Proposed Commercial Development
Quinton Hazell Enterprise Parc, Mochdre

Noise Assessment Report

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Authorised by	Ryan Swales, BSc, MIOA Director & Principal Consultant

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RS Acoustic Engineering Ltd
76 Marple Road
Stockport
SK2 5QH
Tel: 07861 373794
Web: www.rsacoustic.co.uk
Email: info@rs-acoustic.co.uk

A company registered in England & Wales (No: 07604309)
Corporate Member of the Institute of Acoustics (MIOA)
Member of the Sound Insulation Testing & Measurement Association (SITMA)

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1. Introduction

1.1 RS Acoustic Engineering Ltd have been appointed by Site Quest to undertake a noise impact assessment with regard to a proposed commercial development at Quinton Hazell Enterprise Parc, Glan-Y-Wern Road, Mochdre, Colwyn Bay, LL28.

1.2 The proposals are split into two phases and initially consist of the construction of eight commercial units with associated parking and landscaping (phase one). At a later stage (phase two), a number of additional units will be constructed directly west of the phase one units.

1.3 The existing commercial development operates twenty-four hours per day, seven days per week and it is understood that similar usage is being sought for the proposed extension.

1.4 It is also understood that none of the existing businesses will be displaced as a result of the proposed development.

1.5 The nearest noise-sensitive receptors to the site are dwellings to the east along Crafnant Road. There are also dwellings along Bodnant Road and Llewelyn View further east and Colwyn Bay Crematorium is located to the south east.

1.6 The most notable sources of noise at the site are distant road traffic on the A55, intermittent road traffic on the local network and operational activity associated with the existing commercial premises.

1.7 An environmental noise survey has been conducted over a number of days in order to determine the existing background sound levels during the daytime and night-time period.

1.8 The end tenant details and finalised construction details are not yet known and therefore an indicative plant noise assessment has been undertaken with reference to the guidance given within BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*.

1.9 Sound level criteria for new building services plant has been recommended based on the measured background sound levels.

1.10 An assessment of noise breakout from the building envelope has also been conducted and the resulting sound levels determined at neighbouring dwellings.

1.11 Sample noise measurements of HGV's, forklift trucks and roller shutter operation have been used to provide an indication of the resulting sound level at neighbouring dwellings during the daytime and night-time period.

1.12 The survey and assessment was conducted by Mr Ryan Swales ($BSc_{(Hons)}$, MIOA), Principal Acoustic Consultant and Corporate Member of the Institute of Acoustics.

1.13 This report provides the survey results, calculation details, predicted sound levels at neighbouring dwellings, anticipated impact and a brief discussion on site context.

2. Assessment Guidance & Criteria

Planning Guidance (Wales) Technical Advice Note 11, Noise (1997)

2.1 Technical Advice Note 11: Noise (TAN11), published by the Welsh Government in 1997, provides advice on how the planning system can be used to minimise the adverse impact of noise without placing unreasonable restrictions on development or adding unduly to the costs and administrative burdens of business.

2.2 The document outlines some of the main considerations which local planning authorities should take into account in drawing-up development plan policies and when determining planning applications for development which will either generate noise or be exposed to existing noise sources.

2.3 With regard to noise generating development, Paragraphs 8 and 9 of TAN11 provide the following guidance:

8. Local planning authorities must ensure that noise generating development does not cause an unacceptable degree of disturbance. They should also bear in mind that if subsequent intensification or change of use results in greater intrusion, consideration should be given to the use of appropriate conditions.

9. Noise characteristics and levels can vary substantially according to their source and the type of activity involved. In the case of industrial development, for example, the character of the noise should be taken into account as well as its level. Sudden impulses, irregular noise or noise which contains a distinguishable continuous tone will require special consideration.....

2.4 With regards to measures to mitigate the impact of noise, Paragraph 11 of TAN11 advises that:

11. Measures introduced to control the source of, or limit exposure to, noise should be proportionate and reasonable, and may include:

i. engineering – reduction of noise at point of generation (e.g. using quiet machines and/or quiet methods of working); containment of noise generated (e.g. insulating buildings which house machinery and/or providing purpose -built barriers around sites); protection of surrounding noise-sensitive buildings (e.g. improving sound insulation in these buildings and/or screening them by purpose-built barriers);

ii. lay-out – adequate distance between noise source and noise-sensitive building or area; screening by natural barriers, other buildings, or non-critical rooms in a building;

iii. administrative: limited operating time of noise source; restricting activities allowed on the site; specifying an acceptable noise limit.

British Standard 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

2.5 BS 4142 (amended June 2019) describes methods for rating and assessing sound of an industrial and/or commercial nature, such as sound from manufacturing processes and fixed mechanical plant/machinery.

2.6 Outdoor sound levels are used to assess the likely effect on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

2.7 BS 4142 is not intended to be applied to the derivation of indoor sound levels arising from sound levels outside, or the assessment of indoor sound levels.

2.8 The standard has three different methods (subjective, objective and reference) of applying a penalty to tonal, impulsive and intermittent noises, as separate entities.

2.9 The current standard no longer indicates significance of noise impacts as giving rise to a '*likelihood of complaint*' but rather as an '*indication*' of varying degrees of '*adverse impact'*.

2.10 BS 4142:2014 states that a difference of around +10 dB or more (excess of rating level above the background sound level) is likely to be an indication of a significant adverse impact, depending on the context.

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

2.12 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.

2.13 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.

2.14 With regard to determining the background sound level at the site, the standard provides the following guidance:

Where possible, measure the background sound level at the assessment location(s). If this is not possible measure at an alternative location where the residual sound is comparable to the assessment location(s). A detailed justification for considering this should be reported.

Ensure that the measurement time interval is sufficient to obtain a representative value of the background sound level for the period of interest. This should comprise continuous measurements of normally not less than 15 min intervals, which can be contiguous or disaggregated.

2.15 The standard also provides the following general commentary on background sound level:

The background sound level is an underlying level of sound over a period, T, and might in part be an indication of relative quietness at a given location. It does not reflect the occurrence of transient and/or higher sound level events and is generally governed by continuous or semi-continuous sounds.

In using the background sound level in the method for rating and assessing industrial and commercial sound it is important to ensure that values are reliable and suitably represent both the particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods.

Among other considerations, diurnal patterns can have a major influence on background sound levels and, for example, the middle of the night can be distinctly different (and potentially of lesser importance) compared to the start or end of the night-time period for sleep purposes. Furthermore, in this general context it can also be necessary to separately assess weekends and weekday periods.

Since the intention is to determine a background sound level in the absence of the specific sound that is under consideration, it is necessary to understand that the background sound level can in some circumstances legitimately include industrial and/or commercial sounds that are present as separate to the specific sound.

3. Environmental Noise Survey

Survey methodology

3.1 Continuous sound level monitoring was conducted over a 48-hour period at the sites eastern boundary line, directly adjacent to the dwellings on Crafnant Road.

