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240108

Noise Impact Assessment

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Contents

Section	Description	Page No
1.0	Introduction	5
2.0	Criteria	6
2.1	Local Planning Authority	6
2.2	BS4142 Assessment Methodology	6
2.3	Recommended Criteria	7
3.0	The Site and Nearby Noise Sensitive Receptors	8
4.0	Baseline Noise Survey	9
4.1	Method	9
4.2	Weather Conditions	9
4.3	Noise Monitoring Locations	9
4.4	Results	9
5.0	Assessment	11
5.1	Proposal	11
5.2	Criteria	13
5.3	Plant Noise Data and Noise Level Limits	13
5.4	Indicative Noise Emission Prediction	13
5.5	Discussion & Recommendations	15
5.6	Assumptions and Limitations	15
	Appendix A - Glossary of Acoustic Terminology	16
	Appendix B - Summary of Relevant Planning Policy and Guidance	20

Noise Impact Assessment

Executive Summary

CPW Acoustics were appointed by The University of Reading to provide a noise impact assessment in support of a planning application for new items of proposed external plant.

The proposed plant comprises 1no. containerised standby generator, acoustically rated to achieve a sound pressure level of 75 dB L_{pA} at 1 m.

The nearest noise sensitive receptors are boarding residences along Pepper Lane. These belong to and are situated within the grounds of Leighton Park School approximately 350 m from the proposed plant location.

Existing Background Sound Levels ($L_{A90, T}$) were measured during a noise survey undertaken between 24th and 25th March 2025. Monitoring was undertaken at a location where Background Sound Levels were considered to be representative of those at the nearest existing noise sensitive receptors.

Existing Background Sound Levels at the nearest residential NSRs were dictated by traffic noise from the local and surrounding road networks. Some low-level plant noise from nearby university buildings and buildings along Pepper Lane was audible during the survey. The representative Background Sound Levels for daytime and night-time were 49 dB $L_{A90, 1\text{hour}}$ and 44 dB $L_{A90, 15\text{minute}}$ respectively.

The proposed plant is to provide back-up/emergency power and therefore is expected to only be operational during periods of a loss of power or for periodic testing.

The University of Reading Whiteknights Campus is divided geographically with parts under the jurisdiction of Wokingham Borough Council and parts under the jurisdiction of Reading Borough Council. The proposed plant site falls under WBC's authority, however, due to the proximity of the NSRs it is likely that RBC will be a consultee.

At this stage it is understood that WBC does not have specific noise criteria applicable to the installation of new mechanical plant.

In response to enquiries made, Reading Borough Council confirmed that noise emissions from new plant are controlled as per policy EN17 of the Local Plan¹, however, in the case of emergency plant, the requirement is normally relaxed. Therefore, a less onerous noise limiting criterion has been assigned, compared to those for fixed plant. This is a typical approach adopted by many local authorities.

It is considered appropriate to target RBC criteria, therefore it is required that the noise source Specific Sound Level shall not exceed a level equal to the pre-existing Background Sound Level, as measured at the nearest noise-sensitive receptor.

An indicative assessment of the noise from the plant has been undertaken and the proposed noise limiting criteria are predicted to be achievable based upon the proposed generator selection. The assessment shows that the predicted Specific Sound Levels are below the Reading Borough Council requirements. Therefore, the proposals satisfy the planning criteria.

¹ Reading Borough Council (2019); 'Reading Borough Local Plan, Adopted November 2019'

Noise Impact Assessment

1.0 Introduction

The University of Reading propose to install a new standby generator to provide emergency/backup power to the existing University Library and Park House building on the Whiteknights campus.

CPW Acoustics were appointed by the university to undertake a noise impact assessment in support of a planning application for the proposed items of external plant.

This report presents suggested criteria based on industry guidance, noise level limits for the plant to achieve and an indicative assessment of their noise impact. The noise level limits are derived from the criteria and measured background sound levels.

The following works have been carried out as part of the noise assessment:

- A review of relevant noise criteria and guidance to establish requirements for noise emission.
- A review of baseline environmental noise survey data, measured a location representative of nearby noise sensitive receptors to determine the existing noise climate.
- Specification of noise emission limits for external plant to adhere.
- An indicative assessment of plant noise.

A glossary of common acoustic terms is included within Appendix A and supporting information relating to Planning Policy Standards is provided in Appendix B.

Noise Impact Assessment

2.0 Criteria

Consideration has been given to relevant planning policy and regulations concerning the redevelopment and the Site. The National Planning Policy Framework (NPPF)², the Noise Policy Statement for England (NPSE)³ and Noise Guidance⁴ provide a framework for how noise should be considered within the planning system. Generally, noise policy and guidance gives Local Authorities the flexibility to develop specific requirements appropriate to their area and the Site in question.

The core aim of these documents is to avoid and reduce significant adverse impacts and other adverse impacts on health and quality of life. A more detailed overview of these documents is included within Appendix B of this document.

2.1 Local Planning Authority

The University of Reading Whiteknights Campus is divided geographically, with parts of the grounds falling under the jurisdiction of Wokingham Borough Council (WBC) and parts of it falling under the jurisdiction of Reading Borough Council (RBC). The location of the proposed plant site is within the bounds of WBC, with the nearest noise sensitive receptors located on the RBC side of the boundary. Due to the proximity of the NSRs it is understood that RBC will be a consultee.

At this stage it is understood that the WBC does not have specific noise criteria applicable to the installation of new mechanical plant.

The Local Planning Authority of RBC require that noise emissions from new plant are controlled as per policy EN17 of the Local Plan. Policy EN17 is presented as follows:

EN17: NOISE GENERATING EQUIPMENT

Where noise generating equipment is proposed, the noise source specific⁶¹ level (plant noise level) should be at least 10dBA below the existing background level as measured at the nearest noise sensitive receptor.

