DRAGONFLY

CONSULTING

JD Wetherspoon PLC

34 Kilburn High Road, London

Plant Noise Impact Assessment

DC3790-R1v2

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Report Version Issue Log

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This report has been prepared by Dragonfly Consulting with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client.

Dragonfly Consulting disclaims any responsibility to the client and others in respect of any matters outside the agreed scope of the work.

Limitations to this Report

This report entails a physical investigation of the site with a sufficient number of sample measurements to provide quantitative information concerning the type and degree of noise affecting the site. The objectives of the investigation have been limited to establishing sources of noise material to carrying out an appropriate assessment.

The number and duration of noise measurements have been chosen to give reasonably representative information on the environment within the agreed time, and the locations of measurements have been restricted to the areas unoccupied by building(s) that are easily accessible without undue risk to our staff.

As with any sampling, the number of sampling points and the methods of sampling and testing cannot preclude the existence of “hotspots” where noise levels may be significantly higher than those actually measured due to previously unknown or unrecognised noise emitters. Furthermore, noise sources may be intermittent or fluctuate in intensity and consequently may not be present or may not be present in full intensity for some or all of the survey duration.

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List of Appendices

1.0 INTRODUCTION

JD Wetherspoon PLC has appointed Dragonfly Consulting to carry out a Noise Impact Assessment for a proposed new plant installation on the re-development of 34 Kilburn High Road, London.

The noise assessment has been conducted with reference to the National Planning Policy Framework, appropriate British Standards and recognised guidance.

This report describes a noise survey of the site and the subsequent analysis to determine the noise environment of the proposed development. It then compares the results with the adopted criteria. Recommendations are also made with respect to the design of the development.

A glossary of technical terminology is included in Appendix A to support this document.

2.0 SITE DESCRIPTION

2.1 Existing Site Conditions

The proposed development site is a currently an unoccupied building located on the eastern side of Kilburn High Road to the south and west of Springfield Lane. The site previously operated as a licenced premises (Public House) and benefits from planning permission for the upper floors to be used as a bed and breakfast or hostel (Ref: 2020/1412/P).

Residential dwellings are located on Springfield Lane to the east of the proposed development site, and immediately to the south and west.

The closest Noise Sensitive Receptors (NSRs) to the site are identified as the rear façade of residential dwellings 6-12 Springfield Lane, the fifth floor of the apartment building to the south and Maida Vale Aparthotel to the west. NSR locations can be seen in Appendix C.

- NSR1 – 6-12 Springfield Lane (Grid Ref: X;525542, Y;183548);
- NSR2 – Maida Vale Aparthotel (Grid Ref: 525518, 183547); and,
- NSR3 – Apartment Building (Grid Ref: X;525527, Y;183528).

2.2 Proposed Site Conditions

It is proposed to develop the site to operate as a public house, with an extension to the existing building at first floor level to the rear of the site.

Details of the noise levels of the proposed plant are provided in Section 6.2. A proposed site plan is shown at Figure 2.1 below:

Figure 2.1
Proposed Development Site

3.0 GUIDANCE

3.1 National Planning Guidance

3.1.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these are expected to be applied. At the heart of the NPPF is a presumption in favour of sustainable development. It requires Local Plans to be consistent with the principles and policies set out in the NPPF with the objective of contributing to the achievement of sustainable development.

The NPPF states that the planning system has three overarching objectives in achieving sustainable development including a requirement to 'contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.'

Paragraph 174 of the NPPF states:

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

…

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability."

Additionally, Paragraph 185 of the NPPF states:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life…"

3.2 Noise Policy Statement for England

The document 'Noise Policy Statement for England' sets out the following vision for ongoing noise policy:

"Promote good health and a quality of life through the effective management of noise within the context of Government policy on sustainable development."

This vision should be achieved through the following Noise Policy Aims:

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *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."*

To achieve this vision, the Noise Policy Statement sets 3 noise levels to be defined by the assessor:

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.

