



Moxy Hotel, Plymouth
Noise impact assessment – Application No. 23/01432/FUL

9055.4

15th December 2023

Revision A



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2 Summary

- 2.1 This report has been prepared in support of a Planning Application for an emergency generator at the Moxy Hotel, Plymouth.
- 2.2 Background sound levels have been taken from a previous noise assessment for the site.
- 2.3 Plant details have been provided by the client. Source noise levels are calculated based on the provided on-time of a 15-minute maintenance test once per week during daytime hours.
- 2.4 Noise emission from the proposed plant has been determined and noise propagation modelled with proprietary software CadnaA.
- 2.5 The potential noise impact is calculated and rated in accordance with BS 4142.
- 2.6 Based on current proposals, the rated plant sound impact is calculated to be 2 dB above the background sound level.
- 2.7 Considering the context of the emergency use and weekly maintenance test operation, it is considered the BS 4142 assessment results indicate the likelihood of low impact. This impact is considered to be below a LOAEL in alignment with the NPSE aims.

3 Introduction

- 3.1 Apex Acoustics has been commissioned to undertake a noise assessment to support Planning Application Ref. 23/01432/FUL for the fitting of a diesel generator externally to the building of the Moxy Hotel site, Millbay Road, Plymouth, PL1 3LH.
- 3.2 The generator is to supply the sprinkler system of the hotel in the event of a fire or power outage and is ran weekly for a maintenance test.
- 3.3 The scope of our instruction includes:
- Use previously measured noise survey data collected by others.
 - Analysis of proposed source noise levels, using data provided by the client.
 - Calculate noise propagation using proprietary noise modelling software to the noise sensitive receptors and assess the rating level of the sound in accordance with BS 4142.
 - Advise on a scheme for noise mitigation to satisfy Local Authority requirements.
- 3.4 The Noise Sensitive Receptors (NSRs) are identified as the development to the immediate north-west of the hotel site (22/02109/FUL) and the development of town-houses to the immediate south east of the hotel site (18/0104/OUT).
- 3.5 The location of the NSRs and the location of the generator are shown in Figure 1.