⁶¹ The noise source specific level is the measured noise level, as opposed to the rating level, which is the specific level with correction factors included.

Enquiries were made to the council to understand whether the specific noise criteria were applicable to emergency plant, the following response was received,

"We would normally relax the 10 dB below background requirement, and instead require equal to background, if this is achievable. This would depend on how often the generator is to be tested etc."

The plant noise emission criteria set in this report have been derived based on response received from Reading Borough Council policy.

2.2 BS4142 Assessment Methodology

British Standard 4142 describes methods for rating and assessing sound of an industrial and/or commercial nature. The Standard covers 'sound from fixed installations which comprise mechanical and electrical plant and equipment'. A relevant summary of BS 4142 is included within Appendix B of this document.

BS 4142 presents an initial guide for assessing the noise impacts of industrial and commercial sound sources by subtracting the measured Background Sound Level from the Rating Sound Level. The Rating Level includes penalty corrections to the Specific Sound Level (the cumulative noise level produced by the proposed plant) for the presence of any negative acoustic characteristics. BS4142 states the following:

- a) Typically, the greater this difference, the greater the magnitude of the impact.

² Ministry of Housing, Communities and Local Government (MHCLG) (2023); 'The National Planning Policy Framework', OGL.

³ Department for Environment, Food and Rural Affairs (DEFRA) (2010); 'Noise Policy Statement for England', DEFRA.

⁴ MHCLG (2019); 'Noise Guidance'. (<https://www.gov.uk/guidance/noise--2>)

Noise Impact Assessment

- b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on context.
- c) A difference of around +5 dB is likely to be an indication of a significant adverse impact, depending on the context.
- d) 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.

2.3 Recommended Criteria

It is understood that the proposed 1no. standby generator is to be used for back-up power only. The mechanical engineers have advised the unit will only operate in an emergency or when backup power is required.

Maintenance testing will take place once per month for a few hours only. Should the generators be required to be operational it is likely to be for a relatively short period, for example a few hours up to a few days.

Due to their essential function and limited operation, it is normal practice to set a less onerous level criterion such that their operation is not compromised. Due to the expected limited operation, higher level limits may have similar adverse effects when compared to lower limits for continuously operating plant.

In the absence of WBC noise emission criteria and based on the proximity of the nearest NSRs, which are within the bounds of RBC, it is considered appropriate to undertake an assessment based on the specific noise criteria provided by RBC. It has been confirmed by RBC that the following noise emission criteria should be targeted for the scheme.

- A Specific Sound Level limit, dB $L_{A,T,r}$, equal to the existing representative Background Sound Level dB L_{A90} as measured at the nearest noise sensitive receptor.

Noise Impact Assessment

3.0 The Site and Nearby Noise Sensitive Receptors

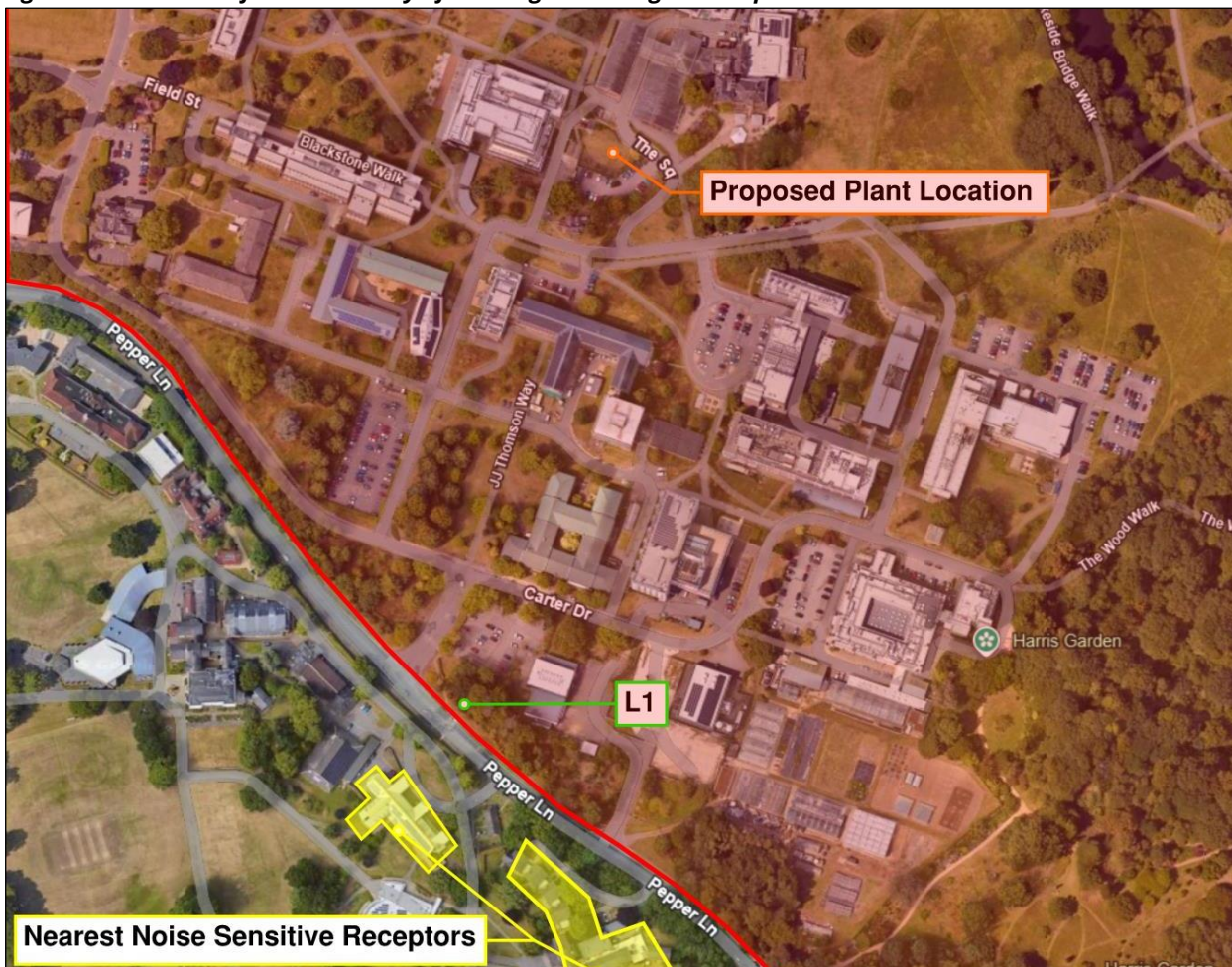
The University of Reading Whiteknights Campus is located along Pepper Lane, Reading, and accommodates numerous university buildings and surrounding car parks. The surrounding area is used predominantly for educational facilities and residential dwellings.

