

ENVIRONMENT

Wilson Bowden Developments Ltd

Plot J2, Kingsway Business Park, Rochdale

Noise Impact Assessment

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Noise Impact Assessment

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July 2022

DOCUMENT ISSUE RECORD

Revision	Date of Issue	Status	Author:	Checked:	Approved:
1	15/07/22	Draft	Michaela Moffatt BSc (Hons), MSc, AMIOA	Luke Smith BEng (Hons) Acoustics, MIOA	Dawit Abraham MSc, MIOA
2	20/07/22	Issue	Michaela Moffatt BSc (Hons), MSc, AMIOA	Luke Smith BEng (Hons) Acoustics, MIOA	Dawit Abraham MSc, MIOA
3	21/07/22	Issue	Michaela Moffatt BSc (Hons), MSc, AMIOA	Luke Smith BEng (Hons) Acoustics, MIOA	Dawit Abraham MSc, MIOA

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EXECUTIVE SUMMARY

BWB Consulting has been instructed by Wilson Bowden Developments Ltd to undertake a Noise Impact Assessment for the proposed development of a vacant site into 2 no. B2/B8 use warehousing units.

The main noise sources associated with the proposed development are expected to be HGVs and fixed external plant items.

This assessment predicts the likely noise emissions from vehicle movements to and from the Site, and determines suitable noise limits for any fixed plant which will be installed as part of the scheme (details for which are currently unknown).

Given the results of this assessment, it is considered that noise need not be a determining factor in granting planning permission for the proposed development.

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1. INTRODUCTION

- 1.1 BWB Consulting (BWB) has been instructed by Wilson Bowden Developments Ltd (the Client) to undertake a Noise Impact Assessment to support a planning application for a proposed B2/B8 use development comprising 2no. warehouse units on a site off John Milne Avenue, Rochdale.
- 1.2 The Client is seeking a self-contained full planning permission 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 This report is necessarily technical in nature, so to assist the reader, a glossary of acoustic terminology can be found in **Appendix A**.

Site Details

- 1.4 The Site is located off Lower Lane on Kingsway Business Park and is located within the administrative area of Rochdale Borough Council (RBC). **Figure 1.1** details the location of the proposed development.
- 1.5 The Site is bound to the north by Lower Lane with residential dwellings beyond, to the east by John Milne Avenue, and to the south by commercial uses with the M62 motorway beyond. The west of the Site is bound by residential dwellings on Broad Lane.
- 1.6 The nearest noise sensitive receptor (NSR) is located to the north west of Lower Lane and is detailed in **Table 1.1**.

Table 1.1: Noise sensitive receptors

Receptor Location	Type of Receptor	Description / Name	Approximate Distance to Site Boundary
NSR 1	Residential	Dwelling located off Lower Lane	~29m

Figure 1.1: Site Location



Existing Planning Permission

- 1.7 The Plot J2 site 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} (5min) 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."

- 1.8 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.
- 1.9 The stated noise limits and location zoning are shown in **Appendix B**. 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

- 1.10 Proposals comprise the erection of two employment buildings (Classes E(g)(iii), B2 and B8) with ancillary office space, new access, car parking, servicing, boundary treatments, hard and soft landscaping and other associated works. The proposed layout is illustrated in **Figure 1.2** below.

[illegible]

2. STANDARDS AND GUIDANCE

National Planning policy Framework (NPPF)

- 2.1 Published in July 2021, this document sets out the Government's planning policies for England and supersedes the previous NPPF published in 2012. It makes the following reference to noise in the section entitled Conserving and enhancing the natural environment:

"174. 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:

"185. 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 life⁶⁰;

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.

⁶⁰ See Explanatory Note to the Noise Policy Statement for England (Department for Environment, Food & Rural Affairs, 2010)."

And

"187. 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."

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.
- 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."

