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September 2026

DOCUMENT ISSUE RECORD

Document Number:	267509-BWB-ZZ-XX-RP-YA-0001_NIA
BWB Reference:	267509_001

Revision	Date of Issue	Status	Author:	Checked:	Approved:
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EXECUTIVE SUMMARY

BWB Consulting was instructed by KPP Architects to undertake a Noise Impact Assessment in order to discharge a planning condition related to a planning application for a new distribution centre located at Interchange 26, Bradford. The development comprises a new manufacturing and distribution centre formed of two buildings, associated parking, access road and landscaping.

The results of a third-party site noise survey¹ has been deemed representative to inform a robust assessment. Details regarding the noise survey is summarised in **Section 3**.

The subsequent assessment work has been undertaken in accordance with current standards/guidance summarised in **Section 2**.

An assessment of noise impact, informed by a noise source study presented in **Section 4**, has considered noise emissions associated with development operations such as vehicle movements, deliveries and external plant.

At the time of writing, specific details regarding plant location, make & model and noise emission data are not available. In the absence of this information, assumptions have been made based on similar sites and professional judgement.

The Noise Impact Assessment detailed in **Section 5** indicates the notion of 'low impact' in accordance with BS 4142 guidance, which is supported through contextual assessment. As such, mitigation is not considered warranted.

Based on the results of the assessment, it has been demonstrated that the Site is suitable for the proposed development from a noise perspective and that Planning Condition 17 can be discharged.

It should be noted that if the finalised external plant locations and selections vary from those assumed in this report, any changes should be reviewed by a suitably qualified acoustician at the relevant design stage.

¹Dragonfly Consulting report 202191932_+Noise+Assessment_900011 dated January 2020

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1. INTRODUCTION

Instruction

- 1.1 BWB Consulting Ltd (BWB) was instructed by KPP Architects (the Client) to undertake a Noise Impact Assessment in order to discharge a planning condition related to a planning application for a new manufacturing and distribution facility located at Interchange 26, Bradford (the Site).

- 1.2 The wording of the relevant Planning Condition (17) is as follows:

"Plans and particulars relating to the Reserved Matters of layout and appearance of each phase approved pursuant to condition 6, notwithstanding the submitted information, shall include a Noise Impact Assessment report by a suitably competent person. The report shall include:

- a) An assessment of all of the noise emissions from the proposed development*
- b) Details of existing background and predicted future noise levels at the boundary of the nearest noise sensitive premises*
- c) A written scheme of how the occupants of the above-mentioned noise sensitive premises will be protected from noise from the proposed development including details of all necessary noise attenuation*

Each phase shall not be brought into use until the respective works comprised within the measures specified in the approved report have been carried out in full and such works shall be thereafter retained".

- 1.3 This assessment has been undertaken based on the results of a third-party baseline noise survey undertaken within the vicinity of the Site (*Dragonfly Consulting report 202191932_+Noise+Assessment_900011 dated January 2020*).
- 1.4 Where appropriate, consideration has been given to noise mitigation measures to reduce noise levels at noise sensitive receptors (NSRs).
- 1.5 This report is necessarily technical in nature, so to assist the reader, a glossary of acoustic terminology can be found in **Appendix A**.

Site Setting

- 1.6 The Site is located at Interchange 26, Interchange Way Bradford and is immediately east of the M606 and west of the M62 motorways. The site is within the administrative area of Kirklees Council and also bound by agricultural land to the north-east and the intersection of both motorways to the south.
- 1.7 The existing acoustic climate across the Site is dominated by continuous road traffic noise from the adjacent motorways.

- 1.8 The development comprises a new manufacturing and distribution centre formed of two buildings, associated parking, access road and landscaping.

Noise Sensitive Receptors

- 1.9 The nearest identified NSRs comprise residential dwellings situated off Bradford Way to the west and north-west of the Site. Should noise be controlled to minimise impacts at the NSRs identified below, it is considered that levels would also be suitably controlled at receptors further away (e.g. Premier Inn Bradford South hotel) due to increased distance attenuation and masking from the nearby motorways.

