{A90} index (i.e. the level exceeded for 90% of the measurement period) respectively. Road traffic noise is generally described using the L_{A10} index (i.e. the level exceeded for 10% of the measurement period). For the long-term (LT) locations, the presented $L_{Aeq,T}$ and $L_{A10,T}$ are average noise levels whilst the L_{A90} is the modal noise level of each 5 minute measurement over the stated survey period.

The results of the statistical measurements and frequency measurements conducted during the survey are summarised in the following table. All values are sound pressure levels in dB (re: 2×10^{-5} Pa).

Table 4.4 Results of Baseline Noise Monitoring Survey (Average Levels)

Period	Duration (T)	Monitoring Date and Times	Location	$L_{Aeq,T}$ (dB)	$L_{Amax,T}$ (dB)	$L_{Amin,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
Weekday Daytime 07:00 - 23:00	40 Hours	08/10/2020 – 13/10/2020 18:23 – 09:43	LT1	55.6	96.9	35.2	57.4	50.0
Weekday Night-time 23:00 – 07:00	24 hours	08/10/2020 – 13/10/2020 23:00 – 07:00		49.4	72.8	29.2	51.1	37.0
Weekend Daytime 07:00 - 23:00	32 Hours	10/10/2020 – 11/10/2020 07:00 - 23:00		56.3	81.3	35.0	58.3	53.0
Weekend Night-time 23:00 – 07:00	16 hours	10/10/2020 – 11/10/2020 23:00 - 07:00		48.5	75.1	31.7	50.9	37.0
Weekday Daytime 07:00 - 23:00	40 Hours	08/10/2020 – 13/10/2020 17:35 – 09:20	LT2	61.7	98.7	38.3	63.5	53.0
Weekday Night-time 23:00 – 07:00	24 hours	08/10/2020 – 13/10/2020 23:00 - 07:00		54.0	91.7	34.5	53.0	40.0

Noise Assessment

Period	Duration (T)	Monitoring Date and Times	Location	L _{Aeq,T} (dB)	L _{Amax,T} (dB)	L _{Amin,T} (dB)	L _{A10,T} (dB)	L _{A90,T} (dB)
Weekend Daytime 07:00 - 23:00	32 Hours	10/10/2020 – 11/10/2020 07:00 - 23:00		60.8	100.3	38.2	62.5	54.0
Weekend Night-time 23:00 – 07:00	16 hours	10/10/2020 – 11/10/2020 23:00 - 07:00		52.2	85.2	35.5	53.1	40.0
Weekday Daytime 07:00 - 23:00	40 Hours	08/10/2020 – 13/10/2020 17:05 – 09:05	LT3	60.3	89.9	40.1	62.4	56.0
Weekday Night-time 23:00 – 07:00	24 hours	08/10/2020 – 13/10/2020 23:00 - 07:00		58.5	93.0	36.3	60.9	54.0
Weekend Daytime 07:00 - 23:00	32 Hours	10/10/2020 – 11/10/2020 07:00 - 23:00		59.8	86.0	42.1	62.0	54.0
Weekend Night-time 23:00 – 07:00	16 hours	10/10/2020 – 11/10/2020 23:00 - 07:00		58.1	71.2	35.3	60.5	54.0
Daytime 07:00 - 19:00	15 Mins	12/10/2020 14:51	ST1	56.2	76.4	41.9	55.6	45.8
	15 Mins	12/10/2020 15:46	ST3	64.8	78.0	51.2	69.0	54.5
	15 Mins	12/10/2020 15:21	ST4	67.2	90.1	54.7	70.2	59.3
Evening 19:00 - 23:00	15 Mins	12/10/2020 21:49	ST1	53.5	79.9	37.9	50.3	41.8
	15 Mins	12/10/2020 22:03	ST3	67.4	91.4	41.2	69.6	50.5
	15 Mins	12/10/2020 21:44	ST4	63.9	78.3	44.4	68.8	47.8
Night-time 23:00 - 07:00	15 Mins	12/10/2020 23:11	ST1	44.6	66.3	33.8	44.7	37.8
	15 Mins	12/10/2020 23:51	ST3	57.4	77.7	36.1	59.6	38.6
	15 Mins	12/10/2020 23:33	ST4	57.5	78.4	41.0	59.1	43.2

All values are sound pressure levels in dB re: 2x 10⁻⁵ Pa

5.0 Assessment of Key Effects

5.1 Building Services Plant Noise Assessment

This assessment has been undertaken in order to establish the maximum external noise levels from the proposed building services plant located at a worst-case rooftop locations. This includes eight indicative sources around the perimeter of the development site to represent potential building services plant compounds. The assessment compares the predicted worst-case breakout noise levels from the plant with the existing measured daytime and night-time background noise level (L_{A90}) at the closest existing residential receptors.

