FI REAL ESTATE MANAGEMENT

PROPOSED EMPLOYMENT DEVELOPMENT

THE OAKS, WREXHAM

NOISE IMPACT ASSESSMENT

R2433-REP01-JW

27 OCTOBER 2025

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REPORT DETAILS

Project	The Oaks , Oaks Road, Wrexham Industrial Estate, Wrexham LL13 9RG
Client	FI Real Estate Management Canal Mill Botany Brow Chorley, Lancashire PR6 9AF
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SUMMARY

Red Acoustics Ltd has been commissioned by FI Real Estate Management to provide an assessment of the impact of industrial sound on nearby residential properties from the proposed employment development at The Oaks, Wrexham.

The proposal is to construct an employment unit and new vehicular access, car and HGV parking, servicing and storage area, landscaping and ancillary development on land at Oaks Road, Wrexham Industrial Estate, Wrexham LL13 9RG.

Environmental surveys have been carried out to determine existing sound climate at the nearest noise sensitive dwellings to undertake an assessment with respect the guidance in TAN 11 and BS4142:2014+A1:2019.

It has been shown that predicted worst case sound levels at the nearest noise sensitive properties associated with the proposed new employment development result in low impact when rated in accordance with BS4142:2014+A1:2019.

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1.0 INTRODUCTION

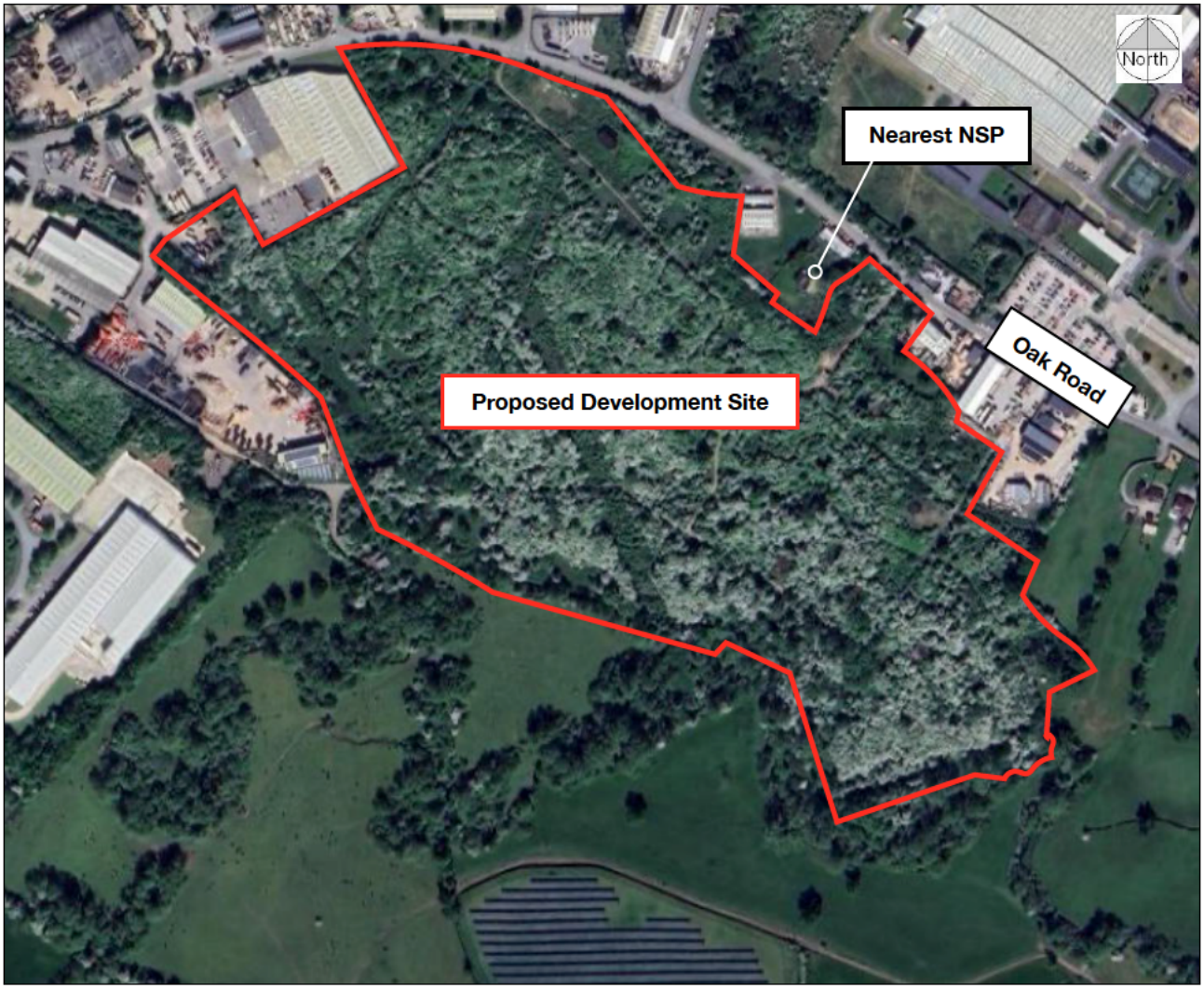
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2.0 SITE DESCRIPTION