The nearest noise sensitive receptors (NSR) are boarding residence belonging to Leighton Park Boarding School located on Pepper Lane approximately 350 m north from the proposed plant location. For the purpose of this assessment, it is assumed that the boarding residence facilitates activities in line with residential dwellings, including resting and sleeping by the occupants during the daytime and nighttime.

Existing Background Sound Levels at the nearest residential NSRs were dictated by local road traffic noise during the daytime and noise from the surrounding road network during the nighttime. During the site survey some low level plant noise was audible from the surrounding university buildings and buildings along Pepper Lane.

The figure below shows the University of Reading site bound in red, the nearby residential NSRs in yellow and the proposed plant location in orange.

Figure 3.1: Location of The University of Reading Whiteknights Campus Site and Nearest NSRs



Noise Impact Assessment

4.0 Baseline Noise Survey

4.1 Method

A noise survey was undertaken 24th – 25th March 2025 to measure the existing prevailing Background Sound Levels at a location representative of the nearby residential NSRs.

Environmental noise monitoring was undertaken in general accordance with BS 7445-1:2003 Description and measurement of environmental noise – Part 1: Guide to quantities and procedures.

Details of the survey equipment are provided in Table 4.1

Table 4.1: Survey Equipment Details

Equipment
Sound Level Meter: Norsonic NOR 140 – Serial No. 1407754, NTi XL2 – Serial No. A2A-21318-E0
Calibrator: Norsonic NOR 1255 – Serial No. 125526121, NTi – Serial No. 20256
Accuracy: Sound level meters were field-checked and calibrated at the start and end of the survey periods. No significant drift in calibration was observed.
Sound calibrator: The accuracy of the sound calibrator used can be traced to National Physical Laboratory Standards.

4.2 Weather Conditions

Weather conditions at the time of the noise survey were appropriate for noise monitoring. The conditions were dry and clear during the survey period. Temperatures were between 6 and 14°C. Wind conditions ranged between 2 – 5m/s.

4.3 Noise Monitoring Locations

Long term monitoring was undertaken over a period of 24 hours at Location, L1, shown in figure 3.1. L1 was located at the south of the site, close to the site boundary along Pepper Lane and was chosen to understand the prevailing noise climate at the boarding residence to Leighton Park Boarding School (nearest NSRs).

The Background Sound Levels captured at this location are considered representative of the background sound environment at the most exposed residential NSRs (see Figure 3.1).

4.4 Results

As discussed within BS 4142, when determining the Background Sound Level, the objective is not simply to ascertain the lowest measured Background Sound Level, but to quantify what is typical during a given period or in the most sensitive period. By adopting the 10th percentile during the daytime using 1-hour measurement periods, and 15-minute measurement periods during the night-time, it's possible to ascertain Background Sounds amongst the lowest recorded during the night. The absolute lowest Background Sound Levels commonly occur during the middle of the night, which can be of a lesser importance when compared to the start and end which are often more noise sensitive from a sleep perspective. The 10th percentile is normally lower than the modal, median or mean average Background Sound Level values and therefore typically more representative of quieter periods.

Noise Impact Assessment

Table 4.2 shows a summary of noise monitoring data. Our full measurement data can be provided upon request.