3.2 Measurements were performed from 13:15 hours on Sunday 29th through to 13:15 hours on Tuesday 31st August 2021.

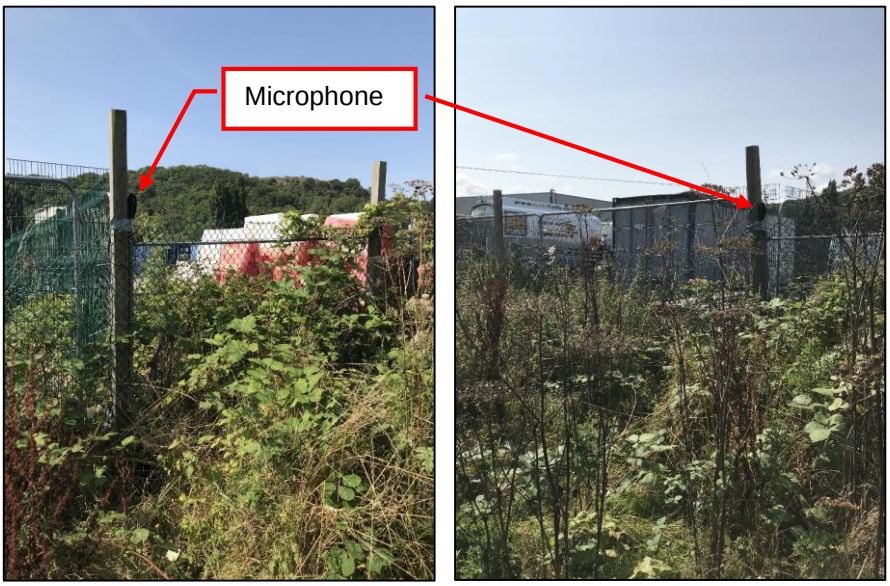
3.3 A measurement interval of 15-minutes was used throughout the survey and measurements were considered to be subject to free-field conditions. Both one-third octave band and A-weighted broadband sound pressure levels were recorded during the survey.

3.4 The measurement position was considered to be the most secure location with regard to leaving the equipment partially unattended over three days and was considered to be representative of the background sound level experienced at the neighbouring dwellings.

3.5 The site location, surrounding area and survey measurement position are shown in Figure 3.1 and 3.2 overleaf.

Figure 3.1 – Site location and survey measurement position (Source: Google Earth)

Figure 3.2 – Photographs showing survey measurement position



Survey equipment

3.6 The survey was performed using the following Class-1 specification equipment:

- Brüel & Kjaer 2250-Light data logging sound level meter, with microphone type 4189 and pre-amplifier type ZC0032.
- CEL-120/1 Acoustic calibrator.

3.7 Calibration of the sound level meter and microphone used for the measurements are traceable to UKAS accredited laboratories (calibration certificates are provided within Appendix C).

3.8 The calibration of both sound level meter and microphone was checked using a 1 kHz tone at 94 dB prior to and following the survey. The drift in calibration was less than 0.1 dB.

Weather conditions

3.9 The weather conditions during the survey were generally dry and fine with clear sunny spells. Wind speed measurements taken on site were less than 2.5 m/s^{-1}. The wind direction was from the north east.

3.10 The air temperature during the survey ranged between approximately 10°C and 19°C. The overall weather conditions were considered suitable to obtain representative measurements.

Measured indices

3.11 Although a wide range of statistical sound level data was recorded during the survey, the L_{Aeq} and L_{A90} indices are of most interest for this assessment:

- $L_{Aeq,T}$ - The A-weighted equivalent continuous sound pressure level over a period of time, T. Representative of the 'average' sound pressure level over a given period (used to describe the ambient sound level).
- $L_{A90,T}$ - The sound pressure level that is exceeded for 90% of the measurement time interval, T. L_{A90} is often used to describe the 'background' sound level.

3.12 Sound pressure level measurements are taken with an A-weighting (denoted by a subscript 'A', e.g. L_{Aeq}) to approximate the frequency response of the human ear.

Results summary

3.13 Table 3.1 presents a summary of the measured background L_{A90} sound pressure levels from the continuous monitoring position. Measured values have been rounded to the nearest whole number.

Table 3.1 – Summary of continuously measured background L_{A90} sound pressure levels

Date	Period, Hours	Typical[1] $L_{A90,15min}$ dB	Lowest $L_{A90,15min}$ dB	Highest $L_{A90,15min}$ dB
Sunday 29/08/2021 - Monday 30/08/2021	Daytime (13:15-23:00)	39	36	45
	Night-time (23:00-07:00)	35	27	40
Monday 30/08/2021 - Tuesday 31/08/2021	Daytime (07:00-23:00)	39	36	47
	Night-time (23:00-07:00)	33	31	43
Tuesday 31/08/2021	Daytime (07:00-13:15)	44	42	46

[1]Considered to be the representative background sound level from a statistical analysis (modal value)

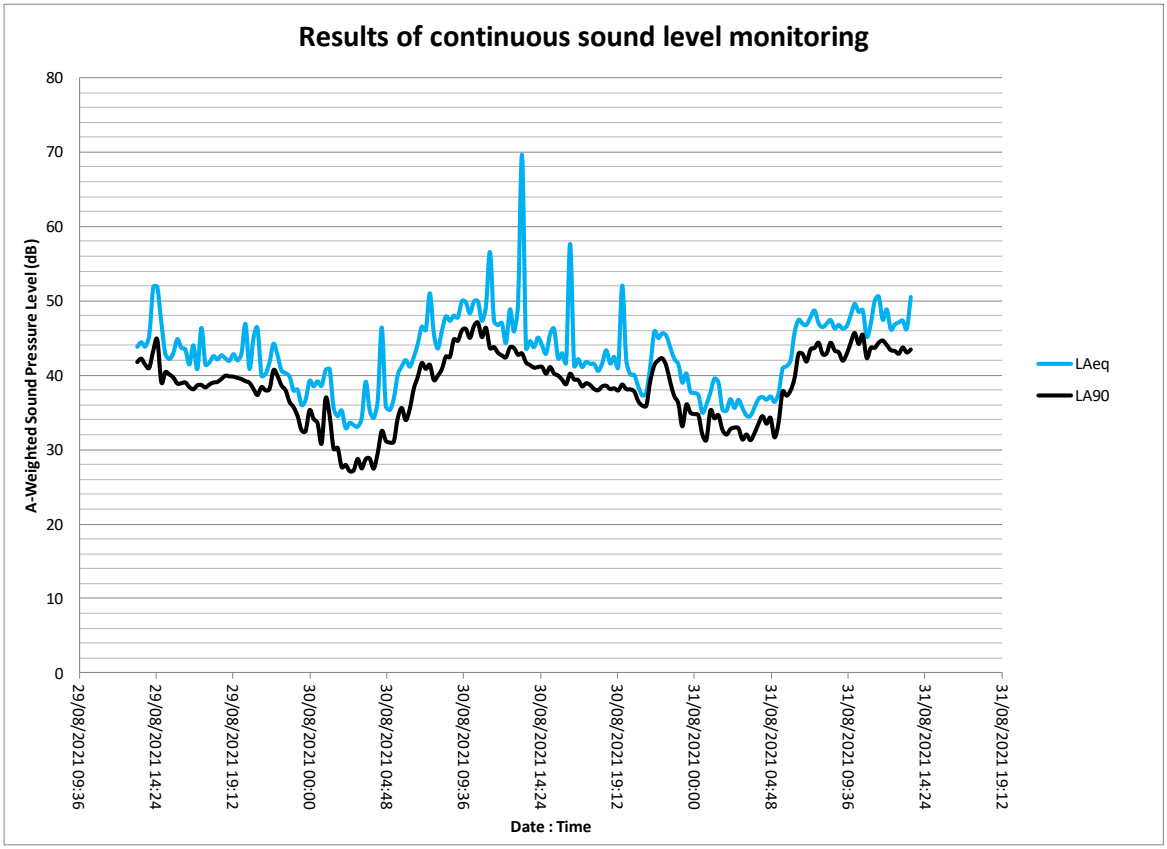
3.14 Table 3.2 presents a summary of the measured ambient L_{Aeq} sound pressure levels from the continuous monitoring position. Measured values have been rounded to the nearest whole number.

