The Astley
61 Houldsworth Street
Manchester

Plant Sound Assessment Report
1432/PSA1
Revision 1

1 October 2025

For:

Harris Infrastructure Advisory Ltd
Unit 1.02D
The Boat Shed
22 Exchange Quay
Salford
M5 3EQ

LIGHTHOUSE ACOUSTICS

2nd Floor 3 Hardman Square
Spinningfields Manchester M3 3EB

☏ 0161 457 0515 ▪ 07415 151 901
✉ Enquiry@LighthouseAcoustics.co.uk
🌍 www.LighthouseAcoustics.co.uk

Plant Sound Assessment Report
1432/PSA1 Revision 1

Contents

		Page
1.0	Introduction	1
2.0	Objectives	1
3.0	Site Description	1
4.0	Local Authority Requirements	2
5.0	Environmental Sound Survey	3
6.0	BS 4142: 2014	5
7.0	Atmospheric Plant Sound Emissions Impact Assessment	6
8.0	Context	9
9.0	Uncertainty	10
10.0	Conclusions	10

Appendices

Time History Graph 1432/THG1

This report (including any enclosures and attachments) has been prepared by Lighthouse Acoustics with reasonable skill and care in accordance with generally accepted acoustic principles and the terms agreed between Lighthouse Acoustics and our Client. Any information provided by third parties and referred to herein may not have been checked or verified by Lighthouse Acoustics unless expressly stated otherwise. This document contains confidential information and no part of this report should be reproduced, distributed or communicated to any third party unless Lighthouse Acoustics provide express prior written consent. We do not accept any liability if this report is used for an alternative purpose from which it is intended, nor to any third party in respect of this report. Where a sound survey has been undertaken, this report is based on the sound climate at the site at the time of the survey and no warranty is given as to the possibility of changes at differing times.

Lighthouse Acoustics is the trading name of Lighthouse Enterprises UK Limited
Registered Office: 2nd Floor 3 Hardman Square Spinningfields Manchester M3 3EB
Registered in England and Wales Company No. 09085491

1.0 Introduction

Lighthouse Acoustics has been appointed by Harris Infrastructure Advisory Ltd to undertake an assessment of atmospheric noise emissions from the proposed 1No. emergency standby generator at The Astley, 61 Houldsworth Street, Manchester to the nearest existing noise sensitive receptor.

The survey methodology, results and assessment are presented in this report.

2.0 Objectives

To establish the Local Authority's plant sound requirements for the proposed 1No. emergency standby generator.

To visit site to undertake a detailed environmental sound survey in order to establish existing environmental sound levels at the nearest noise sensitive receptors.

To undertake an assessment of atmospheric plant sound emission levels from proposed the 1No. emergency standby generator to the nearest noise sensitive receptor and to propose mitigation measures where required in order to achieve the requirements of the Local Authority.

3.0 Site Description

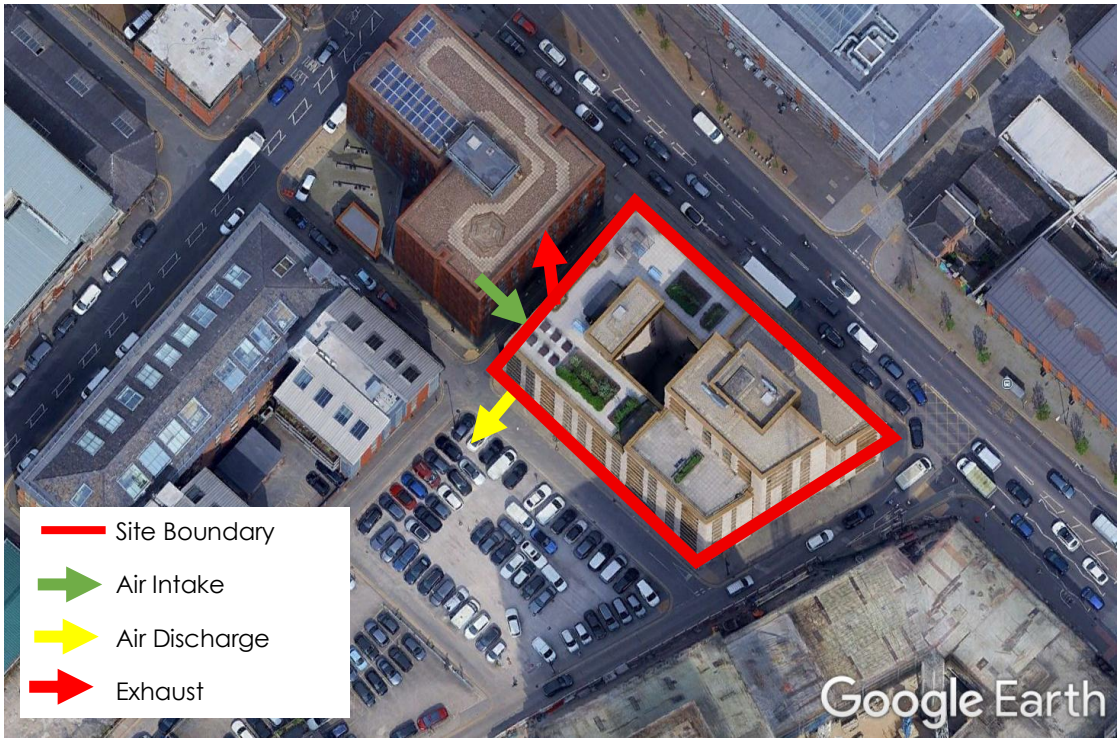
The Astley, 61 Houldsworth Street, Manchester comprises a 15 storey detached residential building with back of house and administration spaces at ground floor level.