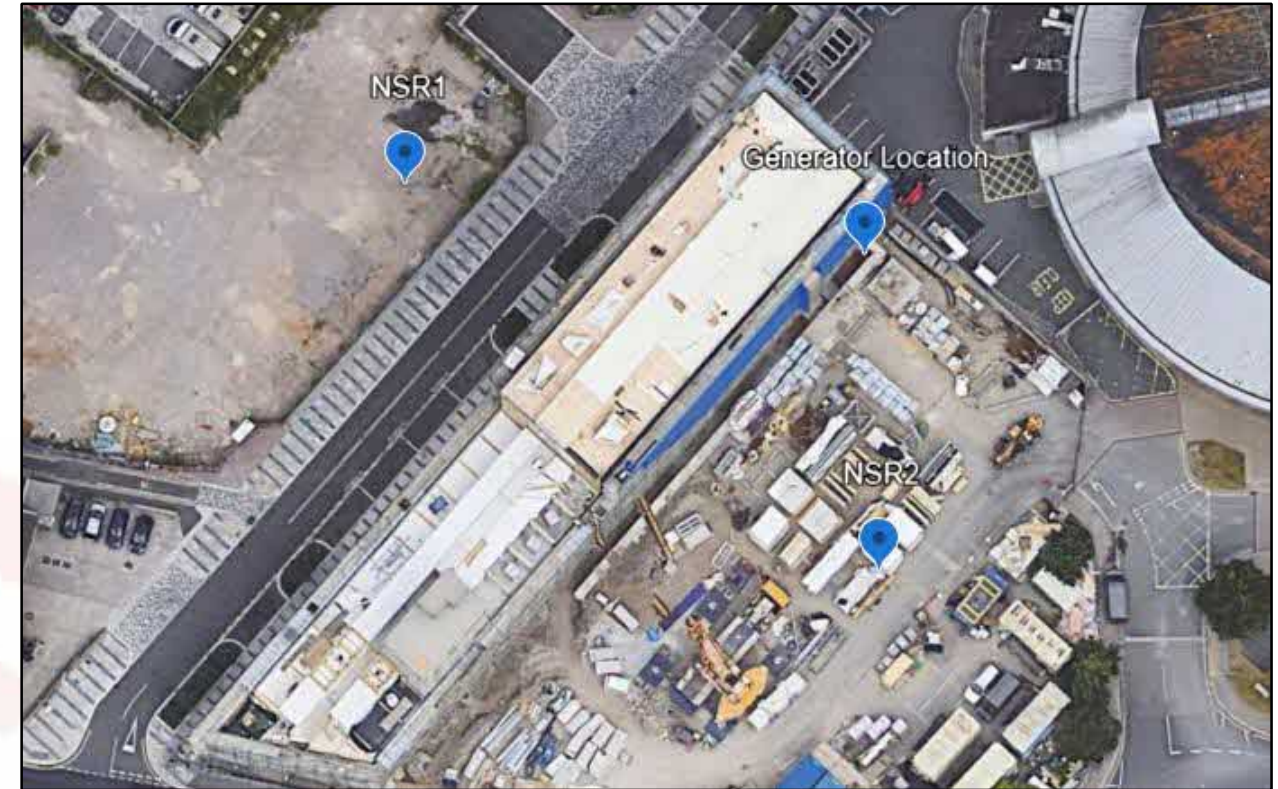


Figure 1: NSR and generator locations, indicated by markers

4 Planning policy and noise criteria

4.1 National Planning Policy Framework (NPPF)

4.2 The National Planning Policy Framework (NPPF) Reference 2, sets out the Government’s planning policies for England and how these should be applied. It provides a framework within which locally-prepared plans for housing and other development can be produced. In respect of noise, Paragraph 174, 185 and 187 of the NPPF states the following:

4.3 Paragraph 174:

“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...”

4.4 Paragraph 185:

“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 life⁶⁵ [See Explanatory Note to the Noise Policy Statement for England];
- 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;

4.5 Paragraph 187:

“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. “

4.6 Noise Policy Statement for England (NPSE)

4.7 The Noise Policy Statement for England, Reference 3, states three policy aims as follows:

“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.”

4.8 The NPSE defines adverse noise impact as follows:

No Observed Effect Level (NOEL)

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

Lowest Observed Adverse Effect Level (LOAEL)

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

Significant Observed Adverse Effect Level (SOAEL)

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

4.9 The first two aims of the NPSE require that no significant adverse impact should occur and that, where a noise level which falls between a level which represents the lowest observable adverse effect and a level which represents a significant observed adverse effect, then according to the explanatory notes in the statement:

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

4.10 Planning Practice Guidance – Noise

4.11 Further Government guidance on how planning can manage potential noise impact in new development is outlined in Planning Practice Guidance (PPG-N) notes on the Government website: www.gov.uk/guidance/noise--2

4.12 BS 4142

4.13 BS 4142, Reference 1, defines an assessment method to quantify the potential level for adverse impact from commercial and / or industrial noise sources impacting upon sound sensitive receptors i.e. residential development.

4.14 The method provides an initial estimate of the impact significance by comparing the Rated noise against the background sound levels, as summarised below:

- 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 + 5dB 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 sources having a low impact, depending on the context.

4.15 With regards to context, BS 4142 notes that where the initial estimate of the impact needs to be modified due to the context, all pertinent factors should be taken into consideration, including the absolute level of the sound:

“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”.

4.16 The terminology used in BS 4142 to describe the various levels of adverse impact is consistent with the terminology used in the NPPF, NPSE and PPG-N.

4.17 NPPF states:

“...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.”

4.18 Therefore, where an adverse impact is identified an acoustic design process is required to demonstrate how the risk of adverse impact can be mitigated and minimised in the finished development.