The Noise Policy Statement considers that noise levels above the SOAEL would be seen to have, by definition, significant adverse effects and would be considered unacceptable. Where the assessed noise levels fall between the LOAEL and the SOAEL noise levels, the Policy Statement requires that:

"…all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development… This does not mean that such adverse effects cannot occur."

Where noise levels are below the LOAEL, it is considered there will be no adverse effect. Once noise levels are below the NOEL, there will be no observable change.

3.3 Local Planning Policy

3.3.1 Local Plan

The National Planning Policy Framework (NPPF) guides that Local Authorities should create a 'Local Plan'. In creating their plan, the NPPF guides that the planning policies created should "*avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development*".

The Camden Local Plan 2017 sets the Core Policies with respect to development within the local area; the policies of which are considered most relevant to this assessment are shown below:

"Policy A4 Noise and vibration

The Council will seek to ensure that noise and vibration is controlled and managed.

Development should have regard to Camden's Noise and Vibration Thresholds (Appendix 3). We will not grant planning permission for:

a. *development likely to generate unacceptable noise and vibration impacts; or*
b. *development sensitive to noise in locations which experience high levels of noise, unless appropriate attenuation measures can be provided and will not harm the continued operation*

of existing uses. We will only grant permission for noise generating development, including any plant and machinery, if it can be operated without causing harm to amenity. We will also seek to minimise the impact on local amenity from deliveries and from the demolition and construction phases of development."

Policy A4 refers to the supplemental planning document '*Camden Planning Guidance – Amenity (2021*)" which states:

"*Developments proposing plant, ventilation, air extraction or conditioning equipment and flues will need to provide the system's technical specifications to the Council accompanying any acoustic report. 'BS4142 Method for rating Industrial and Commercial Sound' contains guidance and standards which should also be considered within the acoustic report*."

Additionally, Appendix 3 (as referenced in Policy A4) indicates the following:

"*Industrial and Commercial Noise Sources*

A relevant standard or guidance document should be referenced when determining values for LOAEL and SOAEL for non-anonymous noise. Where appropriate and within the scope of the document it is expected that

British Standard 4142:2014 'Methods for rating and assessing industrial and commercial sound' (BS 4142) will be used. For such cases a 'Rating Level' of 10 dB below background (15dB if tonal components are present) should be considered as the design criterion)."

Appendix 3 further notes the following in relation to the referencing of the noise levels thresholds set out within the Noise Policy Statement for England (NPSE).

NOEL – 'Rating Level' 10dB Below Background.

LOAEL - Rating level' between 9dB below and 5dB above background.

SOAEL - 'Rating level' greater than 5dB above background.

However, it is noted that the referencing of the criteria set out in BS 4142:2014 to the NPSE thresholds detailed in Appendix 3 of the Camden Local Plan is not consistent with the normal good practice of the interpretation of the BS 4142 criteria.

It is noted that BS 4142:2014 states:

"*A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context*"

Further BS 4142:2014 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*"

3.4 British Standards and Guidance Documents

Summaries of the relevant standards are given below.

3.4.1 British Standard (BS) 4142:2014+A1:2019

British Standard 4142:2014+A1:2019 – *Methods for rating and assessing industrial and commercial sound*. This new edition of BS 4142 clarifies the application of the standard and introduces the consideration of uncertainty as part of the assessment methodology. The standard provides a method for rating and assessing sound of an industrial or commercial nature, including:

- Sound from industrial and manufacturing process;
- Sound from fixed installations which comprise mechanical and electrical plant and equipment;
- Sound from the loading and unloading of goods and materials at industrial and/or commercial premises;
- Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as from FLTs or that from train or ship movements on or around an industrial/commercial site.

The standard is intended for use for both the assessment of complaints and the assessment of the impact of commercial and industrial noise on both new and existing residential developments.

The method described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes at which the sound is incident. The standard specifically excludes itself for the use of determination of nuisance.

The procedure contained in BS 4142 for assessing the likelihood of complaint requires the calculation of the noise level from the source to be assessed at a location immediately outside the relevant dwelling; this is described as the 'specific sound level'. Where the specific noise source already exists, its noise level can be derived by measuring the total noise present, or 'ambient noise', and subtracting from it the noise from sources that are not under consideration. Noises not under consideration are called the 'residual noise'.

