

ADVISORY

Wilson Bowden Developments Ltd
Plot Q, Kingsway Business Park
Rochdale
Noise Assessment

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Noise Assessment

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EXECUTIVE SUMMARY

This Noise Assessment has been undertaken on behalf of Wilson Bowden Developments Ltd for a warehouse distribution/production unit with first floor office and core facilities at Plot Q, Kingsway Business Park, Rochdale.

The results of the noise assessment indicate that the operational noise levels predicted at the nearest noise sensitive receptors to the proposed development would be within the limits in overarching Condition 23.

The assessment of noise impact from the car park usage indicates that, at the worst affected receptors, there is not likely to be an adverse impact from this noise.

The assessment also considers development generated road traffic noise on the surrounding road network in accordance with the general principles from DMRB and predicts a 'minor' impact.

Appropriate noise level limits have been set for fixed plant items in accordance with BS 4142:2014 and the requirements of Condition 23.

Based on the results of the assessment, it has been demonstrated that noise from the proposed development is not likely to adversely impact the nearest sensitive receptors. It is therefore considered that noise need not be a determining factor in the granting of full planning approval for the Site.

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1. INTRODUCTION

Background

- 1.1 This Noise Assessment has been undertaken on behalf of Wilson Bowden Developments Ltd for a warehouse distribution/production unit with first floor office and core facilities at Plot Q, Kingsway Business Park, Rochdale. The wider Kingsway Business Park is subject to outline planning permission (planning reference: 14/00542/OUT).
- 1.2 A self-contained full planning permission is sought for the Site. However, for the purposes of this assessment, noise related conditions associated with the outline permission for the Site have been considered. This has been undertaken based on the previous limits and guidance contained within relevant British Standards relating to noise.
- 1.3 Where appropriate, consideration has been given to noise mitigation measures to demonstrate how an appropriate level of protection could be afforded to future noise sensitive receptors on the Site.
- 1.4 This report is necessarily technical in nature, so to assist the reader, a glossary of acoustic terminology can be found in **Appendix 1**.

Site Setting

- 1.5 The Site is located off Michael Faraday Avenue in Rochdale and comprises Plot Q of the wider Kingsway Business Park. The Site currently generally comprises scrub and grassland. To the north, the Site is bound by Michael Faraday Avenue with undeveloped land, Metrolink line and residential dwellings beyond. Land to the east and west are as yet undeveloped plots of the wider business park. The south of the Site is bound by open land, with JD Sports Kingsway Distribution Centre beyond.
- 1.6 The location of the Site is shown in **Figure 1.1**.

Figure 1.1: Location Plan



Noise-Sensitive Receptors

- 1.7 Noise from any proposed sources will be assessed at nearby existing noise sensitive receptors (NSRs). The nearest existing NSR is located to the north-east, off Turbary Walk, and is detailed below in **Table 1.1** and shown in **Figure 1.2**.

Table 1.1: Existing Noise Sensitive Receptors

NSR Number	Description	Grid Reference		Bearing from Site	Approx. Distance from Site Boundary
		Easting	Northing		
1	Residential dwellings off Turbary Walk	391975	412747	North	190 m
2	Residential dwellings off Buckley Hill Lane	392147	412333	East	200 m
3	Residential dwellings on Jones Way	391539	412629	West	270 m

- 1.8 Noise generated within the Site may be experienced at other receptors; however, given the greater distance to these, any impact is likely to be less than at those stated above.

Figure 1.2: Noise Sensitive Receptor Locations



Existing Planning Permission

- 1.9 Plot Q already has outline planning permission for development (application ref: 14/00542/OUT). This permission allows for development across the Site in accordance with approved parameter plan (drawing ref: 2013-233/102revA) and is subject to several conditions. Condition 23 of planning permission 14/00542/OUT relates to noise emissions and states:

“23). Noise emitted from any building within the Site or from anything attached to any building or from plant and machinery used in connection with any building shall not exceed:

a) 58dB(A) L_{eq} (15 min.) between 0700 hours and 2300 hours and 48 dB(A) L_{eq} (5 min.) at any other time as measured at the facade of any noise sensitive property (or 55dB(A) L_{eq} (15 min.) and 45 dB(A) L_{eq} (5min.) as free field measurements within the curtilage of any noise sensitive building) outside the

boundaries of the Site and to the south of the line A-A (or its linear projection) shown on the Council's plan titled "Noise Control Plan"- condition 23, or within the boundary of the Site and to the south of the line A-A.

b) 52 dB(A) L_{eq} (15 min) between the hours of 0700 and 2300 and 48 dB(A) L_{eq} (5 min) at any other time as measured at the façade of any noise sensitive property, (or 49 dB(A) L_{eq} (15 min) and 45 dB(A) L_{eq} (5 min) as free field measurements within the curtilage of any noise sensitive building) outside the boundaries of the Site and to the north of the line A-A (or its linear projection) and to the south of the line B-B (or its linear projection) shown on the Council's plan titled "Noise Control Plan"- condition 23, or within the boundary of the Site, and to the north of the line A-A and to the south of the line B-B.

c) 51 dB(A) L_{eq} (15 min) between the hours of 0700 and 2300 and 45 dB(A) L_{eq} (5 min) at any other time as measured at the façade of any noise sensitive property (or 48 dB(A) L_{eq} (15 min) and 42 dB(A) L_{eq} (5 min) as free field measurements within the curtilage of any noise sensitive building) outside the boundaries of the Site, and to the north of line B-B (or its linear projection) and to the south of line C-C (or its linear projection) shown on the Council's plan titled "Noise Control Plan"- condition 23, or within the boundary of the Site and to the north of the line B-B and to the south of the line C-C.

d) 48 dB(A) L_{eq} (15 min) between the hours of 0700 and 2300 and 43 dB(A) L_{eq} (5 min) at any other time as measured at the façade of any noise sensitive property (or 45 dB(A) L_{eq} (15 min) and 40 dB(A) L_{eq} (5 min) as free field measurements within the curtilage of any noise sensitive building) outside the boundaries of the Site and to the north of the line C-C (or its linear projection) shown on Council's plan titled "Noise Control Plan"- condition 23, or within the boundary of the Site and to the north of the line C-C.