A series of predictions were made by defining different sound power levels at a point source. 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 the 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.

As the new building services plant has the potential to have tonal characteristics which may be just perceptible at nearby receptor locations, a subjective +2 dB correction has been applied to the predicted noise levels at receptor before comparison with background levels in accordance with section 9.2 of BS4142:2014 + A1:2019.

Table 5.1 Proposed Emission Limits for BSP as Modelled

BSP Location	Noise Emission Limit - Sound Pressure Level (Per Unit)	
	Daytime	Night-time
8 x Indicative Building Services Plant	77.4 dB(A) at 1 m OR 67.8 dB(A) at 3 m	69.4 dB(A) at 1 m OR 59.8 dB(A) at 3 m

Table 5.2 BS 4142 Assessment – Building Services Plant

Location	Existing Measured Background L_{A90}		Specific noise level from plant		Noise rating level from plant (with +2 dB Correction)		BS 4142 Score	
	Daytime	Night-time	Daytime	Night-time	Daytime	Night-time	Daytime	Night-time
R01	46	38	29	21	31	23	-15	-15
R02	46	38	33	25	35	27	-11	-11
R03	46	38	35	27	37	29	-10	-10
R04	46	38	26	19	28	21	-18	-17
R05	46	38	25	18	27	20	-19	-18
R06	46	38	23	17	25	19	-21	-19
R07	46	38	23	15	25	17	-21	-21
R08	53	40	28	20	30	22	-23	-18
R09	53	40	28	21	30	23	-23	-17
R10	53	40	28	21	30	23	-23	-18
R11	53	40	28	20	30	22	-23	-18

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

All calculations used to derive the above table (including averaging of background noise levels and predicted source noise levels) have been undertaken to 1 decimal place to avoid perpetuation of rounding errors. However, in accordance with BS4142 para 8.6 the levels are expressed as integers (with 0.5 dB being rounded up). This may mean that the arithmetic's in the above table may appear to be up to 1 dB incorrect due to this rounding.

5.2 Delivery Noise Assessment

This assessment has been undertaken to establish the noise from the external operations associated with the proposed development (including HGV movements, docking, unloading and parking). The assessment compares 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.

Table 5.3 BS4142 Assessment for Proposed HGV Operations

Location	Measured Average Pre-installation Background L_{A90}		Predicted Noise Level L_{Aeq}		Noise Rating ($L_{A,Tr}$)		BS 4142 Score	
	Daytime	Night-time	Daytime	Night-time	Daytime	Night-time	Daytime	Night-time
R01	46	38	41	43	44	46	-2	8
R02	46	38	49	51	52	54	6	16
R03	46	38	50	52	53	55	7	17
R04	46	38	34	38	37	41	-9	3
R05	46	38	34	37	37	40	-10	2
R06	46	38	28	32	31	35	-15	-3
R07	46	38	34	37	37	40	-10	2
R08	53	40	35	38	38	41	-15	1
R09	53	40	39	43	42	46	-11	6
R10	53	40	39	44	42	47	-11	7
R11	53	40	39	44	42	47	-11	7

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

As shown in Table 5.3 above, worst-case noise levels from worst-case HGV operations are predicted to be around or below background levels during the daytime and night-time period at the majority of existing sensitive receptors. However, noise rating noise levels are predicted to be up to 17 dB above the background noise levels during the night-time at receptor locations R01, R02 and R03 to the southwest of the proposed development, which is an indication of a likely significant adverse impact.

5.3 Combined Noise Intrusion Assessment

Internal noise levels, at existing sensitive receptor locations, from all noise sources including HGVs, staff car parking and building services plant have been assessed both with windows open, where a reduction from a partially open window of 15 dB has been used, and with windows closed where an assumption of single

glazing with a sound reduction of 30 dB has been used. An illustrative noise contour plot is presented in Figure 5.1 which shows the worst-case night-time noise levels associated with the development operating at 100% capacity.

