Northern Crumble
Spar Store
4 New George Street
Manchester

Plant Sound Assessment Report
1662/PSA1

18 September 2026

For:

Northern Crumble
SPAR Store
4 New George Street
Manchester
M4 4AE

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1.0 Introduction

Lighthouse Acoustics has been appointed by Northern Crumble to undertake an assessment of atmospheric noise emissions from the proposed supply and extract fans at Northern Crumble, Spar Store, 4 New George Street, Manchester to the nearest existing noise sensitive receptors.

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 supply and extract fans.

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 the proposed supply and extract fans to the nearest noise sensitive receptors and to propose mitigation measures where required in order to achieve the requirements of the Local Authority.

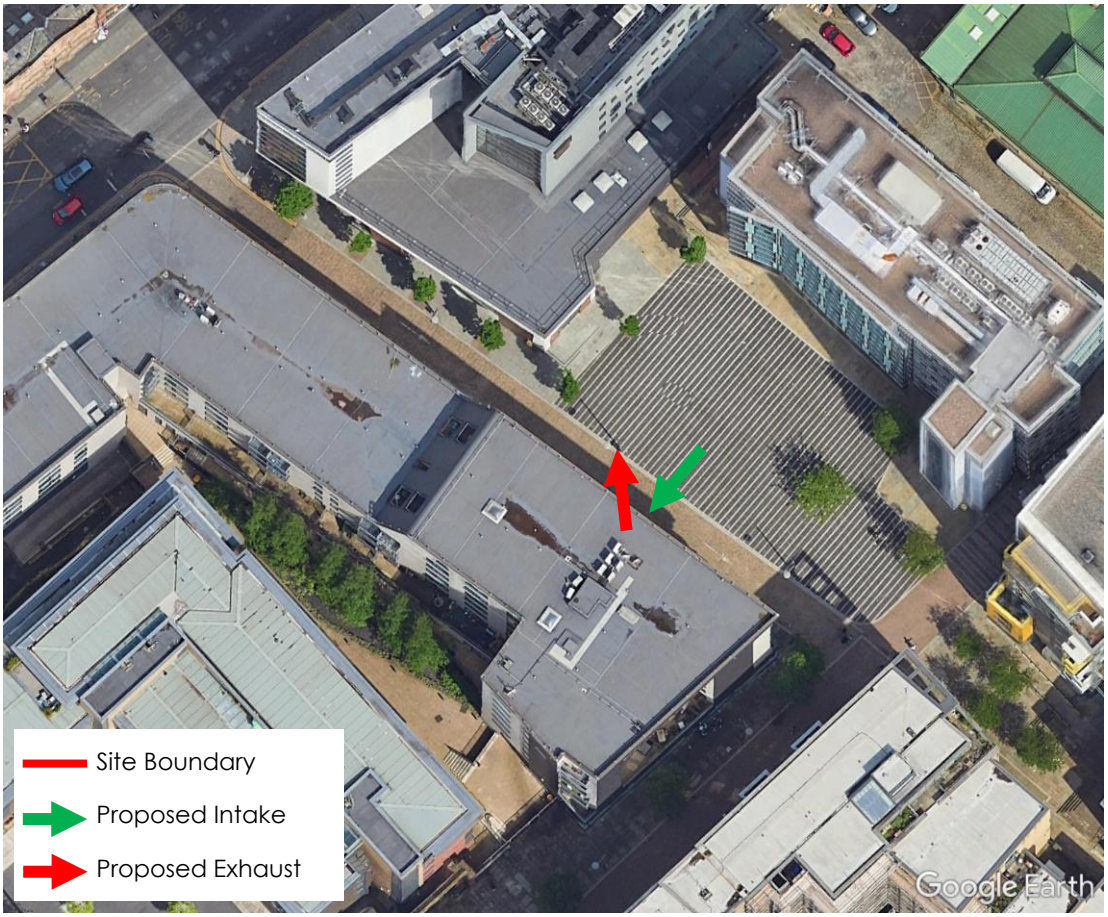
3.0 Site Description

Northern Crumble, Spar Store, 4 New George Street, Manchester comprises a ground floor commercial unit in a 7 storey building. The building is bound by New George Street to the north east, High Street to the south east, courtyard to the south west and Shudehill to the north west.

The proposed supply fan is to be situated internally within the ground floor commercial unit with intake ducted to a louvre in the north east façade whilst the extract fan is to be situated externally at roof level with the extract duct penetrating the roof and the exhaust duct terminating vertically.