For the purposes of this condition, line A-A is from the rear of 13 Verdant Way to the rear of 66A Ashfield Lane, line B-B is from Turf Hill Community Centre to the point where the path to the rear of 67 Beechfield Road crosses the boundary of the Site and line C-C is from the junction of Stiups Lane with Turf Hill Road to the junction of Knowl Road with Princess Road.

A noise sensitive property is defined as any occupied residential unit or similar property or school classroom, except insofar as the element of the condition which relates to the curtilage of the noise sensitive building shall not include any curtilage of any classroom.

Reason: In the interests of the amenity of the area, and in particular that of the nearest neighbouring residents and to prevent nuisance in accordance with policies EC/7-Kingsway Business Park and EM/3-Noise and New Development, of the Council's adopted Unitary Development Plan."

- 1.10 In summary, Condition 23 requires that 'noise emitted from any building within the Site or anything attached to any building or from plant and machinery used in connection with any building' shall not exceed prescribed noise limits, which vary depending on the location.

- 1.11 The stated noise limits and location zoning are shown in **Appendix 2**. It should be noted that "South of BB & north of AA" is incorrectly labelled as "South off CC & north of BB", in the published plan.

Proposed Development

- 1.12 The proposed development comprises a warehouse distribution/ production unit with first floor office and core facilities.

2. STANDARDS AND GUIDANCE

National Planning Policy Framework (NPPF)

- 2.1 Published in December 2024, this document sets out the Government's planning policies for England. It makes the following reference to noise in the section entitled Conserving and enhancing the natural environment:

"187. 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."

- 2.2 It also makes the following references to noise in the Section entitled Ground conditions and pollution:

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

a) mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life⁷²;

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.

⁷² See Explanatory Note to the Noise Policy Statement for England (Department for Environment, Food & Rural Affairs, 2010)."

BS 4142: 2014+A1:2019 Methods for Rating and Assessing Industrial and Commercial Sound

- 2.3 The BS 4142 Standard describes methods for rating and assessing the following:

- Sound from industrial and manufacturing processes;
- Sound from fixed installations which comprise mechanical and electrical plant and equipment;
- Sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train movements on or around an industrial and/or commercial site.

- 2.4 The methods use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident. The Standard advises the purpose of the methodology includes the assessment of sound from any plant and activities associated with existing industrial and/or commercial uses at proposed residential dwellings.
- 2.5 If appropriate, the specific sound level of the source ($L_{Aeq,T}$) is corrected, by the application of one or more corrections for acoustic features such as tonal qualities and/or distinct impulses, to give a 'rating' level ($L_{Ar,Tr}$). The Standard effectively compares and rates the difference between the rating level of the specific sound and the typical background sound level ($L_{A90,T}$) in the absence of the specific sound.
- 2.6 The Standard advises that the time interval ('T') of the background sound measurement should be sufficient to obtain a representative or typical value of the background sound level at the time(s) the source in question operates or is proposed to operate in the future.
- 2.7 Comparing the rating level with the background sound level, BS 4142 states:

"Typically, the greater this difference, the greater the magnitude of impact.

A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."

World Health Organisation (WHO) 1999: Guidelines for Community Noise

- 2.8 The World Health Organisation (WHO) guidance: 1999: Guidelines for community noise. This document draws upon guidance from Vallet and Vernay, which states:

"For good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB L_{AFmax} more than 10-15 times per night".

The Design Manual for Roads and Bridges (DMRB): LA111 Noise and Vibration (Revision 2)

- 2.9 This document sets out procedures for undertaking the environmental assessment of new road schemes, including the assessment of noise impacts from road traffic. In particular, it describes a method for assessing the severity of a noise impact, in terms of the number of people who will be bothered by any noise increases/decreases due to a new road scheme. When undertaking a DMRB assessment, the methodology contained within the Department for Transport 1988 document Calculation of Road Traffic Noise (CRTN) should be used to calculate levels of road traffic noise.

- 2.10 Although the DMRB strictly applies to new road schemes, the principles of the approach contained within the document can also be applied to the assessment of noise from road traffic in general. The proposed development has the potential to affect road traffic noise levels along existing roads, hence there is a need for such an assessment.
- 2.11 The DMRB assessment methodology suggests that the magnitude of noise changes from a project should be classified into levels of impact. LA111 considers how the magnitude of change can be affected by whether a noise level change occurs in the short term (e.g., as a result of a sudden opening of a scheme), or in the long term (e.g., gradually over time, such as that associated with natural traffic growth).
- 2.12 The example classification scale for short term changes, which is the most stringent, is presented in **Table 2.1** below:

Table 2.1: Classification of Magnitude of Noise Impacts in the Short Term

Noise Change, dB LA10, 18h	Magnitude of Impact
0	No Change
0.1 to 0.9	Negligible
1.0 to 2.9	Minor
3.0 to 4.9	Moderate
5.0+	Major

3. ASSESSMENT

- 3.1 In accordance with Outline Planning Condition 23, **Table 3.1** summarises the cumulative operational noise limits at the façade of each receptor.