A 'rating level' is then calculated from the specific sound level. The rating level is then compared with the measured background noise level at that measurement location. If the specific noise source does not yet exist but the details of the intended plant are known, the specific sound level can be derived from first principles using manufacturers and other data.

The specific, ambient and residual noise levels are measured in terms of $L_{Aeq,T}$ values and the background noise level is measured in terms of an L_{A90} value.

BS 4142 considers that certain acoustic features can increase impact of a new noise source over that expected from a simple comparison between the specific noise level and the background noise level. These features can be assessed in one of three ways:

- Objective method - comparing adjoining third octave band noise levels (if available) for the sound source;

- The reference method by analysing measured plant noise levels using the Joint Nordic method;
- Using the prescribed subjective methodology.

These features and the penalties applied to calculate a rating level when assessing subjectively as defined by BS 4142 are as follows:

- Tonality – For sound ranging from not tonal to prominently tonal, the Joint Nordic Method gives a correction of between 0 and +6dB for tonality.
    - 2dB for a tone which is just perceptible;
    - 4dB where it is clearly perceptible;
    - 6dB where it is highly perceptible.
- Impulsivity – A correction of up to 9dB can be applied for sound that is highly impulsive, considering both the rapidity of change in sound level and the overall change in sound level.
    - 3dB just perceptible impulsivity;
    - 6dB clearly perceptible impulsivity;
    - 9db highly perceptible impulsivity.
- Intermittency – Where the specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time period that contain the greatest amount of 'on' time. This can necessitate measuring the specific sound over a number of shorter periods that are in combination less that the reference time interval in total.
    - If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied.
- Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive from the residual acoustic environment, a 3dB penalty can be applied.

In order to assess the significance of the impact, the background noise level is subtracted from the rating level. The standard considers that the greater the difference, the greater the significance.

- 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 standard goes on to highlight that these values are not absolute. There are a number of factors that should be taken into account when assessing the impact and significance of the noise including:

- The absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low;
- Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night;
- Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts. The margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse;
- The character and level of the residual sound compared to the character and level of the specific sound;
- The sensitivity of the receptor and if the receptor already includes acoustic design features to mitigate noise.

4.0 ASSESSMENT METHODOLOGY

4.1 Assessed Sources of Environmental Noise

With reference to the guidance detailed within Section 3.0, the following Table presents the specific methodology adopted for the assessment of noise arising from the development proposals.

Table 4.1
Assessed Sources of Environmental Noise

Potential Nosie Source	Relevant Assessment Methodology
Fixed Plant	BS 4142:2014+A1:2019

4.2 Selection of Assessment Criteria

The following criteria have been selected to determine the threshold of effect levels in the context of the National Planning Policy Framework and Noise Policy Statement for England.

Table 4.2
Assessment Criteria: BS 4142:2014+A1:2019

Effect Level	Criteria	Justification
No Observed Effect Level (NOEL)	Free-field external noise levels at adjacent sensitive receptor locations below the representative background noise level	Noise levels below the background are considered to have no detectable effect on health and quality of life due to the noise.
Lowest Observed Adverse Effect Level (LOAEL)	Free-field external noise levels at adjacent sensitive receptor locations within 0 dB of representative background noise level	Noise levels 0dB above background are considered an indication of where adverse noise impacts may occur in the context of BS 4142. Noise levels below this level are an indication that it is less likely that the specific sound source will have an adverse impact
Significant Observed Adverse Effect Level (SOAEL)	Free-field external noise levels at receptor above +10 dB of representative background noise level	None Mitigate to achieve LOAEL Criteria

5.0 ENVIRONMENTAL NOISE SURVEY

Daytime and night-time measurements were undertaken from the 27th to the 28th of January 2022. The noise measurements established typical external ambient and background noise levels at the site and NSRs.

Safe access to the flat roof areas immediately adjacent to the noise sensitive receptors was not available; however, the selected measurement location was considered to be representative of the noise levels likely incident on the nearest noise sensitive receptors.