5 Existing acoustic environment

5.1 The existing acoustic environment was previously measured by others, Reference 4. The provided results at Position L1 in the Reference 4 report are shown in Table 1

Period	L _{A90} (dB)
Daytime	58
Night time	49

Table 1: Background sound levels taken from ACT Acoustics 2018 noise report

6 Noise sources

6.1 Proposed plant and associated noise levels

6.2 The mechanical plant is assessed based on plant details supplied by the mechanical engineers.

6.3 The location of the all the units have been taken from the mechanical engineers' drawings, Reference 5.

6.4 The proposed plant is understood to comprise of that summarised in Table 2.

Plant	Manufacturer	Model	No. proposed
Generator	Kohler	J130 Industrial Diesel Generator Set	1

Table 2: Proposed plant

6.5 Manufacturer supplied noise levels are shown in Table 3.

Plant	Data type	dB(A)
Generator	L _w	96

Table 3: Manufacturers noise levels

6.6 If plant emitting higher noise levels than those accounted for in this report is proposed, or additional plant also proposed, the impact should be reassessed to check compliance with the Planning Condition limits.

6.7 Operation times

6.8 The generator is understood to be for emergency use. The client has advised that the generator is ran for a maintenance test once a week during daytime hours for 10-15 minutes. This is typically done on weekdays around midday when hotel guests are at a minimum.

6.9 On this basis the source noise level is reduced by 6 dB as an on-time correction of 15 minutes out of every 60-minute daytime assessment period.

6.10 The assessment is not carried out during the night-time.

6.11 Noise transmission and propagation

6.12 Noise transmission and propagation is modelled to the NSR based on the noise source data detailed, using proprietary software, CadnaA, Reference 6.

