

Eritrean Bethel Church, N22 6SL

Planning noise assessment

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30 November 2023

ARM0297-01

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Date: [30 November 2023](#)

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1 Introduction

It is understood that replacement air conditioning / heat pump equipment is to be installed as part of the proposed scheme at the Eritrean Bethel Church, Boreham Road, London, N22 6SL. The plant is taken to comprise 5no. outdoor condenser units (and associated indoor unit) serving the premises, with their operation limited to the hours of the church usage, assumed to be 07:00 – 23:00hrs Monday to Sunday, although typically shorter.

In order to ensure that the amenity of adjacent premises is not unduly affected as a result of noise emission from the mechanical plant, it is necessary to demonstrate to the local planning authority, the London Borough of Haringey, that noise will be adequately controlled. The Haringey Development Management DPD 2017, sets out the Council's approach to planning policies, including Policy DM1: Delivering High Quality Design and Policy DM23: Environmental Protection. The assessment methodology set out in *BS 4142: Method for rating industrial noise affecting mixed industrial and residential areas* will be adopted for purposes of demonstrating compliance with planning policy.

ARM Acoustics have been appointed by the client to evaluate potential noise impacts and effects arising from the foregoing mechanical plant, as necessary to comply with the requirements of the planning regime. This report therefore sets out the relevant assumptions, methodology, results and conclusions of the assessment.

2 Site location and development proposal

2.1 Site location

The main existing church building comprises two storeys, including a double height main hall, with additional single storey accommodation adjoining to the east. A courtyard is present at the north-east corner of the site, within which are located existing condensers / heat pumps serving the premises. The building is to be reconfigured, to allow increased capacity for the congregation space and additional ancillary accommodation. This includes extension to the single storey area and conversion of the courtyard to a garden with a separate, distinct area for the building services.

To the north of the site on Lordship Lane are two storey terraced buildings, generally providing mixed use accommodation, with retail / commercial premises at ground floor and residential accommodation at first floor level. The majority of these premises also have extensive single storey extensions to the rear, providing storage and commercial use, and which are typically accessed via Sofia Mews immediately to the north of the site. Extensive mechanical plant installations (extract fans, condenser units etc) are apparent to the rear of these premises, both at ground floor roof level and on the rear elevations.

Further two storey terraced dwellings are present on Westbury Avenue, however these are exclusively residential in nature. The rear gardens of these premises abut the site boundary, and the rear façade of the closest premises is approximately 15m from the proposed plant location. Two storey terraced dwellings are also located to the west of the site on Boreham Road, although these are screened from the proposed plant installation by the main church building.

The ambient noise climate at the site comprises low level road traffic noise from the local road network, however the sensitive receptors in the vicinity of the proposed plant installation are subject to mechanical plant noise arising from the various installation serving the adjacent premises. This is apparent in the measured baseline survey data, where cyclical patterns of plant operation are in evidence at certain periods.

Please refer to the site layout plan at Figure 1, Appendix 1.

2.2 Development proposal

It is proposed that heat pumps / condensers servicing the building are to be relocated within the reconfigured courtyard / garden area at the north east corner of the site - please refer to the suite layout plan at Figure 1, Appendix 1. The existing plant within the courtyard comprises 5no. heat pumps / condensers of two different types. It is taken that under the new scheme, these units will be replaced on a like for like basis in terms of heating / cooling capacity, with the new location being essentially similar to the existing. The operation of the plant will be limited to the hours of the church usage, assumed to be 07:00 – 23:00hrs Monday to Sunday as a worst case, although the hours of use will typically shorter.

3 Policy, legislation and standards

3.1 National Planning Policy Framework 2021

The *National Planning Policy Framework 2021* (NPPF) sets out the Government's planning policies for England and how these are expected to be applied and is a material consideration in planning decisions. To ensure that sustainable development is pursued in a positive way, at the heart of the Framework is a presumption in favour of sustainable development. With regard to noise, the NPPF paragraph 174 states that:

"Planning policies and decisions should contribute to and enhance the natural and local environment by... 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. Development should, wherever possible, help to improve local environmental conditions... taking into account relevant information".

In support of the above, paragraph 185 states the following:

"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;
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason".

3.2 National Planning Practice Guidance (2019)

The *Planning Practice Guidance – Noise* (PPGN) to the NPPF advises on how the planning regime can manage potential noise impacts arising from new development. It is noted that whilst in some circumstances noise can override other planning concerns, it is important to look at noise in the context of the wider characteristics of a development proposal, its likely users and its surroundings, as these can have an important effect on whether noise is likely to pose a concern. Planning and decisions made by local planning authorities should take account of the acoustic environment, and in doing so consider whether or not:

- a significant adverse effect is occurring or likely to occur;
- an adverse effect is occurring or likely to occur; and
- a good standard of amenity can be achieved.

In consideration of the presence or otherwise of adverse effects, the Noise Policy Statement for England, 2010 (NPSE) introduces these concepts, which are summarised as follows:

SOAEL - Significant observed adverse effect level (SOAEL): This is the level of noise exposure above which significant adverse effects on health and quality of life occur.

LOAEL - Lowest observed adverse effect level (LOAEL): this is the level of noise exposure above which adverse effects on health and quality of life can be detected.

NOEL - No observed effect level: this is the level of noise exposure below which no effect at all on health or quality of life can be detected.

Although the word 'level' is used, this does not mean that the effects can only be defined in terms of a single value of noise exposure. In some circumstances adverse effects are defined in terms of a combination of more than one factor such as noise exposure, the number of occurrences of the noise in a given time period, the duration of the noise and the time of day the noise occurs.

The below table 1 (reproduced from the Guidance) summarises the noise exposure hierarchy, based on the likely average response of those affected.

Table 1: Noise exposure hierarch (as per National Planning Practice Guidance)

Response	Examples of outcomes	Increasing effect level	Action
No Observed Effect Level			
Not present	No effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular	Unacceptable Adverse Effect	Prevent

	sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.		
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The Guidance also suggests four broad types of mitigation against noise:

- engineering: reducing the noise generated at source and/or containing the noise generated;
- layout: where possible, optimising the distance between the source and noise sensitive receptors and/or incorporating good design to minimise noise transmission through the use of screening by natural or purpose-built barriers, or other buildings;
- using planning conditions/obligations to restrict activities allowed on the site at certain times and/or specifying permissible noise levels differentiating as appropriate between different times of day, such as evenings and late at night, and;
- mitigating the impact on areas likely to be affected by noise including through noise insulation when the impact is on a building.

