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INTRODUCTION

8.1 An assessment of the noise impacts associated with the construction and operation of the proposed facility near Micheldever Station has been carried out with reference to British Standard and other government guidance. Noise issues relating to the operation of the development have been considered to the nearest noise-sensitive properties surrounding the application site.

8.2 Technical terms or references are occasionally used in this section. To assist the reader, a glossary of terminology, including a table of example noise levels that may be found in general life, are included in Appendix 8/1.

GOVERNMENT ADVICE, STANDARDS AND GOOD PRACTICE

British Standard 4142:1997

8.3 British Standard 4142:1997 *Method for rating industrial noise affecting mixed residential and industrial areas* is intended to be used to assess whether noise from factories, industrial premises or fixed installations and sources of an industrial nature in commercial premises is likely to give rise to complaints from people residing in nearby dwellings.

8.4 The procedure contained in BS4142 for assessing the likelihood of complaint is to compare the measured or predicted noise level from the source in question immediately outside the dwelling, the 'specific noise level', with the background noise level.

8.5 The specific noise level is measured in terms of a $L_{Aeq,T}$ value and the background noise level is measured in terms of a L_{A90} value.

8.6 Where the specific noise contains a *'distinguishable discrete continuous note (whine, hiss, screech, hum etc.) or if there are distinct impulses in the noise (bangs, clicks, clatters or thumps), or if the noise is irregular enough to attract attention'* then a correction of +5dB is added to the specific noise level to obtain the 'rating level', or $L_{Ar,T}$.

8.7 The likelihood of noise provoking complaints is assessed by subtracting the background noise level from the rating noise level. BS4142 states:

"A difference of around 10dB or higher indicates that complaints are likely. A difference of around 5dB is of marginal significance. A difference of -10dB is a positive indication that complaints are unlikely."

8.8 The standard is not suitable for the assessment of complaint when the background and rating noise levels are both very low; very low background noise levels are defined as those below 30dB L_{A90} and very low rating noise levels are defined as those below 35dB $L_{Ar,T}$.

British Standard 5228:2009

8.9 BS5228:2009 *Noise and vibration control on construction and open sites,* Part 1: *Noise* sets out a methodology for predicting noise levels arising from a wide variety of construction and related activities. BS5228-1:2009 also sets out tables of sound power levels generated by a wide variety of mobile equipment.

8.10 Noise levels generated by the site operations and experienced at local receptors will depend upon a number of variables, the most significant of which are:

- The sound power outputs of processes and plant;
- The periods of operation of processes and plant;
- The distances from sources to receiver;
- The presence of screening by barriers;
- The reflection of sound; and
- Soft ground attenuation.

8.11 The noise predictions in this section have been undertaken using a proprietary software-based noise model, Cadna/A, which implements the full range of UK calculation methods and includes an allowance for positive wind effects and atmospheric absorption.

8.12 BS5228-1:2009 gives several examples of acceptable limits for construction or demolition noise. The most simplistic being based upon exceedance of fixed noise limits and states in paragraph E.2:

"*Noise from construction and demolition sites should not exceed the level at which conversation in the nearest building would be difficult with the windows shut.*"

8.13 Paragraph E.2 goes on to state:

"*Noise levels, between say 07.00 and 19.00 hours, outside the nearest window of the occupied room closest to the site boundary should not exceed:*

- *70 decibels (dBA) in rural, suburban areas away from main road traffic and industrial noise;*
- *75 decibels (dBA) in urban areas near main roads in heavy industrial areas.*

These limits are for daytime working outside living rooms and offices."

ISO9613

8.14 The noise levels generated by the operation of fixed plant at the development site have been predicted in accordance with the noise prediction framework set out in ISO 9613-2 *Acoustics – Attenuation of sound during propagation outdoors – Part 2 General method of calculation.*

8.15 The model takes into account the distance between the sources and the receptors and the amount of attenuation due to atmospheric absorption.

8.16 The model also assumes downwind propagation, i.e. a wind direction that assists the propagation of noise from the source to all receptors.