5.1 Survey Methodology

The equipment used during the survey is detailed in Appendix B. The sound level meter was calibrated before and after the measurements and no significant calibration drifts were found to have occurred (>0.2dB). All of the noise monitoring equipment had been calibrated to a traceable standard within the twenty-four months preceding the survey. Calibration certificates are available on request.

One measurement location was surveyed to establish the typical ambient and background noise levels at the proposed development site. The measurement location is hereby referred to in this report as follows:

- 'Location 1' – sound level meter positioned level with the roof parapet on the eastern side of the existing building approximately 1m from the existing façade. (Grid Ref: 525521, 183538).

The measurement location is shown in Appendix C.

5.2 Survey Results

The weather during the unattended survey was suitable for the majority of noise measurements, it being dry with low wind speeds.

Summaries of the measured noise levels are given in Table 5.1 below. Full survey results are available upon request.

Table 5.1
Summary of Measured Noise Levels – 27/01/22 to 28/01/22– free field, dB

Location	Date	Period	Time (h)	$L_{Aeq,T}$	L_{A90}	L_{AFMax}
1	27/01/22	Daytime	1300-2300	41.7	36.3	63.4
	27/01/22-28/01/22	Night-time	2300-0700	41.7	35.9	61.3
	28/01/22	Daytime	0700-1000	47.8	41.5	67.1

5.3 Observations and Comments

The noise environment at the survey locations is considered to be a combination of road noise from Kilburn High Road and the surrounding road network with noise from street level sources such as people and commercial activities audible at the beginning and end of the survey.

For both the daytime and night-time assessments, it is considered that the levels measured are representative of the typical acoustic environment at the survey location and representative of the levels at the noise sensitive receptors.

5.3.1 BS 4142 Background (L_{A90}) Statistical Analysis

In accordance with Section 8 of BS 4142, the statistical analysis of measured background noise levels is presented in Figure 5.1 and Figure 5.2 below. Where data has returned a bi-modal distribution, the lowest consistent value has been selected to present a reasonable worst-case.

It is understood that the plant could operate on an 'as required' basis 24 hours per day.

Figure 5.1
Daytime Background (L_{A90}) Analysis (0700-2300)