3.3 Local Planning Policy

In order to ensure that the amenity of adjacent premises is not unduly affected as a result of noise emission from the mechanical plant, it is necessary to demonstrate to the local planning authority, the London Borough of Haringey, that noise will be adequately controlled. Relevant local planning policies include Policy D14 of the London Plan and Policies DM1 and DM23 of the Haringey Development Management DPD 2017.

London Plan, 2021

In relation to noise, Policy D14 of the London Plan advises that:

“In order to reduce, manage and mitigate noise to improve health and quality of life, residential and other non-aviation development proposals should manage noise by:

- 1) avoiding significant adverse noise impacts on health and quality of life
- 2) reflecting the Agent of Change principle as set out in Policy D13 Agent of Change
- 3) mitigating and minimising the existing and potential adverse impacts of noise on, from, within, as a result of, or in the vicinity of new development without placing unreasonable restrictions on existing noise-generating uses
- 4) improving and enhancing the acoustic environment and promoting appropriate soundscapes (including Quiet Areas and spaces of relative tranquillity)
- 5) separating new noise-sensitive development from major noise sources (such as road, rail, air transport and some types of industrial use) through the use of distance, screening, layout, orientation, uses and materials – in preference to sole reliance on sound insulation
- 6) where it is not possible to achieve separation of noise-sensitive development and noise sources without undue impact on other sustainable development objectives, then any potential adverse effects should be controlled and mitigated through applying good acoustic design principles
- 7) promoting new technologies and improved practices to reduce noise at the source, and on the transmission path from source to receiver.”

The London Plan also provides high level consideration of the approach to management of noise, in the wider context of achieving sustainable development, such that the foregoing policies can be met.

London Borough of Haringey

The Haringey Development Management DPD 2017, sets out the Council's approach to planning policies, including Policy DM1: Delivering High Quality Design and Policy DM23: Environmental Protection, which advise that:

"DM1: Delivery High Quality Design - Privacy and amenity

D Development proposals must ensure a high standard of privacy and amenity for the development's users and neighbours. The Council will support proposals that...

"Address issues of vibration, noise, fumes, odour, light pollution and microclimatic conditions likely to arise from the use and activities of the development."

"DM23: Environmental Protection - Noise and Vibration

D The Council will seek to ensure that new noise sensitive development is located away from existing or planned sources of noise pollution. Proposals for potentially noisy development must suitably demonstrate that measures will be implemented to mitigate its impact.

E A noise assessment will be required to be submitted if the proposed development is a noise sensitive development, or an activity with the potential to generate noise"

In order to evaluate the potential impacts arising from the scheme and demonstrate compliance with planning policy the assessment methodology set out in *BS 4142: Method for rating industrial noise affecting mixed industrial and residential areas* will be adopted.

3.4 British standards and guidance***BS 4142: 2014+A1:2019 - Method for rating industrial noise affecting mixed industrial and residential areas***

British Standard BS 4142:2019 provides a method for rating and assessment of sound of an industrial nature, together with the procedures for assessing whether the noise in question is likely to give rise to adverse or significant adverse effects upon the amenity residential dwellings, or premises used for residential purposes. The scope of the standard is not applicable to the assessment of the effects of sound on users of commercial, industrial or similar "non-residential" purposes. Industrial and commercial noise sources falling within the scope of the standard include:

- 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 fork-lift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

In carrying out the assessment, the standard advises that an initial estimate of the impact of the specific sound is obtained by subtracting the measured background sound level from the rating level. The standard advises that:

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

Note 2 to Clause 11 advises that:

"Adverse impacts may include but not be limited to annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."

When the initial estimate of the impact needs to be modified due to the context, all pertinent factors should be considered which may include:

- 1) 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.
- 2) The character and level of the residual sound compared to the character and level of the specific sound.
- 3) The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as:
 - i) facade insulation treatment;
 - ii) ventilation and/or cooling; and
 - iii) acoustic screening.

As noted, the initial estimate of impact may be modified depending on the absolute level of the sound. Guidance on absolute sound levels both within buildings is given in BS 8233:2014, which is referred to in the examples of Annex A of the standard. The relevant content of BS 8233:2014 is reviewed below.

BS8233:2014: Guidance on sound insulation and noise reduction for buildings

For residential developments which might be subjected to noise above the Lowest Observed Adverse Effect Levels, the principles of the NPPF require that any adverse effects should be mitigated and reduced to a minimum. In doing so, it is necessary to consider the design noise levels that should be adopted to demonstrate that this has been achieved.

Guidance on suitable internal noise levels for dwelling houses and flats can be found in 'BS8233:2014: Guidance on sound insulation and noise reduction for buildings. In general, it is desirable that for steady external noise sources the internal ambient noise levels set out within Table 4 therein, are not exceeded (reproduced below). These criteria are based upon the guideline values presented within the WHO Guidelines for Community Noise, 1999.

The footnotes to BS8233 Table 4, advise that "where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5dB and reasonable internal conditions still achieved.

Table 2: Internal ambient noise levels for dwellings (as per BS8233:2014)

Activity	Location	07:00 – 23:00hrs	23:00 – 07:00hrs
Resting	Living room	35 dB LAeq,16 hour	-
Dining	Dining room/area	40 dB LAeq, 16 hour	-
Sleeping (daytime resting)	Bedroom	35 dB LAeq,16 hour	30 dB LAeq, 8 hour

For additional context, it is noted that the WHO Guidelines for Community Noise also provide guideline values for application external to bedrooms (assuming partially open windows) during the night time period in order to prevent sleep disturbance; these values are 45 dB $L_{Aeq, 8 \text{ hour}}$ and 60 dB $L_{Amax,f}$; these values are 15dB higher than those applicable within bedrooms, accounting for the open window loss. Outside of bedrooms and living rooms during the daytime, the stated internal guideline values of 35 dB $L_{Aeq, 16 \text{ hour}}$ would therefore correspond to external noise levels of 50 dB $L_{Aeq, 16 \text{ hour}}$.

4 Noise survey

4.1 Baseline noise survey

In order to determine the underlying baseline ambient sound climate in the vicinity of the site an unattended noise survey was carried out over the period 10:15hrs on Friday 24th November to 11:00hrs on Monday 27th November 2023. The survey was carried out in accordance with the general principles set out in *BS 7445 – Description and measurement of environmental noise*.

The baseline measurement location was at ground floor roof level at the north eastern boundary of the site, as indicated at Figure 1, Appendix 1. The measurement location was at a height of approximately 3m above the ground plane and in free-field conditions and considered representative of the ambient noise climate at the nearest noise sensitive premises.

