CAHILL DESIGN CONSULTANTS
FIRE ENGINEERING | ACOUSTIC DESIGN

EMERGENCY BACK-UP POWER GENERATION FACILITY,

RIDGEWAY, IVER

NOISE IMPACT ASSESSMENT

DOCUMENT NO.: 2337-CDC-00-XX-RP-A-0400

CLIENT: AMAZON DATA SERVICES UK LIMITED

REVISION: ENVIRONMENTAL PERMIT APPLICATION

DATE: 04 JUNE 2026

NOTICE

This document and its contents have been prepared for Amazon Data Services UK Limited and are intended for their information only in relation to the proposed Emergency Back-up Power Generation Facility at Ridgeway, Iver, Buckinghamshire.

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1. EXECUTIVE SUMMARY

1.1 This report presents a noise impact assessment for the proposed Emergency Back-up Power Generation Facility at Ridgeway Data Centre, Iver, prepared by Cahill Design Consultants on behalf of Amazon Data Services UK in support of the Environmental Permit application. The assessment considers noise from the back-up generators and associated plant, establishes baseline sound conditions through site measurements, and evaluates the likely impact at the nearest sensitive receptors in accordance with BS 4142:2014+A1:2019 and relevant local authority requirements.

Key findings and measures include:

1.2 A baseline noise survey undertaken between 17 and 22 August 2023 established representative daytime and night-time background sound levels at the site boundaries and nearby sensitive receptors. The survey data, supported by comparable earlier measurements, is considered sufficiently robust for setting operational assessment criteria.

1.3 Noise limits for routine daytime generator testing have been derived with reference to the measured background sound climate and BS 4142 methodology. The assessment assumes the incorporation of appropriate attenuation measures, including reduced-noise generators, exhaust attenuators and suitably selected or acoustically controlled plant.

1.4 Two operational scenarios have been assessed: routine single-generator testing during daytime hours and a full emergency power outage condition. The modelling indicates that routine testing can comply with the adopted daytime noise criterion at all assessed receptors, with predicted rating levels 2 dB to 3 dB below the criterion at the closest residential receptors. Full emergency operation would occur only rarely and for short durations and has been considered in the context of its exceptional emergency nature.

Conclusion

1.5 The assessment demonstrates that, with the specified noise control measures incorporated, the proposed Emergency Back-up Power Generation Facility can operate with an acceptable acoustic impact at nearby sensitive receptors during routine testing. In the event of a full emergency outage, operation of all generators would be infrequent, temporary and consistent with the emergency operating context agreed with the local authority. On this basis, the proposed development is considered acceptable in acoustic terms for the purposes of the Environmental Permit application.

2. INTRODUCTION

2.1 This noise impact assessment has been prepared by Cahill Design Consultants [CDC] to accompany an environmental permit application for the Emergency Back-up Power Generation Facility at Ridgeway, Iver. The application is submitted on behalf of Amazon Data Services UK Limited.

2.2 For context, the operator has submitted a detailed planning application to Buckinghamshire Council for the wider data centre development, which involves redeveloping the site to provide a data centre (Use Class B8).

2.3 Demolition of all existing units and structures on site and the redevelopment of the site to provide a data centre development comprising a data centre building, MV building, 1 no. sprinkler water tank and pump building, security hut, substation compound including 2 switch rooms and electrical infrastructure, generator yard with 27 no. back-up generators, 1 no. diesel tank and re-fuelling area, water tanks, bin store, perimeter security fencing, car and cycle parking and associated ancillary site infrastructure.

2.4 The approximate Gross External Area ('GEA') of the development will be 30,523 sqm over several buildings.

2.5 The development will also comprise an attenuation pond/wetlands, a generator yard with 27 back-up generators, four water tanks within screen enclosures, one sprinkler water tank, perimeter security fencing, a main entrance sally-port, a secondary vehicular entrance, roads, and ancillary site infrastructure.

2.6 The Environmental Permit application is for operation of the back-up generators and associated fuel storage only.

2.7 A noise survey of the site was carried out over the period 17th to 22nd August 2023 to determine background sound levels at existing noise sensitive receptors. The results have been used to determine appropriate limits for noise generated by the proposed development (PD) at existing noise sensitive receptors.

2.8 Predicted noise emissions from the proposed back-up generators have been assessed using the proposed plant information. The plant details presented in this report are intended to indicate the likely noise emissions and to assess the feasibility of achieving the proposed noise limits. The assessment has been undertaken with reference to BS 4142:2014 + A1:2019, *Methods for rating and assessing industrial and commercial sound*.

3. PROPOSED DEVELOPMENT SITE

3.1 The wider data centre development site is bounded to the South by the Grand Union Canal.

3.2 The Site comprises 7 hectares of previously developed land within an industrial area, the Ridgeway Trading Estate, an employment site made up of various units, is located to the south of Iver and on the west side of Thorney Lane North.

3.3 The Site is within the Colne Valley Regional Park and is surrounded by Metropolitan Green Belt Land, although does not fall within it. The existing floorspace on the Site totals approximately 34,000 sqm and is contained within 19 no. of units which are between 5-20m in height.

3.4 The northern and southern boundary of the Site is contained by a vegetation buffer. Vehicular access to the Site is via 'Ridgeway', to the west of Thorney Lane, a road which passes through the centre of the neighbouring industrial estate.

3.5 The site is bounded to the South by the Grand Union Canal. The M25 motorway is approximately 1km to the east. An indicative site layout including the environmental permit red line boundary is presented in Figure 1.