The building is bound by Great Ancoats Street (A665) to the north east, Port Street to the south east, Houldsworth Street to the south west and Dean Street to the north west.

The proposed 1No. emergency standby generator is to be situated internally at ground floor level with the air intake louvre situated in the north west façade, the air discharge louvre situated in the south west facade and the exhaust penetrating the north west façade and terminating vertically.

The nearest noise sensitive receptors are understood to be the residential flats situated to the west (The Wentwood) and north west (Oxid House) opposite Dean Street.

The site plan overleaf indicates the extent of the site and the surrounding environment.



Site plan indicating the extent of the site and the surrounding environment.

4.0 Local Authority Requirements

With regard to noise and vibration from fixed plant/equipment, Section 3.7.1.5 of the Planning & Noise Technical Guidance document (dated October 2022) produced by Manchester City Council states the following:

> *"The noise assessment should be based on BS 4142: 2014 and any application for fixed plant, equipment or machinery must demonstrate that:*
>
> ***Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location."***

In addition, it is understood that Manchester City Council accept that cumulative atmospheric plant noise emissions from proposed emergency plant items (e.g. standby generator, smoke extract fans) shall achieve a rating level of up to 5dB above the typical background (L_{A90}) level at the nearest noise sensitive location. This is on the basis that maintenance testing of the proposed emergency plant items is limited to weekday daytime hours only.

5.0 Environmental Sound Survey

5.1 Measurements

Automated environmental sound measurements were undertaken from 11:00 hours on Tuesday 24 June 2025 to 11:00 hours on Wednesday 25 June 2025. During this period the L_{Amax}, L_{Aeq} and L_{A90} sound pressure levels were measured continuously over 15 minute periods.

5.2 Weather Conditions

At the start of the survey period there was a gentle south westerly breeze (<5.0m/s) and the sky was overcast. There was no rainfall and road surfaces were dry. The temperature was approximately 19°C.

At the end of the survey period there was a light westerly breeze (<3.0m/s) and the sky was scattered cloud. There was no rainfall and road surfaces were dry. The temperature was approximately 17°C.