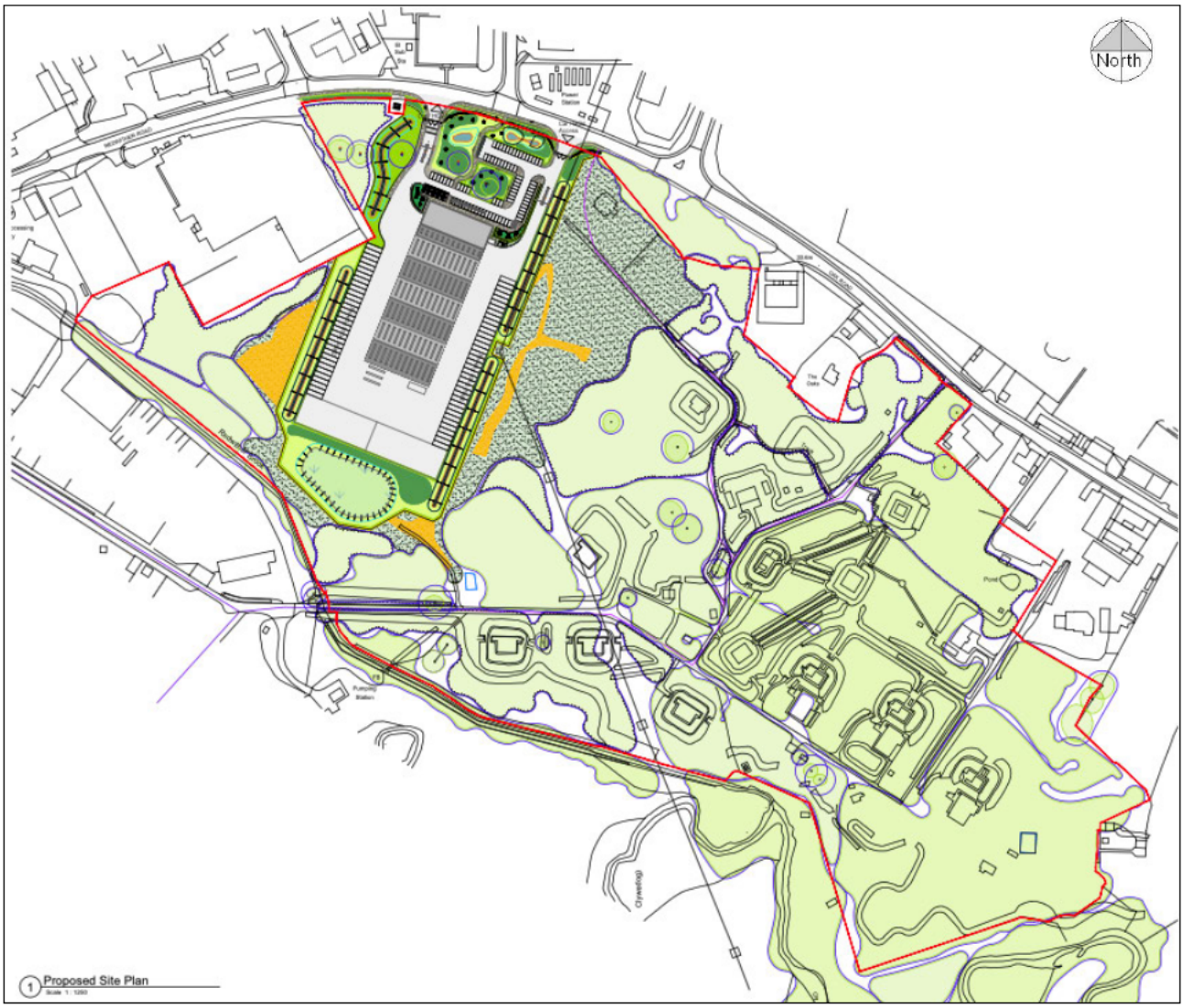
The proposed development site is located on land at the site of a former Second World War ordnance factory at Oak Road, Wrexham Industrial Estate, Wrexham, LL13 9RG. Figure 2.1 details the location of the application site (red outline) and the location of the nearest noise sensitive property (NSP) located approximately 400m to the east known as The Oaks, on Oak Road. Additional NSPs are located further to the east on Oak Road and approximately 400m to the south-west at HMP Berwyn.

Figure 2.1: Proposed Site Location Plan



The site is currently open land known as The Oaks, which was formerly occupied by a Second World War ordnance factory. Following its closure in 1945, the area was repurposed as part of the Wrexham Trading Estate, now known as the Wrexham Industrial Estate. The area is of a highly industrial context with a large number of commercial activities and very few residential dwellings. The proposed employment development site is bordered to the north and west by existing industrial developments within the Wrexham Industrial Estate. Figure 2.2 below shows the proposed site layout and landscape and the employment development area.

Figure 2.2: Proposed Site Layout



The proposed development comprises a large warehouse/manufacturing space with associated office accommodation, all contained within a single building on the site. The unit will include an HGV service and testing yard, delivery and storage yard, ancillary parking with access for both cars and HGVs provided directly from Oak Road. For the purposes of this assessment, the proposed operational hours are assumed to be 24 hours per day, although it is noted that the current HIAB operations typically take place between 07:00 and 18:00 hours.

3.0 POLICY CONTEXT & ASSESSMENT GUIDANCE

Planning Policy Wales

Planning Policy Wales (PPW) Edition 11[1] is the latest version of PPW and was published in February 2021[2]. The document sets out the context for planning in Wales and outlines the main policy objectives and principles. PPW emphasises sustainability as a key driver in land use planning and introduces the concept of placemaking.