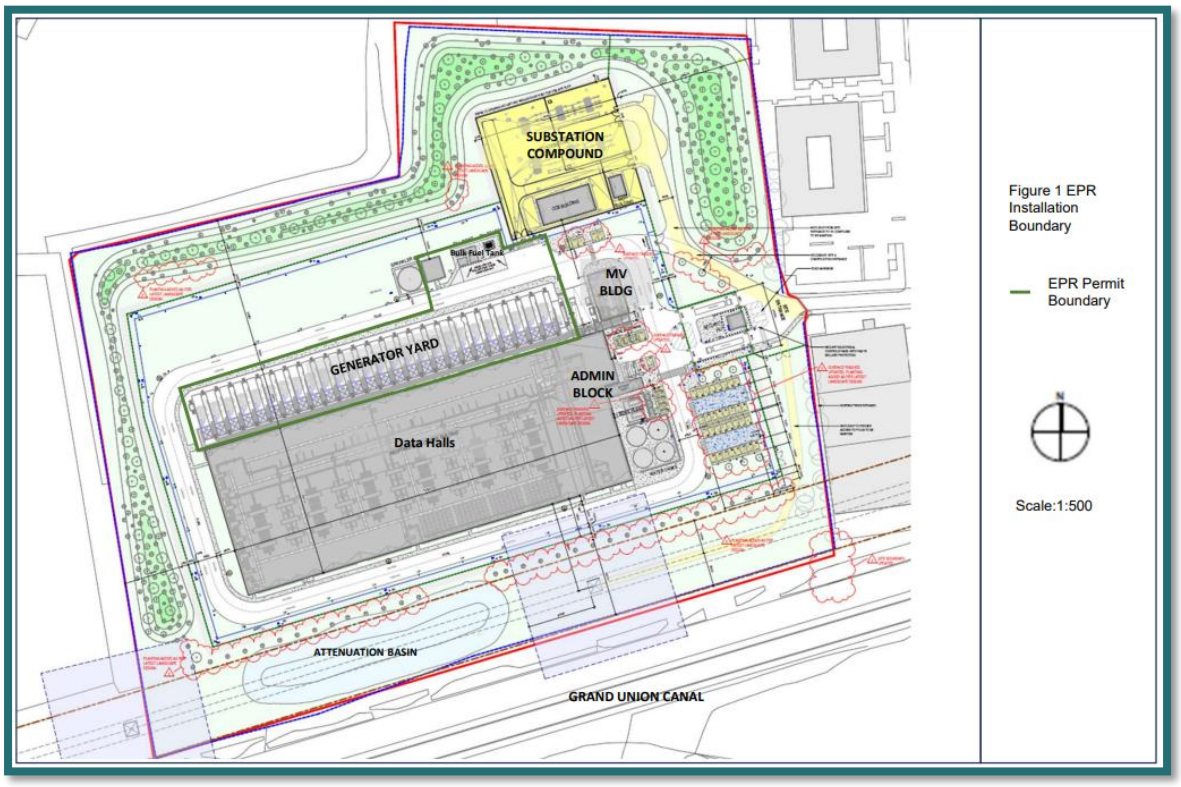


Figure 1 – Indicative Site Layout (Dwg. No. 2337-MCA-00-XX-DR-A-1020)

3.6 Although the surrounding uses are mainly commercial, two of the adjacent buildings (DX House and Olympia House), which were previously in office use, have recently been converted to residential use. The property formerly known as 'DX House' utilised Permitted Development rights to change from office use to 51 residential apartments, and 'Olympia House' the same, to convert to 57 residential apartments (references

15/01501/JNOT and 17/00438/JNOT respectively). These two buildings although located on the boundary of the development site are approximately 70m from the nearest proposed noise producing equipment.

3.7 To the north and east of the Site, the landscape is predominantly grassland and arable farmland.

3.8 The nearest noise sensitive receptors to the development site are shown in Figure 2.

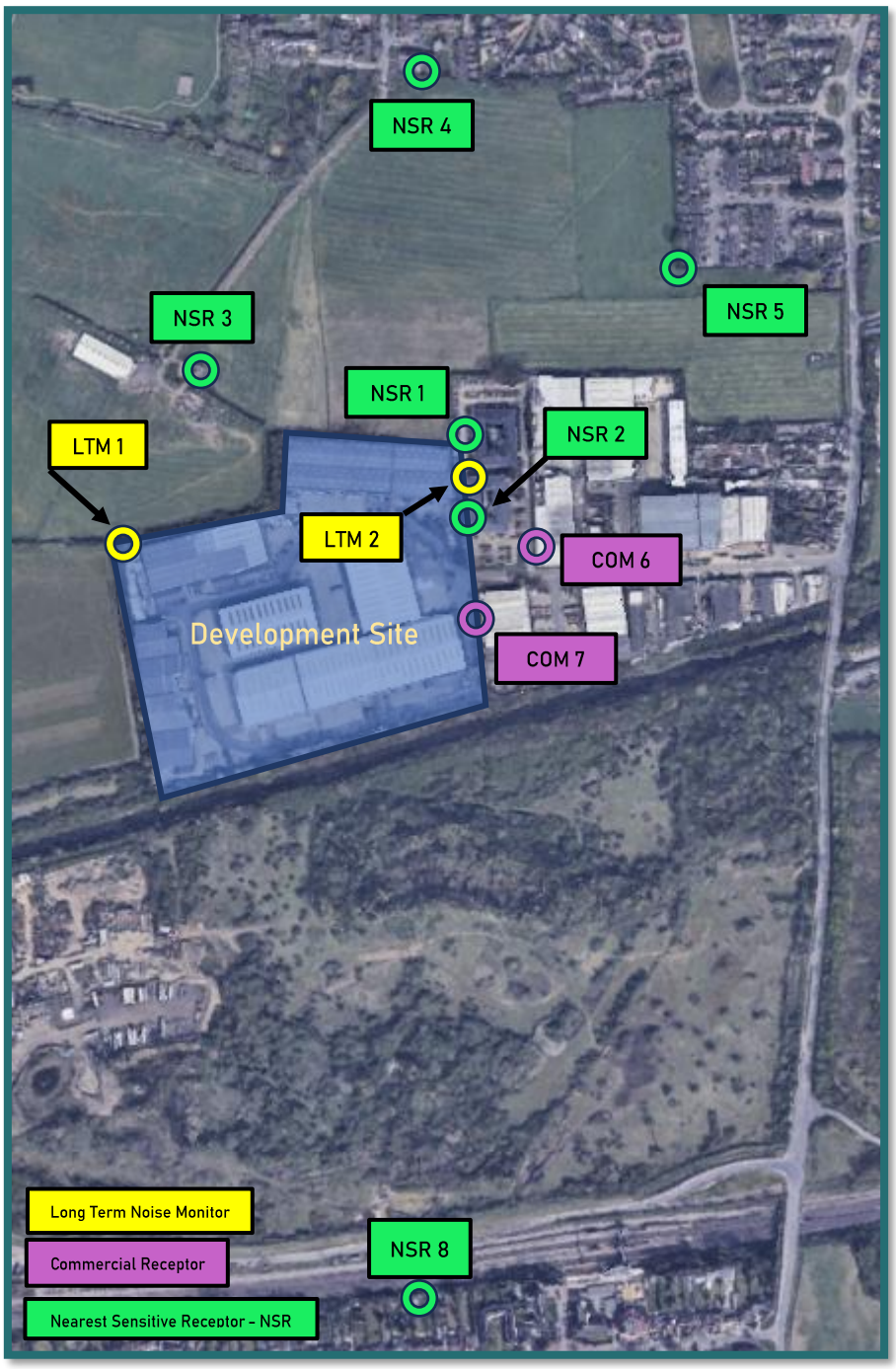


Figure 1- Sketch showing the locations of the nearest sensitive receptors.