BS 8233:2014: Guidance on Sound Insulation and Noise Reduction for Buildings

- 2.8 This standard provides guidance for the control of noise in and around buildings. The guidance provided within the document is applicable to the design of new buildings, or refurbished buildings undergoing a change of use, but does not provide guidance on assessing the effects of changes in the external noise levels to occupants of an existing building.
- 2.9 The guidance provided includes appropriate internal and external noise level criteria which are applicable to dwellings for steady external noise sources. It is stated that it is desirable that the internal ambient noise level does not exceed the following criteria set out in **Table 2.1** below:

Table 2.1: Summary of Internal Ambient Noise Levels to be Achieved in Habitable Rooms when Assessed in Accordance with BS 8233

Activity	Location	Period	
		07:00 to 23:00 Hours, i.e. Daytime	23:00 to 07:00 Hours, i.e. Night-time
Resting	Living Room	35 dB LAeq, 16 Hour	-
Dining	Dining Room/area	40 dB LAeq, 16 Hour	-
Sleeping (daytime resting)	Bedroom	35 dB LAeq, 16 Hour	30 dB LAeq, 8 Hour

- 2.10 Whilst BS 8233:2014 recognises that a guideline value may be set in terms of SEL or LA_{Fmax} for the assessment of regular individual noise events that can cause sleep disturbance during the night-time, a specific criterion is not stipulated. Accordingly, reference has been made in this assessment to the World Health Organisation (WHO) 1999: *Guidelines for Community Noise* below.
- 2.11 With respect to external amenity space such as gardens and patios it is stated that it is desirable that the noise level does not exceed 50 dB LAeq,T, with an upper guideline value of 55 dB LAeq,T which would be acceptable in noisier environments. It is then confirmed that higher external noise criteria may be appropriate under certain circumstances such as within city centres urban areas, and locations adjoining the strategic transportation network, where it may be necessary to compromise between elevated noise levels and other factors such as convenience of living, and efficient use of land resource.

3. ASSESSMENT

3.1 Condition 23 states that areas of the Site between lines A-A and B-B would be required to achieve:

- 52 dB(A) $L_{eq,15mins}$ between 0700 and 2300 hours and 48 dB(A) $L_{eq,5mins}$ at any other time as measured at the façade of any noise sensitive property, (or 49 dB(A) $L_{eq,15mins}$ and 45dB(A) $L_{eq(5mins)}$ as free measurements within the curtilage of any noise sensitive building.

3.2 An impact may be experienced at other receptors in other zones, however, given the greater distance, any impact is likely to be less than at those stated above.

Noise Model

3.3 In order to predict the noise levels from the proposed development site at the NSR, a detailed acoustic model of the Site has been generated applying the following prediction methodology:

- The model was generated using the PC based CadnaA® noise modelling package.
- For industrial/commercial noise sources, the noise model was set to apply the noise prediction methodology set out in ISO 9613-2: Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation.
- Mapping of the Site and the surrounding area was calibrated into the noise model based on known Ordinance Survey grid reference points.
- Indicative ground topography was approximated using the LIDAR Composite 1m DTM information freely available from the data.gov website.
- 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.

Noise from HGV Trip Movements

3.4 It is assumed that 5 no. and 4 no. of two-way HGV trips could take place during any 1-hour daytime period at Unit J1 and Unit J2, respectively. During the night-time, it is assumed that 1 no. two-way HGV trips could take place during any 15-minute period at both Unit J1 and Unit J2.

3.5 In the absence of specific data for the key sources of noise anticipated within the proposed development, representative data have been sourced from surveys

undertaken at similar developments. **Table 3.1** presents noise measurement data for HGV pass-bys, to represent HGVs travelling along the Site access road.

Table 3.1: Summary of historic HGV pass-by noise data used in assessment

Source	Measurement distance (m)	Measurement duration (s)	Measured sound pressure level	
			dB, $L_{Aeq,T}$	dB, $L_{A,f,max}$
HGV Pass-by	5	6	73	78

- 3.6 For HGV movements, the calculations detailed in BS5228-1:2019+A1:2014¹, for calculating sound power levels (SWL) from mobile plant and haulage routes have been used:

$$SWL = L_{Amax@10m} + 28$$

- 3.7 In calculating the level of noise produced by the Site access road, vehicle quantities and vehicle speed of 10mph (16kmph) have been accounted for. The following equation has been used:

$$L_{Aeq,1hr} = L_{WA} - 33 + 10 \log_{10} Q - 10 \log_{10} V - 10 \log_{10} (d) \quad (BS5228-1:2009+A1:2014(F.6)).$$

Where:

L_{WA}	sound power level of the plant;
Q	number of vehicles per hour; and
V	average vehicle speed in km/h.
d	distance in m.