The nearest noise sensitive receptors are understood to be the residential flat situated at 1st floor level above the commercial unit for the supply fan and the residential flat situated at 6th floor level for the extract fan.

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."***

5.0 Environmental Sound Survey

5.1 Measurements

Automated environmental sound measurements were undertaken from 13:00 hours on Wednesday 9 September 2026 to 13:00 hours on Thursday 10 September 2026. 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 light westerly breeze (<3.0m/s) and the sky was overcast. There was no rainfall and road surfaces were dry. The temperature was approximately 16°C.

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

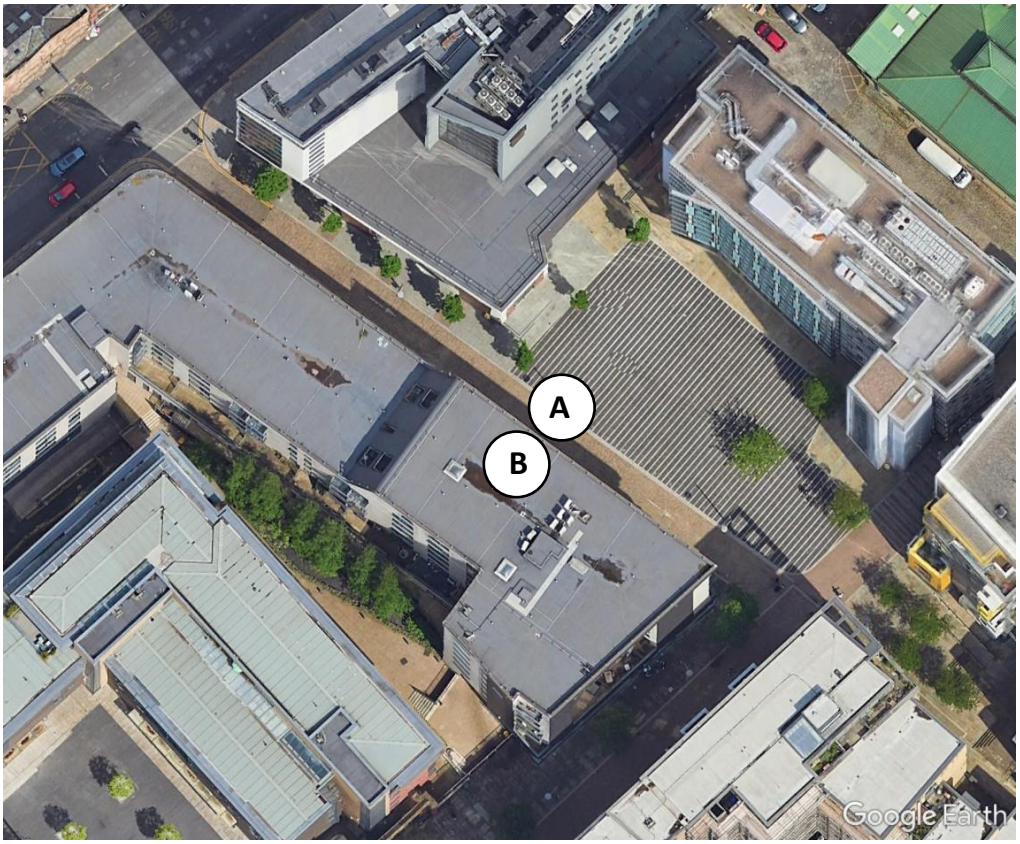
Based on publicly available weather data for the survey period it is understood that weather conditions remained similar for the duration of the survey with no periods of significant rainfall or strong breezes. The weather conditions during the survey period are therefore considered to be suitable for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

5.3 Measurement Positions

Environmental sound levels were measured at 2No. positions on-site as described in the table below.

Position	Description
A	Microphone situated on the north east façade of the building at 2.5m above ground level overlooking New George Street.
B	Microphone situated at roof level of the building overlooking New George Street.

The measurement positions are shown on the site plan below.



Site plan showing measurement positions

Measurement Position A was selected in order to assess typical environmental sound levels incident upon the facade of the nearest noise sensitive receptor at 1st floor level.

Measurement Position B was selected in order to assess typical environmental sound levels incident upon the facade of the nearest noise sensitive receptor at 6th floor level.

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	06/11/2025
Preamplifier	Casella	495	001414	06/11/2025
Microphone	Casella	251	1025	06/11/2025
Class 1 Sound Level Meter	Casella	633C	0721319	06/11/2025
Preamplifier	Casella	495	001446	06/11/2025
Microphone	Casella	251	1996	06/11/2025
Class 1 Sound Calibrator	Casella	120/1	3864878	05/11/2025

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.