4. DRAWINGS AND ASSUMPTIONS

Table 1 – Planning Drawings Used in the Noise Assessment

Drawing Title	Drawing No.
SITE LOCATION MAP	2337-MCA-00-XX-DR-A-1000
BLOCK PLAN	2337-MCA-00-XX-DR-A-1001
EXISTING SITE PLAN (SITE SURVEY)	2337-MCA-00-XX-DR-A-1010
PROPOSED SITE PLAN	2337-MCA-00-XX-DR-A-1020
EXISTING CONTEXTURAL ELEVATIONS	2337-MCA-00-XX-DR-A-1030
PROPOSED CONTEXTURAL ELEVATIONS	2337-MCA-00-XX-DR-A-1040
EXISTING SITE SECTIONS	2337-MCA-00-XX-DR-A-1050
PROPOSED SITE SECTIONS	2337-MCA-00-XX-DR-A-1060
DATA CENTRE A GROUND FLOOR PLAN	2337-MCA-01-XX-DR-A-1000
DATA CENTRE A GROUND FLOOR MEZZ PLAN	2337-MCA-01-XX-DR-A-1005
DATA CENTRE A FIRST FLOOR PLAN	2337-MCA-01-XX-DR-A-1010
DATA CENTRE A FIRST FLOOR MEZZ PLAN	2337-MCA-01-XX-DR-A-1015
DATA CENTRE A ROOF PLAN	2337-MCA-01-XX-DR-A-1020
DATA CENTRE A UPPER ROOF PLAN	2337-MCA-01-XX-DR-A-1021
DATA CENTRE A PROPOSED ELEVATIONS - SHEET 1	2337-MCA-01-XX-DR-A-1000
DATA CENTRE A PROPOSED ELEVATIONS - SHEET 2	2337-MCA-01-XX-DR-A-1005
DATA CENTRE A PROPOSED ELEVATIONS - SHEET 3	2337-MCA-01-XX-DR-A-1052
DATA CENTRE A SECTIONS	2337-MCA-01-XX-DR-A-1060

5. ASSESSMENT METHODOLOGY

Policy and Guidance

5.1 The assessment methodology is based on the following policy and guidance documents:

- BS 8233:2014 – "Guidance on sound insulation and noise reduction for buildings"
- BS 4142:2014 + A1 2019 – "Methods for rating and assessing commercial and industrial sound".

5.2 A review of the relevant planning policy and acoustics guidance is provided in Appendix A.

Description of Noise Sources

5.3 The Emergency Back-up Power Generation Facility includes standby generators that operate only during power outages. Routine generator testing will be limited to weekday daytime periods. A typical testing regime would not normally require simultaneous operation of multiple generators, and single-generator testing is the most common scenario.

Plant Noise Assessment Methodology

5.4 The standard method for assessing noise from commercial and industrial premises in the UK is British Standard BS 4142 "Method for rating and assessing industrial and commercial sound". The standard is applicable for assessing plant noise affecting "dwellings or premises used for residential purposes".

5.5 The methodology requires the determination of the specific sound level, corrected for a characteristic feature to produce a rating level. The rating level is then compared against the background noise level (expressed as $L_{A90,T}$), thereby producing an 'excess of rating over background sound level' figure. This figure is then used for the assessment of the likelihood of adverse impact.

5.6 The existing background sound level is measured during a noise survey. The plant sound level has been estimated by calculation using manufacturers' noise emission data for plant suitable for the proposed Emergency Back-up Power Generation Facility.

5.7 The background sound levels representative of the nearest sensitive receptors have been measured over 5 days in August 2023. A previous noise survey of the site was completed in 2022. Both surveys have indicated comparable results. The noise data used to set criteria is therefore considered acoustically robust.

5.8 The background sound level is measured in terms of the L_{A90} acoustic parameter. The L_{A90} parameter is defined as the level exceeded for 90% of the measurement time. This parameter therefore excludes short duration noise events, such as individual train and vehicle movements, and represents the underlying continuous noise level.

5.9 The proposed noise emission limits for the emergency back-up power generation plant are based on the existing background sound level, in line with the advice from

BS4142:2014. The standard requires a statistical assessment of the measured background sound levels in context to determine the appropriate level for use in the assessment.

5.10 For the proposed Emergency Back-up Power Generation Facility, a computer noise model, which is based on the sound propagation algorithms within ISO 9613:1996, has been used to predict noise levels at receptors. The model includes 27 back-up generators and their associated discharge stacks and flues.

5.11 Where the noise contains a 'distinguishable, discrete, continuous note (whine, hiss, screech, hum etc.) or if there are distinct impulses in the noise (bangs, clicks and clatters), or if the noise is irregular enough to attract attention, then a range of correction factors can be added to the specific sound level to obtain an appropriate rating level.

5.12 The BS4142 standard places great emphasis on the context of the sound environment that is being assessed and the development overall. This is an essential part of the assessment process, particularly when predicting the likelihood of adverse impact. However, for guidance the following is included in the standard:

Typically, the greater the difference, the greater the magnitude of the impact.

- 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".

5.13 However, BS4142:2014 notes that in some circumstances, for example at times when the background sound level is low or during the middle of the night when people are generally asleep, guidance on absolute sound levels may be as, or more, important than the margin by which the rating level exceeds the background sound level.

5.14 BS4142:2014 highlights the importance of considering the context in which a sound occurs. Factors including the absolute sound level, the character of the sound, the sensitivity of the receptor and the existing acoustic character of the area should be considered when assessing the noise impact.

Operational Scenarios Considered:

5.15 The acoustic modelling has been based on the information, drawings, sketches and noise data provided for reduced-noise generators, with a typical sound pressure level of 75 dBA at 1 m.

5.16 The following two plant operational scenarios have been considered:

- Scenario 1, generator testing - Heat rejection plant operating 24 hours per day plus the single, eastern most data generator, operating during the daytime only to simulate the situation when one generator is being tested closest to the nearest residential receptor. Regular Generator run times are expected to be up to 4 hours fortnightly.
- Scenario 2, full emergency - Heat rejection plant operating 24 hours per day plus all duty generators operating during the daytime and night-time.

6. BASELINE DATA COLLECTION

Environmental Noise Survey

6.1 Both attended and unattended noise measurements were completed at the site boundaries and/or nearest sensitive receptors of the proposed development to establish the existing noise climate.

6.2 The noise survey was completed between 17 and 22 August 2023. The measurement period included a weekend to capture any reduction in background noise that might occur at that time.

6.3 The details of all the noise measurement positions (NMP) are summarised in Table 2 below and shown on Figure 2.

- LTM1 (West Boundary): the microphone was located on the western boundary of the proposed site at the closest possible proximity to NSR3. The microphone was secured above the boundary fence 1.9 m above ground level. The measurements were undertaken in 15-minute measurement periods during the attended survey between 14:00 on 17th August and 11:45 on 22nd August 2023.
- LTM2 (East Boundary): the microphone was located on the eastern boundary of the proposed site at a position representative of NSR 1 & 2 (DX House and Olympia House). The microphone was secured above the boundary fence 1.9 m above ground level. The measurements were undertaken in 15-minute measurement periods during the attended survey between 15:00 on 17th August and 04:30 on 18th August 2023.
- NSR4 (Northern Receptors): the microphone was positioned on a tripod approximately 1.5 m above ground level. The measurements were undertaken in 10-minute measurement periods during the attended survey between 14:34 and 16:44 on 17th August 2023.
- NSR5 (Eastern Receptors): the microphone was positioned on a tripod approximately 1.5 m above ground level. The measurements were undertaken in 10-minute measurement periods during the attended survey between 14:34 and 16:44 on 17th August 2023.
- NSR6 (Southern Receptors): the microphone was positioned on a tripod approximately 1.5 m above ground level. The measurements were undertaken in 10-minute measurement periods during the attended survey between 14:34 and 16:44 on 17th August 2023.