Figure 5.1 Worst-case Night-time Operational Noise Contour Plot $L_{Aeq,15mins}$ (Grid Height 4.0m)

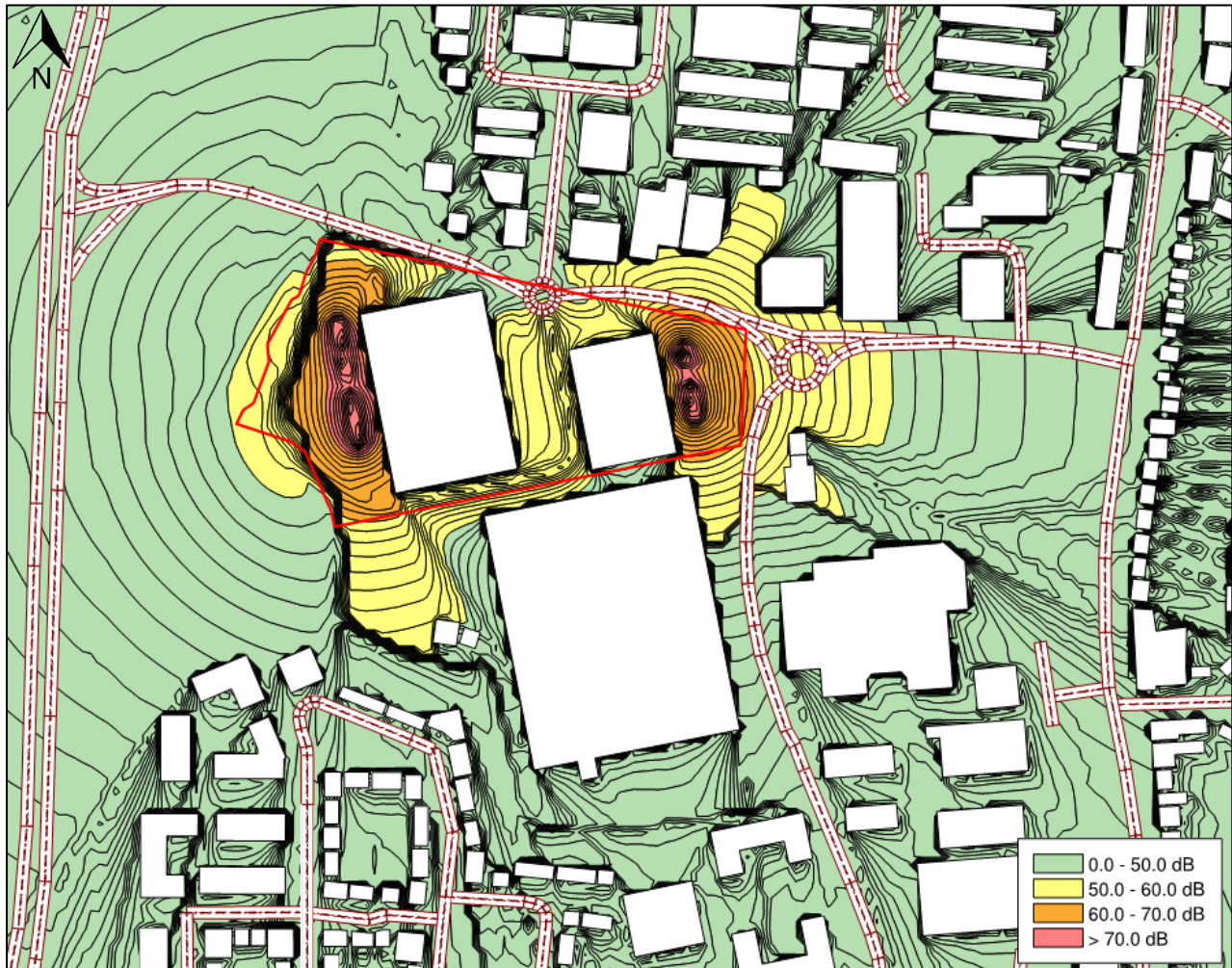


Table 5.4 Existing Residential Noise Intrusion Levels L_{Aeq} (Daytime)

Location	Description	External Façade Levels $L_{Aeq}(1\text{ hr})$	Internal $L_{Aeq}(1\text{ hr})$ with windows open	Internal $L_{Aeq}(1\text{ hr})$ with windows closed	BS 8233 / WHO Criteria – Internal L_{Aeq}
R01	Flats, Osprey House, Bedwyn Mews	40.7	25.7	10.7	35
R02	Flats, Montagu House, Padworth Avenue	48.6	33.6	18.6	35
R03	Flats, Harlequin House, Padworth Avenue	49.5	34.5	19.5	35
R04	53 Greenham Avenue	34.4	19.4	4.4	35
R05	Flats, 39 Greenham Avenue	33.5	18.5	3.5	35
R06	25 Greenham Avenue	28.1	13.1	0.0	35
R07	47 Woolhampton Way	33.5	18.5	3.5	35
R08	255 Basingstoke Road	35.0	20.0	5.0	35
R09	239 Basingstoke Road	38.9	23.9	8.9	35
R10	229 Basingstoke Road	38.9	23.9	8.9	35
R11	219 Basingstoke Road	38.7	23.7	8.7	35

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

Table 5.5 Existing Residential Noise Intrusion Levels L_{Aeq} (Night-time)