Table 3.2 – Summary of continuously measured ambient L_{Aeq} sound pressure levels

Date	Period, Hours	Average $L_{Aeq,15min}$ dB	Lowest $L_{Aeq,15min}$ dB	Highest $L_{Aeq,15min}$ dB
Sunday 29/08/2021 - Monday 30/08/2021	Daytime (13:15-23:00)	45	40	52
	Night-time (23:00-07:00)	39	33	46
Monday 30/08/2021 - Tuesday 31/08/2021	Daytime (07:00-23:00)	53	37	70
	Night-time (23:00-07:00)	40	35	47
Tuesday 31/08/2021	Daytime (07:00-13:15)	48	45	51

3.15 The results of the sound level monitoring are presented graphically in Figure 3.3 overleaf.

Figure 3.3 – Graph showing results of continuous sound level monitoring



4. Assessment & Discussion

Nearest noise sensitive receptors

4.1 The nearest noise-sensitive receptors to the site are dwellings to the east on Crafnant Road. The separation distance from the eastern boundary to the nearest dwellings is approximately 30 metres. The distance from the dwelling to the mid-point of the development site is approximately 105 metres.

Noise criteria for building services plant

4.2 The tenant and plant details for the units have yet to be confirmed. However, at this stage it is prudent to set appropriate external noise targets based on the measured background sound levels.

4.3 BS 4142 states '*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'.*

4.4 Taking into account the guidance within BS 4142, it is recommended that the sound rating level ($L_{Aeq,T}$) from all new building services plant does not exceed the typical background sound level ($L_{A90,T}$).

4.5 Table 4.1 presents the applicable sound level targets for new fixed plant items. It is considered prudent to use the lowest typical background sound level when determining appropriate targets (from Table 3.1).

4.6 The sound level targets should be achieved at approximately 3.5 metres from the nearest residential window/elevation (free-field).

Table 4.1 – Sound level targets for new building services plant

Period, Hours	Typical Background Sound Level $L_{A90,15min}$ dB	Target Rating Level $L_{Aeq,15min}$ dB
Daytime (07:00-23:00)	39	39
Night-time (23:00-07:00)	33	33

4.7 The recommended noise limits should be agreed with the local authority prior to the design and selection of plant.

4.8 The fixing of externally mounted plant such as condenser units and/or ventilation openings should be avoided where possible on the east facing elevation of the new units.

4.9 There is a relatively short separation distance to the neighbouring dwellings and there could be a direct line-of-sight to the windows of habitable rooms. Such factors could make it difficult to achieve the external noise targets without bespoke acoustic mitigation measures.

Noise breakout from the building envelope

4.10 For the purpose of this assessment, the external wall construction is assumed to consist of metal cladding panels with 100 mm thick rigid insulation, steel frame, 100 mm blockwork and two leaves of plasterboard. The sound insulation performance of the external wall is expected to be approximately 45 to 50 dB R_w.

4.11 The roof is expected to be of a lightweight metal standing seam construction (Kingspan or similar). The sound insulation performance of the roof is expected to be approximately 25 to 27 dB R_w.

4.12 There will be a single roller shutter on the front west facing elevation of each unit, that will be approximately 3.4 metres wide by 3.4 metres high. The sound insulation performance of the roller shutter is expected to be approximately 24 to 25 dB R_w.

4.13 There will also be a large glazed panel/unit and main entrance door directly adjacent to the roller shutter. The sound insulation performance of the glazing is expected to be at least 31 dB R_w.

4.14 The composite sound insulation of the building envelope has been determined taking into consideration the building dimensions, surface area and typical sound insulation of each element.

4.15 The calculation results in Table 4.2 indicate a composite sound insulation performance of approximately 28 dB R_w (roller shutter closed).

Table 4.2 – Building envelope sound insulation (roller shutter closed)

Title: Quinton Hazell **Sound Transmission Loss (ISO 12354)**												
Formula/Comment	***Single Value***		***63***	***125***	***250***	***500***	***1000***	***2000***	***4000***	***8000***	***Rw***	***(C,C$_{tr}$)***
R = -10 log Σ 10^(-$R_{p,i}$ / 10)				19.0	22.4	26.8	23.7	32.1	40.7		**28**	**(-2,-3)**
$R_{flanking}$	**ΔR**											
R				19.0	22.4	26.8	23.7	32.1	40.7		**28**	**(-2,-3)**
D_{nT} = R -10 log (S_{tot} / A)												
$D_{nT,flanking}$												
D_{nT}		**Mass**										
Materials with additional layer												
External wall		175.0		36.0	37.0	40.0	46.0	54.0	56.0		**45**	**(0,-3)**
Roller shutter closed (3.4mx3.4m)		11.6		8.0	14.0	20.0	26.0	32.0	38.0		**24**	**(-1,-5)**
Lightweight aluminium roof		140.0		18.0	20.0	24.0	20.0	29.0	39.0		**25**	**(-2,-3)**
Glazing - 6mm thick (3.2mx4.4m)		14.1		18.0	23.0	30.0	35.0	27.0	32.0		**31**	**(-2,-4)**

4.16 With the roller shutter open, the sound attenuation provided by the building envelope will to reduce to approximately 15 dB R_w.

Table 4.3 – Building envelope sound insulation (roller shutter open)

Title: Quinton Hazell **Sound Transmission Loss (ISO 12354)**												
Formula/Comment	***Single Value***		***63***	***125***	***250***	***500***	***1000***	***2000***	***4000***	***8000***	***Rw***	***(C,C$_{tr}$)***
R = -10 log Σ 10^(-$R_{p,i}$ / 10)				13.8	14.2	14.5	14.2	14.6	14.7		**15**	**(0,-1)**
$R_{flanking}$	**ΔR**											
R				13.8	14.2	14.5	14.2	14.6	14.7		**15**	**(0,-1)**
D_{nT} = R -10 log (S_{tot} / A)												
$D_{nT,flanking}$												
D_{nT}		**Mass**										
Materials with additional layer												
External wall		175.0		36.0	37.0	40.0	46.0	54.0	56.0		**45**	**(0,-3)**
Roller shutter open (3.4mx3.4m)		11.6		0.0	0.0	0.0	0.0	0.0	0.0		**1**	**(-1,-1)**
Lightweight aluminium roof		140.0		18.0	20.0	24.0	20.0	29.0	39.0		**25**	**(-2,-3)**
Glazing - 6mm thick (3.2mx4.4m)		14.1		18.0	23.0	30.0	35.0	27.0	32.0		**31**	**(-2,-4)**

4.17 The sound pressure level at the nearest dwelling has been calculated using the following equation:

- $SPL_2 = SPL_1 – R_w + 10 \text{ Log } S – 20 \text{ Log } r – 14 \text{ dB}$

4.18 Where SPL2 is the sound pressure level at the dwelling; SPL1 is the internal sound pressure level adjacent to the wall/roof where sound breakout will occur; R_w is the weighted sound reduction index; S is the surface area of the walls/roof; r is the distance from the building to the nearest dwelling.

4.19 Previous measurements conducted within a variety of warehouse/retail premises indicate a reverberant sound pressure level ranging between 55 to 65 dB $L_{Aeq,15min}$. It is assumed that the

operation will be continuous over a 15-minute period (this time period is commonly used for the assessment of night-time noise or early morning noise).