Draft Guidelines for Noise Impact Assessment

8.17 The draft *Guidelines for Noise Impact Assessment* produced by the Institute of Acoustics/Institute of Environmental Management and Assessment Working Party have been referenced in relation to the potential changes in road traffic noise levels as a result of the operational use of the development site.

8.18 The findings of the Working Party are draft at present although they are of some assistance in this assessment. The draft guidelines state that for any assessment, the noise level threshold and significance should be determined by the assessor, based upon the specific evidence and likely subjective response to noise.

8.19 The impact scale adopted in this assessment is shown in Table 8-1.

Table 8-1
Impact Scale for Comparison of Future Noise against Existing Noise

Noise Level Change dB(A)	Subjective Response	Significance
0	No change	None
0.1 – 2.9	Barely perceptible	Minor
3.0 – 4.9	Noticeable	Moderate
5.0 – 9.9	Up to a doubling or halving of loudness	Substantial
10.0 or more	More than a doubling or halving of loudness	Major

8.20 The criteria above reflect the key benchmarks that relate to human perception of sound. A change of 3dB(A) is generally considered to be the smallest change in environmental noise that is perceptible to the human ear. A 10dB(A) change in noise represents a doubling or halving of the noise level. The difference between the minimum perceptible change and the doubling or halving of the noise level is split to provide greater definition to the assessment of changes in noise level.

8.21 It is considered that the criteria specified in the above table provide a good indication as to the likely significance of changes in noise levels in this case and have been used to assess the impact of the operational noise.

APPROACH TO THE ASSESSMENT

Sources of Information

8.22 Information regarding the development site, including plant utilisations associated with construction and operations, operational hours and proposed vehicles movements to and from the site has been supplied by the applicant and/or their sub-consultants.

Consultation with Local Authority

8.23 Hampshire County Council and Winchester City Council were consulted to confirm their views and policies on noise-related issues for the local area around the application site.

8.24 The noise monitoring locations, periods and assessment methodologies were all agreed.

8.25 It was also agreed that the assessment of noise from the proposed facility and any additional fixed plant should be undertaken in accordance with the guidance contained in British Standard 4142:1997 *Method for rating industrial noise affecting mixed industrial and residential areas*.

8.26 Winchester City Council stressed that night-time impacts would be crucial and the tonality of the noise sources carefully considered. At the time of undertaking this assessment specific plant details were not available therefore a 5dB penalty has been applied to the noise source in order to address the concerns of Winchester City Council.

8.27 It was also agreed that site-related traffic movements along the site access road could be predicted using the haul route calculation methodology contained in British Standard 5228-1:2009 *Code of practice for noise and vibration control on construction and open sites* and assessed against the prevailing ambient noise levels.

Methodology

8.28 This assessment considers the likely noise levels that would be generated by the proposed facility at the nearby noise-sensitive receptors.

8.29 An assessment has been made of the baseline situation and the potential impact of the proposals. Environmental advantages and disadvantages have been identified.

8.30 Noise levels generated by construction of the proposed facility have been predicted using the calculation methodology contained in British Standard 5228-1:2009. The resulting predicted noise levels have been assessed against the guideline noise limits detailed in Paragraph E.2 *Significance based on fixed noise limits and eligibility for noise insulation and temporary re-housing* of BS5228-1:2009 and the draft *Guidelines for Noise Impact Assessment*.

8.31 Noise levels generated by the operation of the facility and related fixed plant have been predicted using the calculation methodology contained in ISO9613-2.

8.32 The noise-sensitive receptors in the immediate vicinity to the application site comprise single and two-storey dwellings therefore noise predictions have been made at a height of 1.5m for ground floor living areas during the daytime and at 1.5m and 4.0m for ground and first floor bedrooms at night.