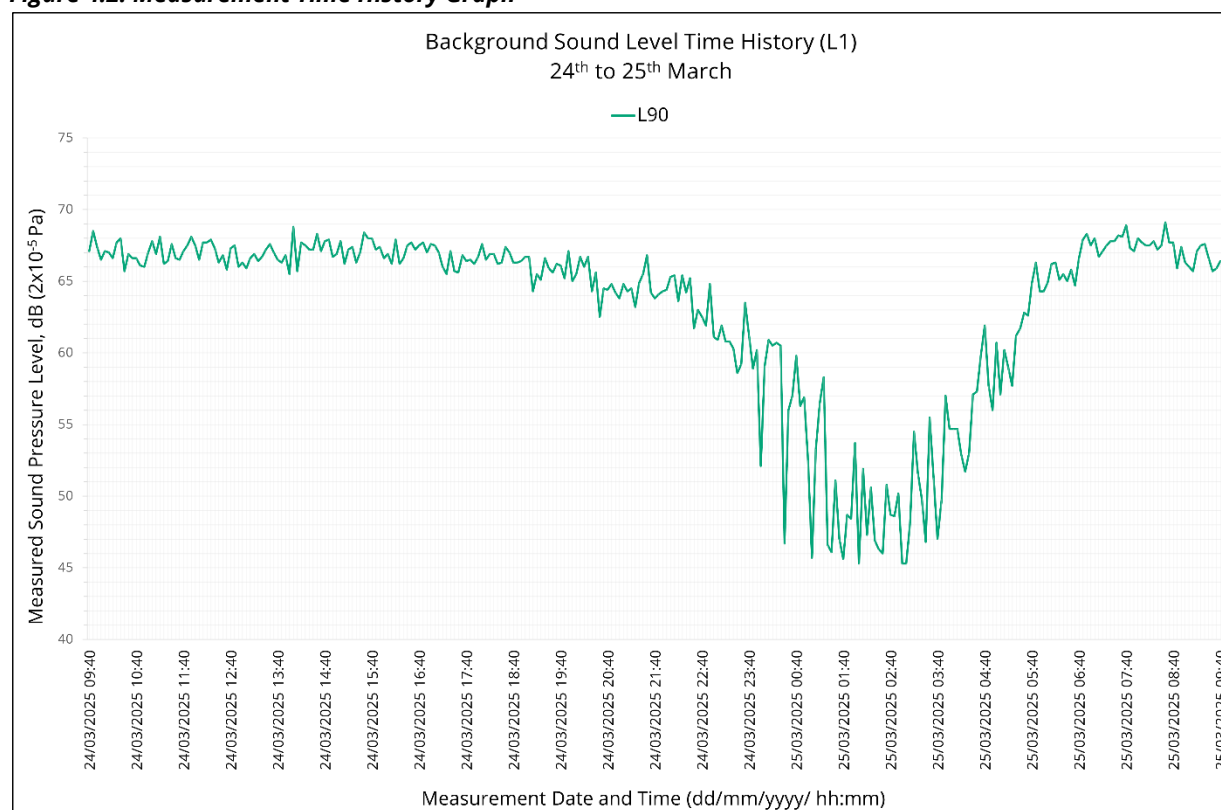
Table 4.2: Survey Results Summary - Measured Background Sound Level

Location	Date	Time Period	dB $L_{A90, T}$
L1	24/03/2025 – 25/03/2025	Day (07:00 – 23:00)	49 ¹
		Night (23:00 – 07:00)	44 ¹

Notes: ¹ The 10th percentile value is given for each time period (daytime 1 hour duration, nighttime 15 minute duration); this is considered representative of the typical lowest Background Sound Levels experienced in each period.

Figure 4.2 presents an overview of the time history of the noise data captured during the survey period at location L1. As is typical of locations influenced by road traffic noise, lower levels are observed during the nighttime period presenting a normal diurnal pattern.

Figure 4.2: Measurement Time History Graph



Noise Impact Assessment

5.0 Assessment

5.1 Proposal

The proposed mechanical plant equipment selection has been provided by the mechanical engineers and comprises:

- 1no. Containerised standby generator

The generator is to be placed within a proprietary container unit which includes attenuation, the container will be located next to a new substation and will provide emergency power to the nearby University Library and Park House building.

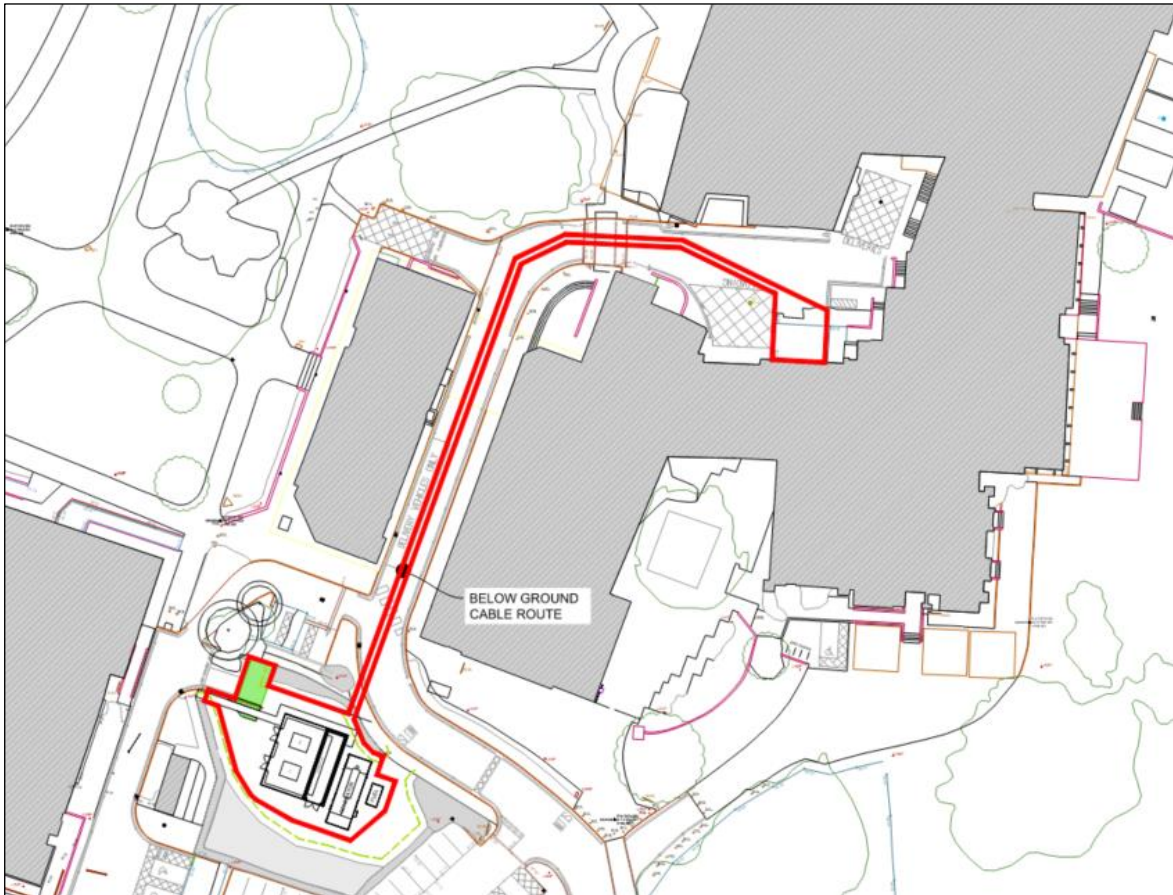
The proposed plant location has been provided by the mechanical engineers and is presented in the figures below.