Measurement Position B1: North eastern boundary of the site at a height of 3m above the ground plane in the free-field [51.597787, -0.093928]

Equipment used is verified to appropriate national standards at a UKAS accredited laboratory, including BS7580: Part 1 1997, as follows:

01dB Solo sound level meter s/n 65335 – laboratory calibration 07/11/23

01dB PRE21S preamp s/n 15939 – laboratory calibration 07/11/23

01dB MCE 212 microphone s/n 142792 – laboratory calibration 07/11/23

Rion NC74 sound calibrator s/n 34304641 – laboratory calibration 23/08/23

The sound level meter underwent a field calibration check on site prior to and following the survey, with no significant variation in the calibration level, 93.8dB $\pm$ 0.1 dB @ 1kHz. Broadband and 1/1 octave band (50Hz to 8kHz) sound pressure levels were measured using the fast (0.125s) time constant and logged throughout the duration of the survey.

Weather during the survey period was cold (temperatures in the range 0 - 12°C), with a brief period of rain at 06:00 on 27th November and with maximum windspeed of upto 4.9m/s. Periods of rainfall have been omitted from the data set in determining the background noise level.

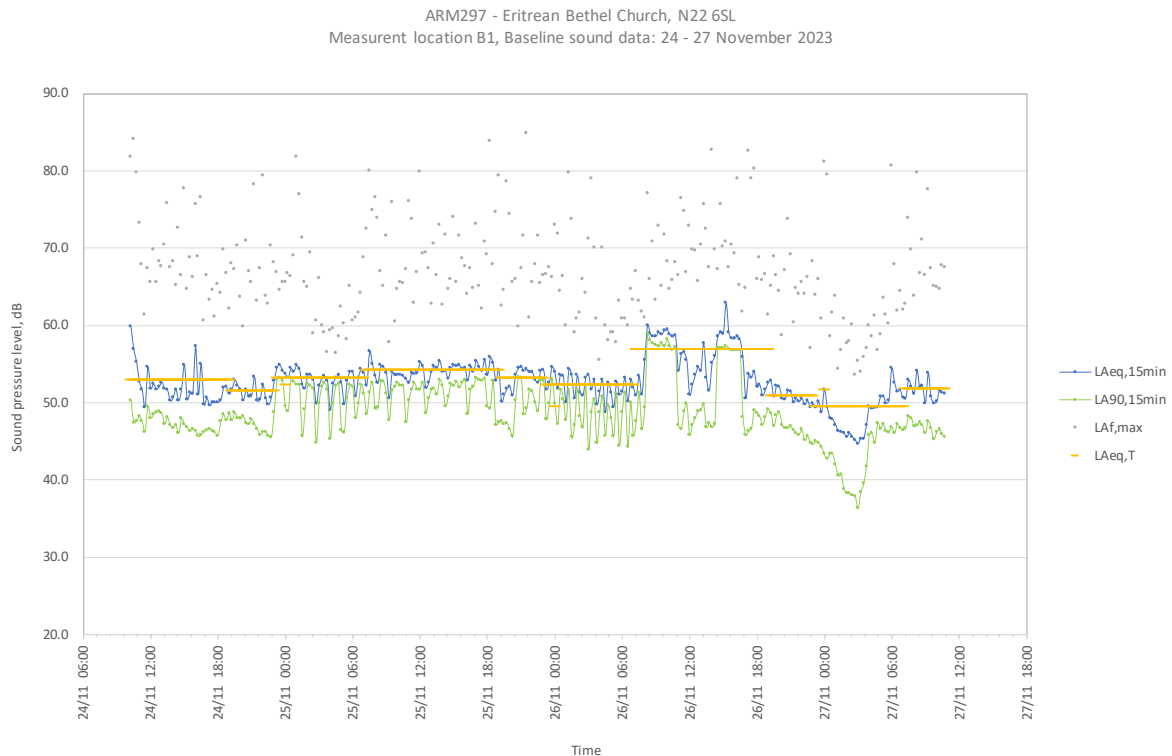
4.2 Baseline sound data

Logged 15-minute data pertaining to the relevant assessment periods across the survey period. The derived broadband survey data in terms of $L_{Aeq,T}$, $L_{A90,T}$ and $L_{AF,max}$ are presented in Table 3, Appendix 2 and graphically in Figure 2, below.

Planning noise assessment

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Figure 2: Baseline ambient noise data

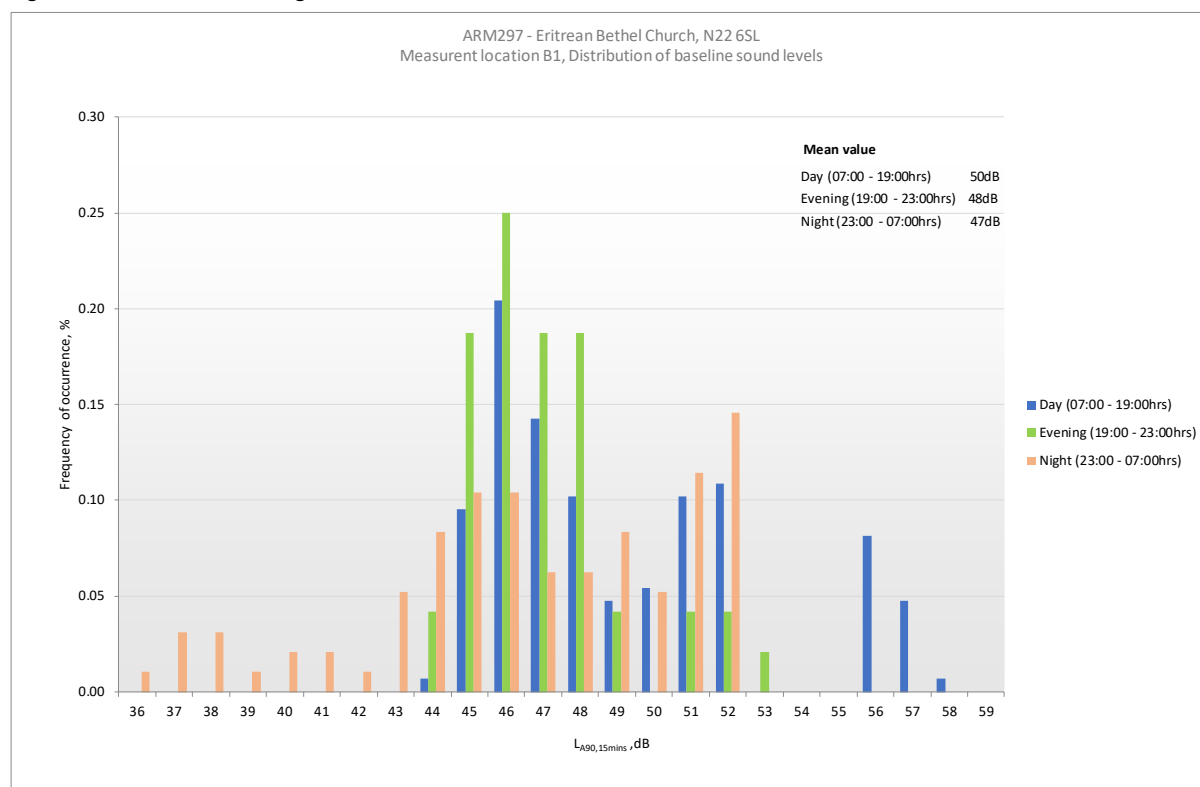


As noted, the method set out in BS 4142 is to be adopted for the assessment. The commentary to Clause 8.1 of the Standard advises that:

“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.”