8.33 The resulting predicted noise levels have been assessed in accordance with the guidance contained in BS4142:1997.

8.34 Noise levels generated by heavy goods vehicle movements associated with the facility on the site access road have been predicted using the calculation methodology contained in BS5229-1:2009 and have been assessed against the ambient noise levels using the impact scale detailed in the draft *Guidelines for Noise Impact Assessment.*

8.35 The cumulative impacts of all operations and vehicle movements associated with the development site have been assessed against the ambient noise levels using the impact scale detailed in the draft *Guidelines for Noise Impact Assessment*.

8.36 Where considered necessary and practicable, mitigation measures have been suggested to reduce any potential impacts.

BASELINE CONDITIONS

8.37 Environmental noise surveys were carried out at the noise-sensitive receptors closest to the application site on Sunday 11th and Monday 12th March 2012 to capture typical background noise levels. The survey methodology and results are set out below.

8.38 The noise monitoring equipment used during the surveys is detailed in Appendix 8/2. All noise monitoring equipment was calibrated before and after the measurements and no calibration drifts were found to have occurred. The equipment had been calibrated to a traceable standard by UKAS-accredited laboratories within the 24 months preceding the surveys.

8.39 The noise monitoring locations, shown in Appendix 8/3, are considered as being representative of the nearest noise-sensitive locations to the proposed facility and proposed access road. These are:

- Location 1 Western Farm, to the southeast;
- Location 2 Travellers Rest, to the southeast;
- Location 3 Brunel Close, to the southwest;
- Location 4 The Boundary, to the northeast; and
- Location 5 New Road, to the south.

8.40 Measurements were taken over a number of 15 minute non-consecutive periods during the daytime and night-time for a Sunday and a midweek

period. Measurements were logged every 15 minutes during the daytime and every 5 minutes during the night-time. The microphone was placed 1.5m above the ground in free-field conditions, i.e. at least 3.5m from the nearest vertical, reflecting surface.

8.41 At the measurement positions the following noise level indices were recorded:

- $L_{Aeq,T}$ The A-weighted equivalent continuous noise level over the measurement period.
- L_{A90} The A-weighted noise level exceeded for 90% of the measurement period. This parameter is often used to describe background noise.
- L_{A10} The A-weighted noise level exceeded for 10% of the measurement period. This parameter if often used to describe road traffic noise.
- L_{Amax} The maximum A-weighted noise level during the measurement period.

8.42 The weather conditions during the survey periods were acceptable for noise monitoring, being mainly dry with little or no wind.

8.43 The results of the noise surveys are presented in full in Appendix 8/D and are summarised in Table 8-2 and 8-3.

Table 8-2
Summary of Measured Noise Levels, free-field, dB - Sunday

Location	Period	$L_{Aeq,T}$	L_{A90}	L_{A10}	L_{Amax}
Western Farm	Daytime	58.0	51.6	59.5	79.5
	Night-time	48.2	37.7	50.0	70.5
Travellers Rest	Daytime	56.5	45.6	56.9	78.5
	Night-time	45.2	33.5	41.7	72.8
Brunel Close	Daytime	54.2	51.3	55.8	74.7
	Night-time	47.5	39.2	49.7	64.4
The Boundary	Daytime	56.1	51.2	57.9	75.7
	Night-time	52.9	43.8	56.2	65.7
New Road	Daytime	51.5	40.8	52.6	73.2
	Night-time	38.5	32.5	41.7	59.5

Table 8-3
Summary of Measured Noise Levels, free-field, dB – Midweek

Location	Period	$L_{Aeq,T}$	L_{A90}	L_{A10}	L_{Amax}
Western Farm	Daytime	58.6	52.4	60.4	78.6
	Night-time	49.7	37.3	52.8	63.3
Travellers Rest	Daytime	58.1	45.0	57.0	81.8
	Night-time	43.9	33.3	46.7	63.1
Brunel Close	Daytime	51.2	47.7	52.9	71.7
	Night-time	50.2	40.8	51.4	73.7
The Boundary	Daytime	53.7	50.8	55.4	73.7
	Night-time	52.2	40.9	55.5	69.3
New Road	Daytime	64.0	40.9	57.6	85.3
	Night-time	37.3	28.8	39.8	60.8

8.44 The daytime noise climate in the area around the application site comprised distant and local road traffic, rail traffic, light aircraft and natural sounds such as birdsong, wind in trees and animals.