6.4 Measurements were undertaken following the guidance outlined in BS 4142:2014 and BS 7445-1:2003.

6.5 Each measurement position was selected to represent free-field conditions, i.e. at least 3.5 m from building façades, walls or fences. A windshield was fitted to the monitoring equipment throughout the survey.

6.6 The sound level meter was calibrated to a reference level of 114 dB at 1kHz both before, and on completion of, the noise survey. No significant drift in calibration was noted during the survey (≤ 0.3 dB).

6.7 Details of the noise monitoring equipment used are provided in Table 2.

Table 2 – Details of the noise monitoring equipment used during the survey.

Measurement Location	Type	Manufacturer	Model	Serial No.	Last Calibrated	Certificate No.
Manned Measurements	Sound Level Meter	Norsonic	Nor-118	28254	10/03/2022	05650/2, 05650/3 & 05650/4
	Microphone	Norsonic	Nor-1225	335374	10/03/2022	Inc. SLM
	Preamplifier	Norsonic	Nor-1206	30228	10/03/2022	Inc. SLM
	Calibrator	Norsonic	Nor-1251	35233	22/03/2023	U43768
LTM 1	Sound Level Meter	Svantek	971A	113206	29/10/2021	Factory Cal
	Microphone	ACO PACIFC	7152	80672	29/10/2021	Factory Cal
	Preamplifier	Svantek	SV18A	113704	29/10/2021	Factory Cal
	Calibrator	Svantek	SV33B	116283	06/08/2022	Factory Cal
LTM 2	Sound Level Meter	Svantek	971A	113204	05/09/2023	1506129-1
	Microphone	ACO PACIFC	7152	80678	05/09/2023	1506129-1
	Preamplifier	Svantek	SV18A	113706	05/09/2023	1506129-1
	Calibrator	Svantek	SV33B	116284	06/10/2023	Factory Cal.

6.8 Observations and subjective evaluation of noise sources were carried out during the setup and collection of the survey equipment which identified the following noise sources contributing to the noise climate at the site: Road Traffic: The background sound level was determined by traffic from the M25. Some local traffic movements on Ridgeway, and Thorney Lane were audible but not significant with respect to the background sound level (L_{A90}).

6.9 Other noise sources contributing to the sound environment included rail movements on the Great Western Main Line, located approximately 35 m from one of the monitoring positions. However, these were not considered significant in relation to the measured background sound level (L_{A90}) at any location.

6.10 A record of the weather conditions during the survey, as published by www.timeanddate.com, is presented in Figure 3. Temperature is indicated in °C. Windspeed is indicated in mph.

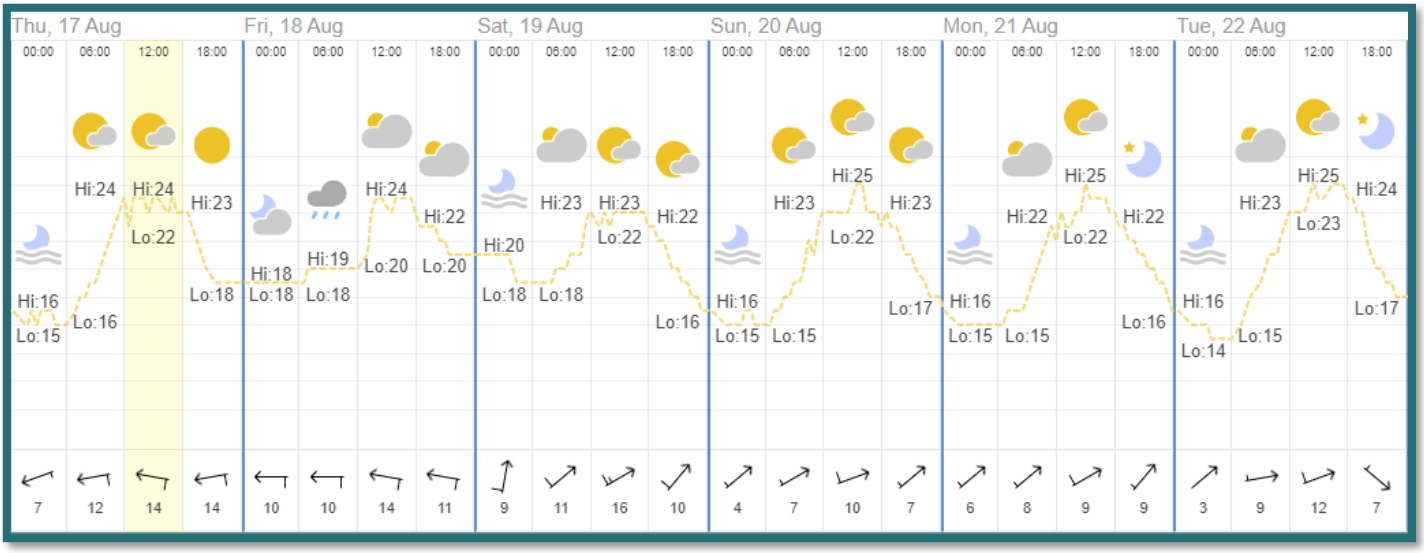


Figure 2 – Weather conditions during the survey at Heathrow approximately 4 km from the site.

6.11 Wind speeds on Saturday 19th August marginally exceeded 5 m/s at the weather station. Measurements obtained on Saturday may have been slightly elevated due to wind noise over the microphone. The affected data has been reviewed with caution during these periods when determining the baseline noise conditions.

Survey Results

6.12 Two main acoustic parameters were measured using a time interval of 15 minutes as described below.

6.13 The 'A'-weighted equivalent continuous sound pressure level over the 15-minute measurement interval ($L_{Aeq,15\ min}$, dB). The equivalent continuous sound level (L_{Aeq}) is the steady-state level with the same energy as the actual fluctuating sound over the same period, and is often described as the ambient noise level.

6.14 The 'A'-weighted background sound pressure level over the 15-minute measurement interval ($L_{A90,15\ min}$, dB). The background sound level is the level exceeded for 90% of the measurement period. A summary of the measured background and equivalent continuous sound levels for the day (07:00 to 23:00 hours) and night (23:00 to 07:00 hours) is presented in Table 3. Graphical time histories of the measured levels are provided in Appendix B.

