

P&G Reading F Building, AC Condenser Plant Replacement

**Retrospective noise impact
assessment report**

JLL UK P&G

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1.0

Introduction

1.0 Introduction

Cundall has been appointed to undertake a noise impact assessment to inform a retrospective planning application for the removal and installation of external plant equipment at ground level adjacent to the F Building, at the Procter & Gamble Reading site, 452 Basingstoke Road, Reading RG2 0RX.

The purpose of this report is to:

- Review appropriate national and local planning policy and relevant guidance
- Identify noise limiting criteria for externally mounted plant
- Determine background noise levels at nearby noise sensitive receptors
- Determine impact of the plant in operation on the receptors
- Identify if mitigation measures are required to comply with the plant noise limiting criteria

2.0

Site description

2.0 Site description

2.1 Site description

Building F is located within the industrial campus of P&G Reading which includes office, laboratories and factory buildings, as well as a shipment area to the north-east of the site, with lorries transiting in and out of the site during daytime and night-time hours.

The site is located within the administrative boundaries of Reading Borough Council (RBC).

2.2 Noise-sensitive receptors

The nearest noise sensitive receptors (NSR) are residential properties along Basingstoke Road to the east of the site (NSR1), approximately 100 metres (m) from Building F, and residential properties along Longships Way to the west of the site (NSR2), approximately 175 m from Building F.

Figure 2-1 shows the relative locations of Building F, the NSRs, and noise monitoring positions (MP1 and MP2).



Figure 2-1: Development location, NSRs location and monitoring positions

3.0

Assessment criteria

3.0 Assessment criteria

3.1 National policy

3.1.1 National Planning Policy Framework

The National Planning Policy Framework (published March 2012 and revised in December 2024 with February 2025 amendments) sets out the Government's planning policies for England and how these are expected to be applied.

With relevance to noise, the NPPF states:

"139. Development that is not well designed should be refused, especially where it fails to reflect local design policies and government guidance on design, taking into account any local design guidance and supplementary planning documents such as design guides and codes. Conversely, significant weight should be given to:

a) development which reflects local design policies and government guidance on design, taking into account any local design guidance and supplementary planning documents such as design guides and codes; and/or

b) outstanding or innovative designs which promote high levels of sustainability or help raise the standard of design more generally in an area, so long as they fit in with overall form and layout of their surroundings.

187. 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. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;

198. 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; [...]

200. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed."

3.1.2 Noise Policy Statement for England

The Noise Policy Statement for England (NPSE) was published by Defra in March 2010. The NPSE sets out the long-term vision of Government noise policy:

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

The NPSE long term vision is supported by the following 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.”*

The ‘Explanatory Note’ within the NPSE provides further guidance on defining ‘significant adverse effects’ and ‘adverse effects’ using the concepts:

- No Observed Effect Level (NOEL) - the level below which no effect can be detected. Below this level no detectable effect on health and quality of life due to noise can be established;
- Lowest Observable Adverse Effect Level (LOAEL) - the level above which adverse effects on health and quality of life can be detected; and
- Significant Observed Adverse Effect Level (SOAEL) - the level above which significant adverse effects on health and quality of life occur.

With reference to the SOAEL, the NPSE states:

“It is recognised that 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.”

For situations where noise levels are between the LOAEL and SOAEL, all reasonable steps should be taken to mitigate and minimise the effects. However, this does not mean that such adverse effects cannot occur.

3.1.3 Planning Practice Guidance

The Planning Practice Guidance concerned with noise (PPGN) (2019) advises that:

“Noise needs to be considered when development may create additional noise or would be sensitive to the prevailing acoustic environment (including any anticipated changes to that environment from activities that are permitted but not yet commenced).”

It also provides guidelines that are designed to assist with the implementation of the NPPF. The PPG states that 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;*
- *whether or not an adverse effect is occurring or likely to occur; and*
- *whether or not a good standard of amenity can be achieved.”*

Factors to be considered in determining whether noise is a concern are identified including the absolute noise level of the source, the existing ambient noise climate, time of day, frequency of occurrence, duration, character of the noise, and cumulative effects.