5.5 Results

5.5.1 Time History Graphs

The results of the environmental sound survey are presented on Time History Graphs 1662/THG1 and 1622/THG2 enclosed at the rear of the report.

5.5.2 L_{A90} Background Sound Levels

The lowest representative $L_{A90,15min}$ background sound level measured at each measurement position over the proposed operating hours (11:00 to 00:00) are detailed in the table below.

Position	Lowest Representative $L_{A90,15min}$ Background Sound Level (dB)
	Proposed Opening Hours (11:00–00:00)
A	54
B	52

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 received for the proposed supply and extract fans as detailed in the Plant Schedule 1662/PS1 enclosed at the rear of the report.

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 supply and extract fans have the potential to operate between 09:00 and 00:00 hours Monday to Sunday.

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

7.3 Plant Location

The locations of the proposed supply and extract fans have been taken from the following drawings.

Author	Drawing No.	Revision	Date
Skyline Architecture Ltd	UBD-PL-1061	-	06.07.2026
BSE Solutions Ltd	251-BSE-00-00-2D-M-0100	01	01.06.2026
	251-BSE-00-RF-2D-M-0100	02	05.06.2026

These indicate that the proposed supply fan is to be situated internally within the ground floor commercial unit with intake ducted to a louvre in the north east façade whilst the extract fan is to be situated externally at roof level with the extract duct penetrating the roof and the exhaust duct terminating vertically.

7.4 Attenuation Measures

The proposed supply and extract fans shall be fitted with atmospheric silencers as specified in the Silencer Schedule 1662/SS1 enclosed at the rear of the report.

The supply fan unit and any ductwork between the atmospheric and roomside silencers 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 extract fan unit and any ductwork between the atmospheric silencer and penetration of the roof 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.

In addition, all building services should be mounted on appropriate anti-vibration mounts in order to minimise structure borne noise to the residential flats situated at 1st floor level above the supply fan and at 6th floor level below the extract fan.

7.5 Nearest Noise Sensitive Receptors

The nearest noise sensitive receptor to the proposed supply and extract fans are understood to be the residential flat situated at 1st floor level above the commercial unit for the supply fan and the residential flat situated at 6th floor level for the extract fan. The table below details the approximate distance between the proposed supply and extract fans and the window of the nearest noise sensitive receptors.

Nearest Noise Sensitive Receptor	Plant Item	Approximate Distance (m)
1st Floor Residential Flat	Supply Fan	2
6th Floor Residential Flat	Extract Fan	4

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.

Supply Fan

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
1st Floor Residential Flat	47	54	-7	Low Impact

The assessment indicates that atmospheric plant sound emissions from the proposed supply fan 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.

Extract Fan

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
6th Floor Residential Flat	45	52	-7	Low Impact

The assessment indicates that atmospheric plant sound emissions from the proposed extract fan 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.

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:

- The proposed supply and extract fans operate between 11:00 and 00:00 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 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.

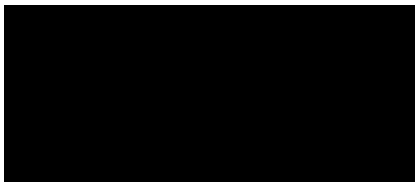
10.0 Conclusions

The Local Authority's plant sound requirements for the proposed supply and extract fans 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 the proposed supply and extract fans to the nearest noise sensitive receptors has been undertaken.

The assessment indicates that atmospheric plant sound emissions from the proposed supply and extract fans are likely to have a low impact at the nearest noise sensitive receptors with the incorporation of the proposed attenuation measures and achieve the requirements of the Local Authority.