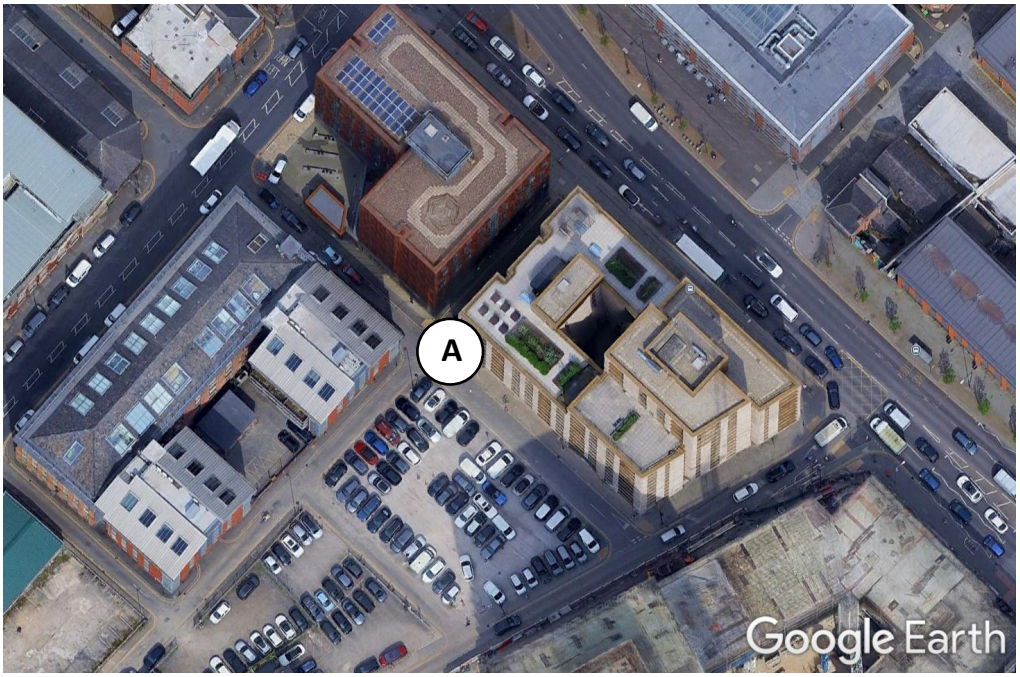
Based on publicly available weather data for the survey period it is understood that weather conditions remained similar for the duration of the survey with no periods of significant rainfall or strong breezes. The weather conditions during the survey period are therefore considered to be suitable for undertaking measurements of sound levels.

5.3 Measurement Position

Environmental sound levels were measured at a single position on-site as described in the table below.

Position	Description
A	Microphone situated on the western corner of the building at 1st floor level overlooking Houldsworth Street & Dean Street.

The measurement position is shown on the site plan below.



Site plan showing measurement position

Measurement Position A was selected in order to assess typical environmental sound levels incident upon the facades of the nearest noise sensitive receptors.

5.4 Equipment

The following equipment was used to undertake the environmental sound survey.

Equipment	Manufacturer	Model	Serial No.	Calibration Date
Class 1 Sound Level Meter	Casella	633C	0721320	07/11/2023
Preamplifier	Casella	495	001414	07/11/2023
Microphone	Casella	251	1025	07/11/2023
Class 1 Sound Calibrator	Casella	120/1	3864878	31/10/2024
Environmental Noise Kit	Casella	6847	-	-
Microphone Extension Cable	Casella	C6717/5	-	-
Weather Protection System	Casella	6737	-	-

Field calibration checks were performed on the sound level meter prior to and on completion of the survey and were found to be within acceptable tolerance limits.

5.5 Results

5.5.1 Time History Graph

The results of the environmental sound survey are presented on Time History Graph 1432/THG1 enclosed at the rear of the report.

5.5.2 L_{A90} Background Sound Levels

The lowest representative $L_{A90,15min}$ background sound levels measured over the daytime and night-time periods are detailed in the table below.

Position	Lowest Representative $L_{A90,15min}$ Background Sound Level (dB)	
	Daytime (07:00-23:00)	Night-time (23:00-07:00)
A	52	45

5.5.3 Discussion of Sound Climate

At the start and end of the survey period the dominant sound source was noted to be road traffic along the surrounding road network.

Whilst we are unable to comment on dominant sound sources or individual sound events during the survey period, based on the results of the environmental sound survey it is likely that road traffic sound remained the dominant sound source.

6.0 BS 4142: 2014

BS 4142: 2014 "Methods for rating and assessing industrial and commercial sound", describes methods for rating and assessing sound of an industrial and/or commercial nature, which includes:

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

Sound of an industrial and/or commercial nature does not include sound from the passage of vehicles on public roads and railway systems.

It should be noted that the determination of noise amounting to a nuisance is beyond the scope of BS 4142.
The likely impact is indicated by subtracting the existing background sound level from the rating level of the industrial and/or commercial sound. The standard states that:

"a) Typically, the greater this difference, the greater the magnitude of the impact.

b) A difference of around +10dB 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 source having a low impact, depending on the context.

Note 2 Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."

The industrial and/or commercial sound is expressed as the specific sound level and given as a $L_{Aeq,Tr}$ sound level. Should the specific sound level exhibit any acoustic features (i.e. tonality, irregularity or impulsiveness) a character correction is applied. The rating level is the specific sound level with character correction applied (if applicable) and is given as a $L_{Ar,Tr}$ sound level.