Further details on the hierarchy of noise effects are presented in Table 3-1, which has been reproduced from PPG.

Perception	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level (NOEL)			
Not present	No effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level (NOAEL)			
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 (LOAEL)			
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 (SOAEL)			
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 sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

Table 3-1: Planning Practice Guidance noise exposure hierarchy

3.2 Local policy

The Reading Borough Local Plan 2019 specifies the following criteria for noise-generating equipment:

“EN17: Noise Generating Equipment

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

4.2.92 The Local Plan proposals will see a high level of development within Reading. Reading is a densely populated town with many new planning developments taking place. Residents live in close proximity to commercial activities, therefore it is important to minimise background creep in order to protect the noise environment and maintain quality of life for people living and working in the town. The negative impact of environmental noise on health is becoming better understood (for example WHO 1999, 2009 and 2011).

4.2.93 Planning Practice Guidance on noise states that no specific measures are required to manage the acoustic environment in situations where noise can be heard as a result of a development and there is a slight effect on the acoustic character of the area but there is no effect on the behaviour and attitude of people exposed to the noise. However, the guidance also states that:

- *The cumulative impacts of more than one source of noise should be considered; and*
- *In cases where existing noise sensitive locations already experience high noise levels, a development that is expected to cause even a small increase in the overall noise level may result in a significant adverse effect occurring.*

4.2.94 The Council considers that the above two factors apply due to the town being densely populated and there being a high likelihood of subsequent noise generating plant being installed in a particular location. It is therefore necessary for each planning application for noisy plant to protect the acoustic environment and as far as possible prevent the increase in background noise levels because the cumulative impact of installation of noisy plant which causes an increase in background noise level is likely to lead to an adverse effect.

4.2.95 The Planning Practice Guidance on noise also states that local planning authorities may decide to develop specific standards to apply to various forms of proposed development in their area. It cautions against the implementation of fixed thresholds because specific circumstances may justify some variation being allowed. Because this policy sets a noise target in relation to the background noise level, this allows variation of the threshold with the local circumstances because it does not set an absolute noise level that the plant must achieve, it relates it to the local noise level.

4.2.96 Where the plant noise rating level does not meet this standard, the background noise will increase. When subsequent new plant is added it will be assessed against this higher background level which results in an increasing benchmark against which subsequent new plant is introduced. This leads to an incremental increase in the noise in an area each time new plant is introduced ('background creep'). This policy standard has been applied by Reading Borough Council for a number of years and experience has demonstrated it to be achievable in most cases. In addition, noise control technology is improving, therefore further increasing the achievability of this standard."

3.3 BS 4142: 2014+A1:2019

British Standard (BS) 4142: 2014+A1:2019 'Methods for rating and assessing industrial and commercial sound' provides a methodology for assessing the impacts arising at sensitive receptors due to noise from industrial and commercial activities. A formal BS 4142 impact assessment has not been carried out in this report; however, the principles of the standard have been used to inform this assessment.

A key aspect of the BS 4142 assessment method is a comparison between the background noise level in the vicinity of receptor locations and the rating level of the noise source under consideration. The relevant parameters in this instance are as follows:

- Background sound level – dB $L_{A90,T}$ – defined in the Standard as the 'A' weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels
- Specific sound level – dB $L_{Aeq,Tr}$ – the equivalent continuous 'A' weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, Tr; and
- Rating level – dB $L_{Ar,Tr}$ – the specific sound level plus any adjustment made for the characteristic features of the noise.

BS 4142 recommends that the specified interval over which the specific sound level is determined as 1-hour during the day from 07:00 to 23:00 hours and a shorter period of 15-minutes at night from 23:00 to 07:00 hours.