- 1.10 The Site location and NSR locations are indicated in

- 1.11 **Figure 1.1.**

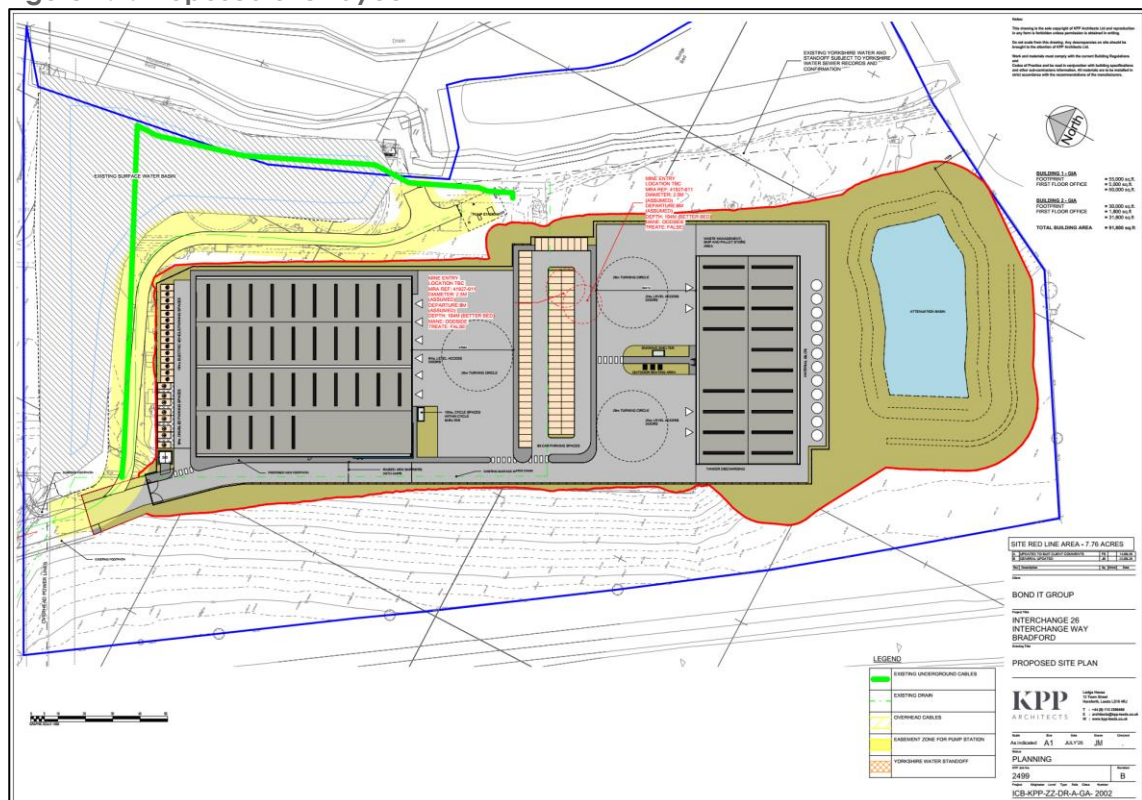
Figure 1.1: Site Location and Nearest Identified NSRs



Proposed Development

- 1.12 The proposed development comprises a c.60,000 square foot warehouse and distribution building and c30,000 square foot manufacturing building.
- 1.13 Noise sources associated with the development are detailed in **Section 4**, and are understood to comprise:
- External AC units serving office areas;
 - Pneumatic conveying systems for transfer of material between bulk storage silos and manufacturing building;
 - Fork lift truck (FLT) movements between manufacturing and distribution buildings;
 - Incoming bulk tanker deliveries to manufacturing building; and
 - Outgoing HGV deliveries from warehouse and distribution building.
- 1.14 The proposed site layout is shown in **Figure 1.2** below.

Figure 1.2: Proposed Site Layout



Source: KPP Architects drawing 'ICB-KPP-ZZ-DR-A-GA- 2002' dated July 2026

2. STANDARDS AND GUIDANCE

National Planning Policy Framework (NPPF)

- 2.1 Published in August 2026, this document sets out the Government's planning policies for England. It makes the following reference to noise in the section entitled Pollution, public protection and security:

"P1: Planning for clean and safe spaces

1. *To support efforts to avoid and mitigate risks from natural and man-made hazards, minimise levels of pollution and create clean, liveable and safe places for people to live, work and visit, development plans should:*

[...]

- b. *Consider any wider opportunities to reduce air, water, soil, noise or other forms of pollution, and contribute to compliance with national and local environmental targets and objectives, through the spatial strategy and policies for specific parts of the plan area (such as by identifying opportunities for strategic nature-based solutions);"*

[...]

P3: Living conditions and pollution

1. *Development proposals should be appropriate for their location, taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, whether these effects are on or off-site; and whether this is as a result of the development itself or the product of preexisting conditions in its vicinity. In assessing the potential effects of pollution, consideration should be given to the potential sensitivity of the site, and its intended occupiers and users, as well as that of the environment and population in the surrounding area (including where certain groups could be particularly vulnerable to its effects, such as children and older people).*

2. *Within this context development proposals should:*

- a. *Provide healthy living conditions for occupiers and users in terms of adequate access to light and avoiding exposure to levels of air, noise, artificial light or other sources of pollution which could have an unacceptable adverse effect on health and the quality of life. Where necessary suitable mitigation measures should be incorporated to secure acceptable living conditions;*
 - b. *Not give rise to, or contribute to, an unacceptable level of access to daylight and sunlight for neighbouring residents and occupiers, or unacceptable levels of air, noise, artificial light, water, soil or other forms of pollution on or beyond the site. Adverse impacts of this nature should be*

avoided where possible, or else mitigated to an acceptable degree. Where possible, opportunities should be taken to reduce pollution affecting the wider area (such as through traffic and travel management or improved external lighting);

[...]

- d. *Mitigate and reduce to a minimum potential adverse impacts resulting from noise, not result in levels of noise exposure which would have a significant observed adverse effect, and maintain the character of tranquil areas (those areas that have remained relatively undisturbed by noise from human sources and are prized for their recreational and amenity value for this reason);*

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

- 2.2 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.
- 2.3 The guidance provided includes appropriate internal and external noise level criteria which are applicable to dwellings and office 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

Activity	Location	Internal Noise Level Criteria (L _{Aeq,T} , dB)	
		Daytime (07:00 - 23:00hrs)	Night-time (23:00 - 07:00hrs)
Resting	Living room	35	-
Dining	Dining room/area	40	-
Sleeping (daytime resting)	Bedroom	35	30

- 2.4 Whilst BS 8233 recognises that a guideline value may be set in terms of Sound Exposure Level (SEL) or L_{AFmax} 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.
- 2.5 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 L_{Aeq,T}, with an upper guideline value of 55 dB L_{Aeq,T} which would be acceptable in noisier environments.