Location	Description	External Façade Levels $L_{Aeq}(15\text{ mins})$	Internal $L_{Aeq}(15\text{ mins})$ With windows open	Internal $L_{Aeq}(15\text{ mins})$ With windows closed	BS 8233 / WHO Criteria – Internal L_{Aeq}
R01	Flats, Osprey House, Bedwyn Mews	43.3	28.3	13.3	30
R02	Flats, Montagu House, Padworth Avenue	51.2	36.2	21.2	30
R03	Flats, Harlequin House, Padworth Avenue	52.1	37.1	22.1	30
R04	53 Greenham Avenue	38.1	23.1	8.1	30
R05	Flats, 39 Greenham Avenue	37.3	22.3	7.3	30
R06	25 Greenham Avenue	31.7	16.7	1.7	30
R07	47 Woolhampton Way	36.7	21.7	6.7	30
R08	255 Basingstoke Road	37.6	22.6	7.6	30
R09	239 Basingstoke Road	42.9	27.9	12.9	30
R10	229 Basingstoke Road	43.7	28.7	13.7	30
R11	219 Basingstoke Road	43.6	28.6	13.6	30

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

Table 5.6 Existing Residential Noise Intrusion Levels L_{Amax} (Night-time)

Location	Description	External Façade Levels L_{Amax}	Internal L_{Amax} with windows open	Internal L_{Amax} with windows closed	BS 8233 / WHO Criteria – Internal L_{Amax}
R01	Flats, Osprey House, Bedwyn Mews	45.6	30.6	15.6	45
R02	Flats, Montagu House, Padworth Avenue	54.3	39.3	24.3	45
R03	Flats, Harlequin House, Padworth Avenue	55.4	40.4	25.4	45
R04	53 Greenham Avenue	41.0	26.0	11.0	45
R05	Flats, 39 Greenham Avenue	40.0	25.0	10.0	45
R06	25 Greenham Avenue	35.4	20.4	5.4	45
R07	47 Woolhampton Way	39.1	24.1	9.1	45
R08	255 Basingstoke Road	44.9	29.9	14.9	45
R09	239 Basingstoke Road	49.8	34.8	19.8	45
R10	229 Basingstoke Road	49.7	34.7	19.7	45
R11	219 Basingstoke Road	49.6	34.6	19.6	45

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

The assessment presented in the tables above shows that internal daytime L_{Aeq} , night-time L_{Aeq} and night-time L_{Amax} noise levels from all sources of noise at the proposed site are predicted to be within the WHO/BS 8233 criteria at nearly all receptors with windows open or closed, with the exception of R02 and R03 during the night-time L_{Aeq} scenario, assuming a windows-open scenario (although it is understood that properties associated with the Kennet Island development incorporate intrinsic acoustic mitigation measures to protect sensitive internal spaces from the existing distribution centre and retail park). However, as part of the cautious approach adopted within this assessment, additional mitigation is considered within Section 6.0.

5.4 Overall Change in Noise Level Assessment

This assessment has been undertaken to compare worst-case change in noise levels from the 'existing ambient noise levels' (L_{Aeq}) to the 'proposed scheme' noise at identified existing and proposed residential receptors. The differences between the 'existing' and the 'proposed' development scenarios including deliveries and car parking, during the daytime and night-time are presented in tables 5.7 and 5.8 below.

Table 5.7 Overall Change in Noise Levels L_{Aeq} (Daytime)

Location	Description	External L_{Aeq} Noise Level at (Existing Baseline)	Cumulative L_{Aeq} Noise Level at 1 metre from façade (Baseline + Proposed)	Difference Between Baseline and Proposed
R01	Flats, Osprey House, Bedwyn Mews	53.5	53.7	0.2
R02	Flats, Montagu House, Padworth Avenue	53.5	54.7	1.2
R03	Flats, Harlequin House, Padworth Avenue	53.5	55.0	1.5
R04	53 Greenham Avenue	53.5	53.6	0.1
R05	Flats, 39 Greenham Avenue	53.5	53.5	0.0
R06	25 Greenham Avenue	53.5	53.5	0.0
R07	47 Woolhampton Way	53.5	53.5	0.0
R08	255 Basingstoke Road	60.8	60.8	0.0
R09	239 Basingstoke Road	60.8	60.8	0.0
R10	229 Basingstoke Road	60.8	60.8	0.0

Location	Description	External L _{Aeq} Noise Level at (Existing Baseline)	Cumulative L _{Aeq} Noise Level at 1 metre from façade (Baseline + Proposed)	Difference Between Baseline and Proposed
R11	219 Basingstoke Road	60.8	60.8	0.0

Table 5.8 Overall Change in Noise Levels L_{Aeq} (Night-time)