Figure 5.1: Proposed Plant Location



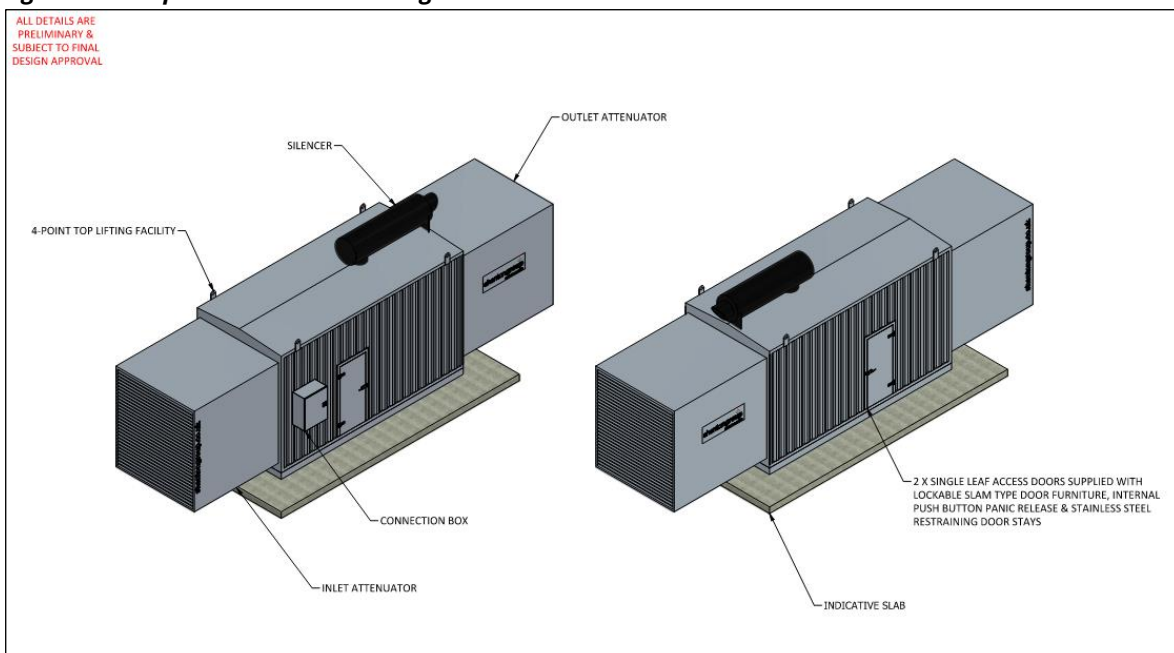
Noise Impact Assessment

Figure 5.2: Proposed Generator Configuration in Context of Site



The figure below presents the proposed containerised generators arrangement.

Figure 5.3: Proposed Container Arrangement



Noise Impact Assessment

5.2 Criteria

Using the Local Authority criteria presented in Section 2.3, Table 5.1 sets out recommended Plant Level Limits to be achieved as measured at the most exposed NSR. The Plant Level limits were derived using the Background Sound Levels presented in Table 4.2.

Table 5.1: Plant Level Limit at the Most Exposed Residential NSR

Receptor Point	Period	Plant Level Limit $L_{A_{r, Tr}}$ (dB)
Nearest Residential Receptor (See Figure 3.1)	Day	49 dB
	Night	44 dB

5.3 Plant Noise Data and Noise Level Limits

The manufacturers and mechanical engineer's proposal is to containerise the generator so that it is acoustically rated to achieve a sound pressure level of 75 dB L_{pA} at 1 meter outside the container as presented in Table 5.2 below.

Table 5.2: Manufacturer's Plant Noise Data

Plant Item	A-weighted Sound Pressure Level dB L_{pA} @ 1m
Containerised Generator	75

5.4 Indicative Noise Emission Prediction

Noise emission predictions were undertaken using CadnaA, a proprietary noise modelling package which performs predictions in accordance with BS EN ISO 9613-2⁵.

It is understood that the generator will only run in an emergency or when backup power is required. To present a worst case scenario, modelling is based on the generator running at 100% capacity.

Figure 5.4 gives an overview of the modelled Specific Sound Level from the proposed plant at the nearest residential NSR, the highest level is predicted to be 15 dB $L_{Aeq, Tr}$, along Pepper Lane.

⁵ International Standards Organisation ISO 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation

Noise Impact Assessment

Figure 5.4: Specific Sound Level dB $L_{Aeq, Tr}$ at Nearest NSRs



As defined in BS 4142, a **Specific Sound Level**, $L_{Aeq, Tr}$ is the equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given time interval, T .

Table 5.5 presents the resulting predicted plant Specific Sound Level at the nearest NSRs.

The predicted Specific Sound Level resulting from the proposed mechanical plant is 34 dB and 29 dB below the limiting criterion during the daytime and nighttime respectively and are below the Reading Borough Council requirements.

Table 5.5: Predicted Plant Noise Emission Rating Level at Most Exposed NSR.

	Daytime Assessment (07.00 – 23.00)	Night-time Assessment (23.00 – 07.00)
Predicted Specific Sound Level, $L_{Aeq, Tr}$	15	15
Plant Level Limits, $L_{A90, T}$	49	44
Level Difference, dB	-34	-29

Should an assessment be undertaken following the methodology within BS 4142 it is expected that the likelihood of any adverse effects would be low, based on the predicted levels.

Noise Impact Assessment

5.5 Discussion & Recommendations

An indicative assessment has been undertaken to understand the likely noise impact of the proposed standby generator.