- 2.6 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.

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

- 2.7 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.
- 2.8 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.
- 2.9 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.
- 2.10 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.
- 2.11 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."

2.12 BS 4142 provides scope as to where the initial estimate of the impact needs to be modified due to the context. It states that all pertinent factors should be taken into consideration including the following:

1. The absolute level of sound – the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high.

Where the background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.

Where residual sound levels are very high, the residual sound might itself result in adverse or significant adverse impacts.

2. When the character and level of the residual sound is compared to the specific sound, consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound. This will assess the degree to which the specific sound source is likely to be distinguishable.

It also states that consideration should be given to evidence on human response to sound and industrial and/or commercial sound where it is available.

3. The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions.

2.13 It is considered that where there is a low impact in accordance with BS 4142 adverse effects on health and quality of life would not be detected and so this would be equivalent to a sound level below the 'Lowest Observed Adverse Effect Level' (LOAEL). Where a significant adverse impact remains once contextual factors have been considered in accordance with BS 4142, this would be equivalent to a sound level above the 'Significant Observed Adverse Effect Level' (SOAEL).

3. THIRD PARTY BASELINE NOISE SURVEY

- 3.1 A third-party site noise survey (*Dragonfly Consulting report 202191932_Noise+Assessment_900011 dated January 2020*) has been used for assessment purposes. The site assessed by the third-party consultancy is noted to be in proximity with the site assessed in this report, and therefore shares the same NSRs.
- 3.2 Due to the location of the nearest NSRs and nearby major transport corridors, noise levels within the vicinity of the site are expected to be the same or greater than that measured by the third-party consultancy when potential traffic flow increases are accounted for. This is expected to inform a robust assessment, where the background noise levels will be used to assess operational noise impact in accordance with BS 4142.
- 3.3 Therefore, the following survey information and results summary presented in this chapter have been derived from the third-party report. For ease of reference, full methodology details, equipment used, measurement locations etc has been omitted.

Survey Details

- 3.4 Day and night-time measurements were undertaken on the 12th and 13th November 2019 to establish typical external ambient and background noise levels within the vicinity of the Site. Measurements were undertaken near to the location of the NSRs detailed in this report.
- 3.5 It was noted that the noise environment during the noise survey was dominated by road traffic along the M606 and nearby road networks such as the M62. A summary of the third-party measured noise levels to be used for the assessment is provided in the following table.

Table 3.1: Summary of Third Party Measured Sound Pressure Levels

Measurement Location	Period	Date	Time/Duration	dB LAeq,T	dB LA90,T
1 (Representative of NSR1)	Daytime	12/11/2019	21:50 - 23:00	62	57
	Night-time	12/11/2019 – 13/11/2019	23:00 - 02:10	58	49

Noise Limits

- 3.6 For determining noise limits via analysis of the measured data, the third-party report states that the background noise levels for the 1-hour period (daytime) and 15-minute

period (night-time) with the lowest measured L_{A90} were used for assessment purposes. These limits have been adopted for this assessment and presented in **Table 3.2**.

- 3.7 The noise limits represent a level no higher than the existing background noise level during the day, and 5 dB below existing background noise levels at night.

Table 3.2: Noise Rating Limits

NSR	Period	Time	Rating Level Limit (dB $L_{A,r,T}$)
1a / 1b	Daytime	07:00 – 23:00	57
	Night-time	23:00 – 07:00	44

- 3.8 Should noise be controlled to minimise impacts at the NSR identified above, it is considered that levels would also be suitably controlled at receptors further away due to increased distance attenuation and/or shielding from other buildings.

4. NOISE SOURCE STUDY

4.1 A noise source study has identified the following sources associated with the Site that shall be considered for assessment:

- Vehicle movements;
- delivery activities; and
- fixed plant.

4.2 The following section describes the noise source study in detail based on proposed operational information provided by the client, and defines the noise levels used in the assessment.

4.3 The client has stated that site operations will take place between 6 am and 6 pm, five days per week.

Vehicle Movements

FLT Movements

4.4 It is understood that finished goods will be transferred from the manufacturing building to the warehouse and distribution building with between 130 – 150 trips per day.

4.5 Based on the worst-case 150 trips spread over a 12-hour working day, this corresponds to the following number of FLT movements during each assessment period:

- 13 no. FLT movements during a typical 1-hour daytime period; and
- 4 no. FLT movements during a typical 15-min night-time period.

4.6 **Table 4.1** shows the calculated level of noise from the Site access roads during the daytime and night-time, using a sound pressure level of 81 dB $L_{Aeq,T}$ at 1m distance in accordance with BWB library data for a representative FLT with reversing alarm, and correcting for an on-time based on the number of pass-bys.

Table 4.1: Calculation of FLT Noise

Assessment Period	Individual FLT Movement at 1m, $L_{Aeq,T}$	Number of FLTs per Assessment Period	Sound Pressure Level of FLT movements at 1m $L_{Aeq,T}$
1-hour Day (07:00 – 23:00)	81	13	69
15-min Night (23:00 – 07:00)		4	70

4.7 Forklift movements have been modelled as line sources at 1.5 m height above local ground level along an assumed route between the two buildings, in accordance with the BWB library octave band sound power data shown in **Table 4.2** below and calibrated to the noise levels determined by this noise source study.