Location	Description	External L _{Aeq} Noise Level at (Existing Baseline)	Cumulative L _{Aeq} Noise Level at 1 metre from façade (Baseline + Proposed)	Difference Between Baseline and Proposed
R01	Flats, Osprey House, Bedwyn Mews	44.6	47.0	2.4
R02	Flats, Montagu House, Padworth Avenue	44.6	52.1	7.5
R03	Flats, Harlequin House, Padworth Avenue	44.6	52.8	8.2
R04	53 Greenham Avenue	44.6	45.5	0.9
R05	Flats, 39 Greenham Avenue	44.6	45.3	0.7
R06	25 Greenham Avenue	44.6	44.8	0.2
R07	47 Woolhampton Way	44.6	45.3	0.7
R08	255 Basingstoke Road	52.2	52.3	0.1
R09	239 Basingstoke Road	52.2	52.7	0.5
R10	229 Basingstoke Road	52.2	52.8	0.6
R11	219 Basingstoke Road	52.2	52.8	0.6

The results presented in the tables above show the change in noise levels between the existing monitored L_{Aeq} noise levels and the contribution from the proposed scenario. The differences between the 'existing' and 'proposed' scenario are no greater than 1.5 dB(A) at all receptors during the daytime which is considered to represent a low impact. During the night-time, the differences between the 'existing' and 'proposed' scenario are no greater than 2.4 dB(A) at nearly all receptors, which represents a low impact. However, receptor locations R02 and R03 show a difference of up to 8.2 dB, which may have a significant impact. Therefore, additional mitigation is considered within Section 6.0.

5.5 Tranquillity Assessment

An assessment of the existing tranquillity level of the site has been based on the mapping data published by Campaign to Protect Rural England (CPRE). This uses a colour coded system and a 500m assessment grid for the whole of England, and a tranquillity rating of between 1 and 10 is assigned (1 being least tranquil and 10 being most). By reference to these maps the development is assessed as falling into Zones 2-3.

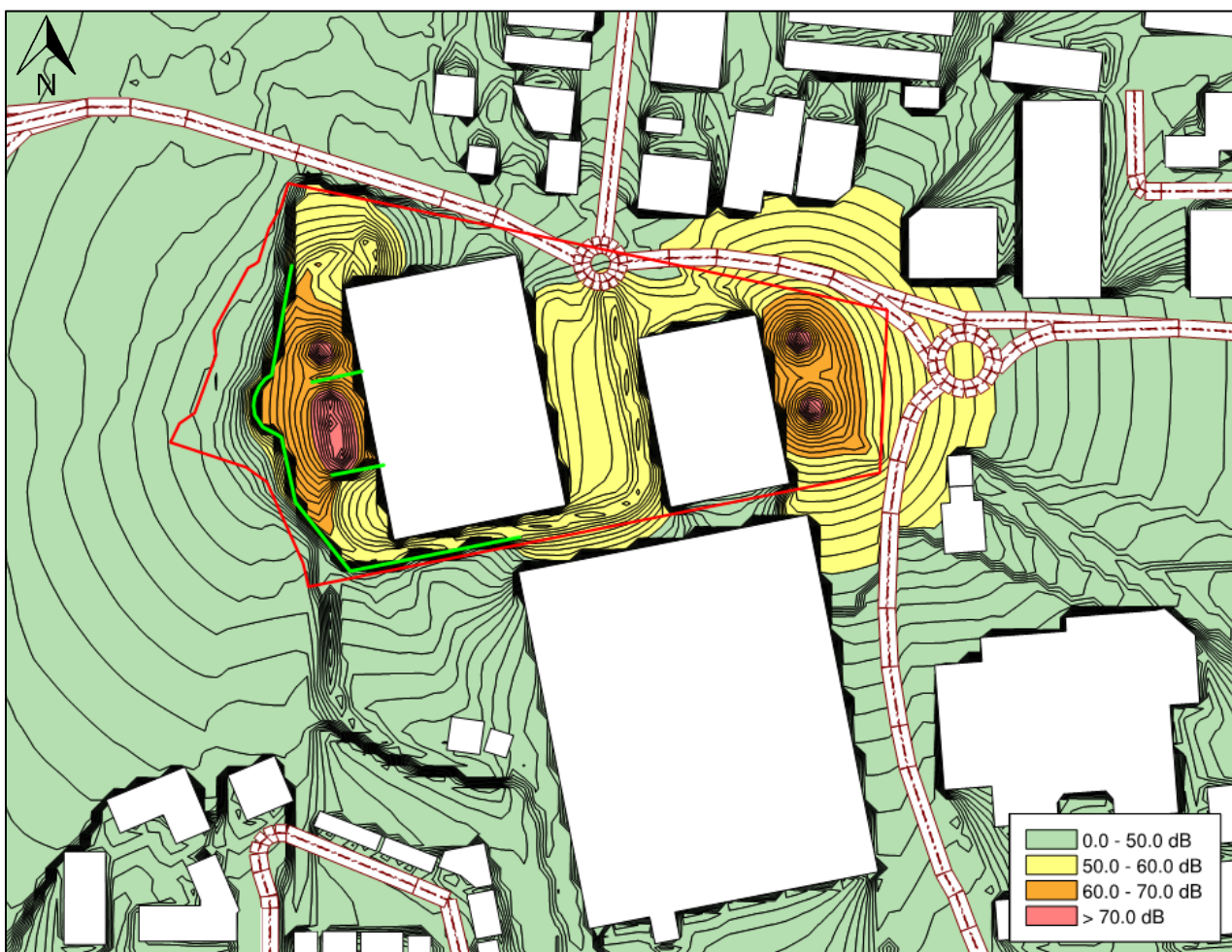
Considering the surrounding the existing industrial use of the site and surrounding industrial premises, there is expected to be a negligible impact on the tranquillity of the area.