6.15 The noise survey measurement period covered a period of operation when Heathrow Airport was operating in both modes of operation. Noise levels at the site were noticeably increased on Thursday and Friday. The noise data used to create the summary below has been taken from the quieter days measured over the weekend and Monday. Discounting the noisiest days from the measured results is an acoustically robust method of determining baseline noise data.

Table 3 – Summary of Noise Survey Results

Measurement Location	Day (07:00 – 23:00)		Night (23:00 – 07:00)	
	Ambient dB L_{Aeq}	Background dB L_{A90}	Ambient dB L_{Aeq}	Background dB L_{A90}
LTM 1	52 (16 hour)	50 (15 min)	49 (8 hour)	44 (15 min)
LTM 2	51 (16 hour)	49 (15 min)	47 (8 hour)	45 (15 min)
NSR 4	50 (10 mins)	48 (10 mins)		
NSR 5	57 (10 mins)	51 (10 mins)		
NSR 8	55 (10 mins)	51 (10 mins)		

6.16 The typical background noise levels summarised above have been taken as the mode average for the 3 quietest days in the survey period. The measurements were taken in 15-minute periods.

6.17 The determination of an appropriate background noise level for the site is in line with the methodology set out in BS4142:2014. To take a robust approach we will use the typical background sound level measured at the long-term noise monitors for all the sensitive receptors.

6.18 The measurement results obtained are comparable with a survey completed at the site by Arup in 2021. Arup confirmed typical background sound levels at DX House and Olympia House of 49 dB $L_{A90\ (15min)}$ during the day and 44 dB $L_{A90\ (15min)}$ at night.

7. PROPOSED PLANT NOISE LIMITS

Noise Limits at Sensitive Receptors

7.1 Generator Testing (Scenario 1) is to be strictly controlled and will only happen during the core hours of the day (typically 07:00 – 19:00 hrs). Adopting a plant noise rating criteria which is equal to the typical daytime background is therefore appropriate for this generator testing during the daytime.

7.2 Under a full emergency condition (Scenario 2), all plant, and all generators would be operational. This is only ever expected to happen in a true emergency (e.g., grid power failure) and for a limited duration. The frequency of occurrence of this emergency mode of operation is anticipated to be very low. CDC's experience of similar data centres indicates outages of once per year and normally resolves in a period totalling less than a few hours.

7.3 Given the very low likelihood of emergency operation, this assessment assumes that higher noise levels in these circumstances would be acceptable, consistent with confirmation provided by South Buckinghamshire Council for this development. Similar allowances are commonly accepted by local authorities in England for generators operating under emergency conditions or during testing.

Proposed Plant Noise Limits

7.4 The following table summarises the plant noise limits during single generator testing at the nearest sensitive receptors for each operational scenario.

Table 4 – Power Generation Plant Noise Limits at each sensitive receptor during testing

Sensitive Receptor Location	Scenario 1 (Generator Testing)
NSR 1	49 dB $L_{A\,Tr}$
NSR 2	49 dB $L_{A\,Tr}$
NSR 3	50 dB $L_{A\,Tr}$
NSR 4	48 dB $L_{A\,Tr}$
NSR 5	51 dB $L_{A\,Tr}$
NSR 8	51 dB $L_{A\,Tr}$

8. PLANT NOISE EMISSIONS

8.1 Sound levels at the identified nearest sensitive receptors have been predicted using SoundPlan noise modelling software. A model has been developed specifically for this project. The Emergency Back-up Power Generation Facility, local topography, surrounding buildings, noise sources and receptors have been included in the model.

Sound power data for the noise sources have been obtained from the relevant mechanical and electrical engineers.

8.2 The modelling was carried out using the following assumptions:

- Ground absorption for all paved areas is set to 0.
- Order of reflection set to 1.
- Reflection loss from buildings set to 2 dB.
- Noise levels shown at the receptors are on the 1st floor at the location of the façade.

8.3 Sound Power Data for all modelled noise sources included in the model is included in Appendix C.

8.4 A 3 dB character correction penalty has been applied to the contributions from the emergency generators.

8.5 The modelled noise rating levels at each sensitive receptor are presented in the tables below, together with an indication of compliance with the plant noise criteria set out in Section 7.0. The further below the criterion the predicted level falls, the lower the perceived noise impact of the Emergency Back-up Power Generation Facility is likely to be.

Table 5 – Plant Noise Levels modelled for Scenario 1 (Single Generator Testing)

Location	Scenario 1 Predicted Plant Noise Rating Level	Plant Noise Limit	Comparison With Criteria
NSR 1	46 dB $L_{A\,Tr}$	49 dB $L_{A\,Tr}$	-3 dB
NSR 2	47 dB $L_{A\,Tr}$	49 dB $L_{A\,Tr}$	-2 dB
NSR 3	45 dB $L_{A\,Tr}$	50 dB $L_{A\,Tr}$	-5 dB
NSR 4	39 dB $L_{A\,Tr}$	48 dB $L_{A\,Tr}$	-9 dB
NSR 5	38 dB $L_{A\,Tr}$	51 dB $L_{A\,Tr}$	-13 dB
NSR 8	33 dB $L_{A\,Tr}$	51 dB $L_{A\,Tr}$	-18 dB

Please note that the values in the table above assume testing of a single generator close to the relevant NSR. In most cases, actual levels during single-generator testing will be lower, as most generator sets are located further from the receptors.

Table 6 – Plant Noise Levels modelled for Scenario 2 (Full Emergency All Plant)

Location	Scenario 2 Predicted Plant Noise Rating Level
NSR 1	53 dB $L_{A\,Tr}$
NSR 2	54 dB $L_{A\,Tr}$
NSR 3	53 dB $L_{A\,Tr}$
NSR 4	47 dB $L_{A\,Tr}$
NSR 5	46 dB $L_{A\,Tr}$
NSR 8	34 dB $L_{A\,Tr}$

8.6 Plant noise rating levels at the most affected receptor during Scenario 1 (single generator testing) are predicted to be 2 dB below the typical daytime background noise level (NSR 2).

8.7 Noise contour maps for each assessed operational scenario, showing the noise levels emanating from the proposed Emergency Back-up Power Generation Facility, are included in Appendix D of this report.

9. CONTEXT AND UNCERTAINTY

Context

9.1 The numerical assessments provided in this report should be considered in context. The proposed emergency back-up power generation facility will replace existing industrial buildings that are likely to themselves be noise-generating uses.

9.2 It should be further noted that the closest receptors to the proposed Emergency Back-up Power Generation Facility, DX House and Olympia House, are currently subjected to variable noise sources generated by commercial activities within the Ridgeway Distribution Centre. Residents in this accommodation may therefore already be less sensitive to noise sources from the surrounding commercial environment.

Uncertainty

9.3 The noise survey was completed over a five-day period, including a weekend, and captured a representative range of prevailing wind conditions and Heathrow Airport operating modes. The highest measured noise data has not been used when establishing the background noise conditions for the assessment.