Table 4.2: FLT Movement Octave Band Sound Pressure Spectrum Used in Assessment

Source	Octave Band Sound Pressure Levels (dB)								Overall
	63 Hz	125 Hz	250 Hz	500 Hz	1kHz	2kHz	4kHz	8kHz	dBA
FLT Movement	77	84	84	73	76	69	68	60	81

Inbound and Outbound Distribution Movements

- 4.8 The BS 4142 reference periods of 1-hour daytime and 15-minute night-time have been used for assessment purposes. The assumed quantity of deliveries in any 1-hour daytime period and a 15-minute night-time period has been derived based on the greatest predicted hourly movements provided by the client, as a worst-case.
- 4.9 It is understood that inbound and outbound HGV deliveries will comprise:
- Up to 4 no. bulk tanker deliveries to the manufacturing building per day; and
 - Up to 30 no. HGV trailer collections from the distribution building per day.
- 4.10 The derived vehicle movements for each assessment period are presented in **Table 4.3**, accounting for an even spread of movements over a 12-hour working day. It is assumed that vehicles could make a return trip (i.e. in and out of the yard) in a daytime 1- hour period, but vehicles would only move one way during a 15-minute night-time period.

Table 4.3: Total Number of Vehicle Movements

Scenario	Number of movements per Hour – Daytime	Number of Movements per 15 - Minutes – Night-time
Manufacturing Inbound	2	1
Distribution Outbound	6	1

- 4.11 **Table 4.4** presents noise measurement data for a representative HGV pass-by travelling along the Site access roads. The data has been derived from BWB's technical library.

Table 4.4: 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
HGV Pass-by	10	16	68

- 4.12 **Table 4.5** and **Table 4.6** presents the calculated level of noise from the Site access roads during the daytime and night-time, using the data from **Table 4.4** and correcting for an on-time based on the number of pass-bys.

Table 4.5: Calculation of Noise Level from the Access Road, Daytime

Scenario	Individual HGV Pass, dB L _{Aeq,T}	Number of Vehicles per Hour	Sound Pressure Level of Access Road at 10 m L _{Aeq,1hr}
Manufacturing	68	2	47
Distribution		6	52

Table 4.6: Calculation of Noise Level from the Access Road, Night-time

Plot No.	Individual HGV Pass, dB L _{Aeq,T}	Number of Vehicles per 15 minutes	Sound Pressure Level of Access Road at 10 m dB L _{Aeq,15 min}
Manufacturing	68	3	50
Distribution		1	50

- 4.13 Vehicle movements have been modelled as line sources at 1.5 m height above local ground level along an assumed haul route for each building, calibrated to the noise levels determined by this noise source study.
- 4.14 **Table 4.7** details the octave band sound power levels that have been included in the noise model for vehicle movements.

Table 4.7: HGV Movement Octave Band Noise Spectrum Used in Assessment

Source	Octave Band Sound Power Levels (L _w dB)								Overall
	63 Hz	125 Hz	250 Hz	500 Hz	1kHz	2kHz	4kHz	8kHz	dBA
HGV Passby	103	99	95	93	92	89	82	73	96

Noise from Deliveries

- 4.15 Activities associated with the loading and unloading of vehicles have been assessed in accordance with BS 4142 and the noise source study detailed below.

Manufacturing

- 4.16 It is understood that delivery activities at the production building will comprise pressurised / pumped transfer of material into the bulk storage silos.
- 4.17 Pumped deliveries have been modelled as point sources at 1.5 m height above local ground level, assigned a sound pressure level of 72 dB L_{Aeq,T} at 10m distance in accordance with Table C.4-15 of BS 5228².
- 4.18 **Table 4.8** details the octave band sound power levels that been included in the noise model for pumped tanker deliveries.

² British Standards Institution (2014) BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Part 1: Noise

Table 4.8: Pumped Tanker Delivery Octave Band Noise Spectrum Used in Assessment

Source	Octave Band Sound Power Levels (L_w dB)								Overall
	63 Hz	125 Hz	250 Hz	500 Hz	1kHz	2kHz	4kHz	8kHz	dBA
Tanker pumping	103	98	95	95	97	94	88	81	100

- 4.19 It is assumed that a tanker delivery would last 75% (45mins) of a daytime hour period, and 100% of a night-time 15-minute period. **Table 4.11** presents the calculated noise level from delivery activities during the day and night-time, correcting for an assumed on-times.

Table 4.9: Calculation of On-time Corrected Delivery Activity

Period	On-time per period, (s)	Sound Pressure Level of Level Loading Bay Activity at 10 m
Daytime (07:00 – 23:00)	2700	59 dB $L_{Aeq,1hr}$
Night-time (23:00 – 07:00)	900	60 dB $L_{Aeq,15min}$

Warehouse & Distribution

- 4.20 It is understood that delivery activities at the warehouse and distribution building will comprise the level-loading of trailers for onward distribution.
- 4.21 The number of deliveries for each assessment period has been based on the total amount of arrivals (as specified in the vehicle movements subsection above). This corresponds to 3 no. deliveries during the worst-case daytime hour and 1 no. delivery during the worst-case night-time hour.
- 4.22 The delivery noise levels used within the assessment are presented in **Table 4.10** and are based on BWB measurements at a representative location.