PPW introduces four themes into the Welsh land use planning framework:

- Strategic and Spatial Choices
- Active and Social Places
- Productive and Enterprising Places
- Distinctive and Natural Places

PPW outlines policy on the main issues affecting development planning in Wales such as housing, transport, commercial and retail use, energy, minerals, infrastructure and services, economic development, electronic communications, tourism, biodiversity, environmental risk, coastal issues, the historic environment and recreation.

The Welsh National Development Framework (NDF) is Future Wales: the National Plan 2040 (Future Wales)[3] which was published in February 2021. The document sets out a 20 year land use framework which forms a material consideration in planning decision making and local planning policy must be produced in line with the framework.

Both PPW and Future Wales are supported by Technical Advice Notes (TANs) which are intended to provide detailed guidance on specific technical issues such as noise.

[1] Planning Policy Wales Edition 11 February 2021 - Welsh Government: https://www.gov.wales/sites/default/files/publications/2021-02/planning-policy-wales-edition-11_0.pdf

[2] The Planning Series 1 - National planning policy December 2021 - Welsh Parliament: https://senedd.wales/media/w1bdruqf/21-27-national-planning-policy.pdf

[3] Future Wales: the National Plan 2040 February 2021 - Welsh Government https://www.gov.wales/sites/default/files/publications/2021-02/future-wales-the-national-plan-2040.pdf

Welsh planning policy in relation to Noise makes reference to TAN 11: Noise 1997[4]. The document provides advice to planners on how the planing system can be used to minimise the impact of noise without placing unreasonable demands on business or unreasonable restrictions on development.

With regard to development control for noise generating development (as in the case of the development considered in this noise impact assessment), local planning authorities must ensure that noise generating development does not cause an unacceptable degree of disturbance.

To achieve this, reasonable and proportionate measures to limit the impact of new noise sources may include:

- Engineering - Reduction of noise at its source such as using quieter machinery, containment of noise or screening using barriers.
- Layout - Adequate distance between sources and receivers and adoption of the principle of good acoustic design to make use of site layout and features to minimise noise impact.
- Administration - Managing activities in terms of limits on produced noise or hours of operation.

Although TAN 11 discusses noise impact in a number of scenarios, the relevant scenario to this noise impact assessment is that of noise from industrial and commercial developments. Paragraph B17 in Appendix B of TAN 11 makes reference to the appropriate British Standard BS4142, though this document has been updated since the 1990 version referenced specifically.

BS4142:2014+A1:2019 is the most up to date version of the British Standard referred to in Tan 11 and as the relevant method of assessing noise in the specific scenarios considered in this noise impact assessment, this is discussed in more detail below.

[4] Planning Guidance (Wales) Technical Advice Note (Wales) 11, Noise - October 1997 - Welsh Government https://www.gov.wales/sites/default/files/publications/2018-09/tan11-noise.pdf

British Standard 4142

BS 4142:2014+A1:2019[5] presents methods for rating and assessing the potential impact of commercial and industrial sound upon noise sensitive receptors. In order to assess impact using BS 4142, the 'rating level' of the new sound source is compared with the existing contextual 'background sound level'.

- Typically, the greater this difference, the greater the magnitude of the 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.

The 'rating level' is determined by assessing the 'ambient sound level', distinguishing the 'specific sound level' from the 'residual sound level' and applying any sound specific penalties for acoustic features that would subjectively cause the sound to be perceived differently.

The 'specific sound level' of the commercial / industrial sound source is determined by either; measurement or calculation with regard to the appropriate reference time interval (for daytime or night-time periods). The standard requires separate analysis for daytime and night-time periods, evaluating the 'rating level' over an appropriate reference time interval (T_r) of: 1hr for daytime (07:00 - 23:00 hrs) and 15min for night time (23:00 - 07:00 hrs). The 'specific sound level' is defined as equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, *T* (determined either by calculation or deducting the measured 'residual sound level' from the measured 'ambient sound level').

'Ambient sound' is defined as the totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far (The ambient sound comprises the residual sound and the specific sound when present).

'Residual sound' is defined as the ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound.

[5] BS4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

Where appropriate, a rating penalty can be applied to the specific noise level to account for the character of the noise, namely: tonality, impulsivity and intermittency. Such acoustic feature corrections can be added together linearly.

Tonality can be determined objectively (using adjacent third octave band analysis or the Joint Nordic method) or subjectively as described below:

- +2dB penalty: Just perceptible
- +4dB penalty: Clearly perceptible
- +6dB penalty: Highly perceptible

Impulsivity can be determined objectively (using Fast Fourier Transform analysis) or subjectively as described below:

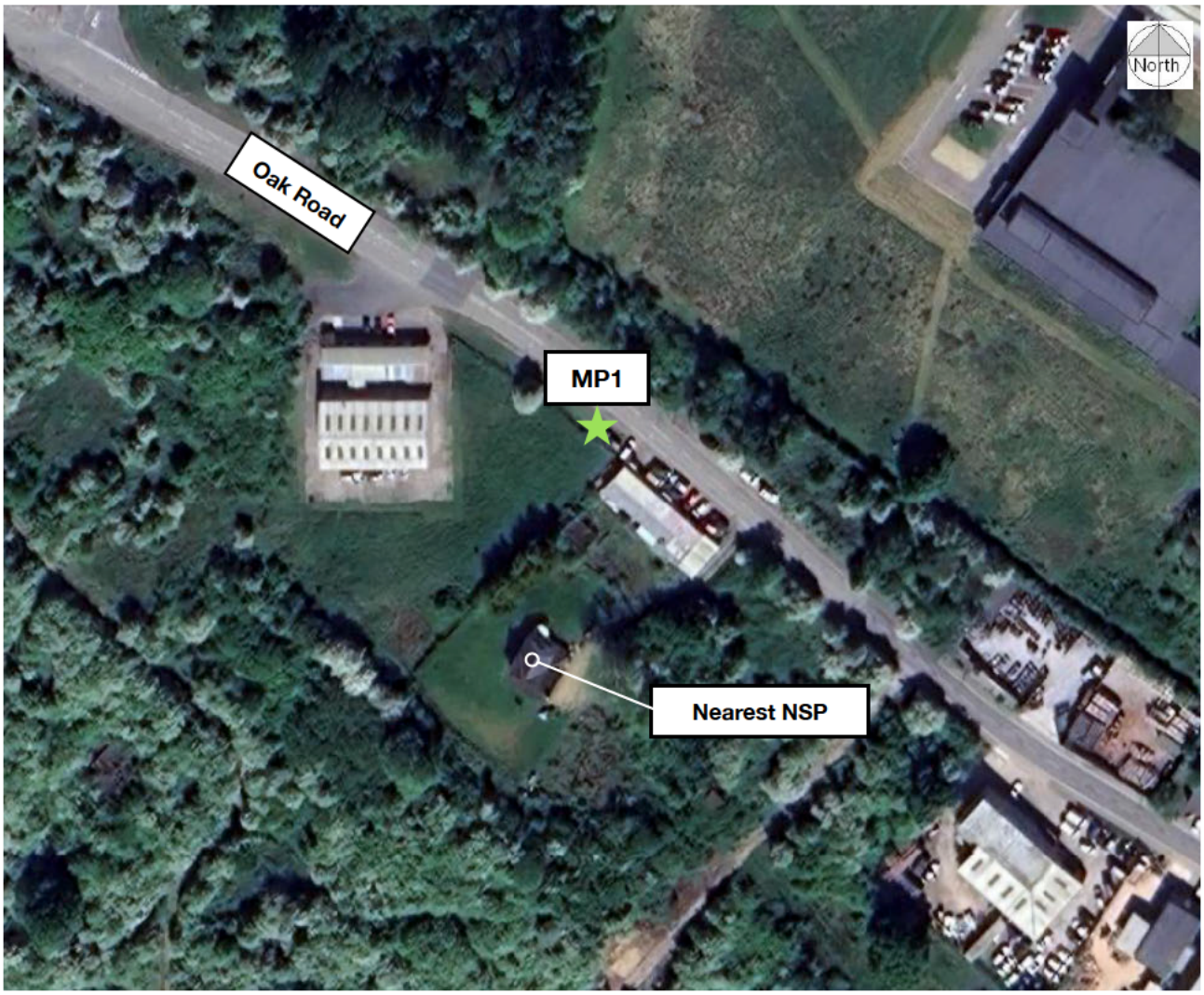
- +3dB penalty: Just perceptible
- +6dB penalty: Clearly perceptible
- +9dB penalty: Highly perceptible

Where intermittency is present, a +3dB penalty can be applied. Where the acoustic feature characteristics are neither tonal nor impulsive, but are clearly distinguishable against the residual noise, a +3dB penalty can be applied.

4.0 ENVIRONMENTAL SOUND SURVEYS

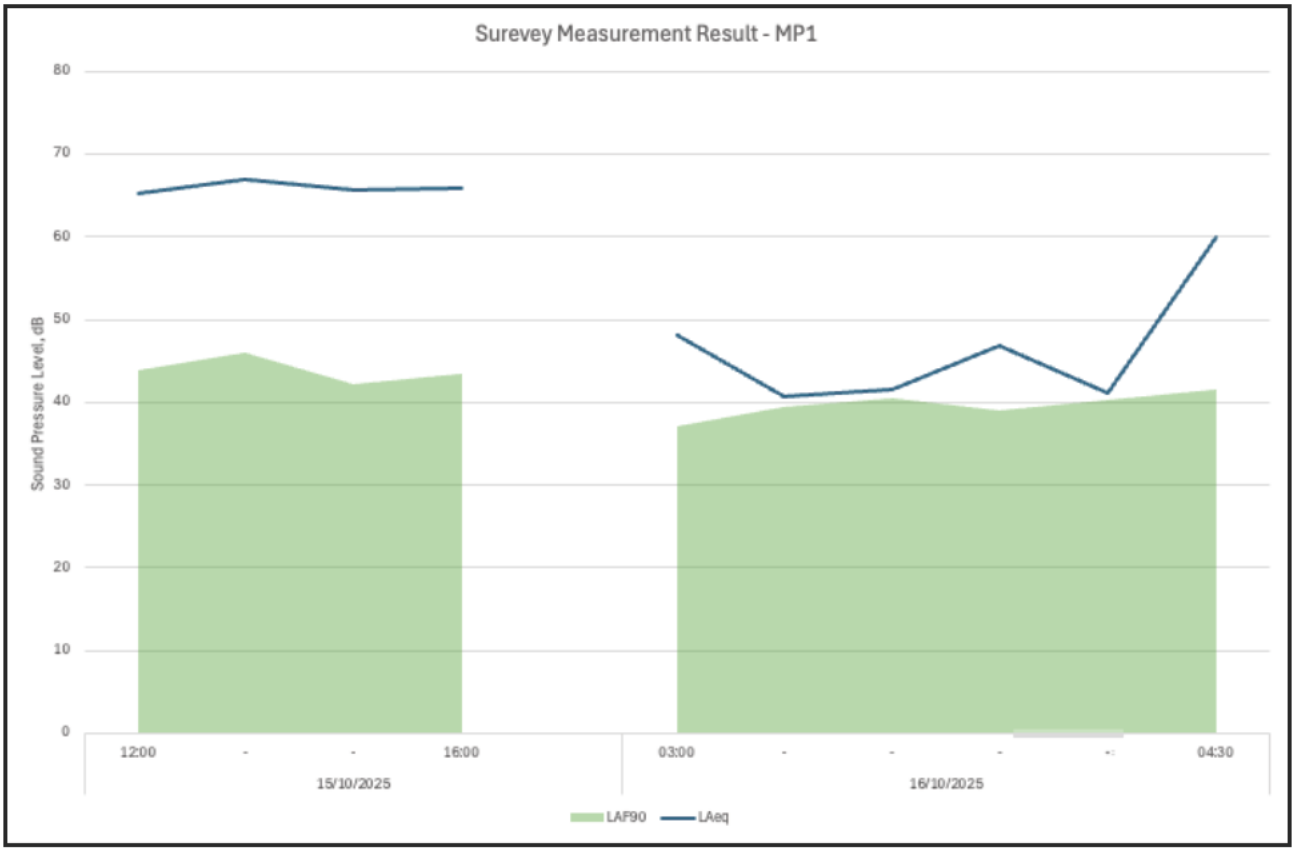
The location of measurement position MP1 was selected to capture the existing sound climate at the nearest noise sensitive residential property. MP1 was fully attended and measurements were undertaken using a Class 1 Sound Level Meter (SLM) positioned on a tripod at a height of 1.5 m above ground level, in free field conditions. To establish the representative existing environmental sound climate, daytime measurements were carried out between 12:00hrs and 16:00hrs on Wednesday 15th October 2025, with the SLM configured to log data in 1 hour intervals. Nighttime measurements were undertaken in the early morning of Thursday 16th October 2025, between 03:00hrs and 04:30hrs, with the SLM logging data in 15 minute intervals.