- 3.8 **Table 3.2** calculates the level of noise from the Site access roads as per the calculation detailed in BS5228-1:2009+A1:2014. The sound power level used in equation F.6 has been derived from the sound pressure level in **Table 3.1**.

Table 3.2: Calculation of noise level from the access road

Unit	L_{WA}	Number of vehicles per period	Average vehicle speed in km/h	Sound pressure level of access road at 10m $L_{Aeq,1hr}$
J1	100	5	16	52
J2	100	4	16	51

- 3.9 In calculating the level of noise produced by deliveries in the service yard, **Table 4.3** considers vehicles manoeuvring during arrival, departure, and during loading/unloading operations.

¹ British Standards Institute (2014), BS 5228-1:2009+A1:2014 – Code of practice for noise and vibration control on construction and open sites. Part 1:Noise

Table 3.3: Calculated sound pressure level at 10m – level access door

Event	Sound pressure level, $L_{Aeq,T}$ (dB)	Measurement distance (m)	Assumed, on-time per period (s)	Time corrected, sound pressure level @10m, $L_{Aeq,T}$ (dB)
Daytime 1-hour				
HGV Delivery including arriving/departing, impact noise and cases being wheeled	66	5	1800 ¹	57
Night-time 15-minutes				
HGV Delivery including arriving/departing, impact noise and cases being wheeled	66	5	900	60
¹ On-time during 3600s daytime period				
² On-time during 900s night-time period				

3.10 Using the data contained within **Tables 3.2** to **3.3**, 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:

- Calculated specific sound levels from the car transporters has been calculated using equation F.6 detailed in BS5228-1:2009+A1:2014 based on indicative number of HGV trips provided by the Applicant. These have been included in the model as a line source at a height of 1.5m using the calculated sound pressure level in **Table 3.2**; and
- Unloading operations associated with deliveries to site within the service yard is based on the daily number of deliveries to the Site provided by the client. These have been included in the model as a point source at a height of 1.5m using the combined, time-corrected sound pressure Level in **Table 3.3**.

3.11 Noise contour maps have been generated across the Site and surrounding area, including outdoor living areas of NSRs at heights of 1.5m for the daytime and 4m above ground for the night-time. The resultant daytime and night-time specific sound level is presented in **Figure 3.1** to **Figure 3.2**.

Figure 3.1: Daytime noise contours of specific noise levels – calculation at 1.5m above ground