Table 4.10: Level Loading Bay Delivery Noise Data Used in Assessment

Source	Measurement Distance (m)	Measurement Duration (minutes)	Measured Sound Pressure Level (dB $L_{Aeq,T}$)
Entry level delivery	10	45	60

- 4.23 **Table 4.11** presents the calculated noise level from delivery activities during the day and night-time, correcting for an on-time based on the expected duration of deliveries.

Table 4.11: Calculation of On-time Corrected Delivery Activity

Period	On-time per period, (s)	Sound Pressure Level of Level Loading Bay Activity at 10 m
Daytime (07:00 – 23:00)	2700	59 dB $L_{Aeq,1hr}$
Night-time (23:00 – 07:00)	900	60 dB $L_{Aeq,15min}$

- 4.24 Deliveries have been modelled as point sources at 1.5 m height above local ground level, calibrated to the noise levels determined by this noise source study. **Table 4.12** details the octave band sound power levels that been included in the noise model for deliveries.

Table 4.12: Entry Level Delivery Octave Band Noise Spectrum Used in Assessment

Source	Octave Band Sound Power Levels (L _w dB)								Overall
	63 Hz	125 Hz	250 Hz	500 Hz	1kHz	2kHz	4kHz	8kHz	dBA
Entry level delivery	88	85	83	83	85	79	73	67	88

External Plant Noise

- 4.25 It is understood that external mechanical services associated with the development will comprise:
- External air conditioning condensers servicing office areas;
 - Dust/fume extraction system – exhaust located at the north-west facing facades of both buildings; and
 - Pneumatic conveying systems for transfer of liquids or solids into manufacturing areas from bulk storage silos.
- 4.26 At the time of writing, specific details regarding plant locations and selections have not been confirmed. In the absence of this information, assumptions have been made based on similar sites and professional judgement.

External AC Units

- 4.27 The external AC units have been based on Daikin REYA10A9 heating and cooling units with a manufacturer declared sound power level of 81 dB L_{WA} which are considered representative based on similar assessments.
- 4.28 The assessment has assumed 2 no. external AC units on each building, based on professional judgement and experience of similar schemes. It is assumed that all AC units could operate continuously and simultaneously to inform a robust assessment.
- 4.29 The AC units have been modelled as point sources at 1 m above local ground level.

Dust / Fume Extraction

- 4.30 The dust/fume extraction fans are based on Multi-Wing 3kW spray booth extract fans with a manufacturer declared sound power level of 92 dB L_{WA} which are considered representative based on similar assessments.
- 4.31 The assessment has assumed 2 no. extract outlets on each building, based on professional judgement and experience of similar schemes. It is assumed that all extract fans could operate continuously and simultaneously to inform a robust assessment.

- 4.32 The extract outlets have been modelled as point sources at 3 m above local ground level.

Pneumatic Conveying Systems

- 4.33 The pneumatic conveying systems are based on a Kongsilde MultiAir 1075 5.5kW high pressure blower with a manufacturer declared sound pressure level of 69 dB at 1m distance. This has been converted to a sound power level of 77 dB L_{WA} accounting for hemispherical propagation.
- 4.34 The assessment has assumed 12 no. pneumatic conveyor system on the manufacturing building (1 system per bulk storage silo). It is assumed that all pneumatic conveyor systems could operate continuously and simultaneously to inform a robust assessment.
- 4.35 The pneumatic conveying systems have been modelled as point sources at 1.5 m above local ground level.