Figure 4.1: Environmental Sound Survey Location



During the surveys, the noted weather conditions were, dry, calm with wind speeds typically below <5m/s. Figure 4.2 present the both the daytime and nighttime measurement results at position MP1.

Figure 4.2: Environmental Sound Survey Results - MP1



During the manned environmental noise surveys, it was observed that the primary source of sound influencing the nearest noise sensitive properties (NSPs) was road traffic on Oaks Road, supplemented by industrial noise from the nearby industrial area. The surrounding area is predominantly industrial in nature, with few distant NSPs present within the local context. The sound climate at the site is therefore characterised by industrial activity over a wide range of sites including vehicles, machinery and plant, tonal machinery and loading/reversing beepers audible at the NSP monitoring position during the daytime and nighttime surveys.

The typical background sound level measured at position MP1 was typically 43dB(A) during the daytime period and 39dB(A) during the nighttime period.

5.0 DETERMINATION OF OPERATIONAL SOUND LEVELS

It is proposed that the occupants of the new employment development will be HIAB Limited, with the site serving as the company's main UK operational facility. The relocation is planned from their existing premises in the nearby town of Ellesmere.

To inform the assessment, operational sound level measurements were undertaken by Red Acoustics Ltd between Wednesday 8th October and Thursday 16th October 2025.

Noise breakout has been assessed from the proposed development based on measured internal levels from actual proposed activity at the existing headquarters site. Similarly, external sound levels for HGV and car access, machinery testing and delivery/storage areas have been assessed based on measured data for existing site operations at HIAB. Measured levels used for the purpose of the assessment are presented in Table 5.1 below.

Table 5.1: Measured Internal Operating Levels

Item Description	Broadband Level	Octave Band Centre Frequency (dB)								
		31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1.0 kHz	2.0 kHz	4.0 kHz	8.0 kHz
Main Manufacturing Workshop	73.3dB LAeq, 07:00 to 17:30	62.2	64.9	64.7	66.0	65.0	67.0	67.7	66.6	61.6
Parts Store and Dispatch	57.9dB LAeq, 08:15 to 16:15	48.2	49.0	57.3	63.0	51.1	51.2	50.5	46.6	41.2
Testing Area (External)	62.1dB LAeq, 15:30 to 16:30	64.4	63.4	65.4	63.3	57.7	58.3	53.4	46.4	40.6
Delivery & Store (External) Including FLT Loading	59.9dB LAeq, 08:30 to 09:30	64.9	63.7	62.7	61.7	55.4	55.3	52.0	46.3	39.8
Main Gate (Car Pass-by 3m @15kph)	58.0dB LAeq	72.6	63.8	57.6	54.8	52.5	53.0	52.8	43.6	38.1
Main Gate (HGV Pass-by 3m@15kph)	65.5dB LAeq	72.6	71.4	62.2	60.3	60.9	61.5	58.3	53.8	46.9
Main Gate (HGV Idling 5m)	63.6dB LAeq	64.3	68.0	62.9	57.2	56.9	61.3	55.1	51.5	42.8

The measured levels have been taken for input into a CadnaA 3D noise propagation model for use as internal sound levels within the proposed building and sound levels in the relevant external areas. It should be noted that internal levels are assumed to be the internal reverberant sound level incident on all facades and roof elements. Given the large size of the proposed unit, this represents a robust assessment of noise breakout. Noise propagation is then predicted to the nearby noise sensitive uses. The measured internal sound levels and delivery, storage and testing area levels are assumed to be the case for the entire daytime and nighttime assessment period and are therefore worst case. Vehicle numbers for the assessment period are taken from the transport assessment submitted in support of the application for planning approval (ref: P24012/TA, Prime Transport Planning, September 2025) This is discussed further in section 6.0 below.