The assessment is based on the generator running at 100% load, however this is unlikely, therefore, it can be assumed that the noise emissions will be lower than predicted and our assessment can be considered to be conservative.

The University of Reading Whiteknights Campus is geographically split across two local authority jurisdictions. The proposed plant site falls under the control of WBC, the nearest NSRs are within the bounds of RBC. It is understood that due to the proximity of the NSRs, RBC will be in consultation with WBC.

The indicative assessment results show that the predicted Specific Sound Levels resulting from the proposed mechanical plant were 34 dB and 29 dB below the derived limiting daytime and nighttime criteria. Based on the assessment the predicted Specific Sound Levels are below the Reading Borough Council requirements. Therefore, the proposals satisfy the RBC planning criteria.

It is understood that periodic testing will be required, it is recommended that this is carried out during daytime periods in order to limit the impact of noise during the testing period.

5.6 Assumptions and Limitations

The calculations are based on the proposed plant selection and proposed location provided by the mechanical engineers, should these change additional calculations may be required.

All reasonable steps to reduce the level of uncertainty of the measurement and assessment have been undertaken. Reviews of the captured survey data identified a consistent noise environment with a typical diurnal pattern, with little variance over shorter periods and no observable discrete intermittent conditions. Calculations were undertaken using industry standard propagation methodology. Input data for the 3D model was obtained from a range of sources to best replicate the site environment including OpenStreetMap, Ordinance Survey mapping, available site plan drawings and 3D imagery within Google Earth.

Noise Impact Assessment

Appendix A - Glossary of Acoustic Terminology

This Appendix provides a non-specialists explanation of common acoustics terms that may occur in reports and technical notes. It is intended to give a brief overview of the term.

Term	Definition
Decibel, dB	Is a unit of measurement of sound and is expressed on a logarithmic (base 10) scale. The human ear has a large dynamic range in sound reception, the logarithmic scale is a convenient way of compressing a range of sound pressures into a smaller range of numbers.
Sound Pressure Level, L_p	$L_p = 20 \log_{10} \left(\frac{P_{rms}}{P_{ref}} \right) dB$ This is the pressure deviation against a reference pressure caused by a passing sound wave. Where P_{rms} is the root mean square measured pressure and P_{ref} is the reference pressure, which is 2×10^{-5} pascals for air.
Sound Power Level, L_w	$L_w = 10 \log_{10} \left(\frac{P}{P_0} \right) dB$ This is the total sound energy radiated from a given source. P_0 is the reference sound power level (1×10^{-12}) and the measured power.
Noise Rating Level, NR dB	Commonly used when describing noise from building services systems. This is a single figure value derived by plotting a noise spectrum against a set of curves. The lowest curve under which the level fits is the resulting NR level. The overall NR value is the highest of the individual NR values for each frequency band.
Frequency, Hz	$f = \frac{1}{T} = \frac{v}{\lambda}$ Where f is the frequency, T is the time to complete one cycle, v is the speed of sound and λ is the wavelength of a given sound pressure wave. Different frequencies are divided into octave and one third octave bands.
Frequency Weightings	Weightings are often applied to a spectrum of sound and act as a filter to account for different sensitivities and conditions. Weightings are often used to present a single figure value from a spectrum of sound.
A-weighted sound pressure level, L_{pA}	The sound pressure level with the A-weighting applied. The A-weighting is used for most environmental noise measurements and is used to weight a spectrum of sound to match the sensitivity of the human ear.
Measurement Time Weightings, Fast, Slow	Depending upon the measurement in question the time response of a sound level meter can be adjusted. For most measurements the Fast time weighting is selected (F) however, a slow time weighting (S) is often used to for the measurement train noise and vibration.

Noise Impact Assessment

Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$	An energy average and defined as the level of sound which, through a given period of time (T) would equate to the same A-weighted sound energy as the actual measured fluctuating sound.
Octave Band	A frequency band where the upper frequency of the band is twice the frequency of the lower limit.
Maximum noise Level, L_{AFmax}	With the meter set with a fast time response, F, this is the maximum instantaneous noise level measured during a given period of time.
Percentile level, $L_{AN,T} (L_{A90,T}, L_{A10,T})$	A sound pressure level which is exceeded for a given N% of a specified time period with an A-weighting and measured with a fast time response.
Background Sound/Noise Level, L_{A90}	Typically, these are amongst the lowest noise levels referenced over a given period and act to describe the noise level that is consistently exceeded 90% of the time. The background sound level excludes short term, intermittent noise sources and often acts to describe noise sources that operate consistently through a given period.
Ambient Noise Level	The most commonly used value to describe the ambient noise level the L_{Aeq} . It is the noise level in a given environment whilst it is subject to all of its normal sources of noise.
Rating Level, $L_{Ar,Tr}$	As defined in BS 4142. The equivalent continuous A-weighted sound pressure level that includes corrections for the presence of any acoustic characteristics such as tonality, impulsivity and intermittency.
Reverberation Time, T	The time needed for the sound pressure level to decrease by 60 dB after the sound source has stopped, often written RT60. T is often followed by descriptors to present type of reverberation time value. For example, a T_{mf} is the mid-frequency (500 Hz – 2 kHz) reverberation time.
Absorption Coefficient, α	The fraction of reverberant sound energy absorbed by a material. It is expressed as a value between 1.0 which equates to perfect absorption and 0 which equates to zero absorption.
Acoustic Absorption, A	$A = \alpha S$ This is a measure of how much sound energy is absorbed by a material rather than reflected. Acoustic absorption is derived from the multiplication of the absorption coefficient by the surface area, $S \text{ m}^2$ of a given material.
Absorption Class, A - E	The process of classifying materials into discreet Classes A-E, with Class A having the highest level of absorption. Each class band has upper and lower reference curve for absorption coefficients between 200 Hz and 5 kHz. Materials should be tested in accordance with BS EN ISO 354 and classified according to BS EN ISO 11654.
NRC	A single-number value ranging from 0 (no absorption) – 1 (100% absorption) describing the absorption performance of a material. NRC of a material is calculated by averaging its Sound Absorption Coefficients between 250 Hz – 2 kHz.