Table 3.1: Summary of Cumulative Operational Noise Limits at Receptors

NSR Number	Description	Condition 23 Zone	Operational Noise Limit at Façade of NSR	
			Daytime (07:00 – 23:00)	Night-time (23:00 – 7:00)
1	Residential dwellings off Turbary Walk	South of C-C & North of B-B	51 dB LAeq,15min	45 dB LAeq,5min
2	Residential dwellings off Buckley Hill Lane			
3	Residential dwellings on Jones Way	North of C-C	48 dB LAeq,15min	43 dB LAeq,5min

Noise Source Study

HGV Movements

- 3.2 **Table 3.2** presents noise measurement data for an HGV pass-by, to represent HGVs travelling along the Site access road.

Table 3.2: Summary of Historic HGV pass-by Noise Data used in Assessment

Source	Measurement Distance (m)	Measurement Duration (s)	Measured Sound Pressure Level	
			dB, LAeq,T	dB, LAf,max
HGV Pass-by	8	16	74	78

- 3.3 **Table 3.3** shows the calculated level of noise from the Site access road during the daytime and night-time, using the data from **Table 3.2** and correcting for an on-time based on the number of pass-bys. "On-time" is defined as the amount of time that a noise source is operating during the assessment period. The number of pass-bys are based on BWB transport consultant data for a worst-case B8 use class scenario (acoustically in terms of HGV movements).
- 3.4 The worst-case hourly number of 12 HGV movements has been used to derive a total of 4 HGV movements during a typical worst-case 15-minute daytime assessment period ; whilst the worst-case night-time hourly number of 8 HGV movements has been used to derive a total of 2 HGV movement during a typical worst-case 5-minute night-time assessment period.

Table 3.3: Calculation of Specific Sound Level from the Access Road HGV Movements

Period	Individual 16 Second Movement, 10 m Distance	Number of Vehicle Movements	Sound Pressure Level of Access Road at 10m $L_{Aeq,1hr}$
Worst-case daytime 15-min period (07:00 – 23:00)	74 dB $L_{Aeq,T}$	4	63
Worst-case night-time 5-min period (23:00 – 07:00)		2	64

Delivery Activities

- 3.5 Loading/unloading and HGV movements have been included in the noise model using noise data from a library of historical measurement data, which has been collected during surveys undertaken at similar developments as shown in **Table 3.4**.

Table 3.4: Summary of Historic HGV Delivery Data used in Assessment

Source	Measurement Distance (m)	Measurement Duration (mins)	Measured Sound Pressure Level (dB, $L_{Aeq,T}$)
HGV Delivery	10	46	60

- 3.6 The noise levels used within the assessment are presented in **Table 3.5** for each period.

Table 3.5: Summary of Historic Loading and Unloading Noise Data Used in the Assessment – Entry Level Door

Description	Time	$L_{Aeq,T}$ at 10m (dBA)
Daytime (0700-2300)		
HGV Delivery including arriving/departing, impact noise and cargo being wheeled	15 minutes	60
Night-time (2300-0700)		
HGV Delivery including arriving/departing, impact noise and cargo being wheeled	5 minutes	60

- 3.7 **Table 3.6** details the octave band sound power levels that have not included for the above sources.

Table 3.6: Summary of HGV Operations Used in Assessment

Source	Octave Band Sound Pressure Levels (SWL dB)							
	63 Hz	125 Hz	250 Hz	500 Hz	1kHz	2kHz	4kHz	8kHz
HGV Passby	107	94	97	93	93	92	89	82
Delivery noise – Entry level door	88	85	83	83	85	79	73	67

3.8 Using the data summarised within **Table 3.2** to **Table 3.6**, the following noise inputs have been converted into sound power levels assuming line source and point source attenuation respectively, and subsequently included within the model as described below:

- HGV movements have been included in the model as a line source at a height of 1.5m using the calculated sound pressure level in **Table 3.3**.
- HGV deliveries have been included in the model as point sources at a height of 1.5m using the time-corrected sound pressure Level in **Table 3.3**. Based on HGV arrival data provided by the BWB transport consultant, the assessment will assume 6 HGV delivery activities during a worst-case daytime 15-minute assessment period; and 2 HGV deliveries during a worst-case night-time 5-minute assessment period.

Noise Model

3.9 In order to predict the noise levels from the proposed development Site at the NSRs, a detailed acoustic model of the Site has been generated using the PC based CadnaA® noise modelling package, applying the following prediction methodology:

- For industrial/commercial noise sources, the noise model was set to apply the noise prediction methodology set out in ISO 9613-2:2024 Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation¹.
- Mapping of the Site and the surrounding area was calibrated into the noise model based on known Ordinance Survey grid reference points.
- Topographical data for the ground levels across the proposed development and surrounding area, obtained from LIDAR data of 1m resolution, publicly available from the Department for Environment Food and Rural Affairs (DEFRA).
- To reflect the local ground cover, ground absorption was set to $G = 0.5$ (50% acoustically absorptive ground).
- The model was set to include second order reflected noise from solid structures.
- The Site layout has been incorporated into the noise model in order to account for screening that is provided by the development itself.
- Off-Site buildings which would provide screening to the Site have been incorporated as reflective façades.

¹ International Organization for Standardization (2024), ISO 9613-2:2024, Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation

- 3.10 Noise contour maps have been generated in outdoor living areas at heights of 1.5 m and 4 m for the daytime and night-time respectively. The resultant daytime and night-time specific sound levels are presented in **Figure 3.1** and **Figure 3.2**.