Roller shutter closed

4.20 With the roller shutter closed, the predicted ambient sound level at the nearest dwellings due to breakout from the building envelope is approximately 17 dB $L_{Aeq,15min}$.

4.21 Since the specific sound level is significantly below the background sound level, a correction for tonality or other acoustic characteristics is considered unnecessary. The sound rating level is therefore equal to the specific sound level (17 dB $L_{Ar,15min}$).

4.22 The typical background sound level ranged between 39 to 44 dB $L_{A90,15min}$ during the daytime and 33 to 35 dB $L_{A90,15min}$ during the night-time period (ref: Table 3.1).

4.23 The predicted rating level is therefore 22 to 27 dB below the daytime background sound level and 16 to 18 dB below the night-time background sound level.

4.24 In terms of the cumulative sound level, if all of the units were generating noise simultaneously and at the same level (which is highly unlikely in practice), the resulting specific sound level would be approximately 26 dB $L_{Aeq,15min}$ at the nearest dwelling, which is still significantly below the daytime and night-time background sound level.

4.25 With regard to the anticipated noise impact, BS 4142 states:

The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs...

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.

4.26 On this basis, negligible noise related impacts are predicted at the nearest dwellings due to noise breakout from the building envelope.

Roller shutter open

4.27 With the roller shutter open, the composite sound insulation of the building envelope will reduce from 28 dB R_w to approximately 15 dB R_w, in which case the noise emitted from the building will be approximately 30 dB $L_{Ar,15min}$.

4.28 In this instance, the rating level of noise emitted from the building will be notably below the daytime and background sound level (9 to 14 dB below and 3 to 5 dB below respectively).

4.29 With the shutter open, a low to negligible impact is therefore predicted at the nearest dwellings due to noise breakout from the building envelope.

4.30 However, it is recommended that the shutters are left closed during the late evening and night-time period whenever practicable. For example, the shutters could be immediately closed following the loading/unloading of materials. Signage could also be installed to the wall area near the roller shutter to remind personnel and/or included as part of a noise management plan.

Noise from roller shutter operation

4.31 There is a single roller shutter on the west facing elevation of each unit. It is anticipated that the roller shutters will be electronically controlled, as opposed to manually operated.

4.32 It is also assumed that the roller shutters will be of a modern rigid plastic construction, as opposed to steel, with a soft rubber threshold seal for quiet closing.

4.33 Sample measurements previously conducted of a similar sized roller shutter completing one full cycle (fully opening and closing) indicate a specific sound pressure level of 65 dB $L_{Aeq,49sec}$ at a separation distance of approximately 1 metre.

4.34 The roller shutter took approximately 49 seconds to fully open and then immediately close.

4.35 The on-time correction for a 15-minute assessment period is approximately -13 dB L_{Aeq}.

- 10log (49 sec/900 sec) = -13 dB

4.36 The specific sound level from the roller shutter is therefore approximately 52 dB $L_{Aeq,15min}$ at a separation distance of 1 metre.

4.37 Taking into consideration the attenuation of sound with distance, the specific sound level reduces to approximately 20 dB $L_{Aeq,15min}$ at the nearest dwellings on Crafnant Road.

- 20log (1 metre / 40 metres) = -32 dB

4.38 However, the roller shutters are on the west facing elevation and are therefore orientated away from the dwellings to the east (i.e. there will be no line-of-sight). As a result, the row of units will provide a significant degree of acoustic screening with regard to noise made by the roller shutter.

4.39 The resulting specific sound level therefore reduces to approximately 5 dB $L_{Aeq,15min}$ at the nearest dwellings on Crafnant Road.

- 52 dB $L_{Aeq,15min}$ – 32 (distance) – 15 dB (screening) = 5 dB $L_{Aeq,15min}$

4.40 Since the resulting specific sound level will be significantly below the background sound level, a correction for tonality or other acoustic characteristics is considered unnecessary (source will be inaudible). The sound rating level is therefore equal to the specific sound level (i.e. 5 dB $L_{Ar,15min}$).

4.41 The sound rating level of the roller shutter operation is significantly below the daytime and night-time background sound level.

4.42 A negligible impact is therefore predicted at the nearest dwellings for the daytime and night-time due to roller shutter operation.

Noise from mobile plant

HGV movements

4.43 It is reasonable to assume that a single piece of plant may arrive, manoeuvre or depart from the unit within a particular 15-minute period.

4.44 Sample measurements for a range of lorry/HGV related activity (engine idling, door closing, engine start, reverse alarm, air brakes and departure) indicate equivalent continuous sound pressure levels in the region of 67 to 72 dB $L_{Aeq,60sec}$ at a distance of approximately 4 metres.

4.45 For this assessment, it is considered prudent to use the highest measured sound pressure level to represent on-site vehicle movements (72 dB $L_{Aeq,60sec}$).

4.46 It is assumed that the vehicle may generate noise continuously over five minutes and therefore an appropriate on-time correction needs to be applied to account for the remaining period without vehicle related noise.

- 10log (300 sec/900 sec) = -5 dB

4.47 On this basis, the specific sound level from the HGV is approximately 67 dB $L_{Aeq,15min}$.

4.48 Mobile plant is a moving noise source and therefore the distance between the noise source and receptor (dwelling) will vary.

4.49 To determine the level of sound attenuation due to distance separation, standard acoustic principals for a point source are considered appropriate (6 dB of attenuation per doubling of distance from the source). Sound attenuation due to air absorption and ground absorption are considered negligible.

4.50 It is considered appropriate to use a separation distance of approximately 45 metres between the HGV and the nearest dwelling on Crafnant Road. It is assumed that the vehicle is adjacent to the front elevation of the commercial unit.

4.51 The level of sound attenuation due to distance separation has been estimated using the following equation:

- 20log (4 metres/ 45 metres) = -21 dB

4.52 On this basis, the specific sound level reduces to approximately 46 dB $L_{Aeq,15min}$ at the nearest dwellings on Crafnant Road.

4.53 There will be no line-of-sight between the HGV and receptor since the row of units will provide a significant degree of acoustic screening (circa 15 to 20 dB attenuation) between the noise source and the receptor (e.g. dwelling window). The height of the units is approximately 5.8 metres.

4.54 The resulting specific sound level therefore reduces to approximately 31 dB $L_{Aeq,15min}$ at the nearest dwellings on Crafnant Road.

- 46 dB $L_{Aeq,15min}$ – 15 dB (screening) = 31 dB $L_{Aeq,15min}$

4.55 It is prudent to assume that a tonal sound component may be just perceptible at the nearest dwellings and therefore a correction of +2 dB is considered appropriate. Since the specific sound level is below the background sound level, 'just perceptible' is considered to be the most likely scenario.

4.56 On this basis, the sound rating level is 33 dB $L_{Ar,15min.}$

- Specific sound level of 31 dB $L_{Aeq,15min}$ + 2 dB penalty = 33 dB $L_{Ar,15min}$.

4.57 The typical background sound level ranged between 39 to 44 dB $L_{A90,15min}$ during the daytime and 33 to 35 dB $L_{A90,15min}$ during the night-time period (ref: Table 3.1).

4.58 The predicted rating level is therefore 6 to 11 dB below the daytime background sound level and of a very similar magnitude to the night-time background sound level.

4.59 BS 4142 states *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.*

4.60 On this basis, a low impact is expected during the daytime and night-time period.

Forklift truck movements

4.61 It is anticipated that forklift trucks will be used to move products/materials on-site and to potentially unload from HGV's.