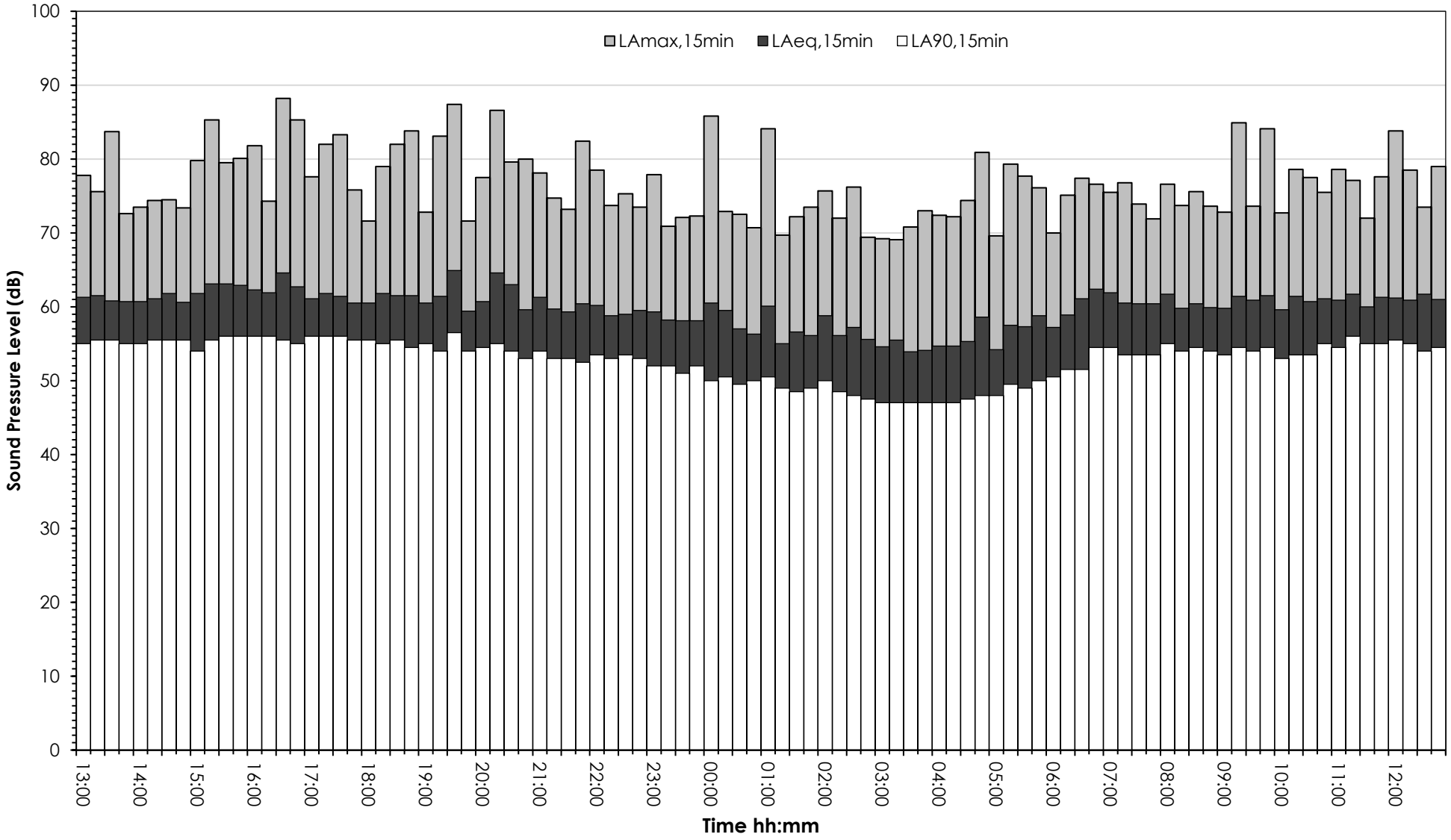
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1662/THG1