Figure 3.1: Daytime Noise Contours of Specific Sound Levels at 1.5 m Above Ground

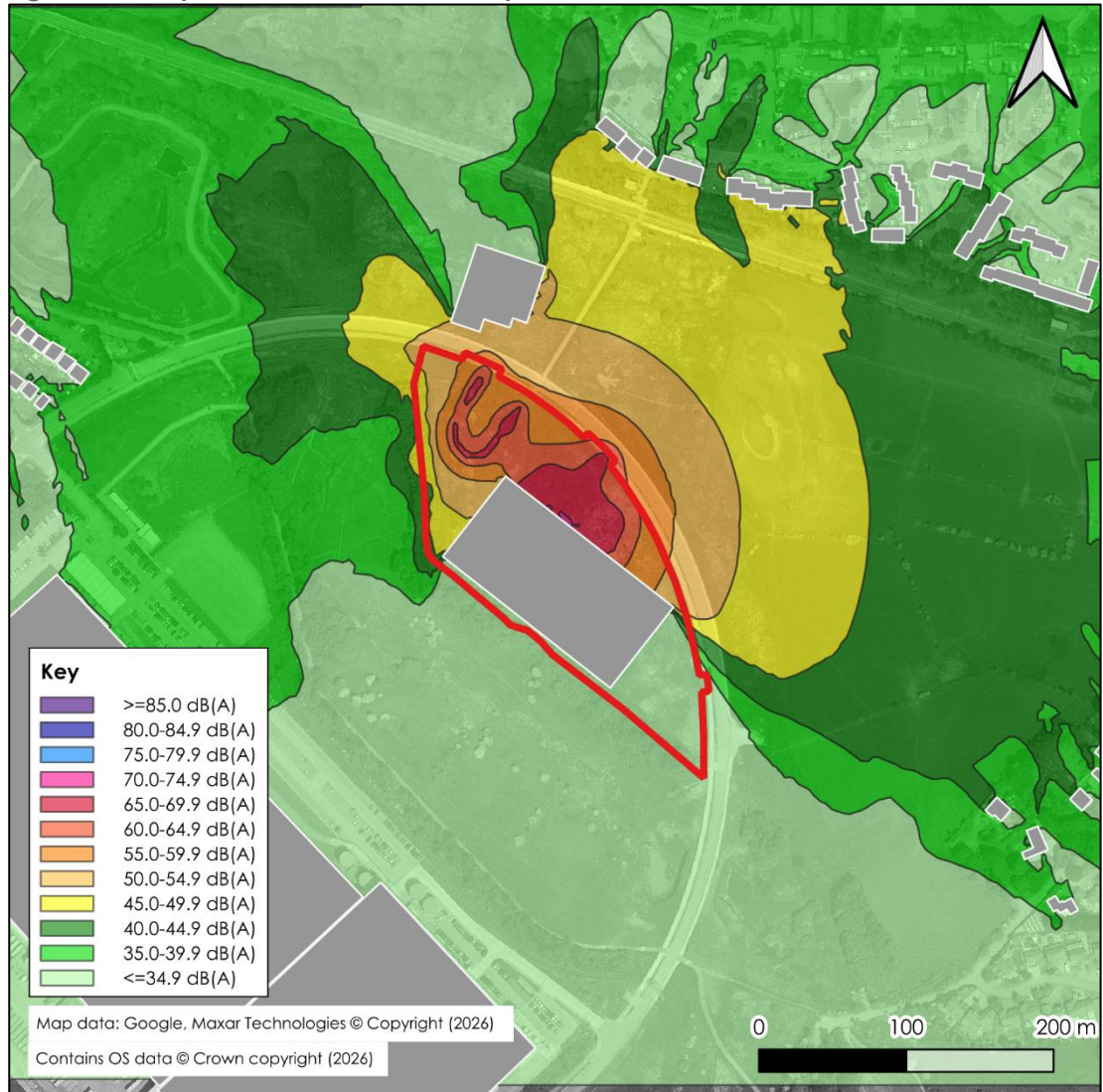
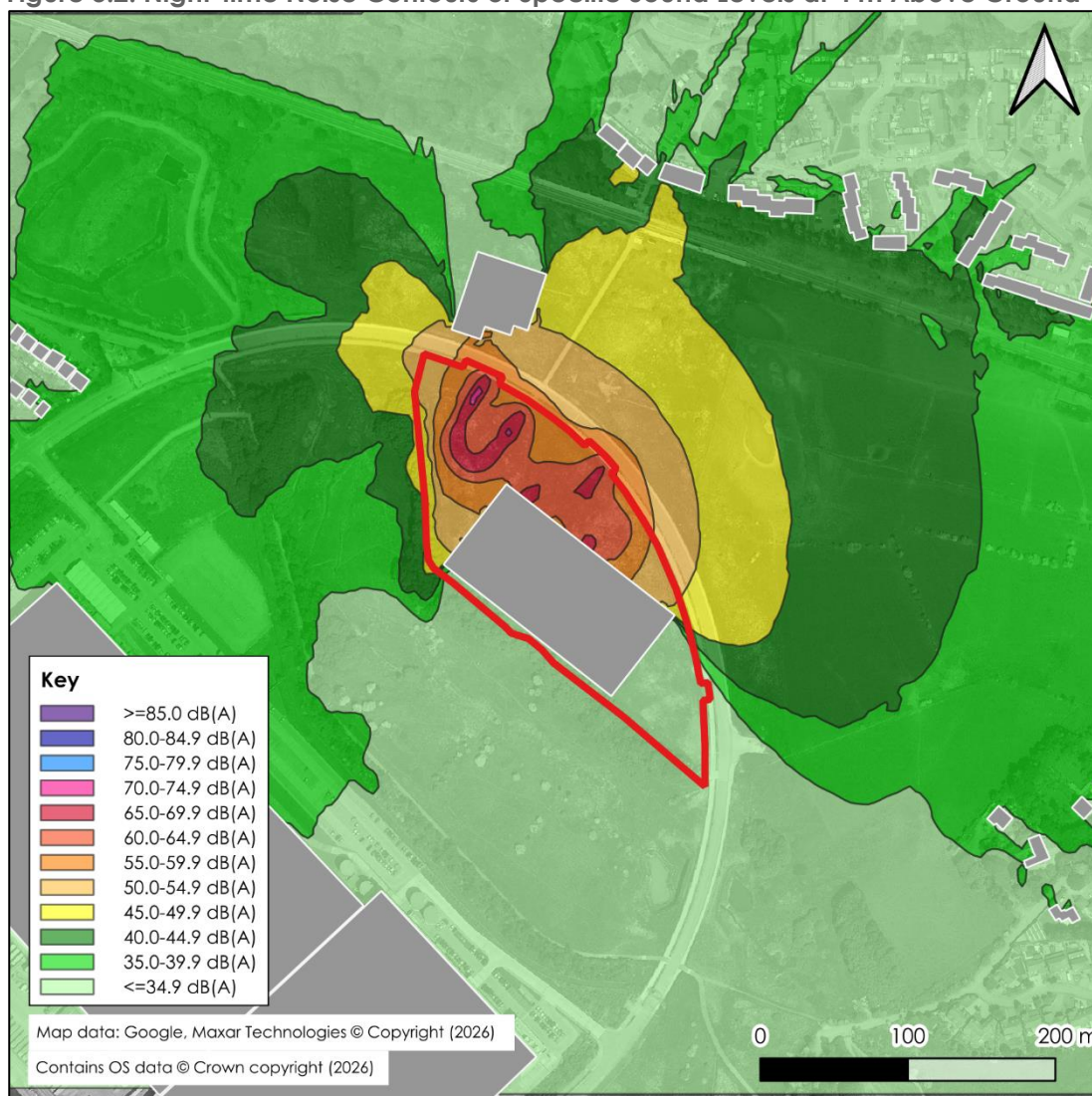