6.13 This models noise propagation outdoors according to ISO 9613, Reference 7.

6.14 The model parameters and assumptions are summarised in Appendix A.

7 Assessment results

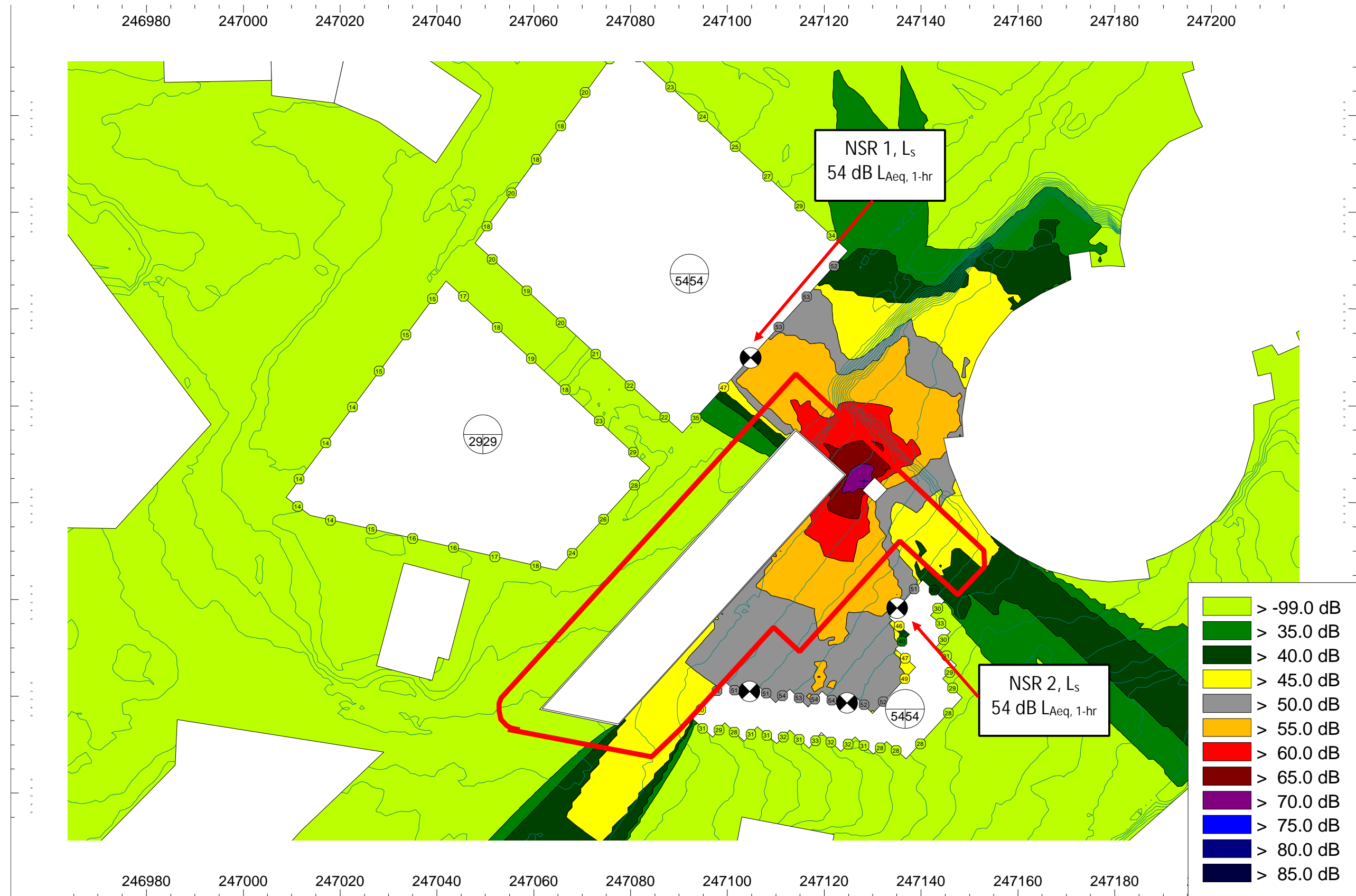


Figure 2: Sound contours at 4 m, showing the calculated specific sound level, $L_{Aeq, 1 hr}$ based on current proposals

Parameter	Daytime assessment	Relevant clause of BS 4142	Commentary
Background sound level	58 dB $L_{A90, 1-hr}$	8.1.2	Taken from previous assessment carried out by others.
Specific sound level L_s , due to all sources for the required assessment interval	54 dB $L_{Aeq, 1-hr}$	7.2 7.3.6	The on-time for the sources during the assessment period are discussed in Section 6.7. The calculated L_s contours across the site during the assessment period are shown in Figure 2; the L_s assessed is the highest calculated level at NSR 2.
Acoustic feature correction	6 dB	9.2	A subjective assessment to determine acoustic features is undertaken, a 3 dB penalty is applied for intermittency on the basis the generator runs infrequently. No tonal data is available for the generator but it is considered a source of this type is likely to have some tonal content and a 3 dB penalty is applied. Tonality – 3 dB; Impulsivity – 0 dB; Intermittency – 3 dB; Other – 0 dB;
Rating level, $L_{Ar,Tr}$	60 dB		
Uncertainty of assessment		10	The background noise level is taken from a report issued by others and it is considered there may therefore be an uncertainty associated with this. The source noise data for the generator is provided as a single-figure value. This has been modelled at the location of the exhaust flue opening. This is considered a worst-case assumption on the basis that the casing and intake of the generator have screening to the NSRs. An assumption has been made as to the tonality of the generator.
Excess of $L_{Ar,Tr}$ over background sound level	+ 2 dB	11	The initial assessment indicates the + 2 dB difference between the $L_{Ar,Tr}$ and L_{A90} is below the level that would be an indication of an adverse impact, dependent on the context. On the basis that the plant is for emergency use and runs for a small window on a weekly basis, with consideration of the context the assessment is thought to indicate a low impact.