The standard recognises that certain acoustic features of a sound source can increase the impact over that expected based purely on the sound level. The standard identifies the following features to be considered:

- Tonality - a penalty of 2 dB is applied for a tone which is just perceptible at the receptor, 4 dB where it is clearly perceptible and 6 dB where it is highly perceptible
- Impulsivity - a penalty of 3 dB is applied for impulsivity which is just perceptible at the receptor, 6 dB where it is clearly perceptible and 9 dB where it is highly perceptible. An impulse is defined as the sudden onset of a sound
- Intermittency - a penalty of 3 dB can be applied if the intermittency of the specific sound is readily identifiable against the residual acoustic environment at the receptor i.e. it has identifiable on/off conditions
- Other sound characteristics - a penalty of 3 dB can be applied where the specific sound features characteristics that are neither tonal nor impulsive, nor intermittent, though otherwise are readily distinctive against the residual acoustic environment. Note that this correction should only be applied in the absence of the other characteristics and is not to be added to the corrections for tonality, impulsivity, or intermittency.

Once any adjustments have been made, the background level and the rating levels are compared. BS 4142 advises the following:

“a) Typically, the greater the difference, the greater the magnitude of impact.

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

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

d) The lower the rating level is to the measured background sound level, the less likely it is that the specific sound 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 have a low impact, depending on the context.”

3.4 NOAEL / LOAEL / SOAEL thresholds

In the context of BS4142 and NPSE, the NOEL/NOAEL/LOAEL/SOAEL thresholds are considered equivalent to the following:

- SOAEL = rating level 10 dB above background levels
- LOAEL = rating level 5 dB above background levels
- NOAEL = rating level equal to background levels
- NOEL = rating level 10 dB below background levels (equivalent to RBC ENV17 requirements)

4.0

Environmental noise survey

4.0 Environmental noise survey

4.1 Methodology

The environmental noise survey comprised of attended noise monitoring at two locations between Tuesday 5 November and Wednesday 6 November 2024. The noise survey was originally carried out for an assessment of plant installations on other locations of the P&G Reading site. There have been no significant changes to the nature of activities associated with the overall P&G Reading site or to the local road network that will result in changes to the environmental noise climate around the site. As such, the November 2024 are considered to remain valid for the purposes of this assessment.

The noise monitoring positions are shown in Figure 2-1 and described below:

- MP1: approximately 4m away from Basingstoke Road
- MP2: approximately 5m away from the rear façade of the residential property at 15 Commercial Road (which is on the corner of Commercial Road and Longships Way)

All measurements were taken with the microphone at approximately 1.5m above local ground height.

The choice of the monitoring location was based on accessibility and in order to safely secure the equipment and in a location suitably representative of the noise environment at the nearest NSRs.

Measurements were carried out following guidance from BS 4142: 2014+A1:2019 and BS 7445-1:2003 'Description and measurement of environmental noise Part 1: Guide to quantities and procedures'.

Measurements were taken of the following sound level indicator:

- Background sound level dB $L_{A90,T}$ (the A-weighted background sound level over a given time period, T).

Table 4-1 provides relevant details of the equipment used during the survey. The sound level meter used conforms to BS EN 61672-1:2013 Class 1 accuracy and was field calibrated before and after use with no significant drift in measurements observed between calibrations.

Equipment	Manufacturer & model	Serial number
Sound level meter	01dB Fusion	11766
Calibrator	01dB Cal31	84908

Table 4-1: Noise survey equipment

Copies of external calibration certificates are provided in Appendix A. Photos of the equipment setup are provided in Appendix B.

4.2 Observations

During site visits, the main contributors to the noise climate were observed to be:

- Noise from existing plant units at ground level from P&G Reading and road traffic from surrounding roads (primarily from Basingstoke Road) at NSR1; and
- Noise from existing plant units, industrial noise from nearby sites and noise from surrounding roads (primarily from Commercial Road) at NSR2.

The date of the evening/night-time measurements coincided with the Guy Fawkes Night, with fireworks noise affecting the measured ambient sound level, $L_{Aeq,T}$. However, the background sound level, $L_{A90,T}$ measurements were not affected due to the intermittent and short-duration nature of the fireworks noise.

Weather conditions over the measurement period were conducive to noise measurements and within the recommended limits in BS 4142: 2014+A1:2019 (i.e. wind speeds less than 5 m/s).

4.3 Uncertainty

There is some inherent uncertainty associated with the results of any noise survey. However, the measurement locations chosen are considered representative of the conditions at the nearest receptors, Class 1 equipment was used, calibrations were made before/after measurements and weather conditions during the survey period were conducive with noise monitoring. It is therefore considered that the potential risk associated with such uncertainties is minimal and that the measured noise levels are appropriate to inform the noise assessment detailed in this report.