The standard doesn’t explicitly advise how a typical background sound level(s) may be determined. Note 1 to Subclause 8.1.4 makes it clear that it is not a simple matter of identifying a minimum or modal value over a particular period, but recognizing that several periods of measurement may be necessary and that a thorough analysis of the data may be required. The distribution of the 15-minute background sound level data has been plotted as histograms for the day, evening and night periods as per Figure 4, below. Periods of rainfall have been omitted from the data set in determining the background noise level.

Figure 3: Distribution of background sound levels



Considering the foregoing data, typical background noise values have therefore been determined, as below:

Table 4 Typical representative background sound levels

Location	Typical background sound level, LA90,15mins (free-field)		
	Day (07:00-19:00hrs)	Evening (19:00-23:00hrs)	Night (23:00-07:00hrs)
B1 – All receptors	46 dB	46 dB	43 dB

4.3 Specific sound data

The specific sound level arising from operation of the proposed outdoor condenser units (5no., assumed to be Daikin RZQG140L9V1B or equivalent) is taken from manufacturer's laboratory test data derived in accordance with Eurovent standards. Data are stated as a sound pressure levels at 1m in Table 5, below.

Table 5: Source sound pressure level data

Plant ref.	Plant item	Octave Band Centre Frequency Hz								L _{p,A}
		63	125	250	500	1000	2000	4000	8000	
C1	Daikin_RZQG140LV91 Heating	60	54	52	48	48	46	43	32	53
	Cooling	58	55	53	51	46	44	40	29	53

NB. Sound pressure level @ 1m under free field condition, according to Eurovent 2012.

5 Noise assessment

5.1 Noise modelling

The foregoing information has been used to carry out modelling and assessment of the potential noise impacts arising from use of the proposed plant, comprising 5no. outdoor condenser units. Modelling of noise was undertaken using the proprietary environmental modelling software package CadnaA, implementing the standards set out within *ISO 9613-2:1996, Acoustics -- Attenuation of sound during propagation outdoors -- Part 2: General method of calculation*. Site geometry and building data is based upon opensource mapping data and information obtained during site visits.

the condenser unit may potentially operate at any point over a given 24 hour period. Predictions have been undertaken for both “heating” and “cooling” modes, with the former providing the worst case. Whilst the unit may potentially operate in both heating and cooling modes, it is anticipated that “heating” mode will rarely be utilised as the dwelling will have other forms of heating.

As stated at 2.2, the operation of the plant will be limited to the hours of the church usage, assumed to be 07:00 – 23:00hrs Monday to Sunday as a worst case, although the hours of use will typically shorter. Heating mode has been assumed in the calculations, as this gives rise to slightly higher noise emissions.

5.2 Predicted noise levels

Resultant specific sound pressure levels have been calculated at positions external to the façade of noise sensitive receptors in the vicinity of the site. It is anticipated that the heat pump / condenser units are likely to operate intermittently for approximately 50% of the time during the 1-hour reference period. A suitable on-time correction has therefore been applied for the operation of the unit. The resulting specific sound levels are presented in Table 6, below.

Table 6: Predicted specific sound pressure levels

AL_ID	Address	Specific sound level, $L_{Aeq,T}$
R1	203 Westbury Avenue, Noel Park, N22 6RX	28 dB
R2	201 Westbury Avenue, Noel Park, N22 6RX	34 dB
R3	197 Westbury Avenue, Noel Park, N22 6RX	33 dB
R4	193 Westbury Avenue, Noel Park, N22 6RX	30 dB
R5	437 Lordship Lane, N22 5DJ	27 dB
R6	441 Lordship Lane, N22 5DJ	28 dB
R7	445 Lordship Lane, N22 5DJ	28 dB
R8	451a Lordship Lane, N22 5DJ	29 dB
R9	455 Lordship Lane, N22 5DJ	27 dB
R10	3 Boreham Road, N22 6SL	19 dB

5.3 Noise impact assessment

Based upon the predicted specific sound levels in Table 6, an evaluation of the potential impact of the plant sound rating level on the most affected noise sensitive receptor (R2, 201 Westbury Avenue) during the day time period has been carried out in accordance with the methodology set out in BS4142 as set out in Table 7, below.

Table 7: BS4142 assessment at R2, 201 Westbury Avenue – Day time (07:00 – 23:00hrs).

Results		Relevant clause	Commentary
Background sound level	$L_{A90(15min)} = 46$	8.3	Background sound level determined from measured values at B1
Residual sound level	$L_{Aeq,T} = 53$	7.3.3	Estimated residual sound level. Noise climate incorporates a number of mechanical plant items serving various commercial premises
Reference time interval of 1 hour on the basis that plant will operate during the day time period.		7.2	
On time correction	-3 dB	7.3.15	Assumes 50% on time during the day time reference period.
Specific sound level (calculated)	$L_{Aeq(1\text{ hour})} = 34$	7.3.6	Accounting for geometric attenuation, ground absorption, reflection effects and on time.
Acoustic feature correction	3 dB	9.2	Specific sound level below the residual and background noise levels. As a worst case assessment, an allowance of 3dB has been made to account for intermittency or other sound characteristics that may be distinctive.
Rating level	$34 + 3 = 37$ dB	9.2	
Background sound level	$L_{A90(15min)} = 46$	8.6	
Excess of rating over background sound level	$(37 - 46)$ dB = -9 dB	11	
Assessment is below a level likely to indicate an adverse impact		11	
Uncertainty of the assessment		10	Specific sound levels are based upon manufacturer's test data and calculations undertaken in accordance with ISO9613-2. Existing noise climate incorporates mechanical plant noise from various sources in the vicinity of the site, with cyclical fluctuations evident during both the daytime and night time periods.

From the foregoing assessment it can be seen that for the worst case “heating” mode, the rating level is anticipated to be 9dB below the typical $L_{A90,15minute}$ background sound level during the period of operation. As advised within BS4142, where the rating level does not exceed the background sound level, this is an indication that of the specific sound source having a low impact. 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.