Table 4: BS 4142 assessment results, based on current proposals

8 Conclusion

- 8.1 This report has been prepared in support of a Planning Application for an emergency generator at the Moxy Hotel, Plymouth.
- 8.2 Background sound levels have been taken from a previous noise assessment for the site.
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9 References

- 1 BS 4142 2014: A1+2019, Method for rating and assessing industrial and commercial sound.
- 2 National Planning Policy Framework, Ministry of Housing, Communities & Local Government, September 2023.
- 3 Noise Policy Statement for England, Department for Environment, Food and Rural Affairs, March 2010.
- 4 ACT Acoustics, Noise impact assessment for Millbay Road Hotel and Residential Development, Ref 180608-1526, June 2018.
- 5 Mechanical engineers drawing, Cumming and co, PL-04-04 Moxy Hotel Spinkler Generator Elevation, 20th November 2023.
- 6 CadnaA environmental noise modelling software, version 2017, Datakustik GmbH.
- 7 ISO 9613: Acoustics - Attenuation of sound during propagation outdoors.
- 8 Architects drawings, Cummings and co, MT008-CUM-10-ZZ-DR-A-004 Rev 1 June 2020.

Appendix A Noise transmission and propagation

A.1 Noise transmission and propagation is modelled using proprietary software, CadnaA. This models noise propagation outdoors according to ISO 9613. The parameters used, source of data and details are described in Table 5.

Parameter	Source	Details
Model dimensions	Google Earth	British Transverse Mercator coordinates
Site location and layout	Architects' drawings	Architects' drawings, Reference 8
Topography	DEFRA	LIDAR DTM 2022 1 m x 1 m
Building heights – proposed buildings	Drawings	Architects' drawings
Building heights – outside of site	Site observations and Google Street view	3 m per storey + 3 m roof
Receptor positions	Site observations and Google Street view	On the NSR façade closest to the source at a height of 4 m to represent first floor window heights respectively
Building and barrier absorption coefficient	ISO 9613-2	0.21 to represent a reflection loss of 1 dB
G, Ground factor	ISO 9613-2	Hard ground, G = 0
Max. order of reflections	Apex Acoustics	Three

Table 5: Modelling parameters and assumptions

- A.2 A plan view and a 3D perspective of the CadnaA model are shown in Figure 3 and Figure 4 respectively.
- A.3 NSR receivers are positioned as shown by the black and white circles in Figure 3.
- A.4 A point source is used to represent the generator noise source. The point source is located at the position of the generator exhaust flue exit which is considered to represent the worst-case for the distribution of the sound power over the source area.