Noise Impact Assessment

Sound Insulation	The capacity of building elements to reduce sound transmission between spaces across a range of frequencies.
Sound Reduction Index, R	$R = L_1 - L_2 + 10 \log_{10} \left(\frac{S}{A} \right) dB$ A laboratory measure of the sound insulation performance of a material in a given frequency band or range. Where L_1 is the average sound pressure level in the source room and L_2 is the average sound pressure level in the receive room, S is the area of the tested element and A is the equivalent sound absorption area.
Weighted Sound Reduction Index, R_w	A single figure value derived from a range of frequencies that characterises the sound reduction of a material. A reference curve is compared to the measured sound reduction indices and is adjusted until the total of unfavourable deviations below the reference curve is as close to but does not exceed 32.
Weighted Level Difference, D_w	$D = L_1 - L_2$ The difference in noise level between a source room and a receive room. Where L_1 is the average sound pressure level in the source room and L_2 is the average sound pressure level in the receive room. The difference is then weighted and stated as a single figure.
Standardized Weighted Level Difference, $D_{nT,w}$	$D_{nT} = D + 10 \log_{10} \left(\frac{T}{T_0} \right) dB$ Where D is the measured level difference standardised for the reference reverberation time, T_0 and then weighted.
Weighted, Normalised Flanking Level Difference, D_{nFw}	The level difference via a flanking element, such as a mullion or ceiling detail, which is normalised and weighted.
Weighted, Normalised Element Level Difference, D_{new}	The level difference through a small element such as a trickle ventilator, which is normalised and weighted.
C_{tr}	A spectrum adaption term applied to the sound insulation single-number values (R_w , $D_{w,i}$ and $D_{nT,w}$). The C_{tr} adaption term acts to describe the performance of an element in the context of low frequency noise, such as that generated by traffic.
Impact Sound	Is the noise generated by an impact on a structure, such as walking or weight drops.
Weighted standardized impact sound pressure level, $L_{nT,w}$	$L_{nT} = L_i - 10 \log_{10} \left(\frac{T}{T_0} \right) dB$ Where L_i is the measured impact sound pressure level standardised for the reference reverberation time, T_0. It is used to describe the impact sound insulation performance of a floor. This is a measured noise level in a receive room generated by a standardised impact source in the room above.
Insertion Loss, IL	The reduction of noise level due to the presence of a noise control device such as an attenuator, excluding any regeneration noise created by its presence. A dynamic insertion loss, DIL, would include the impact of any regenerated noise.

Noise Impact Assessment

Cross-talk	This references noise transmission via ventilation duct or similar air path between rooms.
Vibration	The vibratory motion of a surface can be described by the displacement (m), velocity (m/s) or the acceleration (m/s²) of its oscillation. Depending upon the circumstance it is often useful to quantify the magnitude of vibration in a range of ways, including Peak to Peak, Peak, r.m.s. and dB. A reference level of 10-6 m/s² r.m.s. is usually used for acceleration.
Ground borne noise	Where the noise propagation path from a source is transmitted through the ground into a structure and is radiated via the structure, such as noise experienced from an underground train within a building above ground.
Structure borne noise	Noise caused by vibrating of elements of a structure, the source of which is within a building or structure with common elements.
Vibration Dose Value, VDV	$VDV = (\int_0^T a^4(t) dt)^{\frac{1}{4}}$ Where a(t) is the frequency weighted acceleration (m/s²), T is the total measurement period in seconds, VDV is the Vibration Dose Value (m/s^{1.75}) and is the dose a person is expected to be exposed to over the course of the day or night.
Estimated Vibration Dose Value, eVDV	$eVDV = k \cdot a_{rms} \cdot t^{0.25}$ Where k is a constant for crest factors (typically 1.41), a_{rms} is the weighted rms acceleration and t is the cumulative time of the period Typically used on short duration measurements of transients with known durations and occurrences

Noise Impact Assessment

Appendix B – Summary of Relevant Planning Policy and Guidance

National Planning Policy Framework, 2024

The National Planning Policy Framework sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally-prepared plans for housing and other developments can be produced.

One of the stated aims of the NPPF is to conserve and enhance the natural environment, as part of this new and existing developments should be prevented from contributing to or being put at risk from, or being adversely affected by unacceptable levels of noise pollution. Planning policies and decisions should aim to mitigate and reduce to a minimum potential adverse impacts resulting from noise or as a result of noise from a new development.

The NPPF makes reference to the Noise Policy Statement for England.

Noise Policy Statement for England, 2010

The aim of the NPSE is to provide clarity regarding current policies and practices to enable noise management decisions to be made within the wider context, at the most appropriate level, in a cost-effective manner and in a timely fashion.

The following are the general national noise policy aims:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life.

In order to define and quantify noise impacts the NPSE presents the following measures:

NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur.

It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.

Planning Practice Guidance, Noise 2019

The Planning Practice Guidance provides an online resource appraising when noise is relevant to the planning process, its relationship with other planning concerns and how noise impacts can be determined. The resource references the NPSE and its approach for determining whether significant adverse effects are likely to occur.

The document presents a noise exposure hierarchy which is a useful framework for assessing the likely responses elicited by noise and whether action should be taken to mitigate.

The guidance document seeks to explain the subjective nature of noise and the factors that apply when determining the level of impact experienced.

The document also outlines how planning and design can address the adverse effects of noise.