8.45 The night-time noise climate comprised local and distant road traffic and occasional animal calls.

ENVIRONMENTAL DESIGN MEASURES

8.46 The main operational processes of the facility would take place within the building envelope. Heavy goods vehicles would arrive at the facility along the access road from Overton Road.

8.47 The layout of the facility has been designed in such a way that external activities are screened from the majority of nearby noise-sensitive receptors by either the intervening landform or by proposed buildings within the application site.

POTENTIAL IMPACT

Construction Noise Assessment

8.48 It is inevitable with any development of this nature that some disturbance will be caused to those living and working nearby during the construction phase. However, disruption due to construction is a localised phenomenon and is temporary in nature. In general, only people living within 100 to 200m of the site boundary are likely to be seriously impacted by construction noise.

8.49 Although there are techniques available to predict the likely noise effects from construction works, such as those contained in BS5228:2009 Part 1: *Noise*, they are necessarily based on quite detailed information on the type and number of plant being used, their location within the site and the length of time they are in operation.

8.50 An estimate of the likely effects of noise from site clearance and preparation and construction of the buildings and surrounding service areas has been made for those properties closest to the site. The predictions are based on the methodology contained within BS5228:2009 Part 1: *Noise* over the core working day and reflect the currently available construction information. The predictions assume that no mitigation measures have been implemented, such as those identified later in this chapter.

8.51 The predicted noise levels have been assessed against an external façade criterion of 70dB $L_{Aeq,1hr}$ and against the existing ambient noise levels in the area. The derivation of the 70dB criterion is given in paragraph 8.13 of this chapter.

8.52 For the purpose of predicting the likely noise impact, the construction works have been divided into the following phases. The full list of plant assumed for each phase or works is contained in Appendix 8/5:

- site preparation;
- foundation works for the buildings; and
- general building works.

8.53 It is acknowledged that there may be other sub-phases of the construction works. However, in the absence of detailed information pertaining to how these operations are likely to be carried out the four main phases assessed are considered to give a good indication of the likely impact during the construction works.

8.54 Predictions for construction works within the main site have been undertaken at the building nearest to the nearby noise-sensitive receptors.

8.55 Predictions have been carried out of the noise levels likely to be generated by each of the above phases of work using the methodology outlined in BS5228-1:2009.

8.56 Construction operations would generally take place between the following hours:

- 0700 – 1900 Monday to Friday
- 0700 – 1600 Saturday

There would be no construction works on Sundays or Public Holidays.

8.57 In each instance, the receptor façade that faces towards the site has been considered where the construction works are being undertaken at a location closest to each property. The predicted noise levels are set out Table 8-4.

Table 8-4
Predicted Construction Noise Levels, $L_{Aeq,1hr}$, dB

Location	Site Prep	Building Foundation Works	Building Works	Total All Operations
Western Farm	55.4	56.2	54.2	60.1
Travellers Rest	39.7	44.3	42.3	47.3
Brunel Close	40.5	45.1	43.1	48.1
The Boundary	43.5	48.3	46.3	51.2
New Road	38.8	43.4	41.4	46.4

8.58 Table 8-4 shows the predicted noise levels generated by individual phases of construction works, at their worst-case location in each instance, would be well within the 70dB criterion adopted for this assessment at all of the receptors assessed.

8.59 Table 8-4 shows that the predicted noise level generated by all construction operations if undertaken at the same time would also be within the 70dB criterion adopted for the assessment at all of the locations assessed.

8.60 Based on the above, specific mitigation measures to reduce noise from construction operations are considered unnecessary.

Construction Traffic Noise

8.61 The predicted noise level produced by construction traffic movements has been calculated using the methodology contained in BS5228-1:2009. Calculations have been undertaken using the proprietary noise modelling software Cadna/A.