Furthermore, the absolute level of the specific sound (34dBA) is substantially below the BS8233 guideline values which would be applicable external to the premises (daytime 50 dB $L_{Aeq,16\text{ hour}}$, allowing for open window losses) and would indicate that no adverse impact will arise from the operation.

6 Conclusion

Replacement air conditioning / heat pump equipment is to be installed as part of the proposed redevelopment scheme at the Eritrean Bethel Church, Boreham Road, London, N22 6SL. The plant is taken to comprise 5no. outdoor condenser units (and associated indoor unit) serving the premises, with their operation limited to the hours of the church usage, assumed to be 07:00 – 23:00hrs Monday to Sunday, although typically shorter.

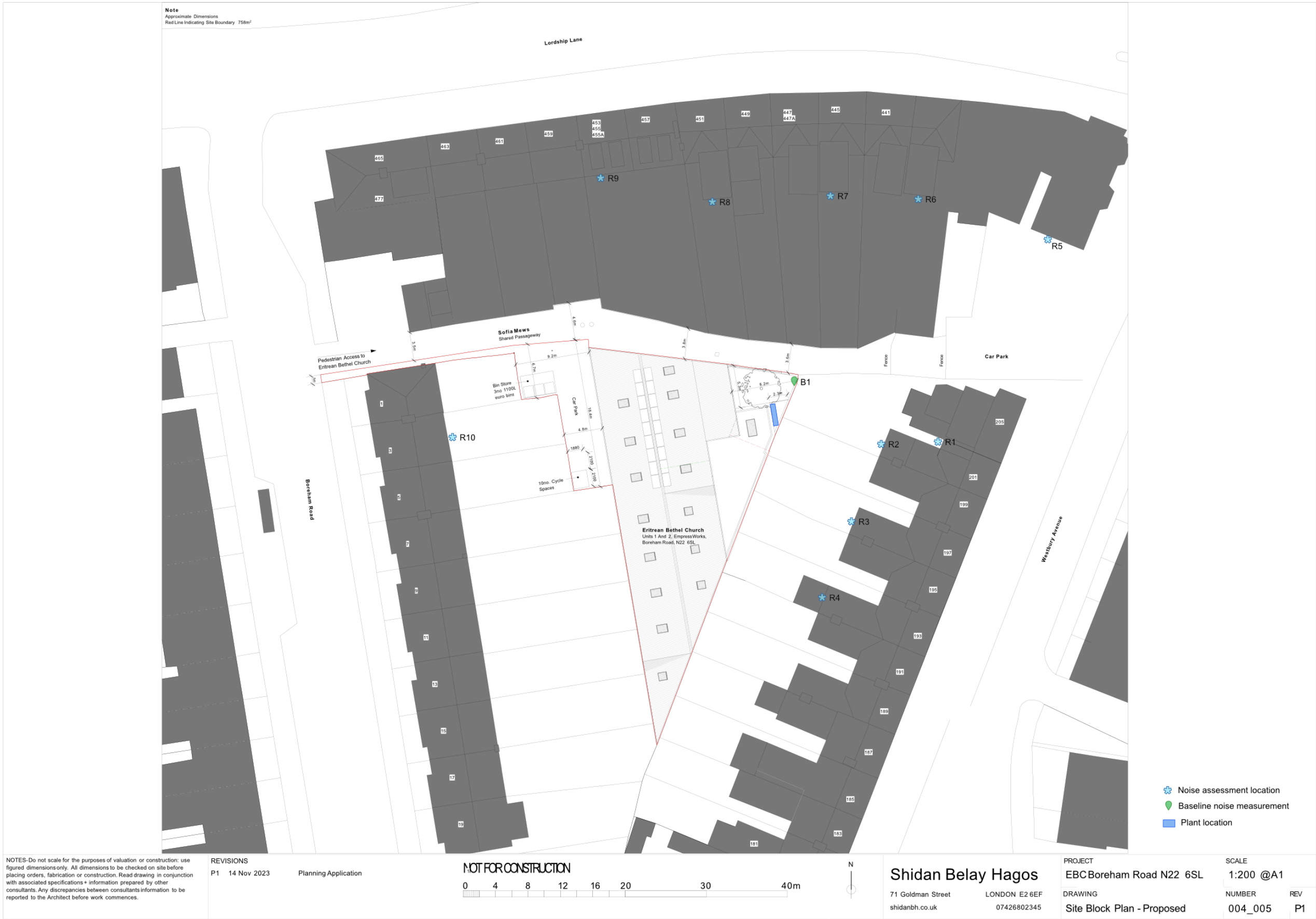
In order to ensure that the amenity of adjacent premises is not unduly affected as a result of noise emission from the mechanical plant, it is necessary to demonstrate to the local planning authority, the London Borough of Haringey, that noise will be adequately controlled. The Haringey Development Management DPD 2017, sets out the Council's approach to planning policies, including Policy DM1: Delivering High Quality Design and Policy DM23: Environmental Protection. The assessment methodology set out in *BS 4142: Method for rating industrial noise affecting mixed industrial and residential areas* has been used to demonstrate compliance with planning policy.

The results of the assessment indicate that for the worst case "heating" mode, the rating level is anticipated to be 0dB below the typical $L_{A90,15\text{minute}}$ background sound level during the period of operation. These results are an indication that the sound source has a low impact. This is further supported through consideration of the contextual considerations, including the level of the residual sound and the low absolute level of the specific sound when considered against BS8233 guideline values.

The assessment therefore serves to demonstrate the suitability of the proposal in the context of national and local planning policy and guidance within the context of sustainable development and the principles of good design, as adverse effects have been avoided or reduced to a minimum. It is therefore considered that sound arising from the operation of the plant installation is compliant with the requirements of the Haringey Development Management DPD 2017 Policies DM1: Delivering High Quality Design and DM23: Environmental Protection.