6.0 Mitigation for Night-time Use

The assessments above indicate that the relevant noise guideline criteria have the potential to be exceeded during the night-time period at the overlooking receptors along Padworth Avenue (R02 and R03). Furthermore, it should be noted that these dwellings are associated with the Kennet Island development and are understood to incorporate acoustic design measures that take into account the existing industrial and commercial uses of the development site and its surroundings which may reduce the sensitivity of these dwellings further.

Nevertheless, to demonstrate how noise associated with the proposed redevelopment will be controlled, additional mitigation (in the event that the site will operate during the night-time period 23:00 – 07:00) has been included at the site in the form of acoustic barriers up to 4.0m high along the southern and western boundary around the service yard for Unit 1 and intermediate barriers within the service yard (locations are shown illustratively in green on Figure 6.1 below).

Figure 6.1 Worst-case Night-time Operational Noise Contour Plot $L_{Aeq,15mins}$ with 4.0m high barriers (Grid Height 4.0m)



6.1 Delivery Noise Assessment (Including Mitigation for night-time use)

Table 6.1 BS4142 Assessment for Proposed HGV Operations (Including Mitigation for night-time use)

Location	Measured Average Pre-installation Background L_{A90}		Predicted Noise Level L_{Aeq}		Noise Rating ($L_{A,Tr}$)		BS 4142 Score	
	Daytime	Night-time	Daytime	Night-time	Daytime	Night-time	Daytime	Night-time
R01	46	38	35	34	38	37	-8	-1
R02	46	38	40	40	43	43	-3	5
R03	46	38	41	40	44	43	-2	5
R04	46	38	31	32	34	35	-12	-3
R05	46	38	30	31	33	34	-13	-4
R06	46	38	25	26	28	29	-18	-9
R07	46	38	30	30	33	33	-13	-5
R08	53	40	35	33	38	36	-15	-4
R09	53	40	39	38	42	41	-11	1
R10	53	40	39	40	42	43	-11	3
R11	53	40	39	40	42	43	-11	3

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

As shown in Table 6.1 above, with the inclusion of additional mitigation for night-time use, worst-case noise rating levels from the proposed HGV operations are predicted to be below background levels during the daytime period at all sensitive receptors, and up to 5 dB above background during the night-time at the closest sensitive receptors, which is an indication of a low impact and falls within the Lowest Observed Adverse Effect Level.

As noted above, the closest properties to the south of the development site associated with the Kennet Island development incorporate intrinsic acoustic mitigation measures to protect sensitive internal spaces from the existing distribution centre and retail park. BS 4142 promotes a flexible assessment methodology that takes into consideration the context of a given site, including intrinsic acoustic mitigation measures designed to secure good internal conditions and absolute, as such despite a nominal exceedance of background noise levels at the closest properties, when considering the results of the noise intrusion assessment presented below and the assessment of the overall change in ambient noise levels, the results of the assessment are not considered to be significant.