In order to assess typical vehicle movements, these have been split into HGV and car movements which are based on measured pass-by data at the existing HIAB site. All vehicles were travelling at approximately 15kph and were measured in free field conditions at 3m from the vehicle pass-by location.

6.0 NOISE PROPAGATION MODELLING

To predict noise levels from the proposed employment unit across the local environment, CadnaA 3D noise propagation modelling software has been used, which implements the calculation procedure specified within ISO9613-2.

The CadnaA 3D noise propagation model has been used to undertake the impact assessment in accordance with BS4142:2014+A1:2019. For this assessment, the typical operating source sound levels presented in Section 5.0 above were used to establish sound propagation from the relevant areas of the proposed buildings and external activity, based on drawn information for the building elements and the predicted sound reduction indices for the building facade elements.

For the purpose of the assessment and calculation, the building envelope is understood to be a portal framed design which includes a standard single skin insulated cladding material for the wall and roof areas. The assumed sound reduction performance of a standard single skin insulated cladding material is ≤ 24dB R_w which is based on manufacturer data. Roller shutter doors were also accounted for using performance data held on file by Red Acoustics. Roller doors are assumed to be open for 25% of the assessment period and closed for the remaining 75% of the time.

The vehicle movements are based on individual sources for both HGV and car movements with the emission set as a moving point source set to 15kph for HGVs and cars. HGVs are also set to idle for 10 minutes during each departure and arrival. Movements of HGVs set to 1 per hour (arriving and then departing) and car movements set to 50 per hour. This is in line with the transport assessment (Table 6.1). Sound levels are those presented in Section 5.0. Vehicles are modelled as moving point sources and testing/delivery areas are modelled as area sources, as are the building facades and doors. As nighttime activity is not currently proposed but restricted hours are not included in the application, future potential night time sound levels are assumed to be the same as the daytime for a worst case assessment.

The modelling software utilises topography data from the Defra Data Service Platform. The existing buildings, and the surroundings are modelled using Google Earth imagery and the proposed buildings are are based on drawn details provided by the client. Buildings are set to fully reflective surfaces in the model and the ground was set to fully reflective on site and 50% reflective off site to account for mixed ground. It was assumed that the proposed building location ground levels will be commensurate with the existing site levels. The CadnaA 3D noise propagation model is then used to calculate the specific sound level from the combined sound sources, taking into account reflections and attenuation from distance, ground, barriers, foliage etc. The specific sound level is predicted to the nearest noise sensitive dwellings. Figures 6.1 & 6.2 below present the result of the model calculation.

Two modelling scenarios are considered. The first scenario is full internal activity and vehicle movements with the delivery area in use. The second scenario is full internal activity and vehicle movements with the testing area in use. As these areas are immediately adjacent it is unlikely that they would be in use at the same time and have been considered separately.

Figure 6.1: Predicted Specific Sound Level (dB $L_{Aeq,1hour}$) - Assessment to NSPs (Delivery Scenario)

