

**Bury Old Road
Prestwich
Manchester**

Plant Sound
Assessment Report
1069/PSA1

4 April 2023

For:

Unimore Ltd



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Plant Sound Assessment Report

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1.0 Introduction

Lighthouse Acoustics has been appointed by Unimore Ltd to undertake an environmental sound survey at Bury Old Road, Prestwich, Manchester and to undertake an assessment of atmospheric plant sound emission levels from the proposed 2No. condenser units.

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

2.0 Objectives

To establish the Local Authority's acoustic requirements for the proposed 2No. condenser units.

To visit site to undertake a detailed environmental sound survey in order to establish existing environmental sound levels at the development.

To undertake an assessment of atmospheric plant sound emission levels from the 2No. condenser units to the nearest noise sensitive receptors and to propose mitigation measures where required in order to achieve the requirements of the Local Authority.

3.0 Site Description

The site comprises a former petrol station which has been demolished to make way for the new retail unit and synagogue building. The site is bound by Bury Old Road (A665) to the north east, access road to the south east and residential/commercial properties to the north west.

The proposed 2No. condenser units are situated towards to centre of the south western site boundary at 1st floor level.

The nearest noise sensitive receptors are understood to be the residential properties (Albert Avenue) to the north west of the site.

The site plan below 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

It is understood that Bury Metropolitan Borough Council require that proposed building services items are assessed in accordance with BS 4142:2014 "Methods for rating and assessing industrial and commercial sound" and that the rating level at the nearest noise sensitive receptor should achieve 5dB below the existing background noise level during the period which the proposed building services items are proposed to operate.

5.0 Environmental Sound Survey

5.1 Measurements

Automated environmental sound measurements were undertaken from 11:00 hours on Monday 27 March 2023 to 11:00 hours on Tuesday 28 March 2023. 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 the wind conditions were calm ($<1.0\text{m/s}$) and the sky was scattered cloud. There was no rainfall and road surfaces were dry. The temperature was approximately 8°C .

At the end of the survey period the wind conditions were calm ($<1.0\text{m/s}$) and the sky was overcast. There was no rainfall and road surfaces were dry. The temperature was approximately 7°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 towards the centre of the site at 2.0m above ground level in free field conditions.

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 representative of those at the nearest noise sensitive receptors to the proposed 2No. condenser units.

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	28/09/2021
Preamplifier	Casella	495	001414	28/09/2021
Microphone	Casella	251	1025	28/09/2021
Class 1 Sound Calibrator	Casella	120/1	3864878	27/10/2022
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 1069/THG1 enclosed at the rear of the report.

5.5.2 LA₉₀ Background Sound Levels

The lowest representative daytime, evening and night-time LA_{90,15min} background sound levels measured during the survey period are detailed in the table below.

Position	Lowest Representative LA _{90,15min} Background Sound Level (dB)		
	Daytime (07:00–19:00)	Evening (19:00–23:00)	Night-time (23:00–07:00)
A	53	50	36

5.5.3 Discussion of Sound Climate

At the start and end of the survey period the dominant sound source at Position A was noted to be frequent road traffic along the Bury Old Road (A665).

Whilst we are unable to comment on dominant sound sources or individual sound events during the survey period, based on the surrounding environment it is likely that road traffic 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,T_r} 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_{A,r,T_r} 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 Plant Sound Emission Assessment

7.1 Plant Sound Data

Atmospheric building services sound levels have been assessed based on the manufacturers sound data received for the proposed 2No. condenser units which indicates octave band sound data as detailed in the table below.

J&E Hall JEHR-0113-B1-M-1

Mode	Sound Pressure Level (dB) at 1m at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Standard	-	55	51	45	40	37	28	27	48

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 2No. condenser units have the potential to operate 24 hours a day.

In order to undertake a worst case assessment, it is assumed that the proposed 2No. condenser units will operate for the full 1 hour daytime/evening and 15 minute night-time assessment periods.

7.3 Plant Location

The locations of the proposed 2No. condenser units has been taken from the following drawing.

Author	Drawing No.	Revision	Date
Debtal Architecture	DA14079.2 003	13	08/02/23

This indicates that the proposed 2No. condenser units are situated towards to centre of the south western site boundary at 1st floor level.

7.4 Nearest Noise Sensitive Receptors

It is understood that the nearest noise sensitive receptors to the proposed 2No. condenser units are the residential properties (Albert Avenue) approximately 20m to the north west of the units.

7.5 Assessment

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

Nearest Noise Sensitive Receptor	Descriptor	Period		
		Daytime (07:00–19:00)	Evening (19:00–23:00)	Night-time (23:00–07:00)
Residential properties (St Ronan's Close) to north west	Rating Level $L_{A,r,Tr}$ at Receptor (dB)	28	28	28
	Lowest Representative Background Sound Level $L_{A90,15min}$ at Receptor (dB)	53	50	36
	Difference (dB)	-25	-22	-8
	BS 4142: 2014 Likely Impact	Low Impact	Low Impact	Low Impact

The assessment indicates that the rating level from the proposed 2No. condenser units is 25dB below the daytime, 22dB below the evening and 8dB below the night-time lowest representative background sound levels at the nearest noise sensitive receptors.

This indicates a low impact during the daytime, evening and night-time periods at the nearest noise sensitive receptor depending on the context.

In addition, the daytime, evening and night-time rating levels achieve the requirement of the Local Authority of 5dB below the lowest representative background sound level by 20dB, 17dB and 3dB respectively.

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 sound in context the following points have therefore been considered:

- Proposed industrial sound is a constant broadband sound;
- Proposed industrial sound achieves rating levels of 8dB to 25dB below the lowest representative background sound levels at the nearest noise sensitive receptors;
- 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 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. Measurement positions were selected that were representative of the nearest noise sensitive receptors. 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.

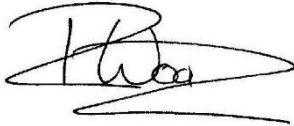
10.0 Conclusion

The Local Authority's acoustic requirements for the proposed 2No. condenser units has been established.

A detailed environmental sound survey has been undertaken in order to establish existing environmental sound levels at the development.

An assessment of atmospheric plant sound emission levels from the proposed 2No. condenser units to the nearest noise sensitive receptor has been undertaken.

The assessment indicates that atmospheric plant sound emissions from the proposed 2No. condenser units are likely to have a low impact at the nearest noise sensitive receptors and achieve the requirements of the Local Authority.

A handwritten signature in black ink, appearing to read 'Robin Wood', with a stylized, sweeping underline.

Robin Wood
LIGHTHOUSE ACOUSTICS

Bury Old Road, Manchester
Time History Graph - Monday 27 March 2023 to Tuesday 28 March 2023
 $L_{Amax,15min}$, $L_{Aeq,15min}$ & $L_{A90,15min}$ Noise Levels at Position A