6.2 Combined Noise Intrusion Assessment (Including Mitigation for night-time use)

Internal noise levels, at existing sensitive receptor locations, from all noise sources including HGVs, staff car parking and building services plant have been assessed both with windows open, where a reduction from a partially open window of 15 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 6.2 Existing Residential Noise Intrusion Levels L_{Aeq} (Daytime)

Location	Description	External Façade Levels $L_{Aeq}(1\text{ hr})$	Internal $L_{Aeq}(1\text{ hr})$ with windows open	Internal $L_{Aeq}(1\text{ hr})$ with windows closed	BS 8233 / WHO Criteria – Internal L_{Aeq}
R01	Flats, Osprey House, Bedwyn Mews	34.6	19.6	4.6	35
R02	Flats, Montagu House, Padworth Avenue	40.3	25.3	10.3	35
R03	Flats, Harlequin House, Padworth Avenue	40.7	25.7	10.7	35
R04	53 Greenham Avenue	31.2	16.2	1.2	35
R05	Flats, 39 Greenham Avenue	30.1	15.1	0.1	35
R06	25 Greenham Avenue	25.3	10.3	0.0	35
R07	47 Woolhampton Way	29.8	14.8	0.0	35
R08	255 Basingstoke Road	35.0	20.0	5.0	35
R09	239 Basingstoke Road	38.9	23.9	8.9	35
R10	229 Basingstoke Road	38.9	23.9	8.9	35
R11	219 Basingstoke Road	38.7	23.7	8.7	35

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

Table 6.3 Existing Residential Noise Intrusion Levels L_{Aeq} (Night-time)

Location	Description	External Façade Levels $L_{Aeq}(15\text{ mins})$	Internal $L_{Aeq}(15\text{ mins})$ with windows open	Internal $L_{Aeq}(15\text{ mins})$ with windows closed	BS 8233 / WHO Criteria – Internal L_{Aeq}
R01	Flats, Osprey House, Bedwyn Mews	33.7	18.7	3.7	30
R02	Flats, Montagu House, Padworth Avenue	39.7	24.7	9.7	30
R03	Flats, Harlequin House, Padworth Avenue	40.2	25.2	10.2	30
R04	53 Greenham Avenue	31.6	16.6	1.6	30
R05	Flats, 39 Greenham Avenue	30.6	15.6	0.6	30
R06	25 Greenham Avenue	25.8	10.8	0.0	30
R07	47 Woolhampton Way	29.7	14.7	0.0	30
R08	255 Basingstoke Road	33.4	18.4	3.4	30
R09	239 Basingstoke Road	37.8	22.8	7.8	30
R10	229 Basingstoke Road	39.9	24.9	9.9	30
R11	219 Basingstoke Road	39.8	24.8	9.8	30

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

Table 6.4 Existing Residential Noise Intrusion Levels L_{Amax} (Night-time)

Location	Description	External Façade Levels L_{Amax}	Internal L_{Amax} with windows open	Internal L_{Amax} with windows closed	BS 8233 / WHO Criteria – Internal L_{Amax}
R01	Flats, Osprey House, Bedwyn Mews	39.5	24.5	9.5	45
R02	Flats, Montagu House, Padworth Avenue	45.8	30.8	15.8	45
R03	Flats, Harlequin House, Padworth Avenue	46.8	31.8	16.8	45
R04	53 Greenham Avenue	37.2	22.2	7.2	45
R05	Flats, 39 Greenham Avenue	36.3	21.3	6.3	45
R06	25 Greenham Avenue	31.0	16.0	1.0	45
R07	47 Woolhampton Way	35.9	20.9	5.9	45
R08	255 Basingstoke Road	44.9	29.9	14.9	45
R09	239 Basingstoke Road	49.8	34.8	19.8	45
R10	229 Basingstoke Road	49.7	34.7	19.7	45
R11	219 Basingstoke Road	49.6	34.6	19.6	45

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

The assessment presented in the tables above show that, with the inclusion of additional mitigation, internal daytime L_{Aeq} , night-time L_{Aeq} and L_{Amax} noise levels from all potential sources of operational noise, with closed or open windows would all be below the relevant noise intrusion criteria at existing residential receptors and below the Lowest Observed Adverse Effect Level.

6.3 Overall Change in Noise Level Assessment (Including Mitigation for night-time use)

This assessment has been undertaken to compare worst-case change in noise levels from the 'existing ambient noise levels' (L_{Aeq}) to the 'proposed scheme' noise at identified existing and proposed residential receptors. The differences between the 'existing' and the 'proposed' development scenarios including deliveries and car parking, during the daytime and night-time are presented in tables 5.7 and 5.8 below.