4.62 Sample measurements for a range of diesel powered forklift trucks indicate an equivalent continuous sound pressure level in the region 65 to 71 dB $L_{Aeq,60sec}$ at a distance of 2 metres. Electrically powered forklifts can be quieter than diesel powered vehicles, however this assessment has considered the loudest vehicles.

4.63 The measured sound level includes engine start, manoeuvring, lifting/lowering pallets and reversing alarm.

4.64 Forklift trucks are a moving noise source and therefore the distance from the source to the receptor will continuously vary.

4.65 It is assumed that the forklift may generate noise continuously over ten minutes and therefore an appropriate on-time correction needs to be applied to account for the remaining period without vehicle related noise.

- 10log (600 sec/900 sec) = -2 dB

4.66 On this basis, the specific sound level from the forklift is approximately 69 dB $L_{Aeq,15min}$

4.67 A separation distance of approximately 45 metres between the loading/unloading area and the nearest dwelling has been assumed. The level of sound attenuation due to distance separation is therefore approximately 27 dB.

- 20log (2 metres/ 45 metres) = -27 dB

4.68 The specific sound level therefore reduces to approximately 42 dB $L_{Aeq,15min}$.

4.69 Again, there will be no line-of-sight between the forklift and the receptor since the row of units will provide a significant degree of acoustic screening between the noise source and the receptor.

4.70 The resulting specific sound level therefore reduces to approximately 27 dB $L_{Aeq,15min}$ at the nearest dwellings on Crafnant Road.

- 42 dB $L_{Aeq,15min}$ – 15 dB (screening) = 27 dB $L_{Aeq,15min}$

4.71 It is prudent to assume that a tonal sound component may be just perceptible at the nearest dwellings and therefore a correction of +2 dB is considered appropriate. Since the specific sound level is below the background sound level, 'just perceptible' is again considered the most likely scenario.

4.72 On this basis, the rating level is 29 dB $L_{Ar,15min}$.

- Specific sound level of 27 dB $L_{Aeq,15min}$ + 2 dB penalty = 29 dB $L_{Ar,15min}$.

4.73 The typical background sound level ranged between 39 to 44 dB $L_{A90,15min}$ during the daytime and 33 to 35 dB $L_{A90,15min}$ during the night-time period.

4.74 The predicted rating level is therefore 10 to 15 dB below the daytime background sound level and 4 to 6 dB below the night-time background sound level.

4.75 On this basis, a low to negligible impact is expected during the daytime and night-time period.

Cumulative sound level

4.76 It is worth noting that the cumulative specific sound level for a roller shutter operation, HGV movement and forklift truck activity is approximately 32 dB $L_{Aeq,15min}$ (i.e. within the same 15-minute period).

4.77 The greatest source of noise associated with the development is expected to be HGV's.

4.78 It is prudent to assume that a tonal sound component may be just perceptible at the nearest dwellings and therefore a correction of +2 dB is considered appropriate.

4.79 On this basis, the rating level is 34 dB $L_{Ar,15min.}$

4.80 The predicted rating level is therefore 5 to 10 dB below the daytime background sound level and of a very similar magnitude to the night-time background sound level.

4.81 BS 4142 states *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.*

4.82 On this basis, a low impact is expected during the daytime and night-time period.

5. Conclusion

5.1 Appropriate sound level targets have been determined for new building services plant based on the measured background sound levels.

5.2 The fixing of externally mounted plant such as condenser units and/or ventilation openings should be avoided where possible on the east facing elevation of the new units.

5.3 With roller shutters open or closed, the rating level of noise emitted from the units will be notably below the daytime and background sound level. A low to negligible impact is therefore expected at the nearest dwellings due to noise breakout from the building envelope.

5.4 It is recommended that the shutters are left closed during the late evening and night-time period whenever practicable to minimise noise breakout.

5.5 The sound rating level of the roller shutter operation is significantly below the daytime and night-time background sound level. A negligible impact is expected at the nearest dwellings due to shutter related noise.

5.6 The greatest source of noise associated with the development is expected to be HGV's. The predicted rating level is 6 to 11 dB below the daytime background sound level and of a very similar magnitude to the night-time background sound level.

5.7 BS 4142 states *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.*

5.8 On this basis, a low impact is expected during the daytime and night-time period.

5.9 With regard to forklift truck activity, the predicted rating level is notably below the daytime and night-time background sound level. On this basis, a low to negligible impact is expected during the daytime and night-time period.

5.10 Site context is also important in the assessment and rating of commercial noise. It should be noted that the existing site immediately south has been in operation for over 50 years and in general terms emits noise of a similar nature to that associated with the proposed development (i.e. vehicle noise, unloading of materials, fixed plant noise etc).

5.11 The proposed development can be viewed as an extension to the existing site as opposed to a completely new commercial site in a rural setting and therefore the addition of this new development and the associated noise is unlikely to add anything new to the area in terms of acoustic characteristics.

5.12 Furthermore, appropriate conditions could also be attached to any planning approval in order to reduce the potential for noise related impacts during the night-time period.