9.4 Noise emissions from the Emergency Back-up Power Generation Facility have been based on manufacturers' noise data for equipment used successfully on comparable data centre developments. The assessment assumes the incorporation of appropriate mitigation measures so that noise from routine generator testing has only a minimal impact on the surrounding area.

9.5 Predictions have been made using ISO9613-2, which is the industry standard for environmental noise predictions. The standard has a stated uncertainty of 3dB.

9.6 Reduced noise level generators (producing a typical sound pressure level of 75 dBA at 1m) will utilise noise control packs that will limit the emitted sound power levels. Generator exhaust noise will be controlled using combination (reactive/ absorptive) attenuators. Appropriate losses have been included in modelling.

9.7 Other plant within the wider development will also incorporate suitable attenuation measures to control noise breakout from associated buildings and enclosures. Condensers will be selected with low-noise characteristics or night-time operating modes to reduce noise levels at sensitive times of day.

9.8 When final plant selections are made, noise emissions may differ from the predictions presented in this report. However, the available attenuation measures and the results of this assessment indicate that the Emergency Back-up Power Generation Facility can be delivered with a low noise impact at surrounding sensitive locations during routine testing.

9.9 The prediction of noise from a single generator being tested (scenario 1) assumes that a generator close to the noise-sensitive receptor is being tested. Other generators are located further away from the sensitive receptors resulting in a lower level of noise. This will result in a reduction in the potential noise impact at the nearest sensitive receptor.

10. CONCLUSION

10.1 This report evaluates the noise impact of the proposed Emergency Back-up Power Generation Facility in Iver, Buckinghamshire. The assessment, prepared by Cahill Design Consultants for Amazon Data Services UK Limited, considers noise emissions and their potential impact on nearby sensitive receptors, and compliance with the requirements for the testing and operation of Emergency power generation plant set by the local authority.

Key findings and measures include:

10.2 Baseline Noise Survey: A comprehensive survey (August 2023) established existing background and ambient noise levels, providing a robust basis for setting operational noise limits.

10.3 Proposed Noise Mitigation: Noise limits for daytime generator testing were defined to align with BS 4142:2014 and local requirements.

10.4 Operational Scenarios: Noise impacts from two scenarios were modelled; normal generator testing and an emergency power outage.

10.5 Generator Testing indicates compliance with defined thresholds, confirming minimal impact on residential and commercial receptors during normal operation.

10.6 South Buckinghamshire Council has confirmed that no noise limits apply during a full power outage. Although predicted noise rating levels at the sensitive receptors would exceed the prevailing background level in this emergency scenario, they remain in line with levels commonly accepted by many local authorities in England for generators operating under emergency conditions or during testing.

Conclusion

10.7 The assessment demonstrates that, with the specified noise control measures incorporated, noise emissions from the Emergency Back-up Power Generation Facility can be controlled to acceptable levels at nearby sensitive receptors. During routine daytime generator testing, the predicted rating levels comply with the adopted assessment criteria, indicating a low noise impact.

10.8 In the event of a full emergency power outage, generator operation would be infrequent, short in duration, and consistent with the emergency operating context agreed with the local authority. On this basis, the proposed development is considered acceptable in acoustic terms, taking account of the infrequent and emergency nature of this mode of operation.

APPENDIX A

PLANNING POLICY, BS 4142 & BS 5228:2009

DOCUMENT SUMMARIES

BS 4142:2014 'Methods for rating and assessing industrial and commercial sound'.

BS 4142:2014 describes methods for determining and assessing noise levels from noise sources to determine the likelihood of adverse impact.

The document has been developed for:

- Investigating complaints.
- Assessing sound from proposed new, modified, or additional sources of the sound of an industrial and/or commercial nature.
- Assessing sound at proposed new dwellings or premises used for residential purposes.

The methodology requires the determination of the specific sound level, corrected for a characteristic feature to produce a rating level. The rating level is then compared against the background noise level (expressed as $L_{A90,T}$), thereby producing an 'excess of rating over background sound level' figure. This figure is then used for the assessment of the likelihood of adverse impact.

Where the noise contains a 'distinguishable, discrete, continuous note (whine, hiss, screech, hum etc.)', or if there are distinct impulses in the noise (bangs, clicks and clatters), or if the noise is irregular enough to attract attention, a range of correction factors can be added to the specific sound level to obtain an appropriate rating level, as follows:

- Tonality: up to +6dB
- Impulsivity: up to +9dB
- Intermittency: up to +3dB

The standard places great emphasis on the context of the sound environment that is being assessed and the development overall. This is an essential part of the assessment process, particularly when predicting the likelihood of adverse impact. However, for guidance the following is included in the standard:

- Typically, the greater the difference, the greater the magnitude of the impact.
- 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 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. When 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.

Regarding background sound level measurements undertaken at an alternative location, the following guidance is provided in BS4142:2014:

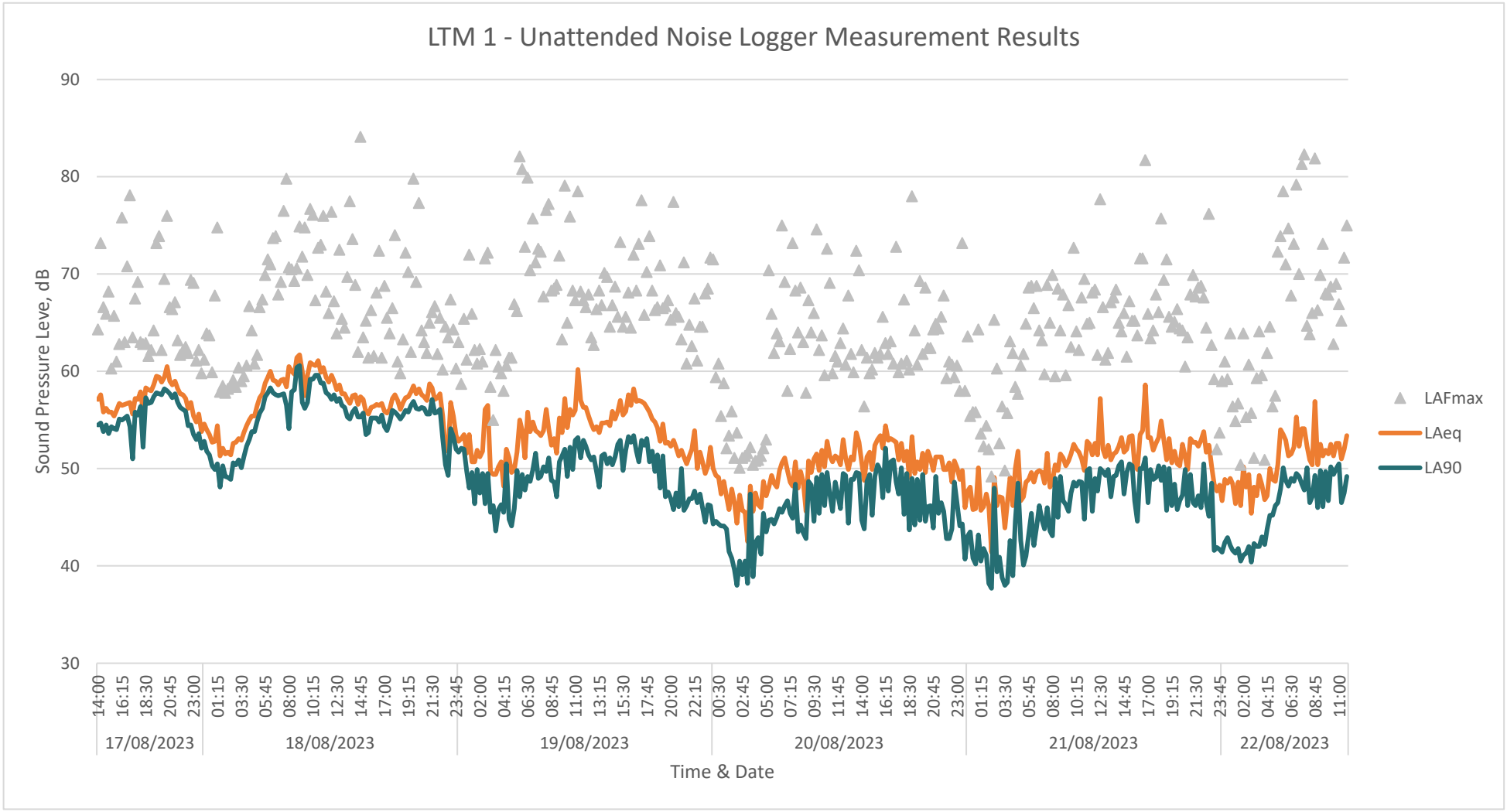
"Where possible, measure the background sound level at the assessment location(s). If this is not possible measure at an alternative location where the residual sound is comparable to the assessment location(s). A detailed justification for considering this should be reported."