8.62 It is assumed that there would be 5 delivery vehicles per hour delivering construction materials to the proposed development (10 movements) as a worst-case. It is assumed that all traffic would access the site from the A303 to the north.

8.63 The former Department of Transport document *Calculation of Road Traffic Noise* (CRTN, 1988) states that calculations of noise level for traffic flows below 50 vehicles per hour or 1000 vehicles per 18 hour day are unreliable and measurements should be taken when evaluating such cases. However, as the site is not yet operational, the noise generated by delivery vehicle movements has been predicted using the haul route method outlined in BS5228-1:2009. The impact of noise from delivery vehicle movements has been assessed against the existing ambient noise levels for the daytime only.

8.64 Table 8-5 shows the predicted noise level produced by delivery vehicle movements at the facility for the worst affected facade, i.e. the facade that faces Overton Road.

Table 8-5
Predicted Noise Levels from Construction Traffic Movements, dB

Location	Prediction Noise Level, $L_{Aeq,T}$
Western Farm	20.4
Travellers Rest	8.7
Brunel Close	8.3
The Boundary	19.0
New Road	7.9

8.65 The future ambient noise levels at the closest noise-sensitive receptors have been calculated by logarithmically adding the above total predicted noise levels to the existing ambient noise levels.

8.66 Table 8-6 compares the predicted future ambient noise levels with the impact scale adopted for this assessment.

Table 8-6
Predicted Ambient Noise Levels from Construction Traffic Movements free-field, $L_{Aeq,T}$ dB

Location	Ambient Noise Levels		Change	Impact
	Existing	Predicted		
Western Farm	58.6	58.6	0	None
Travellers Rest	58.1	58.1	0	None
Brunel Close	51.2	51.2	0	None
The Boundary	53.7	53.7	0	None
New Road	64.0	64.0	0	None

8.67 Table 8-6 shows that when assessed against the existing ambient noise levels the predicted noise levels generated by site-related construction traffic movements would have no impact at the receptors assessed.

8.68 Based on the above, mitigation measures are considered un-necessary.

OPERATIONAL ASSESSMENT

8.69 The operational noise effects associated with the proposed facility are anticipated to include the following:

- fixed plant on the site; and
- site-related vehicle movements.

8.70 There are no assessment methods that apply to all aspects of the operation of the site. BS4142 is applicable to the assessment of noise from fixed plant and there are no specific guidelines for the assessment of on-site vehicle movements. Mobile plant noise and site-related heavy goods vehicle

movements have been calculated using the haul route methodology detailed in BS5228-1:2009 and have been assessed against the existing ambient noise levels. In addition, the cumulative effect of both types of noise generating activities has again been considered against the existing ambient noise levels.

BS4142 Assessment – Facility Operations

8.71 An assessment has been carried out in accordance with the guidance contained in BS4142 to determine whether noise emissions from the fixed plant associated with the proposed facility are likely to give rise to complaints from occupants of the residential noise-sensitive receptors closest to the application site.

8.72 Details of the estimated internal reverberant noise levels for each area of the building used for this assessment are detailed in Appendix 8/5 and are based on data supplied by the technology provider or from assessments made of similar installations. Wherever possible, or available, octave band data has been used.

8.73 It is assumed that the plant would have some intermittent noise sources or noise sources that would be variable in nature, therefore an acoustic feature correction of +5dB has been added to the noise level to give a noise rating level, $L_{Ar,T}$.

8.74 Table 8-7 details the sound reduction index for the materials to be used for the construction of the proposed facility buildings.

Table 8-7
Sound Reduction Index of Proposed Building Materials, dB

Building Element	Frequency, Hz							
	63	125	250	500	1k	2k	4k	8k
Sheet Steel	3.0	8.0	14.0	20.0	24.0	28.0	32.0	37.0

8.75 For the purpose of this assessment it is assumed ventilation systems would be designed to achieve a similar sound reduction index as the main building wall materials. To represent a worst-case situation, it is also assumed that the roller shutter doors remain open at all times.