BS 4142 – Assessment Methodology for Noise from Industrial Sources

Noise Impact Assessment

BS 4142 describes methods for rating and assessing sound of an industrial and/or commercial nature, which includes:

- a) sound from industrial and manufacturing processes;
- b) sound from fixed installations which comprise mechanical and electrical plant and equipment;
- c) sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- d) 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 or ship movements on or around an industrial and/or commercial site.

BS 4142 is applicable to the determination of the following levels at outdoor locations:

- a) Rating Levels for sources of sound of an industrial and/or commercial nature; and
- b) ambient, background and residual sound levels, for the purposes of:
 - 1) investigating complaints;
 - 2) assessing sound from proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and
 - 3) assessing sound at proposed new dwellings or premises used for residential purposes.

BS 4142 defines the following terms:

Rating Level, $L_{Ar,Tr}$

Is the specific sound level plus any adjustment for the characteristic features of the sound. Characteristic features include tonality (up to +6 dB correction), impulsivity (up to + 9 dB correction) and intermittency (up to + 3 dB correction). For corrections of + 3 dB can be applied should any other characteristics be present that are distinctive against the residual acoustic environment.

Residual Sound, L_r

Is 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.

Specific Sound Level, $L_s = L_{Aeq,Tr}$

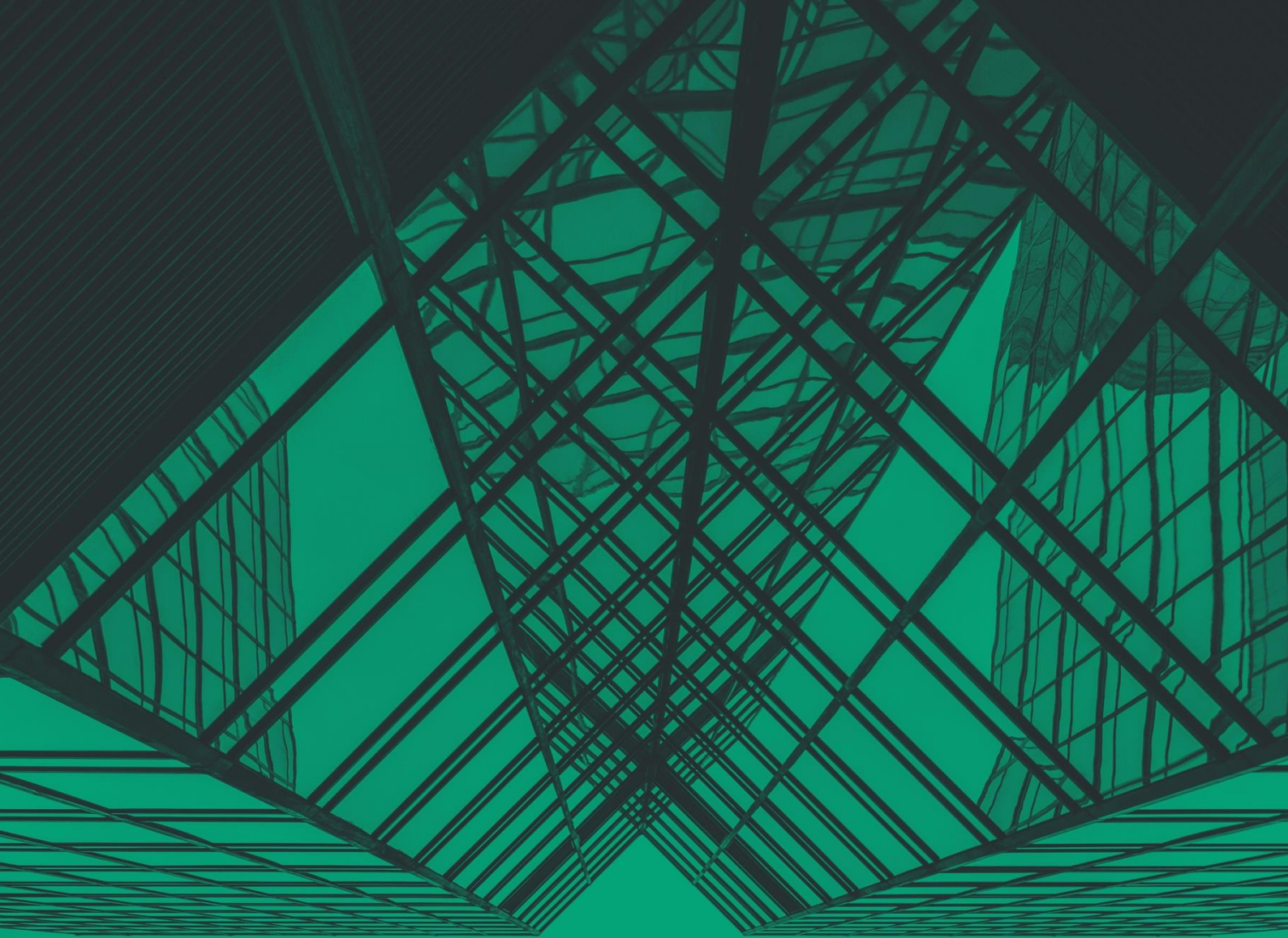
Is the equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T_r .

BS 4142 presents a range of methods and examples on how ratings and assessments can be carried out. BS 4142 also provides a method to assess the likelihood of adverse comment caused by noise from new industrial or commercial sources. A relevant summary of BS 4142 is included within Appendix B of this document.

Within BS 4142 an initial guide for assessing the noise impacts of industrial and commercial sound sources by subtracting the measured Background Sound Level from the Rating Sound Level is presented. BS4142 states the following:

- e) Typically, the greater this difference, the greater the magnitude of the impact.
- f) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on context.
- g) A difference of around +5 dB is likely to be an indication of a significant 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.



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