4.4 Measurement data

A summary of the measured sound levels is given in Table 4-2.

Monitoring position	Date	Measurement periods, T	Background level dB $L_{A90, T}$	Comments
MP1	5 November 2024	15 minutes (13:30- 13:45)	53	Main noise source traffic noise from Basingstoke Road. Assumed to be typical background noise.
	5 November 2024	15 minutes (14:55 - 15:10)	55	Traffic increase on Basingstoke Road compared to measurement take between 13:30- 13:45 affecting background noise
	5 November 2024	30 minutes (19:25 - 19:55)	61	Peak evening traffic on Basingstoke Road
	5 November 2024	20 minutes (22:40 - 23:00)	53	Main noise source traffic noise from Basingstoke Road
	5 November 2024	30 minutes (23:00 - 23:30)	52	Main noise source traffic noise from Basingstoke Road and noise from plant units at ground level at P&G Reading
MP2	5 November 2024	15 minutes (14:03 - 14:18)	43	Main noise source traffic noise from Commercial Road and industrial noise from nearby commercial activities and plant units. Assumed to be typical background noise.
	5 November 2024	15 minutes (14:23 - 14:38)	43	Main noise source traffic noise from Commercial Road and industrial noise from nearby commercial activities and plant units
	5 November 2024	30 minutes (20:10 - 20:40)	57	Peak evening traffic on Commercial Road and noise from lorries transiting in and out from P&G shipment area
	5-6 November 2024	30 minutes (23:42 - 00:12)	54	Noise from lorries and forklifts transiting within P&G shipment area and existing plant noise

Table 4-2: Summary of noise monitoring results

4.5 Representative background levels

For purposes of the noise impact assessment, the following background levels are considered representative of the identified NSRs:

- NSR1, residential properties to east along Basingstoke Road
 - Daytime (07:00-23:00): 53 dB $L_{A90,15min}$
 - Night-time (23:00-07:00) : 52 dB $L_{A90,15min}$
- NSR2, residential properties to west along Longships Way:
 - Daytime (07:00-23:00): 43 dB $L_{A90,15min}$
 - Night-time (23:00-07:00) : 43 dB $L_{A90,15min}$ (lowest background level as measured at this location)

5.0

Noise impact assessment

5.0 Noise impact assessment

5.1 Plant information

Proposed plant locations are illustrated in Figure 5-1 and the plant type, make/model and sound power level data is summarised in Table 5-1.