8.76 The predictions have been undertaken at heights of 1.5m and 4.0m to represent the height of ground and first-floor windows at all locations except Travellers Rest which is a bungalow.

8.77 BS4142 states:

"*A difference of around 10dB or higher indicates that complaints are likely. A difference of around 5dB is of marginal significance. A difference of -10dB is a positive indication that complaints are unlikely*".

8.78 The BS4142 assessment for Sunday is shown in Table 8-8 below.

Table 8-8
Sunday BS4142 Assessment, free-field, dB

Location	Period	Measured Background Noise Level, L_{A90}	Predicted Noise Rating Level, $L_{Ar,T}$	Difference
Western Farm	Daytime	51.6	39.0	-12.6
	Night-time	37.7	41.9	+4.2
Travellers Rest	Daytime	45.6	27.4	-18.2
	Night-time	33.5		-6.1
Brunel Close	Daytime	51.3	25.2	-26.1
	Night-time	39.2	26.9	-12.3
The Boundary	Daytime	51.2	29.8	-21.4
	Night-time	43.8	33.1	-10.7
New Road	Daytime	40.8	24.9	-15.9
	Night-time	32.5	26.1	-6.4

8.79 Table 8-8 indicates that, at weekends, the noise rating levels generated by the fixed plant at the proposed development would lead to:

- a situation where there is a positive indication that complaints would be unlikely at all locations during the daytime;
- a situation where there is a positive indication that complaints would be unlikely at Brunel Close and The Boundary during the night-time; and
- a situation between marginal significance and a positive indication that complaints would be unlikely at all other locations at night.

8.80 The table also shows that the predicted noise rating levels are below the measured background noise level at all times and locations with the exception of Western Farm during the night-time.

8.81 The midweek BS4142 assessment is shown in Table 8-9 below.

Table 8-9
Midweek BS4142 Assessment, free-field, dB

Location	Period	Measured Background Noise Level, L_{A90}	Predicted Noise Rating Level, $L_{Ar,T}$	Difference
Western Farm	Daytime	52.4	39.0	-13.4
	Night-time	37.3	41.9	+4.6
Travellers Rest	Daytime	45.0	27.4	-17.6
	Night-time	33.3		-5.9
Brunel Close	Daytime	47.7	25.2	-22.5
	Night-time	40.8	26.9	-13.9
The Boundary	Daytime	50.8	29.8	-21.0
	Night-time	40.9	33.1	-7.8
New Road	Daytime	40.9	24.9	-16.0
	Night-time	28.8	26.1	-2.7

8.82 Table 8-9 indicates that, during the week, the noise rating levels generated by the fixed plant at the proposed development would lead to:

- a situation where there is a positive indication that complaints would be unlikely at all locations during the daytime;
- a situation where there is a positive indication that complaints would be unlikely at Brunel Close during the night-time; and
- a situation between marginal significance and a positive indication that complaints would be unlikely at all other locations at night.

8.83 The table also shows that the predicted noise rating levels are below the measured background noise level at all times and locations with the exception of Western Farm during the night-time. However, it should be noted that the measured background noise level and predicted rating noise level at New Road are both considered very low and not within the scope of BS4142.

8.84 In order to reduce the likelihood of complaints at Western Farm during the night-time period it is suggested that the doors remain closed. The result of a night-time assessment with the doors closed is given in Table 8-10 below.