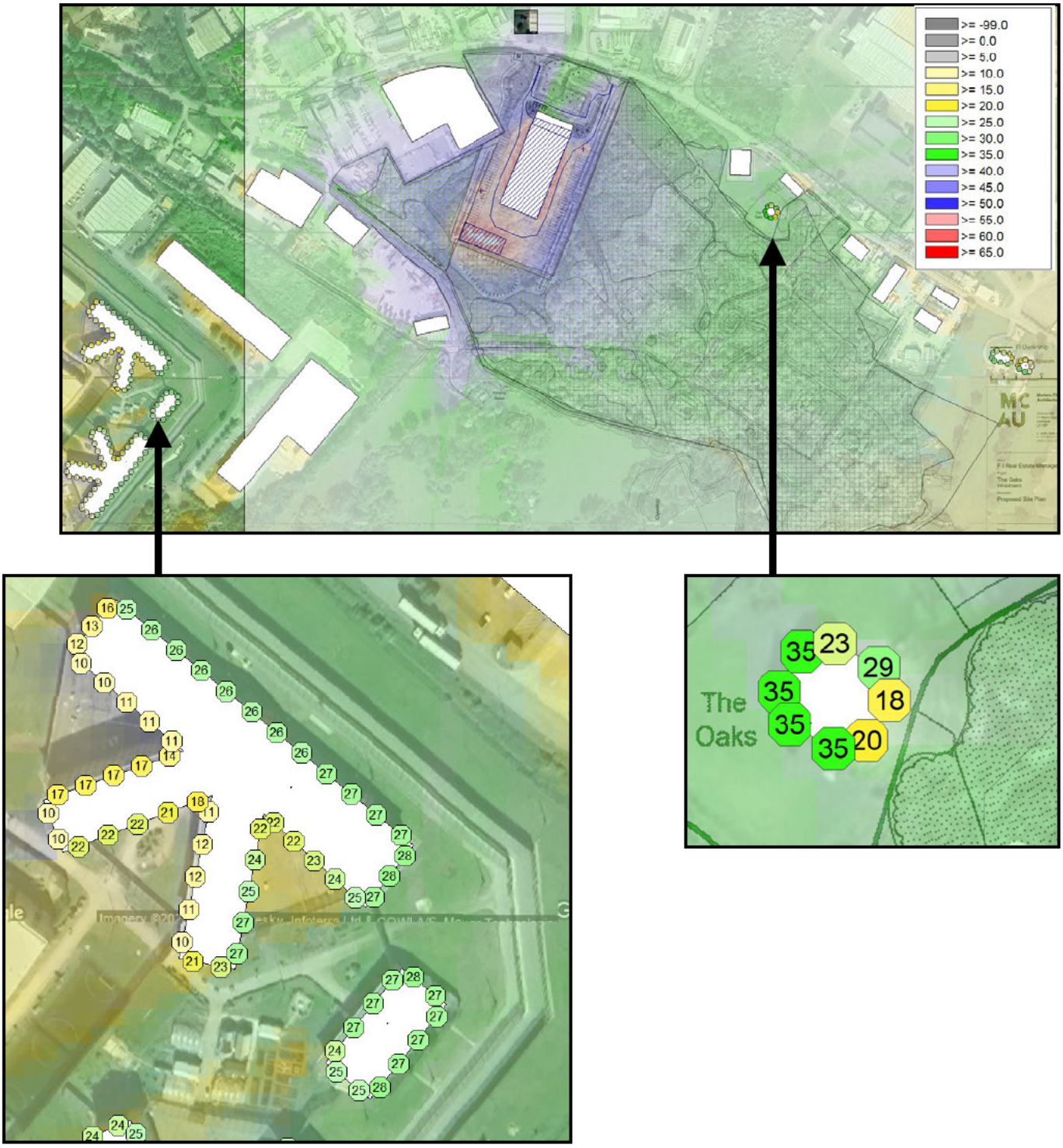
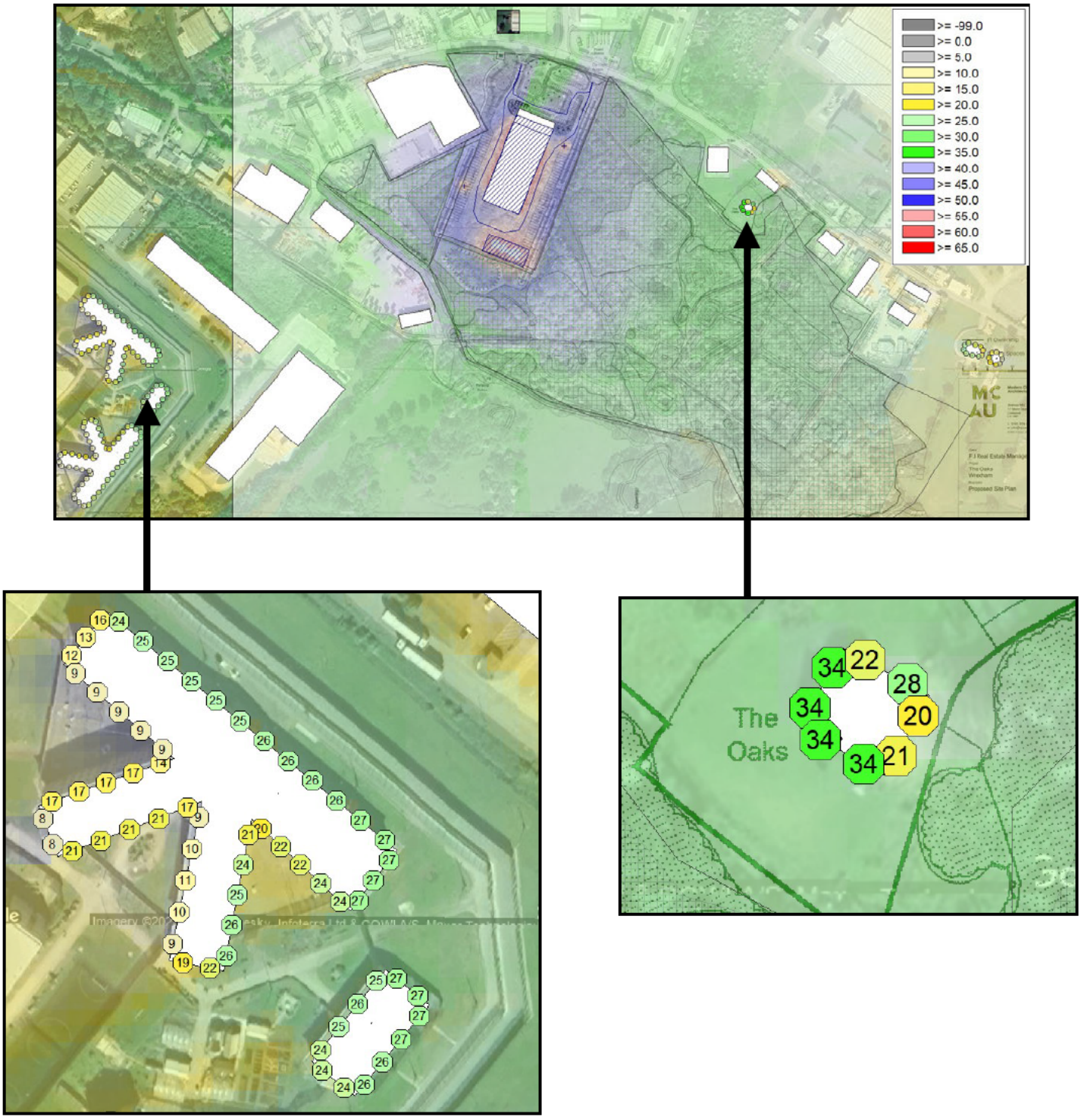


Figure 6.2: Predicted Specific Sound Level (dB $L_{Aeq,15min}$) - Assessment to NSPs (Testing Scenario)



7.0 BS4142 IMPACT ASSESSMENT

Tables 7.1 & 7.2 below present the BS4142 assessments based on impact at the most affected noise sensitive properties.