Appendix 1 – Site plan

Figure 1: Site plan



Appendix 2 – Measurement data

Table 2: Baseline noise data

Equipment	Solo		
Periods	065335		
	15m		
Start	24/11/2023		
	10:00:00:000		
	27/11/2023		
End	11:00:00:000		
Weighting	A		
Unit	dB		
Period start	L _{Aeq,15min}	L _{A90,15min}	L _{AFmax,15min}
24/11/2023 10:00:00:000			
24/11/2023 10:15:00:000	59.8	50.3	81.8
24/11/2023 10:30:00:000	56.9	47.4	84.1
24/11/2023 10:45:00:000	55.2	47.6	79.7
24/11/2023 11:00:00:000	52.7	48.2	73.2
24/11/2023 11:15:00:000	51.6	47.5	67.8
24/11/2023 11:30:00:000	49.4	46.2	61.4
24/11/2023 11:45:00:000	54.6	49.5	67.3
24/11/2023 12:00:00:000	51.8	48	65.5
24/11/2023 12:15:00:000	52.4	48.4	69.8
24/11/2023 12:30:00:000	51.7	48.7	65.5
24/11/2023 12:45:00:000	52	48.8	68.2
24/11/2023 13:00:00:000	52.6	48.6	67.6
24/11/2023 13:15:00:000	51.8	47.2	70.4
24/11/2023 13:30:00:000	51.6	48.1	75.8
24/11/2023 13:45:00:000	50.2	47	67.5
24/11/2023 14:00:00:000	50.6	46.7	68.2
24/11/2023 14:15:00:000	51.7	47.1	65.2
24/11/2023 14:30:00:000	50.2	46	72.6
24/11/2023 14:45:00:000	51.7	47.9	66.4
24/11/2023 15:00:00:000	54.9	47.2	77.7
24/11/2023 15:15:00:000	50.4	46.8	64.7
24/11/2023 15:30:00:000	51.2	46.3	68.7
24/11/2023 15:45:00:000	51.1	46.6	66.2
24/11/2023 16:00:00:000	57.2	46.3	75.7
24/11/2023 16:15:00:000	51	45.6	68.9
24/11/2023 16:30:00:000	55	45.8	76.6
24/11/2023 16:45:00:000	49.7	46.2	60.6
24/11/2023 17:00:00:000	50.6	46.4	66.5
24/11/2023 17:15:00:000	49.6	46.6	63.2
24/11/2023 17:30:00:000	50	46.3	64.6
24/11/2023 17:45:00:000	50	46.1	61.1
24/11/2023 18:00:00:000	50	45.7	65.3
24/11/2023 18:15:00:000	50.3	47.5	64.1
24/11/2023 18:30:00:000	51.9	48.4	69.8
24/11/2023 18:45:00:000	52	47.7	66.7
24/11/2023 19:00:00:000	51.1	48.6	62.1
24/11/2023 19:15:00:000	51.7	47.7	68
24/11/2023 19:30:00:000	52.9	48.7	67.2
24/11/2023 19:45:00:000	52.2	48	70.3
24/11/2023 20:00:00:000	51.7	47.9	63.7
24/11/2023 20:15:00:000	50.2	48.2	59.8
24/11/2023 20:30:00:000	51.6	47.3	70.9
24/11/2023 20:45:00:000	50.7	47.2	67
24/11/2023 21:00:00:000	50.9	47.8	65.6
24/11/2023 21:15:00:000	53.3	47.2	78.2
24/11/2023 21:30:00:000	50.2	46.6	63.1
24/11/2023 21:45:00:000	50.4	45.8	67.4
24/11/2023 22:00:00:000	52.3	46.2	79.3
24/11/2023 22:15:00:000	50.5	46.2	63.8
24/11/2023 22:30:00:000	49.7	45.7	62.8
24/11/2023 22:45:00:000	50.6	45.5	70.3
24/11/2023 23:00:00:000	52.8	48.7	68.1
24/11/2023 23:15:00:000	54.5	52.9	66.9
24/11/2023 23:30:00:000	54.9	53.2	64.6
24/11/2023 23:45:00:000	54.1	52.8	65.5

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25/11/2023 00:00:00:000	53.7	49.5	65.5
25/11/2023 00:15:00:000	53.2	48.9	66.7
25/11/2023 00:30:00:000	54.4	53.2	66.3
25/11/2023 00:45:00:000	54	52.7	69
25/11/2023 01:00:00:000	54.8	52.3	81.8
25/11/2023 01:15:00:000	54.3	52.3	76.9
25/11/2023 01:30:00:000	52.3	45.6	71.3
25/11/2023 01:45:00:000	51.8	49.1	65.6
25/11/2023 02:00:00:000	53.6	52.4	64.9
25/11/2023 02:15:00:000	53.6	52.1	69.4
25/11/2023 02:30:00:000	52.9	51.8	58.9
25/11/2023 02:45:00:000	49.8	44.8	60.6
25/11/2023 03:00:00:000	52.1	49.9	66.1
25/11/2023 03:15:00:000	53.1	52	59.9
25/11/2023 03:30:00:000	53.4	52.5	59.1
25/11/2023 03:45:00:000	52.8	51.7	56.5
25/11/2023 04:00:00:000	49	45.3	59.3
25/11/2023 04:15:00:000	52.4	49.9	59.5
25/11/2023 04:30:00:000	53.2	52.2	56.4
25/11/2023 04:45:00:000	53.5	52.4	58.6
25/11/2023 05:00:00:000	52.5	46.4	62.4
25/11/2023 05:15:00:000	49.7	46.1	60.2
25/11/2023 05:30:00:000	52.8	50.5	58.2
25/11/2023 05:45:00:000	54	52.3	65
25/11/2023 06:00:00:000	54	52	60.6
25/11/2023 06:15:00:000	50.8	48	61
25/11/2023 06:30:00:000	53.2	49.9	61.6
25/11/2023 06:45:00:000	54.3	52.3	64.2
25/11/2023 07:00:00:000	53.8	51.1	68.8
25/11/2023 07:15:00:000	52.2	48.5	72.5
25/11/2023 07:30:00:000	56.6	51.3	80
25/11/2023 07:45:00:000	55	52.6	74.9
25/11/2023 08:00:00:000	53.4	49.2	76.5
25/11/2023 08:15:00:000	52.5	49.3	73.8
25/11/2023 08:30:00:000	54.8	52.8	67
25/11/2023 08:45:00:000	54.6	52.7	65.1
25/11/2023 09:00:00:000	53.8	51.1	71.5
25/11/2023 09:15:00:000	50.5	47.7	57.8
25/11/2023 09:30:00:000	53.9	51.5	75.9
25/11/2023 09:45:00:000	53.5	52	60.4
25/11/2023 10:00:00:000	53.6	52.6	64.7
25/11/2023 10:15:00:000	53.6	52.2	65.6
25/11/2023 10:30:00:000	53.4	52.2	65.4
25/11/2023 10:45:00:000	53	47.4	67.2
25/11/2023 11:00:00:000	52.5	50.3	76
25/11/2023 11:15:00:000	53.8	51.7	73.7
25/11/2023 11:30:00:000	53.7	52.5	62.9
25/11/2023 11:45:00:000	53.8	51.7	66.8
25/11/2023 12:00:00:000	55.2	51.7	79.9
25/11/2023 12:15:00:000	54.7	52.6	69.3
25/11/2023 12:30:00:000	51.9	48.6	69.4
25/11/2023 12:45:00:000	52.5	50.5	67.4
25/11/2023 13:00:00:000	54	51.6	62.7
25/11/2023 13:15:00:000	54.7	51.8	70.5
25/11/2023 13:30:00:000	54.4	51	66.5
25/11/2023 13:45:00:000	55.4	52.9	73
25/11/2023 14:00:00:000	54	52.1	62.6
25/11/2023 14:15:00:000	54.1	49.5	71.7
25/11/2023 14:30:00:000	53.1	50.7	64.7
25/11/2023 14:45:00:000	54.4	52.4	65.9
25/11/2023 15:00:00:000	54.8	52.1	74
25/11/2023 15:15:00:000	54.7	52.7	65.6
25/11/2023 15:30:00:000	54.8	51.9	71.6
25/11/2023 15:45:00:000	54.3	52.6	68.6
25/11/2023 16:00:00:000	54.5	52.9	67.6
25/11/2023 16:15:00:000	52.8	48.5	64
25/11/2023 16:30:00:000	54.7	51.7	67.3
25/11/2023 16:45:00:000	54	52	64.8
25/11/2023 17:00:00:000	55.4	53.2	73.1
25/11/2023 17:15:00:000	54.6	52.9	65.1
25/11/2023 17:30:00:000	54.1	52.8	62.1