Table 8-10
Night-time BS4142 Assessment – Doors Closed, free-field, dB

Location	Period	Measured Background Noise Level, L_{A90}	Predicted Noise Rating Level, $L_{Ar,T}$	Difference
Western Farm	Sunday	37.7	33.4	-4.3
	Midweek	37.3		-3.9
Travellers Rest	Sunday	33.5	21.0	-12.5
	Midweek	33.3		-12.3
Brunel Close	Sunday	39.2	22.4	-16.8
	Midweek	40.8		-18.4
The Boundary	Sunday	43.8	27.9	-15.9
	Midweek	40.9		-13.0
New Road	Sunday	32.5	21.6	-10.9
	Midweek	28.8		-7.2

8.85 Table 8-10 shows that with the doors closed the night-time noise rating levels lead to:

- a situation where there is a positive indication that complaints are unlikely at Travellers Rest, Brunel Close and The Boundary on Sunday and during the week;
- a situation where there is a positive indication that complaints would be unlikely at New Road on Sunday; and
- a situation between marginal significance and a positive indication that complaints are unlikely at all other receptors and periods.

8.86 Table 8-10 also shows that with the doors closed at night, noise rating levels are below the measured background noise level at all locations.

8.87 Based on the above results, if the doors remain closed during the night-time, no further mitigation measures are considered necessary.

Site-related Traffic Movements

8.88 The predicted noise level produced by on-site heavy goods vehicle movements has been calculated using the methodology contained in BS5228:2009. Calculations have been undertaken using the proprietary noise modelling software Cadna/A.

8.89 There would be 102 haulage vehicle movements and 34 light vehicles movements at the site per day and that these movements would be spread evenly over the core working day (08:00 to 18:00 hours), i.e. approximately 10 and 4 movements per hour respectively. There are no vehicle movements envisaged during the night-time.

8.90 It is assumed that all traffic would access the site from the A303 to the north.

8.91 The former Department of Transport document *Calculation of Road Traffic Noise* (CRTN, 1988) states that calculations of noise level for traffic flows below 50 vehicles per hour or 1000 vehicles per 18 hour day are unreliable and measurements should be taken when evaluating such cases. However, as the facility is not yet operational, the noise generated by vehicle movements has been predicted using the haul route method outlined in BS5228:2009. The impact of noise from haulage and light vehicles has been assessed against the existing ambient noise levels for the daytime only.

8.92 Table 8-11 shows the predicted noise levels produced by site related traffic movements at the site for the worst affected facade, i.e. the facade that faces Glenside Road.

Table 8-11
Predicted Noise Levels from Site-related Traffic Movements, dB

Location	Prediction Noise Level, $L_{Aeq,T}$
Western Farm	36.0
Travellers Rest	25.6
Brunel Close	24.8
The Boundary	35.4
New Road	25.2

8.93 The future ambient noise levels at the closest noise-sensitive receptors have been calculated by logarithmically adding the above total predicted noise levels to the existing ambient noise levels. Table 8-12 compares the predicted future ambient noise levels with the impact scale adopted for this assessment.

Table 8-12
Predicted Ambient Noise Levels from Site-related Traffic Movements free-field, $L_{Aeq,T}$ dB

Location	Period	Ambient Noise Levels		Change	Impact
		Existing	Predicted		
Western Farm	Sunday	58.0	58.0	0	None
	Midweek	58.6	58.6	0	None
Travellers Rest	Sunday	56.5	56.5	0	None
	Midweek	58.1	58.1	0	None
Brunel Close	Sunday	54.2	54.2	0	None
	Midweek	51.2	51.2	0	None
The Boundary	Sunday	56.1	56.1	0	None
	Midweek	53.7	53.8	+0.1	Minor
New Road	Sunday	51.5	51.5	0	None
	Midweek	64.0	64.0	0	None

8.94 Table 8-12 shows that when assessed against the existing ambient noise levels the predicted noise levels generated by site-related traffic movements would have a minor, barely perceptible, impact at The Boundary with no impact at the other receptors assessed.

8.95 Based on the above, mitigation measures are considered unnecessary.

MITIGATION MEASURES

Construction Noise

8.96 The assessment of construction noise has shown that the adopted criterion is unlikely to be exceeded at the nearby noise-sensitive receptors. However, several safeguards exist to minimise the effects of construction noise and these will apply during the construction of the proposed development infrastructure. The safeguards include:

- the various EC Directives and UK Statutory Instruments that limit noise emissions of a variety of construction plant; and
- guidance set out in BS5228-1:2009, that covers noise control on construction sites.