5.13 On the basis of this assessment, the site is considered appropriate for the proposed commercial development.

Appendix A
Proposed site layout and elevations

Figure A.1 – Proposed site layout

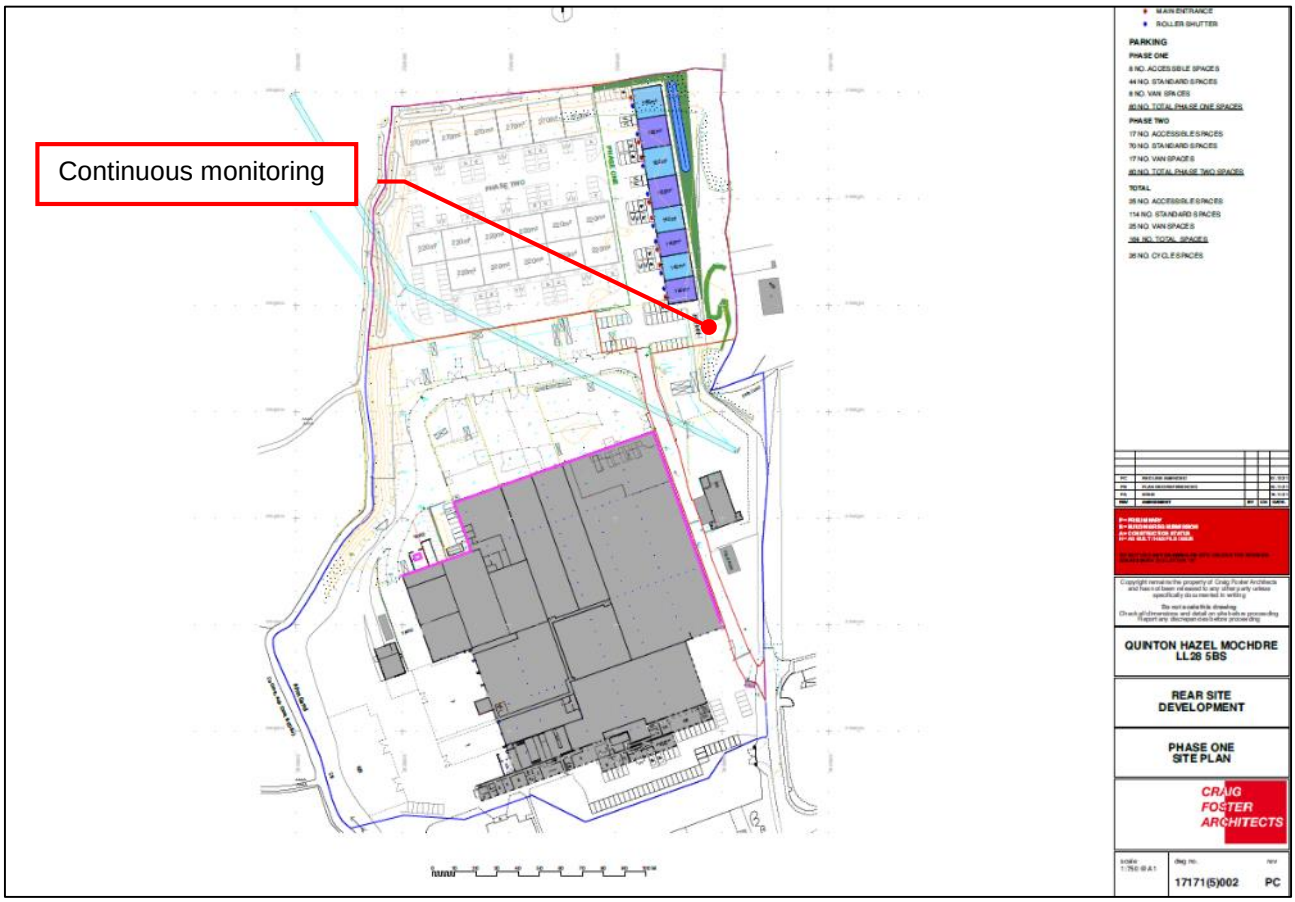
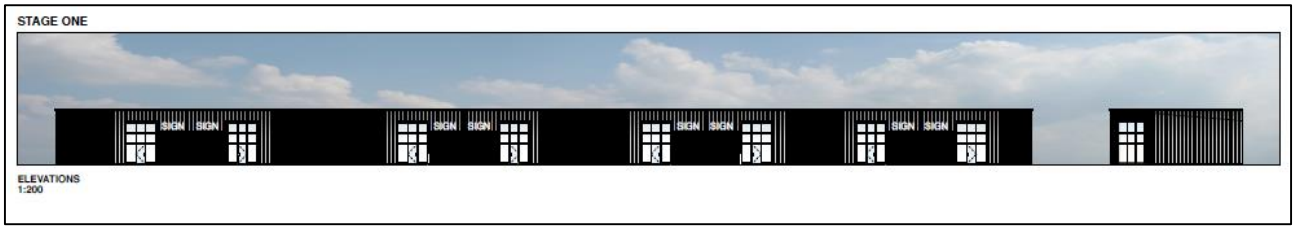


Figure A.2 – Proposed stage one elevations



Appendix B
Tabulated survey data

Table B.1 - Tabulated survey data

Start Time	$L_{AFmax,15min}$ dB	$L_{Aeq,15min}$ dB	$L_{A90,15min}$ dB
29/08/2021 13:15	56.8	43.8	41.8
29/08/2021 13:30	55.7	44.4	42.2
29/08/2021 13:45	60.0	43.9	41.4
29/08/2021 14:00	62.8	45.4	41.0
29/08/2021 14:15	63.2	51.8	43.3
29/08/2021 14:30	59.9	51.9	44.8
29/08/2021 14:45	61.4	47.1	39.1
29/08/2021 15:00	57.4	42.9	40.4
29/08/2021 15:15	56.3	42.2	40.1
29/08/2021 15:30	63.4	43.0	39.7
29/08/2021 15:45	61.9	44.9	38.9
29/08/2021 16:00	61.6	43.7	38.9
29/08/2021 16:15	65.5	43.5	39.0
29/08/2021 16:30	57.1	41.5	38.4
29/08/2021 16:45	67.9	44.0	38.1
29/08/2021 17:00	59.5	40.9	38.6
29/08/2021 17:15	71.7	46.4	38.7
29/08/2021 17:30	59.2	41.5	38.4
29/08/2021 17:45	61.3	41.7	38.7
29/08/2021 18:00	56.7	42.6	39.0
29/08/2021 18:15	58.5	42.2	39.1
29/08/2021 18:30	62.1	42.7	39.5
29/08/2021 18:45	59.3	42.3	39.9
29/08/2021 19:00	61.1	42.0	39.8
29/08/2021 19:15	61.8	42.9	39.8
29/08/2021 19:30	58.6	42.0	39.6
29/08/2021 19:45	63.8	42.9	39.5
29/08/2021 20:00	71.8	46.9	39.2
29/08/2021 20:15	60.4	40.9	39.0
29/08/2021 20:30	74.4	45.0	38.1
29/08/2021 20:45	74.0	46.3	37.3
29/08/2021 21:00	54.7	40.0	38.4
29/08/2021 21:15	48.4	40.2	38.0
29/08/2021 21:30	60.9	41.8	38.1
29/08/2021 21:45	59.0	44.2	40.7
29/08/2021 22:00	55.2	42.7	39.9
29/08/2021 22:15	51.0	40.6	38.6
29/08/2021 22:30	51.6	40.3	38.0
29/08/2021 22:45	65.7	39.8	36.4
29/08/2021 23:00	44.4	38.0	35.7
29/08/2021 23:15	47.7	38.1	34.5
29/08/2021 23:30	43.9	36.0	32.6
29/08/2021 23:45	45.3	36.7	32.5
30/08/2021 00:00	49.5	39.3	35.3

Start Time	$L_{AFmax,15min}$ dB	$L_{Aeq,15min}$ dB	$L_{A90,15min}$ dB
30/08/2021 00:15	56.2	38.6	34.1
30/08/2021 00:30	53.6	39.2	33.5
30/08/2021 00:45	51.9	38.6	30.8
30/08/2021 01:00	49.6	40.7	36.9
30/08/2021 01:15	51.1	40.8	34.5
30/08/2021 01:30	48.4	35.6	30.1
30/08/2021 01:45	44.6	34.5	30.2
30/08/2021 02:00	48.9	35.3	27.6
30/08/2021 02:15	43.1	32.9	27.9
30/08/2021 02:30	49.9	33.7	27.1
30/08/2021 02:45	45.3	33.4	27.2
30/08/2021 03:00	42.0	33.1	28.7
30/08/2021 03:15	47.1	34.3	27.4
30/08/2021 03:30	58.7	39.2	28.7
30/08/2021 03:45	49.6	35.3	28.7
30/08/2021 04:00	48.1	34.3	27.4
30/08/2021 04:15	49.4	36.7	29.5
30/08/2021 04:30	68.3	46.4	32.5
30/08/2021 04:45	51.7	35.9	31.2
30/08/2021 05:00	56.8	35.4	30.9
30/08/2021 05:15	47.8	36.9	31.0
30/08/2021 05:30	57.7	40.1	34.2
30/08/2021 05:45	57.2	41.2	35.6
30/08/2021 06:00	57.7	42.1	33.9
30/08/2021 06:15	54.7	41.2	35.5
30/08/2021 06:30	57.8	42.5	38.2
30/08/2021 06:45	59.2	44.2	39.8
30/08/2021 07:00	61.4	46.6	41.6
30/08/2021 07:15	65.9	46.1	40.9
30/08/2021 07:30	76.5	51.0	41.4
30/08/2021 07:45	62.2	45.6	39.4
30/08/2021 08:00	60.0	43.6	39.9
30/08/2021 08:15	69.6	46.0	40.8
30/08/2021 08:30	65.1	47.9	42.5
30/08/2021 08:45	59.4	47.3	42.5
30/08/2021 09:00	65.8	48.0	44.8
30/08/2021 09:15	58.2	47.8	44.6
30/08/2021 09:30	70.4	50.0	46.1
30/08/2021 09:45	65.2	49.8	46.2
30/08/2021 10:00	60.8	48.3	45.0
30/08/2021 10:15	64.4	49.9	46.6
30/08/2021 10:30	64.2	49.9	47.1
30/08/2021 10:45	54.9	47.3	45.1
30/08/2021 11:00	66.9	49.2	46.4
30/08/2021 11:15	79.6	56.5	43.7