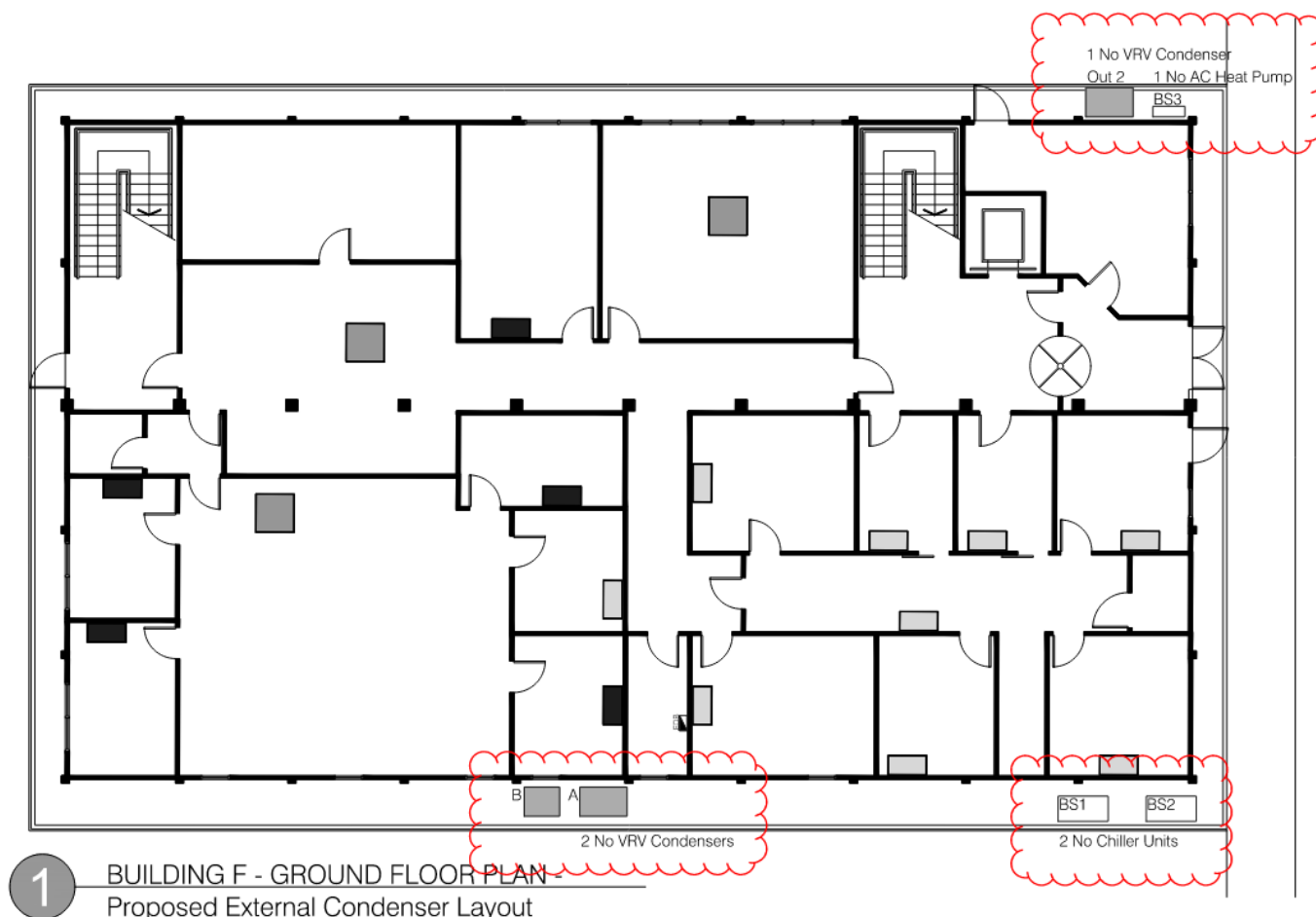


Figure 5-1: Plant locations (sourced from architect drawing A020 Nov 2025)

Type	Make/model	Sound power level (L_{wA}), dB Cooling mode
VRV Condenser - A – Out 1	Daikin REYA16A	84
VRV Condenser - B – Out 1	Daikin REYA12A	83
VRV Condenser – Out 2	Daikin REYA14A	79
Chiller unit BS1	Daikin BS8A14V1B	52
Chiller unit BS2	Daikin BS10A14V1B	53
AC heat pump BS3	Daikin BS4A14V1B	49

Table 5-1: Sound power level data (from Daikin technical datasheets)

5.2 BS4142 assessment

AC plant has been assessed based on their typical cooling mode and would be used during office / daytime hours only.

A noise impact assessment based on the guidance provided in BS 4142 has been undertaken. The results of the plant noise assessment at 1 metre from the NSRs are presented in Table 5-2.

Assessment stage	NSR 1 –Basingstoke Road	NSR 2 –Longships Way	BS 4142 Clause	Commentary
Assessment Period, T_r	1-hour	1-hour	7.2	It is assumed new plant will operate continuously for the full duration of the relevant assessment period (office/daytime hours only).
Predicted specific sound level	$L_{SA} = 39$ dB	$L_{SA} = 24$ dB	7.3.6; 7.3.8	Calculation procedure includes for attenuation due to screening by intervening buildings and propagation over distance.
Acoustic feature corrections	0 dB	0 dB	9.2	Daikin technical datasheets do not indicate any tonal characteristic of the sound level spectrums. Impulsive and intermittent characteristics are not expected.
Rating level	$L_{Ar,Tr} = 39$ dB	$L_{Ar,Tr} = 24$ dB	9.1	Equal to predicted specific sound levels
Background level	$L_{A90,15min} = 53$ dB	$L_{A90,15min} = 43$ dB	8.1 8.2	-
Excess over background level	-14 dB	-19 dB	11	Rating levels are greater than 10 dB below representative background sound level in all instances.