8.97 The precise noise mitigation measures to control noise from the construction works may require the agreement of the local authority prior to the works starting. Generic measures below are given to illustrate the range of techniques available.

8.98 The adoption of Best Practicable Means is usually the most effective means of controlling noise from construction sites. In addition, the following measures should be considered, where appropriate:

- phasing the works to maximise the benefit from perimeter structures;
- any compressors brought on to site should be silenced or sound reduced models fitted with acoustic enclosures;
- all pneumatic tools should be fitted with silencers or mufflers;
- any deliveries should be programmed to arrive during daytime hours only. Care should be taken when unloading vehicles to minimise disturbance to local residents. Delivery vehicles should be prohibited from waiting within the site with their engines running;
- all plant items should be properly maintained and operated according the manufacturers' recommendations in such a manner as to avoid causing excessive noise. All plant should be sited so that the noise impact at nearby noise-sensitive properties is minimised;
- local hoarding, screens or barriers should be erected as necessary to shield particularly noisy activities; and
- problems concerning noise from construction works can sometimes be avoided by taking a considerate and neighbourly approach to relations with local residents. Works should not be undertaken outside if the hours agreed with the local authority.

8.99 Experience from other sites has shown that by implementing these measures, typical noise levels from construction works can be reduced by 5dB(A) or more.

8.100 As construction works are temporary and noise levels have been calculated for a worst-case situation it is considered that no further mitigation measures are necessary.

Construction Traffic Noise

8.101 An assessment has been made of the likely impact of construction traffic movements on the ambient noise climate in the area in accordance with the draft *Guidelines for Noise Impact Assessment*.

8.102 The assessment has shown that noise generated by construction traffic movements would have no impact at the receptor locations assessed.

8.103 Therefore no mitigation measures are considered necessary.

Operational Noise

8.104 An assessment of operational noise from the proposed facility has been made to the nearest noise-sensitive receptors in accordance with the guidance contained in BS4142:1997.

8.105 The assessment with the doors open has shown that:

- during Sunday and weekday daytime periods, the predicted noise rating levels would lead to a situation where there is a positive indication that complaints would be unlikely at all locations;
- during Sunday night-time periods, the predicted noise rating levels would lead to a situation between marginal significance and complaints unlikely at all locations with the exception of Brunel Close and The Boundary where there would be a situation where there is positive indication that complaints would be unlikely; and
- during midweek night-time periods, the predicted noise rating levels would lead to a situation between marginal significance and complaints unlikely at all locations with the exception of Brunel Close where there would be a situation where there is positive indication that complaints would be unlikely.

8.106 In order to mitigate the likelihood of complaints all doors at the facility would remain closed at night.

Site-related Traffic Movements

8.107 An assessment against the existing ambient noise levels at the nearby noise-sensitive properties has been undertaken for site-related traffic movements associated with the proposed development. The assessment has shown that

there would be a minor, barely perceptible, impact at Western Farm and The Boundary and no impact at the other receptor locations assessed.

CONCLUSIONS

The assessment has considered both the potential for the construction and operational proposals to give rise to noise impacts at the closest noise-sensitive receptors.

8.108 The assessment has found that:

- construction noise levels are predicted to be well below the 70dB criterion adopted for this assessment at all receptors;
- when assessed against the existing ambient noise levels construction traffic movements would have no impact at any other receptor locations assessed;
- the BS4142 assessment has shown that the worst-case operational noise rating levels generated by the proposed facility, with the doors open, would lead to a situation between marginal significance and complaints unlikely during the night-time. In order to mitigate the likelihood of complaints it has been suggested that all doors at the facility remain closed at night; and
- when assessed against the existing ambient noise levels site-related operational traffic movements would have a minor, barely perceptible, impact at The Boundary with no impact at any other receptor locations assessed.

8.109 Based on the results of the assessment, noise should not pose a material constraint for the proposed development.