Start Time	$L_{AFmax,15min}$ dB	$L_{Aeq,15min}$ dB	$L_{A90,15min}$ dB
30/08/2021 11:30	62.9	47.3	43.8
30/08/2021 11:45	65.9	46.7	43.0
30/08/2021 12:00	67.3	47.0	42.7
30/08/2021 12:15	53.8	44.4	42.4
30/08/2021 12:30	64.1	48.9	43.7
30/08/2021 12:45	60.9	45.9	43.7
30/08/2021 13:00	78.0	49.5	42.8
30/08/2021 13:15	96.2	69.6	42.9
30/08/2021 13:30	57.8	43.7	41.7
30/08/2021 13:45	60.9	44.6	41.4
30/08/2021 14:00	60.5	43.8	41.0
30/08/2021 14:15	60.8	45.1	41.1
30/08/2021 14:30	60.5	44.0	41.1
30/08/2021 14:45	58.3	42.9	40.2
30/08/2021 15:00	70.9	45.5	41.1
30/08/2021 15:15	68.3	46.2	40.2
30/08/2021 15:30	57.4	42.3	40.0
30/08/2021 15:45	61.2	43.0	39.4
30/08/2021 16:00	56.4	41.7	38.8
30/08/2021 16:15	77.4	57.6	40.2
30/08/2021 16:30	52.7	41.3	39.4
30/08/2021 16:45	59.1	42.2	39.4
30/08/2021 17:00	60.8	41.1	38.5
30/08/2021 17:15	66.0	41.8	38.9
30/08/2021 17:30	63.4	41.5	38.7
30/08/2021 17:45	58.7	41.5	38.1
30/08/2021 18:00	59.8	40.6	38.0
30/08/2021 18:15	59.8	41.6	38.5
30/08/2021 18:30	66.0	43.4	38.6
30/08/2021 18:45	58.3	41.6	38.1
30/08/2021 19:00	60.7	42.5	38.2
30/08/2021 19:15	63.2	41.1	38.0
30/08/2021 19:30	87.0	52.1	38.8
30/08/2021 19:45	63.5	42.1	38.1
30/08/2021 20:00	57.9	40.2	38.1
30/08/2021 20:15	55.5	40.1	37.8
30/08/2021 20:30	59.3	38.5	36.5
30/08/2021 20:45	48.4	37.3	35.9
30/08/2021 21:00	43.1	37.7	35.9
30/08/2021 21:15	54.9	41.3	39.2
30/08/2021 21:30	54.3	45.9	41.3
30/08/2021 21:45	51.9	45.0	42.0
30/08/2021 22:00	55.6	45.7	42.3
30/08/2021 22:15	61.8	45.3	41.3
30/08/2021 22:30	53.5	43.7	39.0

Start Time	$L_{AFmax,15min}$ dB	$L_{Aeq,15min}$ dB	$L_{A90,15min}$ dB
30/08/2021 22:45	52.8	42.2	37.2
30/08/2021 23:00	53.1	41.5	36.2
30/08/2021 23:15	53.2	39.0	33.1
30/08/2021 23:30	51.3	40.3	36.0
30/08/2021 23:45	50.6	37.8	35.0
31/08/2021 00:00	48.6	37.6	34.8
31/08/2021 00:15	48.9	37.4	34.6
31/08/2021 00:30	45.5	35.0	32.0
31/08/2021 00:45	50.2	36.1	31.3
31/08/2021 01:00	53.7	37.7	35.2
31/08/2021 01:15	52.6	39.6	34.2
31/08/2021 01:30	55.2	39.1	34.6
31/08/2021 01:45	53.0	35.5	32.7
31/08/2021 02:00	51.3	35.3	32.0
31/08/2021 02:15	56.1	36.8	32.7
31/08/2021 02:30	43.5	35.6	32.9
31/08/2021 02:45	56.7	36.7	32.8
31/08/2021 03:00	54.1	35.6	31.3
31/08/2021 03:15	49.6	34.6	32.0
31/08/2021 03:30	45.9	34.6	31.2
31/08/2021 03:45	54.2	35.7	32.2
31/08/2021 04:00	50.2	36.9	33.5
31/08/2021 04:15	46.3	37.1	34.5
31/08/2021 04:30	49.1	36.7	33.5
31/08/2021 04:45	47.1	37.2	34.3
31/08/2021 05:00	55.2	36.5	31.6
31/08/2021 05:15	50.1	37.6	33.6
31/08/2021 05:30	51.2	40.9	37.8
31/08/2021 05:45	52.9	41.2	37.3
31/08/2021 06:00	61.5	42.0	38.0
31/08/2021 06:15	59.5	45.7	39.6
31/08/2021 06:30	58.1	47.4	42.9
31/08/2021 06:45	60.9	46.9	42.9
31/08/2021 07:00	67.5	46.8	41.9
31/08/2021 07:15	62.2	47.8	43.5
31/08/2021 07:30	69.5	48.7	43.7
31/08/2021 07:45	63.1	47.0	44.4
31/08/2021 08:00	62.3	46.5	42.9
31/08/2021 08:15	62.0	46.9	43.0
31/08/2021 08:30	65.1	47.4	44.4
31/08/2021 08:45	59.9	46.3	43.3
31/08/2021 09:00	58.4	46.8	43.1
31/08/2021 09:15	64.8	46.3	42.0
31/08/2021 09:30	62.2	46.6	42.9
31/08/2021 09:45	66.6	48.1	44.4

Start Time	$L_{AFmax,15min}$ dB	$L_{Aeq,15min}$ dB	$L_{A90,15min}$ dB
31/08/2021 10:00	64.4	49.6	45.7
31/08/2021 10:15	62.4	48.5	44.2
31/08/2021 10:30	72.1	48.8	45.5
31/08/2021 10:45	57.6	45.2	42.3
31/08/2021 11:00	62.5	46.9	43.7
31/08/2021 11:15	68.2	50.0	43.7
31/08/2021 11:30	67.4	50.6	44.4
31/08/2021 11:45	66.2	47.5	44.7
31/08/2021 12:00	70.5	48.8	44.1
31/08/2021 12:15	61.7	46.2	43.4
31/08/2021 12:30	71.3	46.8	43.3
31/08/2021 12:45	61.2	47.1	42.9
31/08/2021 13:00	62.7	47.4	43.8

Appendix C
Equipment calibration certificates

Certificate of Calibration

Issued by University of Salford (Acoustic Calibration Laboratory)
UKAS ACCREDITED CALIBRATION LABORATORY NO. 0801

Page 1 of 3

APPROVED SIGNATORIES

Claire Lomax [x] Andy Moorhouse [ ]
Gary Phillips [ ] Danny McCaul [ ]

C. Lomax.

UKAS CALIBRATION 0801

University of Salford MANCHESTER

acoustic calibration laboratory

The University of Salford, Salford, Greater Manchester, M5 4WT, UK
http://www.acoustics.salford.ac.uk
t 0161 295 3030/0161 295 3319 f 0161 295 4456 e c.lomax1@salford.ac.uk