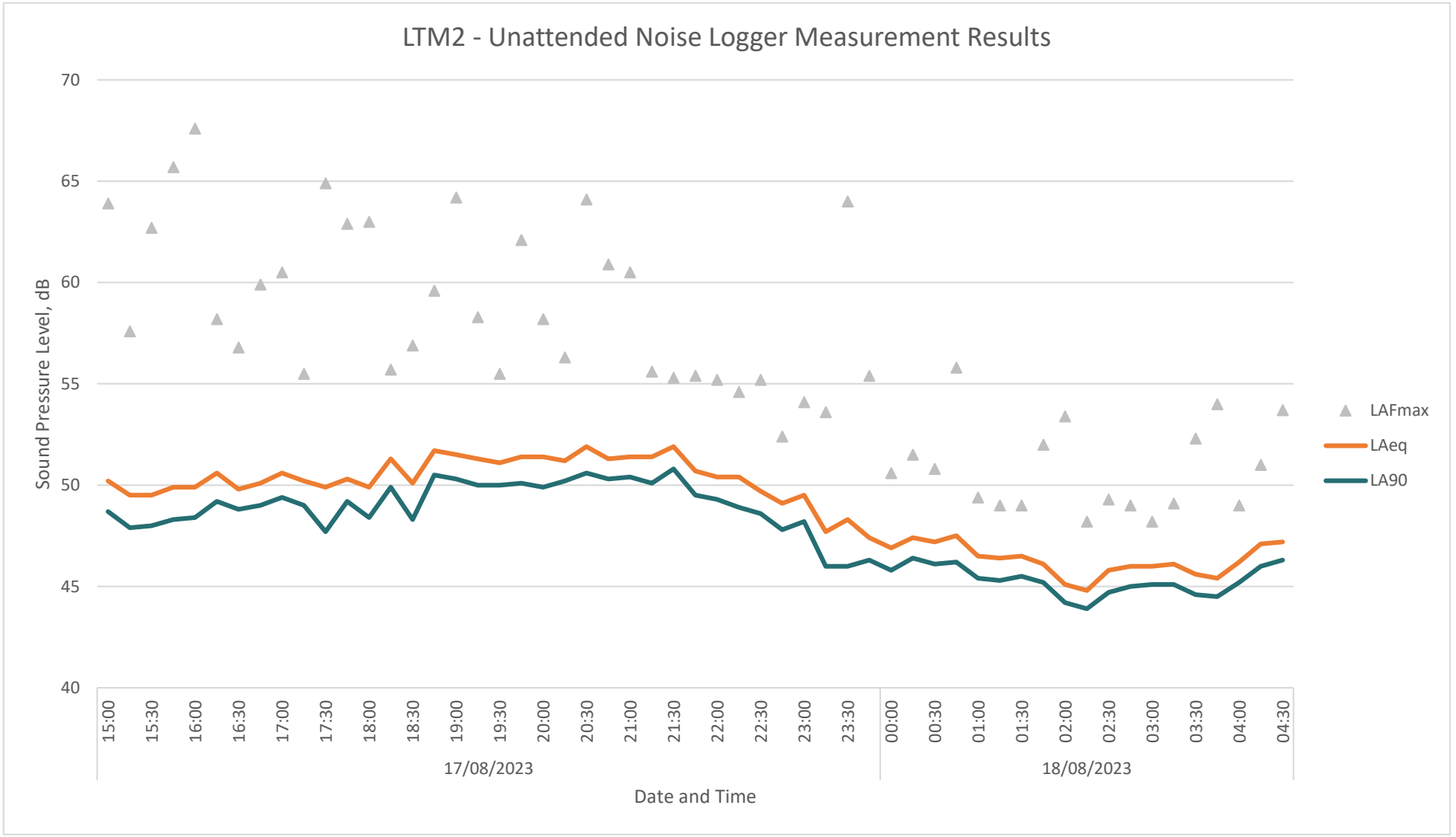
For background sound measurement, the standard says:

"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 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 periods.".