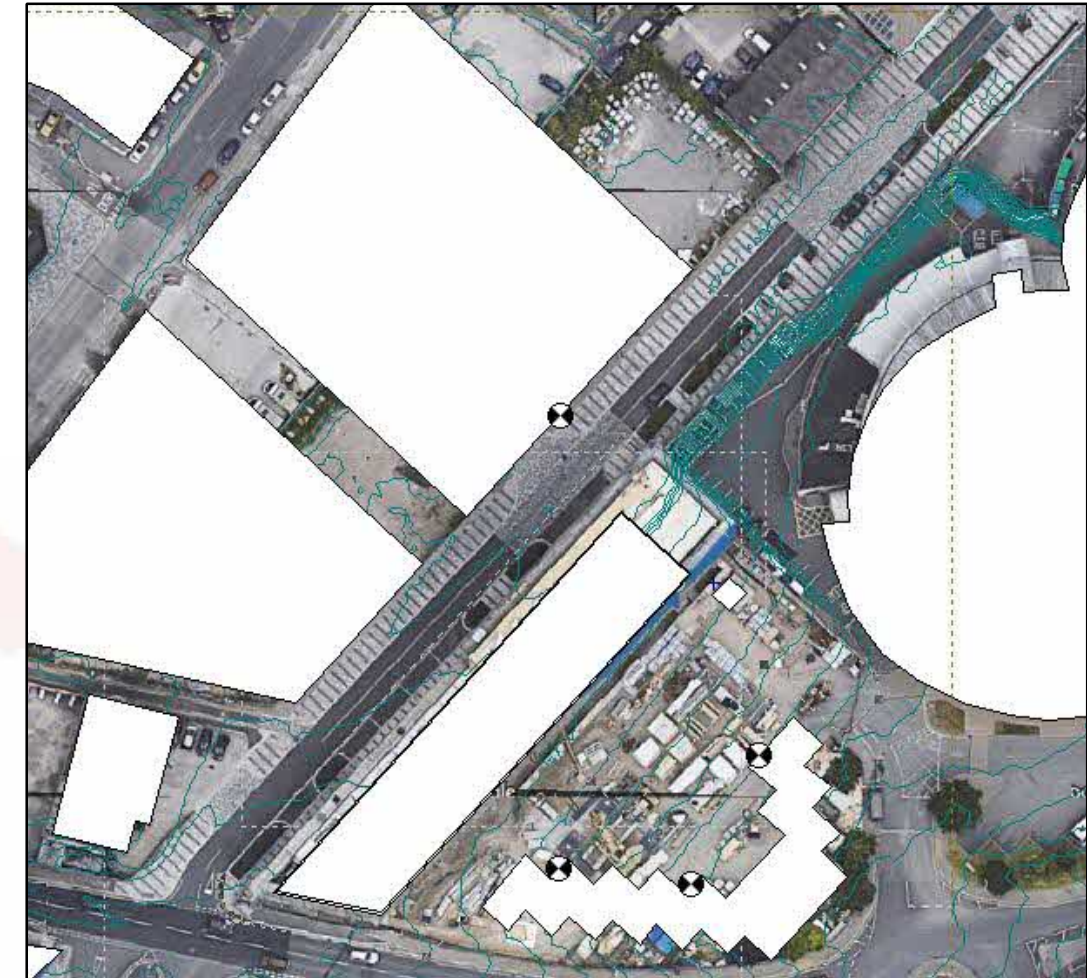


Figure 3: Plan view of the CadnaA model

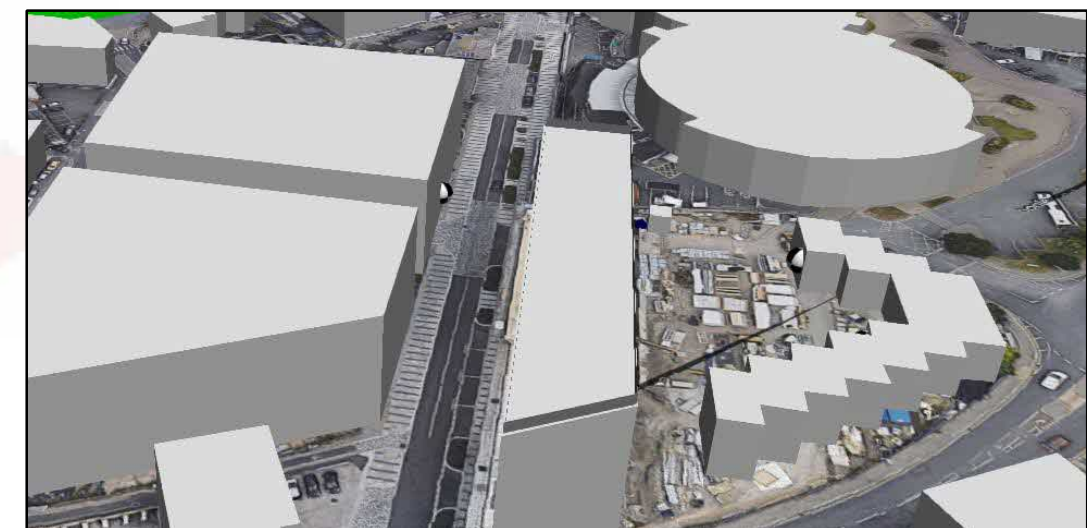


Figure 4: 3D view of the CadnaA model

Appendix B Professional qualifications and competence

- B.1 All Apex Acoustics consultants work under the close supervision of a member who holds qualification in acoustics and is a member of the IOA.
- B.2 This can be verified by searching the Institute of Acoustics' list of Members, available here, with the surname of the consultant.
<http://www.ioa.org.uk/membership-check>
- B.3 Apex Acoustics is a member of the Association of Noise Consultants (ANC). The ANC is a trade organisation which seeks to raise the standards of acoustic consultancy and as such there are barriers to entry to ensure member's competency.
- B.4 This report has been completed and checked by an appropriately qualified and experienced acoustic consultant.