Certificate Number: 04853/1 Date of Issue: 6th October 2020

PERIODIC TEST OF A SOUND LEVEL METER to IEC 61672-3:2006

FOR:	RS Acoustic Engineering Ltd 76 Marple Road Stockport Cheshire SK2 5QH
FOR THE ATTENTION OF:	Ryan Swales
DATE RECEIVED:	30/09/2020
PERIODIC TEST DATE:	5th and 6th October 2020
TEST PROCEDURE:	CTP12 (Laboratory Manual)

Sound Level Meter Details

Manufacturer	Bruel & Kjaer
Model	2250 Light
Serial number	2638934
Class	1
Hardware version: 2.0	Software version: BZ7130 Version 3.1

Associated Items	Microphone	Preamplifier	Calibrator
Manu	Bruel & Kjaer	Bruel & Kjaer	CEL
Model	4189	ZC 0032	CEL-120/1
Serial Number	2143254	8938	3321859

Test Engineer (initial): GP Name: Gary Phillips

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Certificate of Calibration

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Certificate Number: 04853/1 Date of Issue: 6 October 2020

Procedures from IEC 61672-3: 2006 and TPS 49 Edition 2 June 2009 were used to perform the periodic tests. The manufacturer's instruction manual was marked as follows: B&K 2250-L with mic 4950 BE 1774-11 June 2007 From hardware version 2.0.

Adjustment data used to adjust the sound levels indicated in response to the application of an electrostatic actuator to sound levels equivalent to those that would be indicated in response to plane, progressive sound waves were obtained from the microphone manufacturer. The sound level meter calibration check frequency is 1000 Hz, the reference sound pressure level is 94 dB. As this instrument only has a single range, this range is the reference level range.

The environmental conditions in the laboratory at the start of the test were:
Static pressure 98.795 kPa ± 0.014 kPa; air temperature 23.2 °C ± 0.3 °C; relative humidity 45.4 % ± 2.6 %.

The initial response of the instrument to application of the associated sound calibrator was 94.3 dB (C). The instrument was then adjusted to indicate 94.0 dB (C). This indication was obtained from the calibration certificate of the calibrator, 04738/1 and information in the manufacturer's instruction manual specified in this certificate, when the instrument is configured as follows; Transd. Used 4189(2143254), Sound Field Correction: Free-field, Windscreen Correction: None. The instrument was calibrated without a windscreen. Consult manufacturer's instructions if using a windscreen.

With the microphone installed the level of self-generated noise was:

A: 22.7 dB†

†Indicates that the measured level exceeds the highest anticipated level of self-generated noise stated in the manufacturer's instruction manual.

With the microphone replaced by an electrical input device with a similar capacitance to the supplied microphone, the levels of self-generated noise were:

A: 11.8 dB*
B: 11.1 dB*
C: 12.6 dB*
Z: 17.5 dB*

Indicates that the measured level exceeds the highest anticipated level of self-generated noise stated in the manufacturer's instruction manual.

The environmental conditions in the laboratory at the end of the test were:
Static pressure 98.862 kPa ± 0.014 kPa; air temperature 22.6 °C ± 0.3 °C; relative humidity 49.1 % ± 2.6 %.

Certificate of Calibration

Issued by University of Salford (Acoustic Calibration Laboratory)
UKAS ACCREDITED CALIBRATION LABORATORY NO. 0801

Page 3 of 3

Certificate Number: 04853/1 Date of Issue: 6 October 2020

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organization responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

The microphone corrections applied as specified in 12.6 of IEC 61672-3:2006 were obtained from a frequency response measured by this Laboratory using the electrostatic actuator method. This response in isolation is not covered by our UKAS accreditation.

Instruments used in the verification procedure were traceable to *National Standards*. The electrostatic actuator method was employed in the acoustical tests of a frequency weighting.

The uncertainty evaluation has been carried out in accordance with UKAS requirements. All measurement results are retained at the acoustic calibration laboratory for at least four years.

-----END OF CERTIFICATE-----

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to the units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full except with the prior written approval of the issuing laboratory.

Certificate of Calibration

Issued by University of Salford (Acoustic Calibration Laboratory)
UKAS ACCREDITED CALIBRATION LABORATORY NO. 0801

Page 1 of 2

APPROVED SIGNATORIES
Claire Lomax [x] Andy Moorhouse [ ]
Gary Phillips [ ] Danny McCaul [ ]

acoustic calibration laboratory
The University of Salford, Salford, Greater Manchester, M5 4WT, UK
http://www.acoustics.salford.ac.uk
t 0161 295 3030/0161 295 3319 f 0161 295 4456 e c.lomax1@salford.ac.uk

UKAS CALIBRATION 0801

University of Salford MANCHESTER

Certificate Number: 05397/1 Date of Issue: 22 July 2021

CALIBRATION OF A SOUND CALIBRATOR

FOR:	RS Acoustic Engineering Ltd 76 Marple Road Stockport Cheshire SK02 5QH
FOR THE ATTENTION OF:	Ryan Swales
DESCRIPTION:	Calibrator with housing for ½ inch microphone
MANUFACTURER:	CEL
TYPE:	120/1
SERIAL NUMBER:	3321859
DATE RECEIVED:	16 July 2021
DATE OF CALIBRATION:	21 July 2021
LOCATION OF CALIBRATION:	Acoustic Calibration Laboratory, Newton G31, University of Salford.
TEST PROCEDURE:	CTP06 (Laboratory Manual)

Test Engineer (initial):	GP	Name:	Gary Phillips

Results in this certificate relate only to instruments tested.

Certificate of Calibration

Issued by University of Salford (Acoustic Calibration Laboratory)
UKAS ACCREDITED CALIBRATION LABORATORY NO. 0801

Page 2 of 2

Certificate Number: 05397/1 Date of Issue: 22 July 2021

MEASUREMENTS

The sound pressure level generated by the calibrator was measured using a calibrated, WS2P condenser microphone as specified in this certificate. The calibration was carried out with the calibrator in the half-inch configuration.

Five determinations of the sound pressure level, frequency and total distortion were made.

The reported results are valid at the environmental conditions at the time of calibration. Corrections to the stated level may be required depending on the actual environmental conditions at the time of use. Consult the manufacturer's instruction manual for further information.

RESULTS

Coupler configuration:	Half-inch
Microphone type:	B&K 4192
Output level (dB re 20μPa):	94.07 dB ± 0.09 dB
Frequency (Hz):	999.99 Hz ± 0.12 Hz
Total Distortion (%):	0.47 % ± 0.22 %

Average environmental conditions at the time of measurement were:

Pressure:	101.891 kPa ± 0.015 kPa
Temperature:	22.7 °C ± 0.4 °C
Relative humidity:	47.9 % ± 2.1 %

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

All measurement results are retained at the acoustic calibration laboratory for at least four years.

-----END OF CERTIFICATE-----

Appendix D
Assessment terminology

Assessment terminology

Term	Description
dB (decibel)	The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure ($2x10^{-5}$Pa).
dB(A)	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.
Acoustic environment	Sound from all sources as modified by the environment.
Ambient sound level	The totally encompassing sound in a given situation at a given time; it is usually composed of sound from many sources, near and far.
Background sound level	The sound level in the absence of a specific noise source under consideration (e.g. plant/machinery), measured as $L_{A90,T}$.
Residual sound	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.
Specific sound source	Sound source being assessed.
Specific sound level	Equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T.
Rating level $L_{Ar,T}$	Specific sound level plus any adjustment for the characteristic features of the sound.