Figure 3.2: Night-time Noise Contours of Specific Sound Levels at 4 m Above Ground



3.11 The specific sound levels at the NSR have been calculated at the façade of each NSR for each assessment period. The calculated levels due to operational noise during each period are presented in **Table 3.7**.

Table 3.7: Predicted Specific Sound Level at NSRs, dB $L_{Aeq,T}$

NSR	Daytime (07:00 – 23:00) dB $L_{Aeq,15min}$	Night-time (23:00 – 07:00) dB $L_{Aeq,5min}$
1	47	44
2	39	37
3	36	37

Assessment of Impact from Operational Noise

Comparison with Condition 23

- 3.12 The predicted specific sound levels at all NSRs have been assessed in accordance with BS 4142 and the requirements of Condition 23, as summarised in **Table 3.8** to **Table 3.10**.

Table 3.8: BS 4142 Assessment of Impact at NSR 1

Description	NSR 1	
	Daytime (07:00 – 23:00)	Night-time (07:00 – 23:00)
Specific sound level, dB L _{Aeq,T}	47	44
Condition 23 Criterion dB L _{Aeq,T}	51	45
Excess	-4	-1
Achieved?	✓	✓

Table 3.9: BS 4142 Assessment of Impact at NSR 2

Description	NSR 2	
	Daytime (07:00 – 23:00)	Night-time (07:00 – 23:00)
Specific sound level, dB L _{Aeq,T}	39	37
Condition 23 Criterion dB L _{Aeq,T}	51	45
Excess	-12	-8
Achieved?	✓	✓

Table 3.10: BS 4142 Assessment of Impact at NSR 3

Description	NSR 3	
	Daytime (07:00 – 23:00)	Night-time (07:00 – 23:00)
Specific sound level, dB L _{Aeq,T}	36	37
Condition 23 Criterion dB L _{Aeq,T}	48	43
Excess	-12	-6
Achieved?	✓	✓

- 3.13 It is noted that a parcel of land to the east of the development (Plot X) is allocated for residential development, subject to planning consent. **Figure 3.3** and **Figure 3.4** show the predicted noise contours with indicative Plot X residential parcel overlaid, for day and night-time periods respectively.