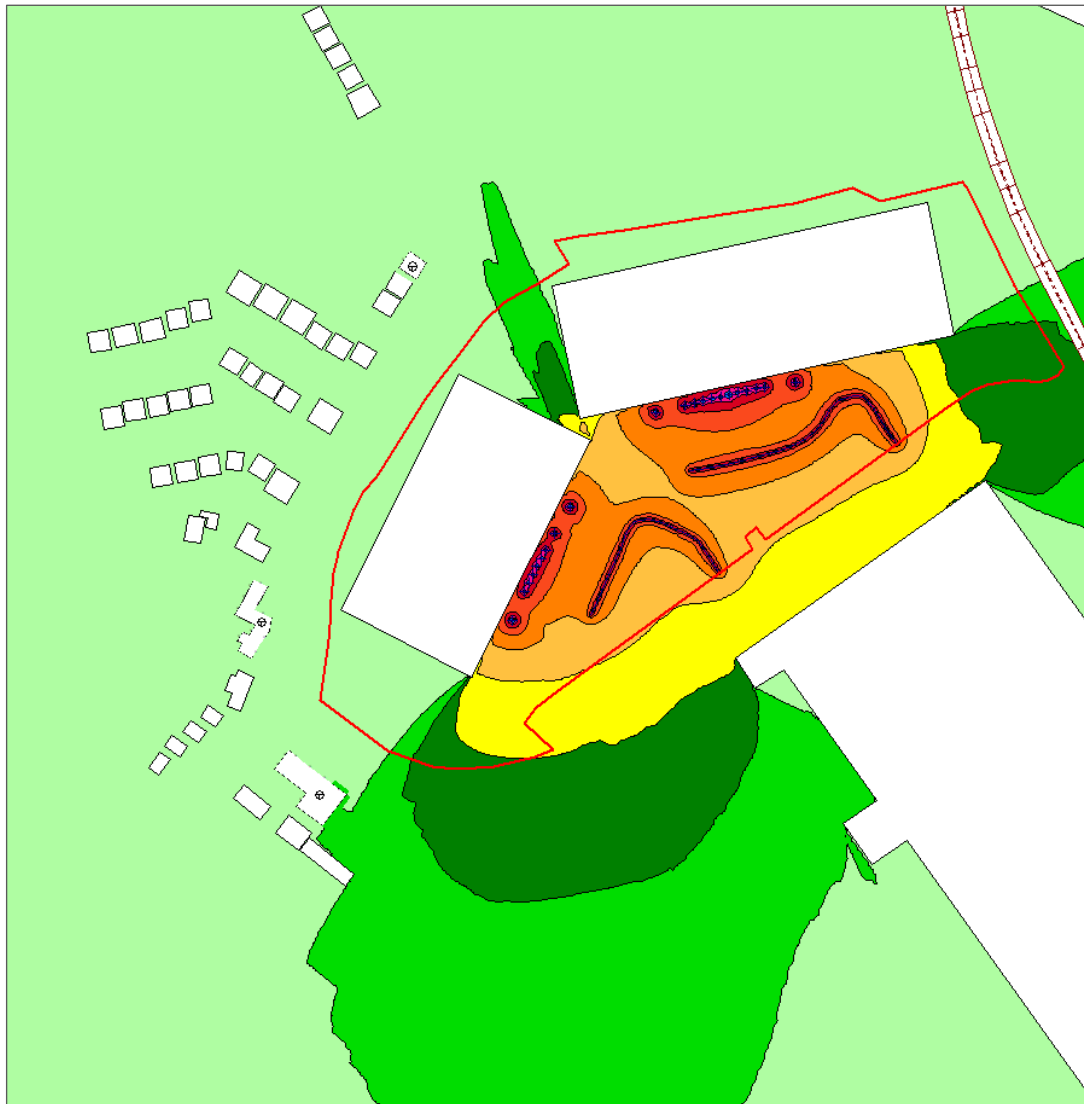


Figure 3.2: Night-time noise contours of specific noise levels – calculation at 4m above ground



- 3.12 The specific sound levels at the NSR have been calculated as receiver points at 1.5m above ground for the daytime. The calculated levels are presented in **Table 3.4**.

Table 3.4: Predicted specific sound level at NSR, dB(A)

Receptor	Daytime (0700 – 23:00)	Night-time (2300 – 0700)
1	35	35

- 3.13 The predicted noise levels at receiver points in the CadnaA® model have been included within the subsequent assessment.

BS 4142 Assessment

- 3.14 In BS 4142: 2014+A1:2019, penalties are applied to the specific sound level in order to provide the rating level. These penalties relate to the acoustic features of the sound

source. Accordingly, the following features have been accounted for as per **Table 3.5**, in accordance with the subjective methods detailed in BS 4142: 2014+A1:2019, for HGV movements and breakout noise.

Table 3.5: Identification of acoustic penalties

Source	Penalty	Applicable?	Attributable penalty	Comment
HGV Movements and Breakout Noise	Tonality	Yes	2	It is considered that tonality from reverse alarms may be just perceptible at NSRs
	Impulsivity	No	-	It is considered impulsivity is unlikely to be perceptible due to the buffer distance and screening
	Intermittency	Yes	3	Intermittent HGV movements along the access road may be perceptible at NSRs.
	Other Sound Characteristics	No	-	Not applicable as other penalties have been assigned.