External Plant Summary

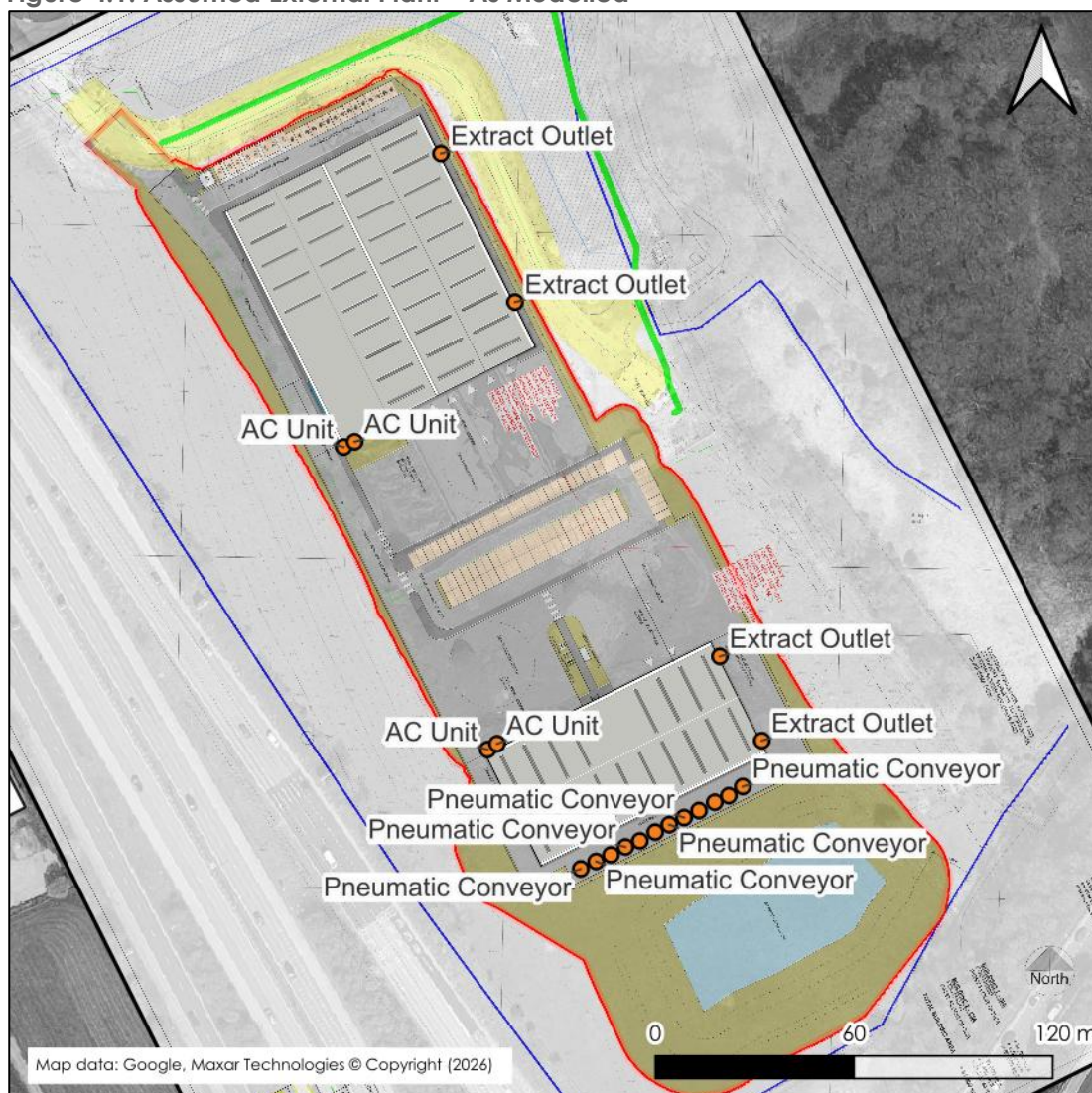
- 4.36 The following table presents the adopted plant noise source levels for assessment.

Table 4.13: Plant Noise Source Levels

<i>Plant Item</i>	Sound Power Level, dB							dBA
	125 Hz	250 Hz	500 Hz	1kHz	2kHz	4kHz	8kHz	
Daikin REYA10A9 External AC Unit	81	82	79	74	71	68	62	81
Multi-Wing 3kW Extract Fan	87	85	85	85	85	85	82	92
Kongsilde MultiAir 1075 Pneumatic Extract System	No octave band data available, modelled using a single 500 Hz frequency band in accordance with ISO 9613-2.							77

- 4.37 **Figure 4.1** shows the assumed external plant locations, as inputted into the model.

Figure 4.1: Assumed External Plant – As Modelled



5. OPERATIONAL NOISE ASSESSMENT

Noise Model

- 5.1 In order to predict noise levels generated by the Proposed Development at the nearest NSRs, a detailed acoustic model has been generated using the PC based CadnaA® noise modelling package, applying the following prediction methodology:
- For 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 calculation³.
 - 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.
 - 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.
- 5.2 The predictions shown are for the worst-case elevation/floor or ground floor garden location during the day and worst-case elevation/floor at night.

Assessment of Operational Noise

- 5.3 This subsection summarises an assessment of operational noise, in accordance with the noise source study described above.
- 5.4 In accordance with BS 4142, it is recommended that the noise rating level associated with Site operations is controlled to a level no higher than the representative background sound level.
- 5.5 It is not expected that specific tonal, impulsive or intermittent characteristics would be perceptible at the nearest NSRs where the specific level is predicted to lie >15 dB below the residual sound level, and the road traffic dominated noise climate is expected to provide significant masking. Therefore, no acoustic character penalty has been applied in accordance with BS 4142.
- 5.6 **Figure 5.1** and **Figure 5.2** present the noise contour plots for operational noise.

³ International Organization for Standardization (2024), ISO 9613-2:2024, Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation

Figure 5.1: Operational Noise Contour Grid for the Daytime Period, at 1.5 m Grid Height, dB LAeq,1h