APPENDIX B

LONG TERM NOISE MONITOR TIME HISTORY


LTM 1 - Unattended Noise Logger Measurement Results
Sound Pressure Leve, dB
90
80
70
60
50
40
30
14:00
16:15
18:30
20:45
23:00
01:15
03:30
05:45
08:00
10:15
12:30
14:45
17:00
19:15
21:30
23:45
02:00
04:15
06:30
08:45
11:00
13:15
15:30
17:45
20:00
22:15
00:30
02:45
05:00
07:15
09:30
11:45
14:00
16:15
18:30
20:45
23:00
01:15
03:30
05:45
08:00
10:15
12:30
14:45
17:00
19:15
21:30
23:45
02:00
04:15
06:30
08:45
11:00
17/08/2023
18/08/2023
19/08/2023
20/08/2023
21/08/2023
22/08/2023
Time & Date
LAFmax
LAeq
LA90


LTM2 - Unattended Noise Logger Measurement Results
Sound Pressure Level, dB
70
65
60
55
50
45
40
15:00
15:30
16:00
16:30
17:00
17:30
18:00
18:30
19:00
19:30
20:00
20:30
21:00
21:30
22:00
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23:00
23:30
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01:00
01:30
02:00
02:30
03:00
03:30
04:00
04:30
17/08/2023
18/08/2023
Date and Time
LAFmax
LAeq
LA90

APPENDIX C

SOUND POWER LEVELS FOR MECHANICAL EQUIPMENT INCLUDED IN THE SOUND PLAN MODEL

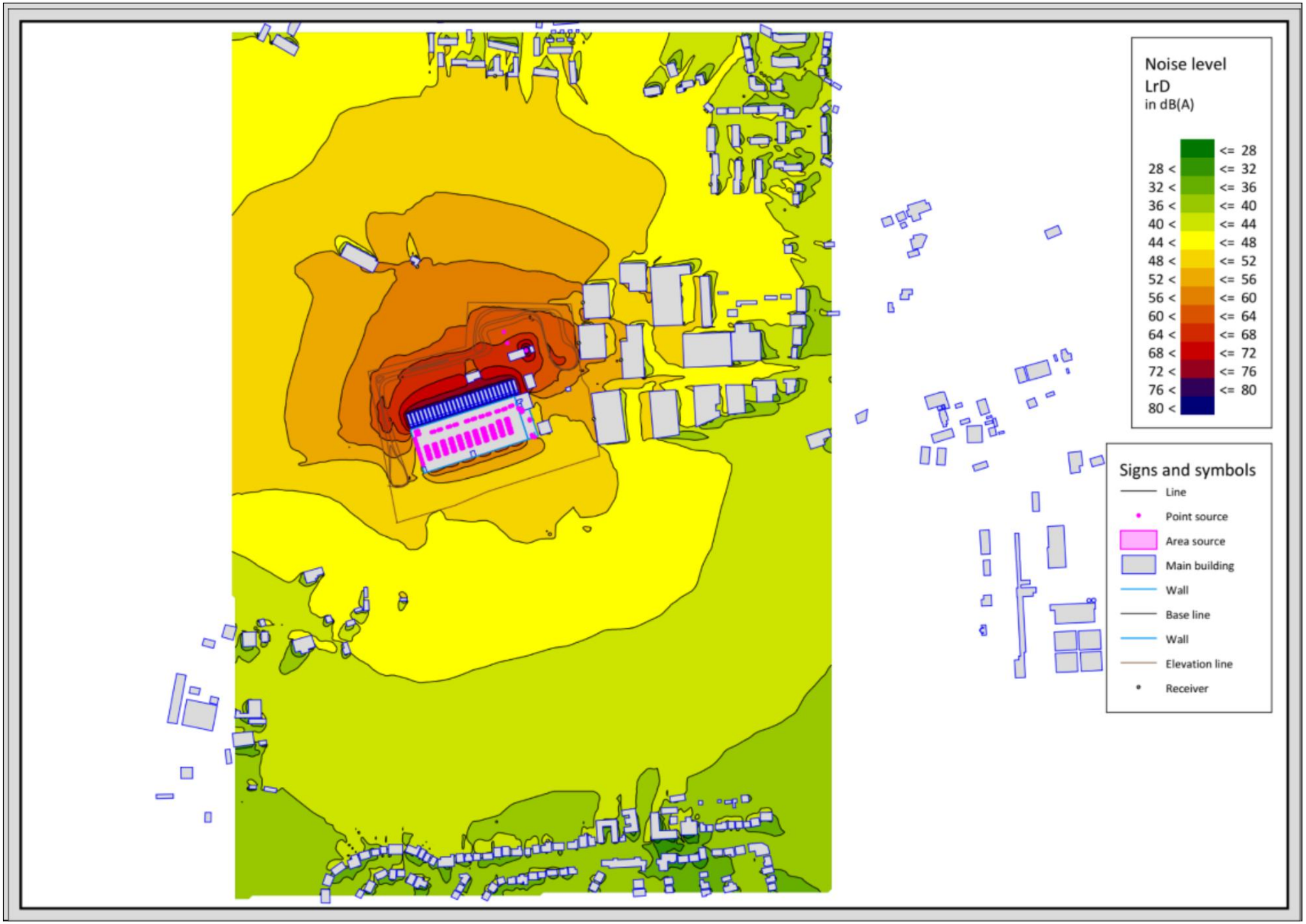
Equipment Sound Power Levels (L_w dB) re 1 x 10^{-12} Watts (supplied or derived from information supplied by Project Mechanical Services Consultant)

Equipment Reference	Source Description	Octave Band Centre Frequency Hz								Overall
		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	Sum (dBA)
1	Data Centre Roof Extract Fan	88	86	79	76	72	69	65	64	79
2	Data Centre Roof Condenser	82	77	74	70	70	67	60	53	74
3	Admin AHU FAI	58	68	51	52	47	45	44	41	56
4	Admin AHU Exhaust	73	81	76	84	85	81	80	71	89
5	Admin Condenser	87	86	84	81	80	78	78	73	86
6	Data Centre AHU Louvre	71	80	60	38	24	34	40	38	64
7	Generator - Sides	78	86	82	88	91	90	84	81	95
8	Generator - Rear Intake	92	100	89	78	73	72	81	89	91
9	Generator - Front	84	91	91	87	84	82	78	76	90
10	Generator - Solid Roof	55	72	71	85	91	90	87	80	95
11	Generator - Discharge Stack	103	115	99	76	73	71	78	104	105
12	Generator - Exhaust Outlet	57	73	86	87	89	89	88	77	95
13	Substation	45	93	45	35	35	35	35	35	77
14	Admin Generator - Sides	78	86	82	88	91	90	83	81	95
15	Admin Generator - Rear Intake	91	99	89	78	73	21	80	89	91
16	Admin Generator - Front	84	91	91	87	83	82	78	76	90
17	Admin Generator - Solid Roof	55	72	72	85	91	90	87	80	96
18	Admin Generator - Roof Discharge	110	105	98	94	92	91	87	75	98
19	Admin Generator - Exhaust Outlet	79	85	90	86	84	83	83	74	91
20	HV Generator - Sides	101	101	87	84	82	81	77	80	90
21	HV Generator - Ends	105	105	91	88	86	85	81	84	94
22	HV Generator - Roof	104	104	90	87	85	84	80	83	93
23	HV Generator - Exhaust Outlet	110	105	98	94	92	91	87	75	98

APPENDIX D

NOISE CONTOUR PLOTS FOR EACH OPERATIONAL SCENARIO

EMERGENCY BACK-UP GENERATOR NOISE LEVELS – SINGLE GENERATOR TESTING NOISE CONTOUR



EMERGENCY BACK-UP GENERATOR NOISE LEVELS- FULL EMERGENCY CONDITION NOISE CONTOUR