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25/11/2023 17:45:00:000	55.5	53.1	70.8
25/11/2023 18:00:00:000	53.5	49.5	69.1
25/11/2023 18:15:00:000	55.8	49.2	83.8
25/11/2023 18:30:00:000	55.1	52.8	67.8
25/11/2023 18:45:00:000	52.8	47.1	74.6
25/11/2023 19:00:00:000	54.2	47.4	79.3
25/11/2023 19:15:00:000	50.1	47.5	62.5
25/11/2023 19:30:00:000	51	47.2	64.5
25/11/2023 19:45:00:000	51.8	47.3	78.6
25/11/2023 20:00:00:000	52	46.5	74.4
25/11/2023 20:15:00:000	50.9	45.6	65.6
25/11/2023 20:30:00:000	53.6	50.2	66
25/11/2023 20:45:00:000	54.4	53.3	59.8
25/11/2023 21:00:00:000	54.6	53.2	67.3
25/11/2023 21:15:00:000	54.1	48.5	71.5
25/11/2023 21:30:00:000	54.3	49.2	84.9
25/11/2023 21:45:00:000	53.9	51.7	61
25/11/2023 22:00:00:000	53.9	51.4	65.5
25/11/2023 22:15:00:000	52.9	50	67.8
25/11/2023 22:30:00:000	52.6	48.9	71.6
25/11/2023 22:45:00:000	54.1	52.8	65.4
25/11/2023 23:00:00:000	54.2	52.8	66.4
25/11/2023 23:15:00:000	51.7	47.8	66.6
25/11/2023 23:30:00:000	52.5	49.8	67.5
25/11/2023 23:45:00:000	54.6	53.1	66.2
26/11/2023 00:00:00:000	53.9	49.8	73
26/11/2023 00:15:00:000	51.8	47.2	71.8
26/11/2023 00:30:00:000	53.6	51.7	64.4
26/11/2023 00:45:00:000	53.4	50.4	66.3
26/11/2023 01:00:00:000	50	47.7	60
26/11/2023 01:15:00:000	54.3	51.6	79.7
26/11/2023 01:30:00:000	53.5	45.5	73.7
26/11/2023 01:45:00:000	50.5	47.1	59
26/11/2023 02:00:00:000	53.5	51.8	60.8
26/11/2023 02:15:00:000	51.3	48.2	61.6
26/11/2023 02:30:00:000	50.9	46.8	65.9
26/11/2023 02:45:00:000	53.2	52.1	64.2
26/11/2023 03:00:00:000	53.6	43.9	71.2
26/11/2023 03:15:00:000	51.7	48.7	79
26/11/2023 03:30:00:000	52.9	50.4	70
26/11/2023 03:45:00:000	49.7	44.7	60.9
26/11/2023 04:00:00:000	51.4	48.7	55.5
26/11/2023 04:15:00:000	52.9	50.7	70
26/11/2023 04:30:00:000	48.7	45.7	59.9
26/11/2023 04:45:00:000	52.5	49.6	58
26/11/2023 05:00:00:000	51.3	48	59.1
26/11/2023 05:15:00:000	49.4	45.6	59.1
26/11/2023 05:30:00:000	52.7	51.1	57.8
26/11/2023 05:45:00:000	51	44.4	63.1
26/11/2023 06:00:00:000	51.4	48.7	60.8
26/11/2023 06:15:00:000	53.2	51.3	60.9
26/11/2023 06:30:00:000	50.1	44.2	60
26/11/2023 06:45:00:000	52.9	50	64.7
26/11/2023 07:00:00:000	51.9	45.7	63.3
26/11/2023 07:15:00:000	50.9	47.6	67
26/11/2023 07:30:00:000	53.4	51.2	63.1
26/11/2023 07:45:00:000	51	46.5	61.7
26/11/2023 08:00:00:000	55.5	49.4	61
26/11/2023 08:15:00:000	60	58.9	77.1
26/11/2023 08:30:00:000	58.9	58	66
26/11/2023 08:45:00:000	58.6	57.6	70.8
26/11/2023 09:00:00:000	58.6	57.4	63.3
26/11/2023 09:15:00:000	59.1	57.2	72.8
26/11/2023 09:30:00:000	58.8	57.6	65.1
26/11/2023 09:45:00:000	59.3	57.2	71.7
26/11/2023 10:00:00:000	59.4	58.1	68.2
26/11/2023 10:15:00:000	58.8	57.3	64.7
26/11/2023 10:30:00:000	58.5	56.8	65.8
26/11/2023 10:45:00:000	58.7	57.1	68.1
26/11/2023 11:00:00:000	54.1	47.1	66.5
26/11/2023 11:15:00:000	56.2	46.5	76.4