Table 5-2: BS4142 plant noise assessment

The results in Table 5-2 show that the plant rating levels predicted at NSRs are greater than 10 dB below background levels.

Based on BS 4142 guidance, this indicates that noise from chillers has no adverse impact. With reference to NPSE and the PPG for noise, this is considered to have 'No Observed Effect'.

The predicted levels comply with the RBC ENV17 requirements for rating levels not to exceed 10 dB below background levels.

No acoustic mitigation measures are required.

6.0

Conclusions

6.0 Conclusions

Cundall has carried out a noise impact assessment of the proposed development at Building F.

A survey was carried out in November 2024 to establish background sound levels representative of the nearest receptors to the site, which remains valid for use as part of this assessment.

Rating levels of proposed plant installations predicted at the receptor positions are greater than 10 dB below background levels.

Based on BS 4142 guidance, this indicates that noise from chillers has no adverse impact. With reference to NPSE and the PPG for noise, this is considered to have 'No Observed Effect'.

The predicted levels comply with the RBC ENV17 requirements for rating levels not to exceed 10 dB below background levels.

No acoustic mitigation measures are required.

Appendices

Appendices

Appendix A Calibration certificates



CERTIFICATE OF CALIBRATION

Date of Issue: 04 April 2023

Certificate Number: TCRT23/1284

Issued by:

ANV Measurement Systems

Beaufort Court

17 Roebuck Way

Milton Keynes MK5 8HL

Telephone 01908 642846 Fax 01908 642814

E-Mail: info@noise-and-vibration.co.uk

Web: www.noise-and-vibration.co.uk

Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

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Approved Signatory

K. Mistry

A handwritten signature in blue ink, appearing to read 'K. Mistry', is written over a horizontal line.

CUSTOMER
Cundall
1 Carter Lane
London
EC4V 5ER

ORDER No Filippo Ciarla

Job No TRAC23/03161

DATE OF RECEIPT 31 March 2023

PROCEDURE Calibration Engineer's Handbook section 25

IDENTIFICATION Sound level meter 01dB type FUSION serial No 11766 connected via its internal preamplifier to a half-inch microphone type GRAS 40CE serial No 383343 fitted with a 'Small' windshield. Associated calibrator 01dB type CAL31 serial No 84908 with a half-inch housing.

CALIBRATED ON 04 April 2023

PREVIOUS CALIBRATION Calibrated on 17 March 2021, Certificate No. TCRT21/1187 issued by this laboratory.

This certificate provides traceability of measurement to recognised national standards, and to units of measurement realised at the National Physical Laboratory or other recognised national standards laboratories. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

**CERTIFICATE OF CALIBRATION****Date of Issue: 15 November 2023****Certificate Number: TCRT23/1840**

Issued by:

ANV Measurement Systems

Beaufort Court

17 Roebuck Way

Milton Keynes MK5 8HL

Telephone 01908 642846 Fax 01908 642814

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Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Page 1 of 2 Pages

Approved Signatory

K. Mistry

A handwritten signature in blue ink, appearing to read 'K. Mistry', is written over a horizontal line.

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ORDER No Filippo Ciarla**Job No** TRAC23/11520**DATE OF RECEIPT** 15 November 2023**PROCEDURE** Procedure TP 1 Calibration of Sound Calibrators**IDENTIFICATION** Sound Calibrator 01dB type CAL31 serial number 84908 with half-inch housing**CALIBRATED ON** 15 November 2023**PREVIOUS CALIBRATION** Calibrated on 24 November 2022, Certificate No. TCRT22/1737 issued by this laboratory.

This certificate provides traceability of measurement to recognised national standards, and to units of measurement realised at the National Physical Laboratory or other recognised national standards laboratories. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Appendix B Survey photos



Figure B-6-1: MP1



Figure B-6-2: MP2

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