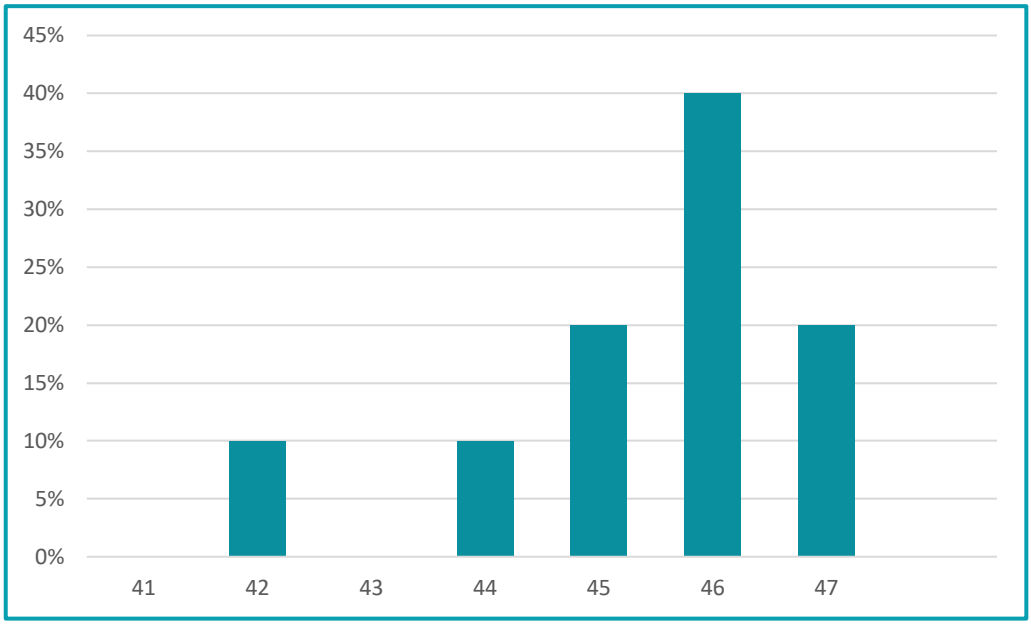
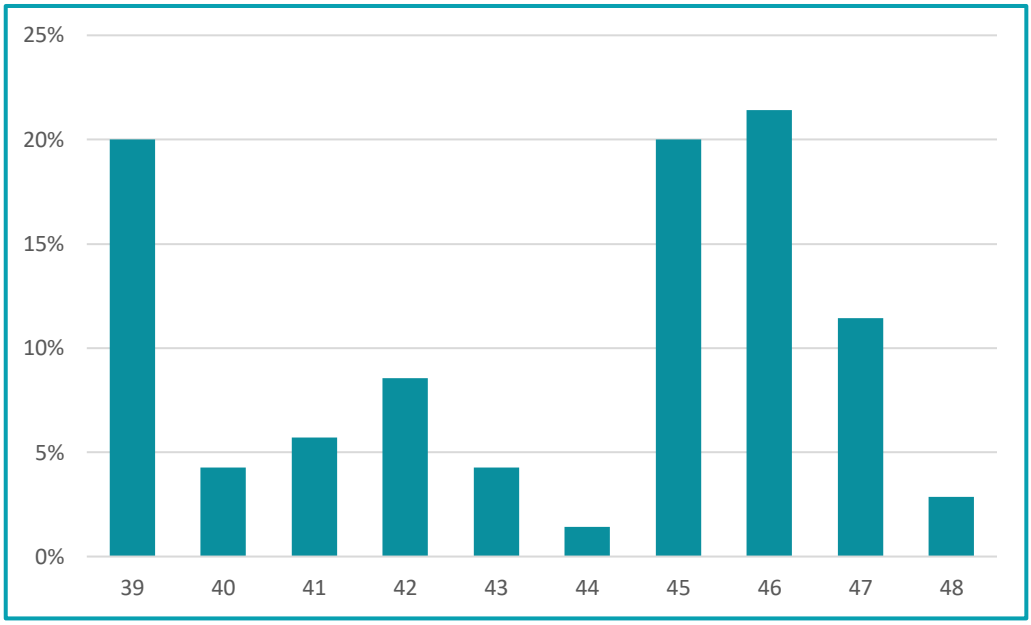


Figure 5.2
Night-time Background (L_{A90}) Analysis (2300-0700)



6.0 NOISE ASSESSMENT METHODOLOGY

6.1 Data Sources

Modelling calculations were undertaken based on the data sources identified below:

- Plans
    - Existing site layout taken from photographs and site inspection.
    - Proposed site layout provided by APL Mechanical Services: Second, Third and Roof Proposed Mechanical Layout Plan (drawing no. 7580-01-B).
- Existing Plant Noise Emission Levels – Taken from manufacturer noise data for similar example units from Toshiba air-con.
- Proposed Plant Noise Levels taken from example scheme utilised at another JD Wetherspoons site. The plant schemes at JD Wetherspoon sites are largely consistent with some small variation depending on the size of the venue.
- Reflections – 1st order reflections have not been accounted for within the noise model.
- Ground Absorption –Hard ground (G=0).

6.2 Source Noise Levels

6.2.1 Proposed Fixed Plant

The proposed fixed plant has been identified within the Equipment Schedule provided by APL Mechanical Services and listed in Table 6.1 below.