Figure 3.3: Indicative Plot X Residential Parcel Noise Contours – Daytime

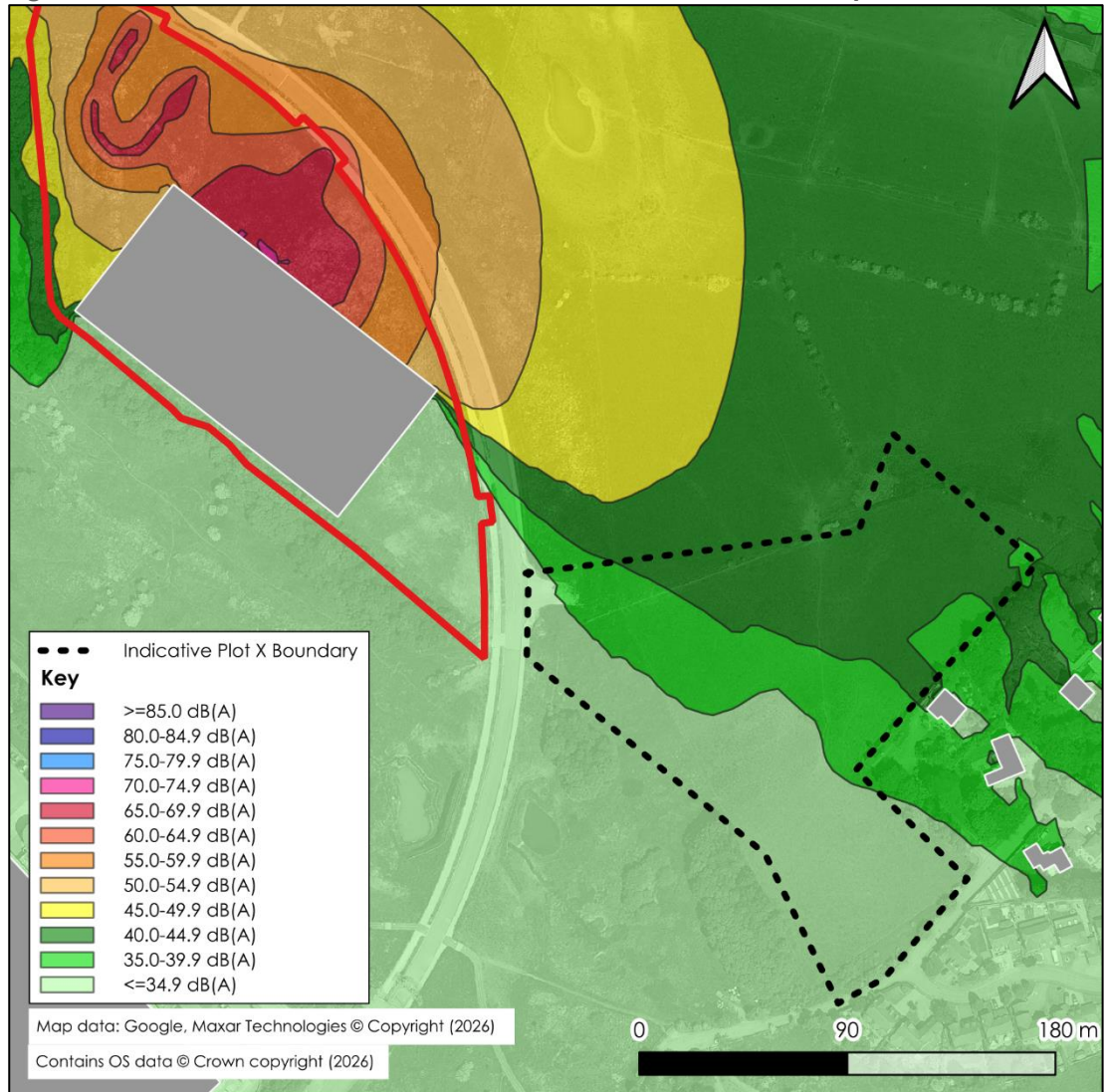
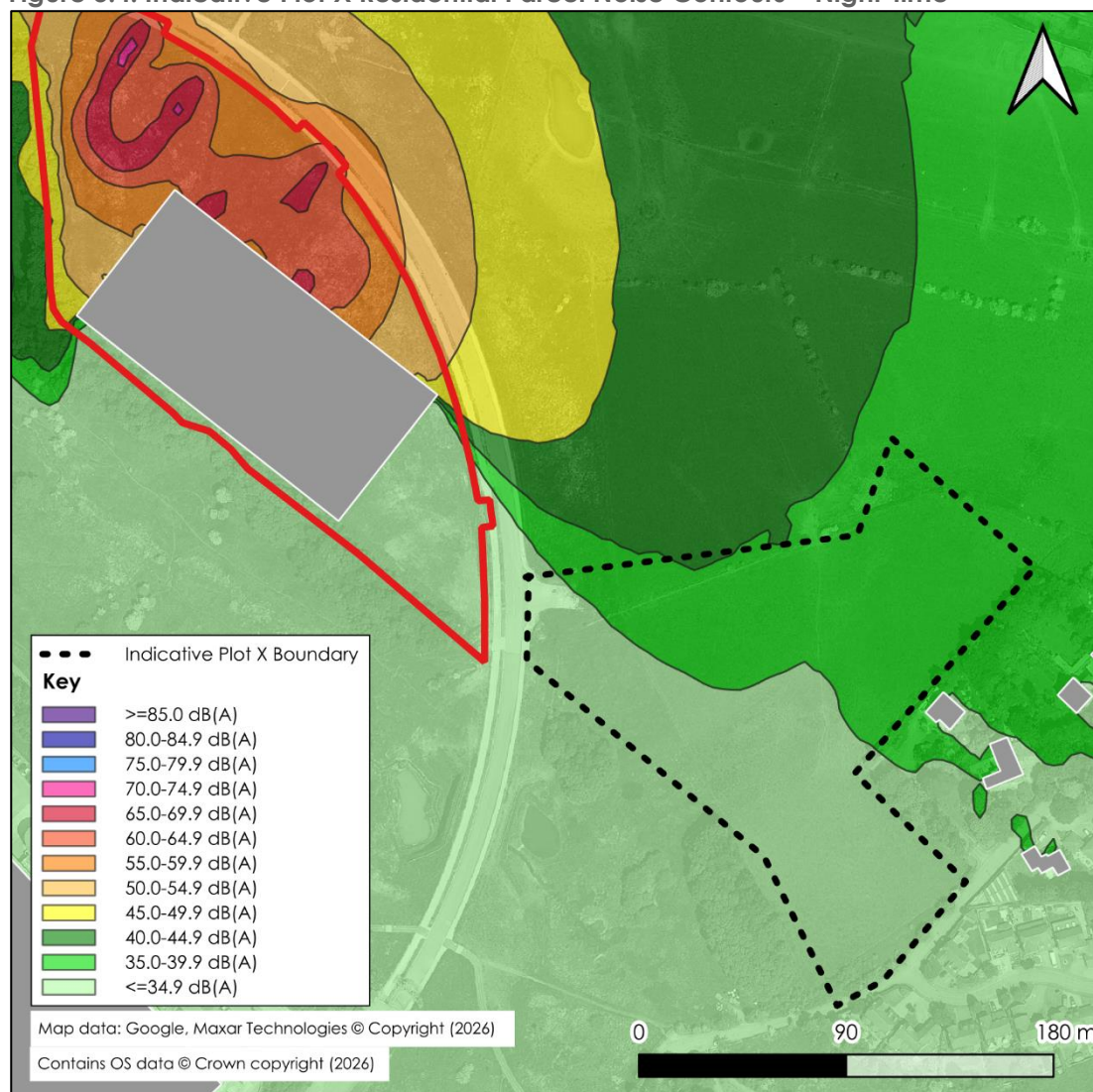