The existing background sound level is given as a L_{A90}, T sound level. The reference time interval, T_r, is 1 hour during the daytime period (07:00 to 23:00 hours) and 15 minutes during the night-time period (23:00 to 07:00 hours).

7.0 Atmospheric Plant Sound Emissions Impact Assessment

7.1 Plant Sound Data

Atmospheric building services sound levels have been assessed based on the manufacturers sound data for the proposed 1No. emergency standby generator which indicates octave band sound data as detailed in the table below.

Emergency Standby Generator – Relkho 165 John Deere 6068-HFG 20 Including Silencer

Air Inlet Sound Pressure Level at 1m (dB) at Octave Band Centre Frequency (Hz)								dBA
63	125	250	500	1k	2k	4k	8k	
68	64	50	28	22	22	18	13	50

Emergency Standby Generator – Relkho 165 John Deere 6068-HFG 20 Including Silencer

Air Discharge Sound Power Level at 1m(dB) at Octave Band Centre Frequency (Hz)								dBA
63	125	250	500	1k	2k	4k	8k	
63	60	47	35	30	28	25	22	46

Emergency Standby Generator – Relkho 165 John Deere 6068-HFG 20 Including Silencer

Exhaust Sound Pressure Level at 5m (dB) at Octave Band Centre Frequency (Hz)								dBA
63	125	250	500	1k	2k	4k	8k	
68	47	32	30	27	26	23	21	43

Whilst it is not possible to assess plant irregularity or impulsiveness based on manufacturer's sound data, BS 4142: 2014 provides an objective method for assessing the audibility of tones in sound. The one-third octave method states that if the level of a one third octave band exceeds the level of both adjacent one third octave bands by the following amounts, then a tonal component may be identified as present:

- 15dB in the low-frequency one-third-octave bands (25Hz to 125Hz);
- 8dB in the mid-frequency one-third-octave bands (160Hz to 400Hz);
- 5dB in the high-frequency one-third-octave bands (500Hz to 10kHz).

However, one third octave band sound data is rarely available from manufacturers as is the case in this instance.

By applying the same principal to the octave band sound data in the table above, a review indicates that these items are unlikely to exhibit a tonal component. As such, no character correction has been applied to the specific sound level for these items.

Should one third octave band sound data become available a revised assessment should be undertaken.

7.2 Operating Hours

It is understood that the proposed 1No. emergency standby generator has the potential to operate at any time 24 hours per day 7 days a week during power outage to the building and that maintenance testing will be limited to weekday daytime hours only.

In order to undertake a worst case assessment, it is assumed that the proposed 1No. emergency standby generator operates for the full 1 hour daytime and 15 minute night-time assessment periods.

7.3 Plant Location

The location of the proposed 1No. emergency standby generator has been taken from the following drawing.

Author	Drawing No.	Revision	Date
Kitson Architecture Ltd	635-004	A	11.08.25

This indicates that the proposed 1No. emergency standby generator is to be situated internally at ground floor level with the air intake louvre situated in the north west façade, the air discharge louvre situated in the south west facade and the exhaust penetrating the north west façade and terminating vertically.

7.4 Attenuation Measures

Should any exhaust silencers be situated external to the plantroom the exhaust ductwork between the external exhaust silencer and penetration of the building should be acoustically lagged comprising 50mm (min.) mineral wool slab (min. 16kg/m^3) wrapped with a polymeric heavy mass barrier material of at least 10kg/m^2.

The existing glazing to the south west façade which forms the south west wall of the generator plantroom shall be replaced with a cavity masonry wall comprising an external leaf of brickwork and an internal leaf of blockwork (min. 100mm dense blockwork ≥1900kg/m^3).

The new wall which forms the south east wall of the generator plantroom to the cycle store shall comprise a blockwork wall (min. 140mm dense blockwork ≥1900kg/m^3).

The plantroom door situated within the new south east wall of the generator plantroom to the cycle store shall achieve a sound insulation rating of R_w ≥45dB.

7.5 Nearest Noise Sensitive Receptors

The nearest noise sensitive receptors to the proposed 1No. emergency standby generator are understood to be the residential flats situated to the west (The Wentwood) and north west (Oxid House) opposite Dean Street. The table below details the approximate distance between the proposed 1No. emergency standby generator and the window of the nearest noise sensitive receptors.