Table 6.1
Proposed Fixed Plant

Unit	Model	SWL dB(A)
Staff Room AC Condenser	Mitsubishi Electric MUZ-HR35VF	59.0
Kitchen Ducted AC Condenser	Mitsubishi Electric PUZ-M140YAR1	65.0
Kitchen Ducted AC Condenser	Mitsubishi Electric PUZ-M200YKA	68.0
Bar Ducted AC Condenser	Mitsubishi Electric PUZ-M250YKA3	70.0
FF Cassette AC Condenser	Mitsubishi Electric PUZ-250YKA3	70.0
GF Cassette AC Condenser	Mitsubishi Electric PUZ-M140YAR1	65.0
Cellar Cooling Condenser	J&E Hall BSCU-40-M3	69.0
Bottle Store Condenser	J&E Hall JCC2 25E	76.0
Britvic Heat Dump	Other	*--
Glycol Condenser	J&E Hall JEHZ-0225-M1	58.8
Glycol Condenser	J&E Hall JEHZ-0225-M1	58.8
Walk in Freezer Condenser	ECO – DCU53H	69.0
Walk in Fridge Condenser	ECO – DCU53H	69.0
Kitchen Intake	**TBD	69.9
Kitchen Outtake	**TBD	69.9

*In the absence of technical data for the 'Britvic Heat Dump', this unit has been excluded from the assessment. It is worthy of note that the additional of this unit would not be significant as to affect the overall noise level of the already proposed units.

**The model for the Kitchen In/Outtake unit has not yet been identified, however calculations have determined that the maximum unit output can have a sound power level of up to 69.9dB(A), which has been included within the assessment.

*** In accordance with ISO 9613, as spectral noise data is not available the attenuation terms for 500Hz have been used to estimate the resulting attenuation and avoid over prediction.

7.0 ASSESSMENT

7.1 Predicted Noise levels from Proposed Plant Installation

The proposed plant installation will be located on the roof of proposed site; the plant items will be situated within a 2m high barrier (represented in green) and is shown in Figure 7.1 below.

Figure 7.1
Proposed Future Plant Location Plan

Assuming all plant is located within this compound and based on the estimated noise levels as set out in Section 6.2.1, the following noise levels have been calculated at each identified NSR.

Table 7.1
Calculations of Proposed Plant Noise Levels at NSRs, dB

NSR	Predicted Specific Noise Level ($L_{Ar,Tr}$)
1	29.3
2	33.7
3	32.2

7.2 BS 4142:2014+A1:2019 Assessment

An assessment has been carried out in accordance with the requirements of BS 4142:2014+A1:2019 to quantify the level and significance of any noise impacts on residents of the properties due to the noise generated by the proposed fixed plant units.

For the purposes of this assessment, it is understood that all plant items will operate at full capacity at all times.

The specific noise level has been obtained by calculating the noise level at the nearest noise sensitive receptor due to the operation of the proposed plant, using achievable source noise levels supplied to Dragonfly Consulting.

When calculating the rating level, there are four correction types that can be considered. They are:

- Tonality;
- Impulsivity;
- Intermittency;
- Specific noise readily distinctive from the residual environment.

It has been determined that due to the existing plant within the area, there will be no change in the acoustic environment and therefore no character corrections are applicable.

The results of the assessment are shown in Table 7.2, in accordance with BS 4142 Para 8.6, the levels are expressed as integers (with 0.5 dB being rounded up):

Table 7.2
Assessment of Plant Noise Impact at NSR, dB

NSR	Existing Measured Background (L_{A90})		Predicted Noise Rating Level ($L_{Ar,Tr}$)	BS 4142: Difference between Rating Level and Background	
	Daytime 0700 - 2300	Night-time 2300 - 0700		Daytime 0700 - 2300	Night-time 2300 - 0700
1	46	45	29	-17	-16
2	46	45	34	-12	-11
3	46	45	32	-14	-13

As shown in Table 7.2, predicted noise rating levels are a minimum of 11dB below the background noise levels at the nearest noise sensitive receptor. Predicted noise levels therefore fall below the NOEL.

Impacts below the NOEL are considered to be acceptable when assessed against the requirements of the Camden Local Plan, based on the contextual criteria set for this development and the requirements of the NPPF.

On this basis, the assessment demonstrates that the proposed plant will not cause an unacceptable adverse impact and therefore meets the requirements of the NPPF and the Camden Local Plan.

7.3 Uncertainty of the Assessment

Following current good practice, an appraisal of the uncertainty within both the on-site noise survey and the prediction calculations has been completed.

The following negative factors have been noted in considering the uncertainty of the on-site noise survey:

- One monitoring location located on site as opposed to directly at receptors.