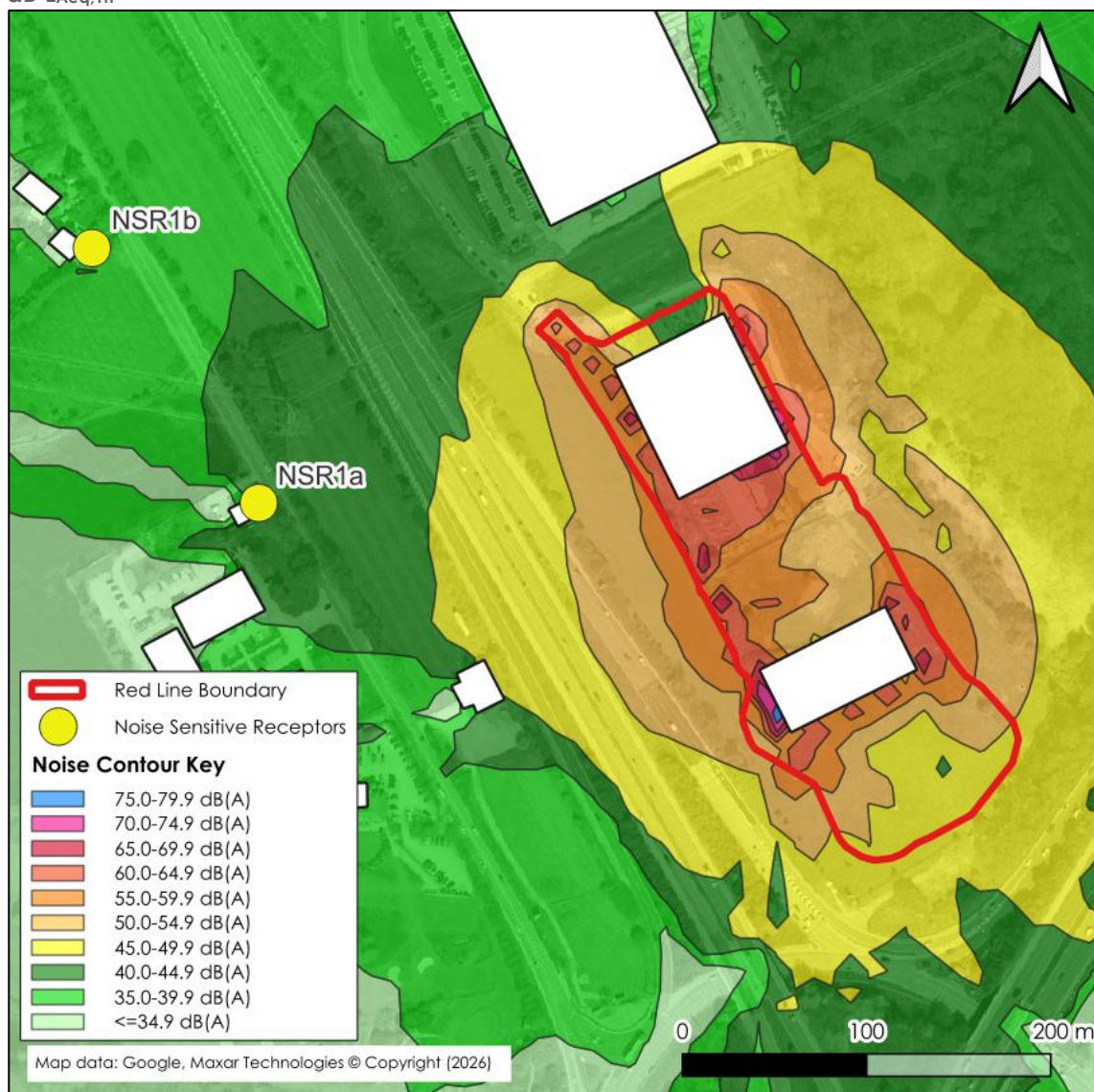
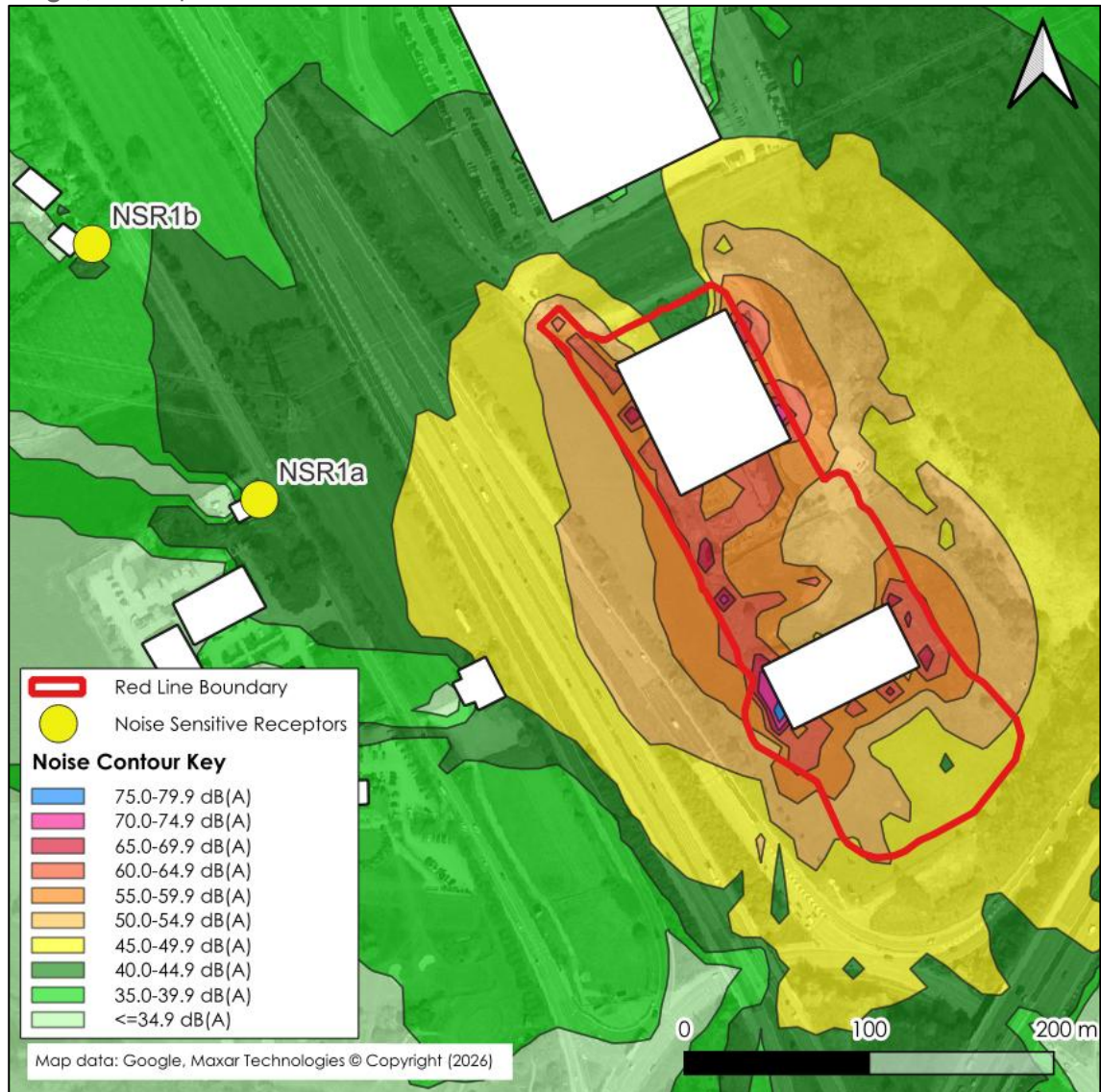