Northern Crumble, Spar Store, 4 New George Street, Manchester

Time History Graph - Wednesday 9 September 2026 to Thursday 10 September 2026

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

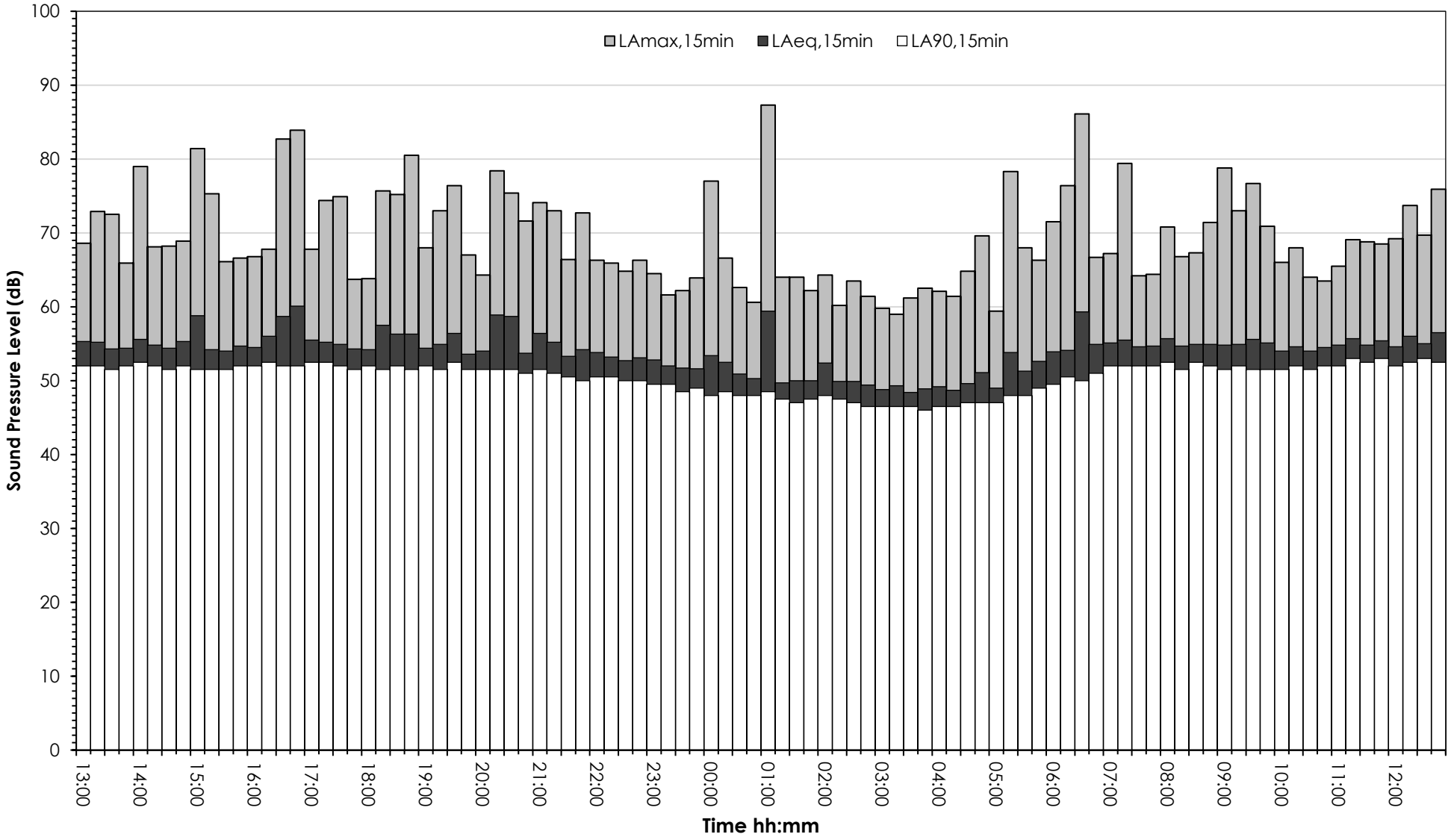


1662/THG2

Northern Crumble, Spar Store, 4 New George Street, Manchester

Time History Graph - Wednesday 9 September 2026 to Thursday 10 September 2026

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



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Plant Ref.	Description	Location	Duty		Data (Inlet/Outlet/Casing)	L_w / L_p at dist. (m)	Sound Level (dB) at Octave Band Centre Frequency (Hz)							
			m^3/s	Pa			63	125	250	500	1k	2k	4k	8k
-	Supply Fan Systemair MUB/T-S 100 630 EC	Ground Floor Internal	2.15	250	Intake	Lw	85	84	80	75	71	66	62	61
					Supply	Lw	87	85	81	76	72	67	63	62
			-	-	Casing	Lw	-	-	-	-	-	-	-	-
-	Extract Fan Systemair MUB/T-S 100 630 EC	Roof Level External	2.88	575	Extract	Lw	82	93	88	84	80	76	71	69
					Exhaust	Lw	84	95	90	86	82	77	72	70
			-	-	Casing	Lw	-	-	-	-	-	-	-	-

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Plant Ref.	Description	Inlet/Outlet	Vol. (m^3/s)	Typical Length (mm)	Face Velocity (m/s)	Pressure Drop (Pa)	Insertion Loss (dB) at Octave Band Centre Frequency (Hz)							
							63	125	250	500	1k	2k	4k	8k
-	Supply Fan Systemair MUB/T-S 100 630 EC	Intake	2.15	1200	<6.0	<55	5	9	16	29	34	26	18	11
		Supply	2.15	1200	<4.5	<55	7	12	19	35	40	36	28	17
-	Extract Fan Systemair MUB/T-S 100 630 EC	Extract	2.88	1200	<4.5	<55	7	12	19	35	40	36	28	17
		Exhaust	2.88	1500	<4.5	<55	8	15	23	40	46	41	33	20