Nearest Noise Sensitive Receptor	Plant Item	Approximate Distance (m)
South West	Air Discharge	10
North West	Air Inlet & Exhaust	5

7.6 Calculation

The assessment has been undertaken in accordance with generally accepted acoustic principles for building services plant items and includes corrections for duct dimensions, grille dimensions, end reflections, directivity and distance loss.

7.7 Assessment

The results of the assessment are summarised in the following tables.

Nearest Noise Sensitive Receptor	Rating Level $L_{r,T}$ at Receptor (dB)	Lowest Representative Day/Night Background Sound Level $L_{A90,15min}$ at Receptor (dB)	Difference Day/Night (dB)	BS 4142: 2014 Likely Impact
Residential window to South West	31	52/45	-21/-14	Low Impact

The assessment indicates that atmospheric plant sound emissions from the proposed 1No. emergency standby generator are likely to have a low impact at the nearest noise sensitive receptor with the incorporation of the proposed attenuation measures. The requirements of the Local Authority are also achieved.

Nearest Noise Sensitive Receptor	Rating Level $L_{r,T}$ at Receptor (dB)	Lowest Representative Background Sound Level $L_{A90,15min}$ at Receptor (dB)	Difference (dB)	BS 4142: 2014 Likely Impact
Residential window to North West	50	52/45	-2/+5	Low/Adverse Impact

The assessment indicates that atmospheric plant sound emissions from the proposed 1No. emergency standby generator are likely to have a low/adverse impact at the nearest noise sensitive receptor with the incorporation of the proposed attenuation measures. The requirements of the Local Authority are also achieved.

8.0 Context

BS 4142: 2014 states the following with regard to the context of the industrial/commercial sound:

> *"The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context."*

In order to place the industrial/commercial sound in context the following points have therefore been considered:

- Maintenance testing of the proposed 1No. emergency standby generator will be limited to weekday daytime hours only.
- Proposed industrial sound is a constant broadband sound;

- BS 4142:2014 only uses outdoor sound levels to assess the likely effects of sound.

Based on the above, it is considered that the proposed industrial/commercial sound is likely to have a have a low impact at the nearest noise sensitive receptors. This conclusion is reached by professional judgement, taking context into consideration.

9.0 Uncertainty

Weather conditions during the survey period are considered to be suitable for undertaking measurements of sound levels. The measurement position was selected that was representative of the nearest noise sensitive receptor. Measurements were undertaken over a 24-hour period to establish the lowest representative environmental sound levels. Whilst environmental sound levels have the potential to be lower than those measured on some occasions, they are likely to be similar to those measured for the vast majority of the time. As such, uncertainty in the survey methodology is considered to be of marginal significance.

The survey was undertaken using Class 1 equipment which had been calibrated within the required intervals. In addition, field calibration checks were performed on the sound level meters prior to and on completion of the survey and were found to be within acceptable tolerance limits. As such, uncertainty in the survey equipment is considered to be of negligible significance.

Assessment data including sound data and operating hours has been based on manufacturers sound data, measured sound data and information received from others. A character correction has been applied as deemed appropriate. As such, uncertainty in the assessment data is considered to be of marginal significance.

Calculations have been undertaken in accordance with recognised procedures and have been performed in a spreadsheet. As such, uncertainty in the assessment is considered to be of negligible significance.

Based on the above, overall uncertainty in the assessment is considered to be of marginal significance.

10.0 Conclusions

The Local Authority's plant sound requirements for the proposed 1No. emergency standby generator has been established.

A detailed environmental sound survey has been undertaken in order to establish existing environmental sound levels at the nearest noise sensitive receptors.

An assessment of atmospheric plant noise emission levels from proposed the 1No. emergency standby generator to the nearest noise sensitive receptors has been undertaken.

The assessment indicates that atmospheric plant sound emissions from the proposed 1No. emergency standby generator are likely to have a low/adverse impact at the nearest noise sensitive receptors with the incorporation of the proposed attenuation measures and achieve the requirements of the Local Authority.



1432/THG1

The Astley, 61 Houldsworth Street, Manchester

Time History Graph - Tuesday 24 June 2025 to Wednesday 25 June 2025

$L_{Amax,15min}$, $L_{Aeq,15min}$ & $L_{A90,15min}$ Noise Levels at Position A