Figure 3.4: Indicative Plot X Residential Parcel Noise Contours – Night-time



3.14 It can be seen that worst-case predicted noise levels within the Plot X parcel are 40 – 45 dB $L_{Aeq,16h}$ during the day, and 35 – 40 dB $L_{Aeq,8h}$ at night. These noise levels comply with Condition 23 criteria for Zone B-B.

3.15 The assessments in **Table 3.8** to **Table 3.10**, in addition to consideration to the allocated Plot X residential parcel, demonstrate that Condition 23 criteria are met at all receptors during all periods of proposed operation. As such, consideration to mitigation is not warranted.

Noise from the Car Park

3.16 The car park associated with Plot Q is noted as being approximately 200m from the nearest sensitive receptor (NSR 2, residential dwellings off Buckley Hill Lane). Given the number of car parking spaces, and the intervening distance, it is considered unlikely that energy-averaged noise levels ($L_{Aeq,T}$) would result in impacts at the nearest sensitive receptors.

- 3.17 However, noise from individual events within the car park (e.g. car doors slamming) require further consideration, particularly during the more sensitive night-time period when occupants of nearby NSRs may be subject to sleep disturbance. Such events are assessed in terms of the $L_{A_{Fmax}}$ noise parameter during the night-time period (23:00 to 07:00) in accordance with the guidance set out in the WHO Guidelines for Community Noise.
- 3.18 Based on a typical noise level of 72 dB $L_{A_{Fmax}}$ for a car door slamming, measured at a distance of 10m, the resulting noise level at a distance of 200 m away (i.e. the distance to the location of NSR 2) is predicted to be 46 dB $L_{A_{Fmax}}$. This is predicted using the distance attenuation correction for a point source.
- 3.19 Based on the assumption that a partially open window provides 15 dB of noise attenuation, this corresponds to an internal maximum noise level of 31 dB from car door slamming events at Plot Q.
- 3.20 This is significantly below the recommended upper limit of 45 dB set out in the WHO guidance. It should also be noted that this assessment is based on a car door slamming at the nearest possible distance within the car park with no screening. The majority of parking spaces are located a greater distance away from NSR2, and consequently, would be exposed to noise levels which are further reduced.

Development Generated Road Traffic

- 3.21 An increase in road traffic due to the proposed development has the potential to increase the noise levels at NSRs in the vicinity of the Site.
- 3.22 Traffic data was provided by the BWB transport consultant as 18-hour Annual Average Weekday Traffic (AAWT). The traffic data was provided for the following scenarios:
- Opening Year – Base; and,
 - Opening Year – Base + proposed development.
- 3.23 The Basic Noise Level (BNL), as referenced in the Calculation of Road Traffic (CRTN), has been calculated for the roads nearest to the NSRs, to predict the change in noise level between opening year with and without the development for both B2 and B8 use scenarios. The B8 use scenario has been found to be worst-case with regards to noise due to the higher HGV composition of generated traffic.
- 3.24 The results of the traffic assessment have been used as the basis for determining the change in road traffic noise levels that would result from development generated traffic.
- 3.25 Road traffic noise calculations have been carried out in accordance with CRTN, and have been undertaken for a notional receptor location 10m from the edge of the carriageway of each road considered, and 1.5m above ground level. A notional receptor has been used because the change in traffic noise level adjacent to any given road will be the same at all distances where noise from that route is dominant. Traffic noise calculations have been undertaken to establish the change in the weekday daytime $L_{A10,18h}$ noise level.

- 3.26 To quantify any potential short-term impacts, calculations have been undertaken for the opening year both with and without the proposed development. Road traffic speeds have been applied based on information provided by the BWB transport consultant. The results are presented in **Table 3.11**.

Table 3.11: Opening Year Road Traffic BNLs (B8 Scenario), Daytime 18-hour, dB(A)

Road Link	No Development, BNL	With Development, BNL	Change in Noise Level Due to Proposed Development
Michael Faraday Avenue	62.8	64.3	+1.5

- 3.27 For the road links assessed in the opening year, there is predicted to be up to a +1.5 dB increase in noise level due to development generated traffic. In accordance with DMRB, this is therefore likely to result in a minor impact during the daytime as a result of the additional road traffic in the short term.
- 3.28 Based on the above, no further consideration of mitigation is considered warranted at this time.

Noise from Fixed Plant

- 3.29 It is anticipated that there will be additional fixed plant and equipment associated with the proposed development that may have the potential to generate noise. However, the exact locations and selections of fixed external plant are not defined.
- 3.30 In the absence of detailed information, it is appropriate to specify suitable noise control limits to which any plant should conform. These limits should include any appropriate corrections for acoustic characteristics, in accordance with BS 4142.
- 3.31 Noise from fixed plant is considered for the area between A-A and B-B, as receptors further afield (i.e. in the zoning areas beyond this) would be subject to lower noise levels.
- 3.32 By subtracting the predicted worst case HGV noise levels from the noise limits in Condition 23 the following noise limits would be applicable for the cumulative effect of all other noise sources from the development to the north of the line B-B and to the south of the line C-C.