The following positive factors have been noted in considering the uncertainty of the on-site noise survey:

- Low winds and no significant precipitation;
- Consistent noise source.

As such, it is considered that the uncertainty for the on-site noise survey element of the work is ±2dB. Uncertainty for the prediction elements of the work has been considered in line with the normal use of ISO9613 based point source propagation calculations and is predicted at ±3dB.

Utilising the root sum of squares method, this gives a combined uncertainty for this assessment of approximately ±3.6dB.

7.4 Assertion of Competence

This assessment has been completed by Adam Shaw, Acoustic Consultant with responsibilities for completing acoustic reports on behalf of Dragonfly Consulting. I am a Technician Member of the Institute of Acoustics and an Associate Member of the British Occupational Hygiene Society. I hold a Bachelor of Science in Sound Engineering, with Honours, from Birmingham City University.

This assessment has been completed with oversight from Chris Chittock, Managing Director of Dragonfly Consulting with direct responsibilities for the acoustics projects within the firm.

I hold a Bachelor of Science Degree, with Honours, in Audio Technology from the University of Salford. I am a Corporate Member of the Institute of Acoustics. I have over 19 years of experience within the field of acoustics in both the public and private sector.

I have completed several assessments under BS 4142:2014+A1:2019 and I assert that I am competent to undertake this assessment under the requirements of BS 4142:2014+A1:2019.

8.0 CONCLUSIONS

JD Wetherspoon PLC has appointed Dragonfly Consulting to carry out a Noise Impact Assessment for a proposed new plant installation on the re-development 34 Kilburn High Road, London.

Measurement of external noise levels has been completed for the proposed development to allow demonstration by calculation that suitable noise levels will be achieved at the nearest noise sensitive properties.

8.1 Assessment of Noise Impact from Fixed Plant

The assessment demonstrates that the predicted noise rating levels will be a minimum of 11dB below the background noise levels at the nearest noise sensitive receptor. Predicted noise levels therefore fall below the NOEL.

Impacts below the NOEL are considered to be acceptable when assessed against the requirements of the Camden Local Plan, based on the contextual criteria set for this development and the requirements of the NPPF. In addition, the proposed installation presents a significant betterment in terms of the reduction in noise level provided by the proposed scheme.

On this basis, the assessment demonstrates that the proposed plant will not cause an unacceptable adverse impact and therefore meets the requirements of the NPPF and the Camden Local Plan.

Appendix A – Glossary of Terminology

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided.

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0dB (the threshold of hearing) to over 120dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

Table A-1
Sound Levels Commonly Found in the Environment

Sound Level	Location
0dB(A)	Threshold of hearing
20 to 30dB(A)	Quiet bedroom at night
30 to 40dB(A)	Living room during the day
40 to 50dB(A)	Typical office
50 to 60dB(A)	Inside a car
60 to 70dB(A)	Typical high street
70 to 90dB(A)	Inside factory
100 to 110dB(A)	Burglar alarm at 1m away
110 to 130dB(A)	Jet aircraft on take off
140dB(A)	Threshold of Pain

Acoustic Terminology

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) A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.

L_{Aeq} This is defined as the notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the A-weighted fluctuating sound measured over that period.

L_{10} & L_{90} If a non-steady noise is to be described, it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and the term refers to the level exceeded for n% of the time. L_{10} is the level exceeded for 10% of the time and is often used as a descriptor for road traffic noise. Similarly, L_{90} is the level exceeded for 90% of the time and is often used to describe the background level. It is common practice to use the L_{10} index to describe traffic noise.

L_{AMax} This is the maximum A-weighted sound pressure level recorded over the period stated. L_{AMax} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment.

Appendix B – Monitoring Equipment

Table B-1
Noise Monitoring Equipment

Equipment	Serial Number
01dB Cube Sound Level Meter	10892
G.R.A.S 40CD Microphone	233511
01dB PRE22N Preamplifier	11071
Castle GA607 Acoustic Calibrator	043074

Appendix C – Measurement Locations

Figure C-1
Measurement Location Plan

Measurement Location

Noise Sensitive Receptors

Barrier Location