Table 6.5 Overall Change in Noise Levels L_{Aeq} (Daytime)

Location	Description	External L_{Aeq} Noise Level at (Existing Baseline)	Cumulative L_{Aeq} Noise Level at 1 metre from façade (Baseline + Proposed)	Difference Between Baseline and Proposed
R01	Flats, Osprey House, Bedwyn Mews	53.5	53.6	0.1
R02	Flats, Montagu House, Padworth Avenue	53.5	53.7	0.2
R03	Flats, Harlequin House, Padworth Avenue	53.5	53.7	0.2
R04	53 Greenham Avenue	53.5	53.5	0.0
R05	Flats, 39 Greenham Avenue	53.5	53.5	0.0
R06	25 Greenham Avenue	53.5	53.5	0.0
R07	47 Woolhampton Way	53.5	53.5	0.0
R08	255 Basingstoke Road	60.8	60.8	0.0
R09	239 Basingstoke Road	60.8	60.8	0.0
R10	229 Basingstoke Road	60.8	60.8	0.0
R11	219 Basingstoke Road	60.8	60.8	0.0

Table 6.6 Overall Change in Noise Levels L_{Aeq} (Night-time)

Location	Description	External L_{Aeq} Noise Level at (Existing Baseline)	Cumulative L_{Aeq} Noise Level at 1 metre from façade (Baseline + Proposed)	Difference Between Baseline and Proposed
R01	Flats, Osprey House, Bedwyn Mews	44.6	44.9	0.3
R02	Flats, Montagu House, Padworth Avenue	44.6	45.8	1.2
R03	Flats, Harlequin House, Padworth Avenue	44.6	45.9	1.3
R04	53 Greenham Avenue	44.6	44.8	0.2
R05	Flats, 39 Greenham Avenue	44.6	44.8	0.2
R06	25 Greenham Avenue	44.6	44.7	0.1
R07	47 Woolhampton Way	44.6	44.7	0.1
R08	255 Basingstoke Road	52.2	52.3	0.1
R09	239 Basingstoke Road	52.2	52.4	0.2
R10	229 Basingstoke Road	52.2	52.4	0.2
R11	219 Basingstoke Road	52.2	52.4	0.2

The results presented in the tables above show the change in noise levels between the existing monitored L_{Aeq} noise levels and the contribution from the proposed scenario with the inclusion of additional mitigation. The differences between the 'existing' and 'proposed' scenario are no greater than 1.3 dB(A) at all receptors which falls within the No Observed Adverse Effect Level.

6.4 Land North of Manor Farm Road Major Opportunity Area Strategy

Land directly south of the proposed development has been allocated for future development within the Reading Borough Local Plan, March 2018. It is understood the development will primarily be for residential dwellings and will link with the adjacent Kennet Island development. Within the local plan, provisional plans indicate that there should be a strong buffer zone for proposed dwellings which lie directly adjacent to the proposed redevelopment at Brunel Retail Park. In addition to this zone, Figure 6.2 below shows the indicative locations at which the proposed acoustic barrier may need to be extended (shown in blue) to further protect future occupiers of these dwellings.

Figure 6.2 Worst-case Night-time Operational Noise Contour Plot $L_{Aeq,15mins}$ with 4.0m high barriers including indicative extension (Grid Height 4.0m)



7.0 Conclusions of Noise Assessment

A noise impact assessment has been undertaken for a planning application for the proposed redevelopment on land at Brunel Retail Park, Rose Kiln Lane, Reading. The NPPF gives a number of test points relating to noise which are referenced below. Considering each of these points, the following conclusions can be drawn in relation to the Development:

NPPF 170 (e) and 180 (a)

Maximum noise levels from the proposed building services plant have been set and are predicted to be at least 10 dB below existing night-time background noise.

Including mitigation for night-time use, in the form of a 4.0m high within the service yard and along the southern and western boundary of the site. noise levels from HGV servicing at the proposed site are predicted to be around or below background noise levels at all sensitive receptor locations during the daytime and night-periods.

Combined operational noise levels (including staff car parking and vehicle movements, HGV activities and building services plant) from all proposed noise sources associated with the scheme are within the WHO/BS 8233 criteria with windows closed and open and would result in a negligible change in ambient noise levels at the closest sensitive receptor locations for existing properties with the inclusion of acoustic barriers up to 4.0m high.

Noise levels are predicted to be below the relevant criteria during both the daytime and night-time at the closest sensitive receptor locations, which is an indication of a low impact and will be within or below the *Lowest Observable Adverse Effect Level* (LOAEL) at the nearest residential receptor locations.

Therefore, considering the NPPF test in section 170 (e), the proposed development is not expected to have an 'adverse impact' on health or quality of life.

NPPF 180 (b), 182 and 183

The development site is located within an existing retail park which features regular HGV servicing and vehicle movements and it is not considered that any existing businesses wanting to develop would be unreasonably restricted by the proposals.

Planning Practice Guidance: Noise

It has been predicted that on-site operational noise effects associated with the Development will not exceed the Lowest Observed Adverse Effect Level (LOAEL).

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.

Noise Assessment



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

PPG – Planning Practice Guidance

UDP – Unitary Development Plan

UKAS – United Kingdom Accreditation Service

WYGE – WYG Environment

Appendix B – Report Conditions

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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. WYG accept no liability for issues with performance arising from such factors.