Table 3.12: Summary of Fixed Plant Noise Limits at NSRs

NSR Number	Description	Condition 23 Zone	Fixed Plant Noise Limit at Façade of NSR	
			Daytime (07:00 – 23:00)	Night-time (23:00 – 7:00)
1	Residential dwellings off Turbary Walk	South of C-C & North of B-B	49	38
2	Residential dwellings off Buckley Hill Lane		51	44
3	Residential dwellings on Jones Way	North of C-C	48	42

- 3.33 It should be noted that the derived limits in **Table 3.12** would be applicable to the total noise from the simultaneous operation of all external plant serving the proposed development. As such, noise emissions from individual items of plant will need to be lower than the given limits, although the exact limit for each individual item of plant will be dependent upon its type, noise characteristics, location etc.
- 3.34 Given the distances between Plot Q and the nearest receptors, it is expected that the plant noise limits can be readily achieved through suitable selection, siting and mitigation of plant equipment, controlled through condition if necessary.

4. CONCLUSIONS

- 4.1 BWB Consulting was instructed by Wilson Bowden Developments Ltd to undertake a Noise Assessment for a proposed warehouse distribution/production unit with first floor office and core facilities at Plot Q, Kingsway Business Park, Rochdale.
- 4.2 The results of the noise assessment indicate that the operational noise levels predicted at the nearest noise sensitive receptors to the proposed development would be within the limits in Condition 23.
- 4.3 The assessment of noise impact from car park usage indicates that, at the worst affected receptors, there is not likely to be an adverse impact from this noise.
- 4.4 The assessment also considers development generated road traffic noise on the surrounding road network in accordance with the general principles from DMRB and predicts a 'minor' impact.
- 4.5 Appropriate noise level limits have been set for fixed plant items in accordance with BS 4142:2014 and the requirements of Condition 23.
- 4.6 Based on the results of the assessment, it has been demonstrated that noise from the proposed development is not likely to adversely impact the nearest sensitive receptors. It is therefore considered that noise need not be a determining factor in the granting of full planning approval for the Site.

APPENDICES

APPENDIX 1: Glossary of Acoustic Terms

Noise

Noise is defined as unwanted sound. Human ears are able to respond to sound in the frequency range 20 Hz (deep bass) to 20,000 Hz (high treble) and over the audible range of 0 dB (the threshold of perception) to 140 dB (the threshold of pain). The ear does not respond equally to different frequencies of the same magnitude but is more responsive to mid-frequencies than to lower or higher frequencies. To quantify noise in a manner that approximates the response of the human ear, a weighting mechanism is used. This reduces the importance of lower and higher frequencies, in a similar manner to the human ear.

Furthermore, the perception of noise may be determined by a number of other factors, which may not necessarily be acoustic. In general, the impact of noise depends upon its level, the margin by which it exceeds the background level, its character and its variation over a given period of time. In some cases, the time of day and other acoustic features such as tonality or impulsiveness may be important, as may the disposition of the affected individual. Any assessment of noise should give due consideration to all of these factors when assessing the significance of a noise source.

The most widely used weighting mechanism that best corresponds to the response of the human ear is the 'A'-weighting scale. This is widely used for environmental noise measurement, and the levels are denoted as dB(A) or L_{Aeq} , L_{A90} etc., according to the parameter being measured.

The decibel scale is logarithmic rather than linear, and hence a 3 dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective, but as a general guide a 10 dB(A) increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3 dB(A) is generally regarded as the minimum difference needed to perceive a change under normal listening conditions.

Acoustic Terminology

Term	Description
dB (decibel)	The scale on which sound pressure level is expressed. Sound pressure level is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (2x10 ⁻⁵ Pa).
dB(A)	A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' - weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
L _{Aeq,T}	L _{Aeq} is defined as the notional steady sound level which, over a stated period of time (T), would contain the same amount of acoustical energy as the A - weighted fluctuating sound measured over that period.
L _{Amax}	L _{Amax} is the maximum A - weighted sound pressure level recorded over the period stated. L _{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall L _{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
L ₁₀ and L ₉₀	If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L _n indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L ₁₀ is the level exceeded for 10% of the time, and the L ₉₀ is the level exceeded for 90% of the time.
Sound Power Level, L _w	logarithm of the ratio of a given sound power to the reference sound power. Such power level in decibels is ten times the logarithm to the base ten of the ratio. unless otherwise specified, the reference sound power is 1 pW. Sound power is the total sound energy radiated by a sound source and measured in watts (W). Sound power level
Free-field Level	A sound field determined at a point away from reflective surfaces other than the ground with no significant contributions due to sound from other reflective surfaces. Generally as measured outside and away from buildings.
Façade Level	A sound field determined at a distance of 1m in front of a large sound reflecting object such as a building façade.
R/R _w	R is the laboratory measurement of the sound insulating properties of a material or building element in a stated frequency band R _w is the weighted Sound Reduction Index a single number quantity which characterises the airborne sound insulation of a material or building element over a range of frequencies, based on laboratory measurements.
D _{ne} /D _{ne,w}	D _{ne} is the laboratory measured level difference of a building element which has been normalised to a referenced absorption of 10m ² . D _{ne,w} is the weighted element-normalised level difference. This is a single number quantity which characterises the airborne sound insulation of a building element over a range of frequencies, based on laboratory measurements.
C _{tr}	Spectrum Adaptation Terms (C and C _{tr}) the single number rating method defined in BS EN ISO 717 uses a standard reference curve to determine the weighted value of airborne sound insulation. The spectrum adaptation term C _{tr} is used to take into urban traffic noise.

APPENDIX 2: Condition 23 of Outline Planning Approval