Table 7.1: BS4142 Assessment - Nearest NSP Manufacturing, Vehicles and Delivery Scenario

Assessment Item	Value / Commentary	
Specific Noise Level (Predicted)	35dB	
Corrections	No corrections necessary as noise impact is low and not expected to be readily distinguishable in context of the existing noise climate.	
Rating Level dB	35dB	
Typical Background $L_{A90,t}$	43dB	39dB
Difference	-8dB	-4dB
Conclusion	Low Impact	

Table 7.2: BS4142 Assessment - Nearest NSP Manufacturing, Vehicles and Testing Scenario

Assessment Item	Value / Commentary	
Specific Noise Level (Predicted)	34dB	
Corrections	No corrections necessary as noise impact is low and not expected to be readily distinguishable in context of the existing noise climate.	
Rating Level dB	34dB	
Typical Background $L_{A90,t}$	43dB	39dB
Difference	-9dB	-5dB
Conclusion	Low Impact	

It can be seen in both scenarios that the predicted impact is low based on a worst case assessment. Although no nighttime activity is proposed at this stage, activity has been assumed to be the same as the daytime though this would be extremely unlikely. This represents a robust assessment and demonstrates that expected impact is expected to be low.

8.0 PLANT NOISE TARGET LIMITS

As details of proposed plant items are not known at this stage and will develop with the overall design and commercial availability, the nature of any plant items that may be installed in future is unknown. At this stage therefore, based on the measured survey data, plant noise target limits are proposed to enable future design targets. Table 8.1 below presents the proposed plant target limits at the nearest noise sensitive dwellings when assessed in accordance with BS4142:2014+A1:2019.

Table 8.1: Proposed Commercial Sound (Plant) Target Limits

	Measured Sound Pressure Level, dB (re: 2x10-5 Pa)			
	Daytime Period 07:00hrs to 23:00hrs		Evening/Night-time Period 23:00hrs to 07:00hrs	
Measurement Location	Typical Existing $L_{A90,15min}$	Proposed Target $L_{Aeq,15min}$	Typical Existing $L_{A90,15min}$	Proposed Target $L_{Aeq,15min}$
Nearest NSP Facade	43	≤ 38	39	≤ 34

9.0 CONCLUSION

An assessment of sound generation from operation of a proposed new employment unit at Oak Road, Wrexham has been undertaken in line with the guidance in BS4142:2014+A1:2019 and TAN 11.

Impact from internal operational activities and vehicle movements is predicted to be low and noise is not expected to be a constraint to the proposed development.

APPENDIX A: NOISE SURVEY DETAILS

Location

The Oaks, Oaks Road, Wrexham Industrial Estate, Wrexham LL13 9RG

Survey Dates

Operational Noise Measurements; Wednesday 8th October and Thursday 16th October 2025.

Environmental Sound Surveys; Wednesday 15th October and Thursday 16th October 2025.

Weather

Conditions during the surveys were dry with wind speeds <5ms^{-1}

Personnel

Johnathan Whittle BSc (Hons), Pg. Dip. IOA AMIOA MCIEH

Paul Clark Pg. Dip. IOA MIOA. - Operational noise measurement set-up only

Instrumentation

Table A1 details the equipment used during the surveys.

Table A1: Survey Instrumentation

Equipment Description	Type Number	Manufacturer	Serial Number	Date of Last Calibration	Calibration Certificate Number
Sound Level Meter	XL3	Nti Audio	A3A-01456-F0	13-Jan-25	UK-25-006
Microphone Capsule	MC230A	Nti Audio	A30133	13-Jan-25	UK-25-006
Preamplifier	MA230	Nti Audio	1916	13-Jan-25	UK-25-006
Sound Level Meter	XL2	Nti Audio	A2A-22062-F0	28/03/2025	UK-25-039
Preamplifier	MA220	Nti Audio	11383	28/03/2025	UK-25-039
Microphone Capsule	MC230A	Nti Audio	A24704	28/03/2025	UK-25-039
Sound Level Meter	XL2	Nti Audio	A2A-16928-E0	29/11/2023	UK-23-140
Preamplifier	MA220	Nti Audio	8653	29/11/2023	UK-23-140
Microphone Capsule	MC230A	Nti Audio	A17736	29/11/2023	UK-23-140
Sound Calibrator	Type 1251 IEC 60942-1997 Class 1	Norsonic	32273	29-Oct-24	49118
Sound Level Meter	CR:171B Type 1	Cirrus	G300554	09-May-24	47689
Microphone	MK:224	Cirrus	606083B	09-May-24	47688
Preamplifier	MK:170	Cirrus	599	09-May-24	47688
Sound Calibrator	CR:515 Type 1	Cirrus	88023	29-Oct-24	49120

Methodology

Before and after the measurements the sound level meters were check calibrated to an accuracy of ±0.3dB using their associated Class 1 Calibrators. No drift in the instruments' sensitivities were noted across any of the survey periods.

Calibration Certificates

Copies of all calibration certificates are kept on file by Red Acoustics Ltd and can be supplied if requested.