- 3.15** The predicted noise levels at the NSR have been assessed in accordance with BS 4142 considering a total +3dB penalty at NSRs.

Table 3.6: BS 4142 delivery noise assessment daytime (NSR 1)

Description	Weekday		Relevant BS 4142 clause
	Daytime (0700 – 2300) dB	Night-time (2300 – 0700) dB	
Specific sound level (L _{Aeq,T})	35		7.3.5
Acoustic feature correction	+5		9.2
Rating level (L _{Ar,T})	40		9.2
Background sound level (L _{A90,T})	49	45	8
Excess over background	-9	-5	-
BS 4142 impact	Low Impact	Low Impact	-

- 3.16** At NSRs 1, the Rating Level is below the existing background level during all periods. Therefore, this demonstrates a 'low impact' in accordance with BS 4142:2014+A1:2019.

- 3.17 Comparing the predicted rating levels against the requirements of Planning Condition 23, the predicted levels are 9 dB below the stipulated limit during the daytime, and between 5 dB below the stipulated limit during the night-time.

Noise from Fixed Plant items

- 3.18 It is anticipated that there may be fixed plant and equipment associated with the proposed warehouses that may have the potential to generate noise. At this stage however, the exact details of any proposed plant items are not known. In the absence of detailed information, it is appropriate to specify suitable noise level limits to which any proposed plant should conform based on the requirements of Condition 23 and the prediction contribution of HGV noise.
- 3.19 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.
- 3.20 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 between lines A-A and B-B:
- 52 dB(A) $L_{eq,15mins}$ between 0700 and 2300 hours and 47 dB(A) $L_{eq,5mins}$ at any other time as measured at the façade of any noise sensitive property, (or 48 dB(A) $L_{eq,15mins}$ and 43dB(A) $L_{eq(5mins)}$ as free measurements within the curtilage of any noise sensitive building.
- 3.21 It should be noted that the derived limits 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.
- 3.22 Plant manufacturers can typically design plant to meet required limits. Therefore, assuming plant are designed to meet the limits proposed above. This issue is best addressed during the detailed design stage.

4. CONCLUSION

- 4.1 BWB has been instructed by Wilson Bowden Developments Ltd to undertake a Noise Impact Assessment to support a planning application for a proposed development at Plot J2 of the Kingsway Business Park, off John Milne Avenue, Rochdale.
- 4.2 This report presents an assessment of the potential noise impacts of HGV associated with the proposed development at nearby noise sensitive receptors. This assessment has been undertaken with due consideration to relevant British Standards and guidance documents relating to noise.
- 4.3 Noise emissions from HGV deliveries to and from the Site have been assessed during daytime and night-time periods and compared with the noise limits stipulated in Planning Condition 23 of the previous outline permission.
- 4.4 As the details of proposed fixed plant items are not known at this stage, the predicted noise contribution from HGVs have been subtracted from the limits in Condition 23 to determine what the permitted noise level limits are for all other noise sources associated with the Site.
- 4.5 Given the results of this assessment, it is considered that noise need not be a determining factor in granting planning permission for the proposed development.

APPENDICES

APPENDIX A: Glossary of Terms

Term	Descriptions
Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of 20 μ Pa (20x10 ⁻⁶ Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds S1 and S2 is given by 20 log ₁₀ (S1 / S2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20 μ Pa.
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
L _{eq,T}	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
L _{max,T}	A noise level index defined as the maximum noise level during the period T. L _{max} is sometimes used for the assessment of occasional loud noises, 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 _{90,T}	A noise level index. The noise level exceeded for 90% of the time over the period T. L ₉₀ can be considered to be the "average minimum" noise level and is often used to describe the background noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5 m.
Façade	At a distance of 1 m in front of a large sound reflecting object such as a building façade.
Fast/Slow Time Weighting	Averaging times used in sound level metres.
Octave Band	A range of frequencies whose upper limit is twice the frequency of the lower limit.

APPENDIX B: Planning Condition 23

Planning Condition 23