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26/11/2023 11:30:00:000	56.5	48.8	74.8
26/11/2023 11:45:00:000	55.5	49.8	66.8
26/11/2023 12:00:00:000	51	45.8	72.9
26/11/2023 12:15:00:000	52.3	47.1	69.8
26/11/2023 12:30:00:000	53.5	48	69.6
26/11/2023 12:45:00:000	54.6	48.8	65.7
26/11/2023 13:00:00:000	54.1	49	70.4
26/11/2023 13:15:00:000	57.7	49.7	75.7
26/11/2023 13:30:00:000	53.2	46.8	72.4
26/11/2023 13:45:00:000	51.5	47.3	67.5
26/11/2023 14:00:00:000	55.1	46.8	82.7
26/11/2023 14:15:00:000	56	47.2	69.8
26/11/2023 14:30:00:000	58.5	57.1	67.2
26/11/2023 14:45:00:000	59.1	57	75.6
26/11/2023 15:00:00:000	58.9	57	70.2
26/11/2023 15:15:00:000	62.9	57.3	70.8
26/11/2023 15:30:00:000	59	56.9	67.5
26/11/2023 15:45:00:000	58.3	56.7	70.4
26/11/2023 16:00:00:000	58.3	56.7	69.3
26/11/2023 16:15:00:000	58.6	56.8	79
26/11/2023 16:30:00:000	58.1	56.8	65.2
26/11/2023 16:45:00:000	55.8	48.1	61.7
26/11/2023 17:00:00:000	50.5	45.8	64.8
26/11/2023 17:15:00:000	53.7	46.3	82.6
26/11/2023 17:30:00:000	53.2	46.6	79
26/11/2023 17:45:00:000	54	49	80.3
26/11/2023 18:00:00:000	52	48.6	66
26/11/2023 18:15:00:000	52.3	48.2	68.8
26/11/2023 18:30:00:000	50.9	47.1	65.8
26/11/2023 18:45:00:000	51.6	48.1	66.6
26/11/2023 19:00:00:000	52.6	49.1	61.4
26/11/2023 19:15:00:000	52.8	48.6	65.1
26/11/2023 19:30:00:000	50.7	46.9	68.9
26/11/2023 19:45:00:000	52.2	48.3	66.4
26/11/2023 20:00:00:000	52	48.7	64.4
26/11/2023 20:15:00:000	50.5	47.1	58.7
26/11/2023 20:30:00:000	50.4	46.7	67.1
26/11/2023 20:45:00:000	51.5	46.7	73.7
26/11/2023 21:00:00:000	51.4	46.9	69.1
26/11/2023 21:15:00:000	50	46.4	60.3
26/11/2023 21:30:00:000	50.5	46	64.8
26/11/2023 21:45:00:000	50.1	45.8	64
26/11/2023 22:00:00:000	50.5	46.5	65.6
26/11/2023 22:15:00:000	49.7	45.1	64
26/11/2023 22:30:00:000	50.2	45.7	66.2
26/11/2023 22:45:00:000	49.4	44.8	57
26/11/2023 23:00:00:000	49.8	44.6	68.3
26/11/2023 23:15:00:000	49.3	45	63.9
26/11/2023 23:30:00:000	50.1	44.8	65.9
26/11/2023 23:45:00:000	48.7	44.3	60.9
27/11/2023 00:00:00:000	51.7	43.3	81.1
27/11/2023 00:15:00:000	49.4	42.7	79.5
27/11/2023 00:30:00:000	48	43.4	58.5
27/11/2023 00:45:00:000	47.8	43.3	61.6
27/11/2023 01:00:00:000	47.1	41.9	63.8
27/11/2023 01:15:00:000	46.3	40.5	54.3
27/11/2023 01:30:00:000	46.2	40.7	56.8
27/11/2023 01:45:00:000	46	38.8	60.8
27/11/2023 02:00:00:000	45.5	38.3	57.7
27/11/2023 02:15:00:000	46	38.2	57.9
27/11/2023 02:30:00:000	45.5	38	60.1
27/11/2023 02:45:00:000	45.1	37.9	53.6
27/11/2023 03:00:00:000	44.6	36.3	55.3
27/11/2023 03:15:00:000	45.3	38.4	53.9
27/11/2023 03:30:00:000	45.3	39.5	55.8
27/11/2023 03:45:00:000	47.1	41.7	57
27/11/2023 04:00:00:000	49.5	45.8	59.9
27/11/2023 04:15:00:000	49.2	46	58.6
27/11/2023 04:30:00:000	49.3	44.7	61.2
27/11/2023 04:45:00:000	49.4	47.3	56.7
27/11/2023 05:00:00:000	50.7	46.6	58.8

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27/11/2023 05:15:00:000	50.8	47.2	63.5
27/11/2023 05:30:00:000	49.9	46.3	61.3
27/11/2023 05:45:00:000	50.2	46.1	60.2
27/11/2023 06:00:00:000	54.4	46.8	80.6
27/11/2023 06:15:00:000	52.6	46	67.8
27/11/2023 06:30:00:000	51.4	47.2	61.9
27/11/2023 06:45:00:000	51.6	46.7	64.4
27/11/2023 07:00:00:000	50.6	46.4	62
27/11/2023 07:15:00:000	50.5	46.7	62.8
27/11/2023 07:30:00:000	52.9	48.2	73.9
27/11/2023 07:45:00:000	52	48	69.8
27/11/2023 08:00:00:000	51.1	46.9	63.8
27/11/2023 08:15:00:000	54.1	47	79.7
27/11/2023 08:30:00:000	51.9	47.4	66.7
27/11/2023 08:45:00:000	52.2	47	71
27/11/2023 09:00:00:000	49.9	46	66.5
27/11/2023 09:15:00:000	53.8	47.6	77.5
27/11/2023 09:30:00:000	50.7	46.7	67.4
27/11/2023 09:45:00:000	49.9	45.2	65
27/11/2023 10:00:00:000	50.1	46.1	64.9
27/11/2023 10:15:00:000	51.5	46.5	64.7
27/11/2023 10:30:00:000	51.3	45.9	67.7
27/11/2023 10:45:00:000	51.1	45.5	67.5

Appendix 3 – SQA statement

My name is Marcus Richardson. I have a BEng (Hons) in Mechanical Engineering and am a Member of the Institute of Acoustics. I have over 20 years' experience in private sector acoustics consultancy, encompassing transportation, environmental and construction noise and vibration, architectural and building acoustics, including providing expert evidence. I am a founding director of ARM Environment Ltd (2007), an ANC member company.

I have worked on projects of all sizes, including major infrastructure projects, from inception through planning, to detailed design and construction and been responsible for noise impact assessments contributing to Environmental Impact Assessments for several rail schemes (including High Speed Two, London – West Midlands) and mixed-use developments. I was engaged by Network Rail for several years in the management and delivery of noise and vibration related aspects of the Thameslink Programme and also provided technical and policy support to the cross-industry Noise Policy Working Group.

I have worked with contractors, developers, architects and their design teams in the development of numerous commercial, residential, industrial and education schemes, ensuring the adoption of best practice in acoustics design and discharge of planning and statutory obligations.

I have contributed to Defra research studies into human response to vibration in residential environments and noise nuisance from windfarms, as well as producing papers and articles for presentation and publication in various journals (Proceedings of the Institute of Acoustics, International Workshop on Railway Noise, Acoustics Bulletin).