Figure 5.2: Operational Noise Contour Grid for the Night-time Period, at 4 m Grid Height, dB LAeq,15min



5.7 **Table 5.1** and **Table 5.2** summarises the assessment of operational noise in accordance with BS 4142.

Table 5.1: BS 4142 Assessment of Impact from Operational Noise – Day (07:00 - 23:00)

Description	BS 4142 Operational Noise Assessment (Day)		Relevant BS 4142 Clause
	NSR 1a	NSR 1b	
Specific sound level ($L_{Aeq,T}$ dB)	42	40	7.3.5
Acoustic feature correction (dB)	0		9.2
Rating level ($L_{Ar,T}$ dB)	42	40	9.2
Existing Background Sound Level (dB L_{A90})	57		-
Excess over Background Sound Level (dB)	-15	-17	-
Less than or Equal to Existing Background Sound Level?	✓		-

Table 5.2: BS 4142 Assessment of Impact from Operational Noise – Night (23:00 - 07:00)

Description	BS 4142 Operational Noise Assessment (Night)		Relevant BS 4142 Clause
	NSR 1a	NSR 1b	
Specific sound level ($L_{Aeq,T}$ dB)	43	41	7.3.5
Acoustic feature correction (dB)	0		9.2
Rating level ($L_{Ar,T}$ dB)	43	41	9.2
Existing Background Sound Level (dB L_{A90})	49		-
Excess over Background Sound Level (dB)	-6	-8	-
Less than or Equal to Existing Background Sound Level?	✓		-

5.8 **Table 5.1** indicates that the predicted daytime Site-wide operational noise rating level is at least 15 dB below the representative background sound level at NSR1. This corresponds with a low impact in the worst-case depending on context.

5.9 **Table 5.2** indicates that the predicted night-time Site-wide operational noise rating level is least 6 dB below the representative background sound level at NSR 1. This corresponds with a low impact in the worst-case.

-
- 5.10 BS 4142 requires that the context of the Proposed Development is required as part of the assessment of impact. Contextually, on-site vehicle movements are not considered to be out of character with the existing road traffic dominated noise climate. Considering the existing neighbouring commercial unit and significant road traffic along the M606 and M62, the acoustic character of the development is expected to be similar in nature.
- 5.11 The specific sound level is expected to lie ≥ 20 dB below the residual noise level during the day and ≥ 15 dB below at night, indicating that significant masking will be afforded by the road traffic dominated noise climate.
- 5.12 It should be noted that the predicted worst-case night-time noise rating level of 43 dB $L_{A,r,T,r}$ also complies with the previously proposed limit of 44 dB $L_{A,r,T,r}$, demonstrating that the night-time rating level lies ≥ 5 dB below the existing background noise level.
- 5.13 Consideration of context further supports the notion of a low impact assessment. The results of the assessment demonstrate that mitigation is not warranted in order to achieve a low noise impact at all receptors in accordance with BS 4142.

6. CONCLUSIONS

- 6.1 Operational noise has been assessed in accordance with relevant standards and guidance as summarised in **Section 2** and based on third-party noise survey data as summarised in **Section 3**.
- 6.2 The assessment of vehicle movements, delivery activities and external plant is based on a noise source study as summarised in **Section 4**. The assessment indicates the notion of 'low impact' in accordance with BS 4142 guidance, as summarised in **Section 5**. As such, mitigation is not considered warranted.
- 6.3 Based on the results of the assessment, it has been demonstrated that the Site is suitable for the proposed development from a noise perspective and that Planning Condition 17 can be discharged.
- 6.4 It should be noted that if the finalised external plant locations and selections vary from those assumed in this report, any changes should be reviewed by a suitably qualified acoustician at the relevant design stage.

APPENDICES

APPENDIX A: 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.

