135-141 Oldham Street
Manchester

Planning Condition Discharge Report

25636/PCD1

24 February 2021

For:

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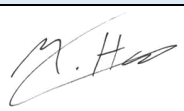
Document Control

Issue	Date	Comment	Prepared by	Authorised by
0	18/09/2020	-		
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1	16/10/2020	Amended to incorporate minor changes to plant design.		
			Jamie Murray Senior Consultant BEng(Hons), MIOA	Jamie Murray Senior Consultant BEng(Hons), MIOA
2	14/12/2020	Amended to incorporate minor changes to plant design.		
			Michael Hartley Consultant MEng(Hons), AMIOA	Jamie Murray Principal Consultant BEng(Hons), MIOA
3	24/02/2021	Amended to incorporated Change to louvre Screen		
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1.0 Introduction

It is proposed to refurbish the existing office building at 135-141 Oldham Street, Manchester. As part of this refurbishment new items of fixed plant items serving the development have been proposed.

A previous assessment has been undertaken by Hann Tucker Associates to assess the potential noise impact the scheme may have on external receptors, on the basis of which planning permission has been granted with conditions. Condition 3a sets out a requirement for an assessment of noise emissions from fixed plant items.

Although the initial design intent was for fixed plant to be located in the lightwell behind the building, the proximity of residential windows overlooking the lightwell in conjunction with low background sound levels ultimately made this design unfeasible. Although the equipment which is being replaced was previously operational in this area (which can often enable a comparison between old vs new, permitting more relaxed noise limits), no information is known on the existing equipment (which has now been removed) so no comparison can be made with regards to old vs new.

We understand that the primary noise generating plant items (i.e. the condensers) are now proposed at roof level with some attenuated internal plant items exhausting to the lightwell.

This report presents the noise impact assessment of fixed plant items now the building services design has been finalised, with the aim of discharging Condition 3a set by Manchester City Council.

2.0 Objectives

To review the previous noise survey undertaken at the site and, if necessary, visit site and establish the prevailing environmental noise levels by means of detailed noise survey by automated monitoring over a minimum 24 hour period in accordance with BS 7445.

To review the plant proposals, the results of the noise survey, in conjunction with the Hann Tucker baseline noise survey report undertaken previously, and the requirements of Planning Condition 3a and confirm plant noise emission limits for the new equipment.

To assess the atmospheric noise emissions from the proposed plant items, based upon data with which we are provided, and comment upon the acceptability.

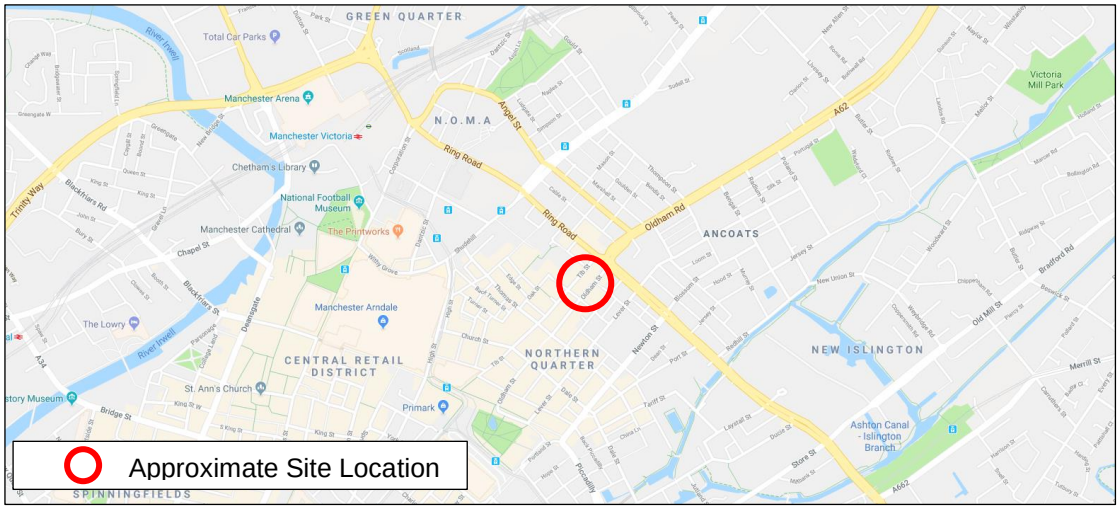
3.0 Acoustic Terminology

Please refer to Appendix A for an explanation of acoustic terminology used herein.

4.0 Site Description

4.1 Location

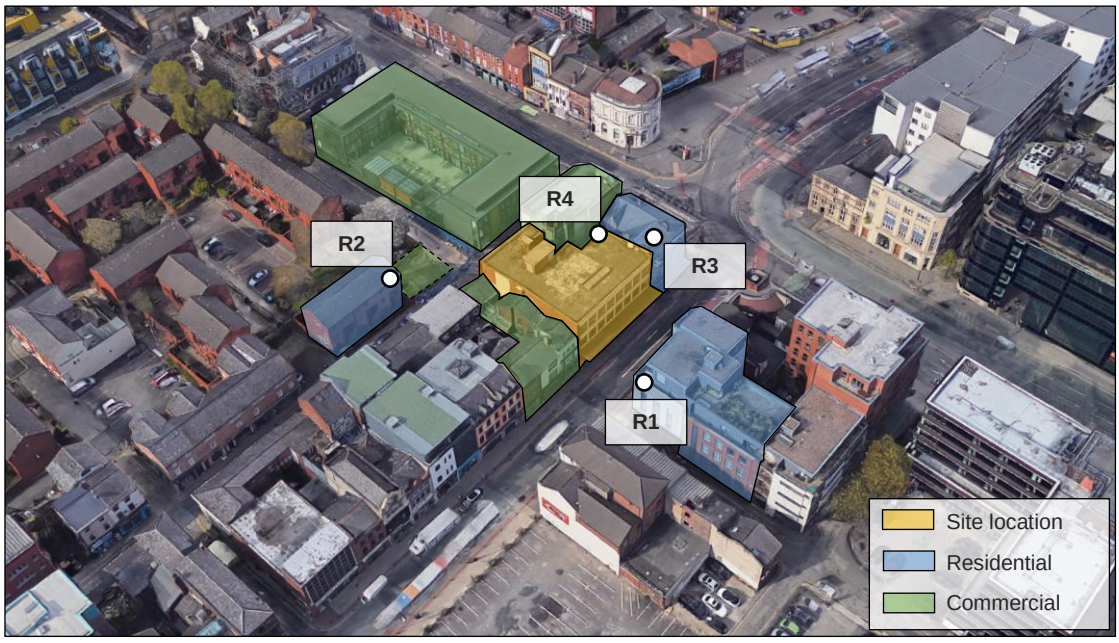
The proposed development is located on Oldham Street in Manchester city centre, and falls under the jurisdiction of Manchester City Council. See site location below.



Site Location (© maps.google.co.uk)

4.2 Description

The site is an existing office building bounded by Oldham Street and Tib Street. The surrounding area is predominantly commercial (offices) with some residential on upper floors of nearby buildings. See site plan below.



Site Plan (© maps.google.co.uk)

4.3 Most Affected Nearby Premises

The most affected nearby noise sensitive premises are listed in the table below and illustrated in Section 4.2.

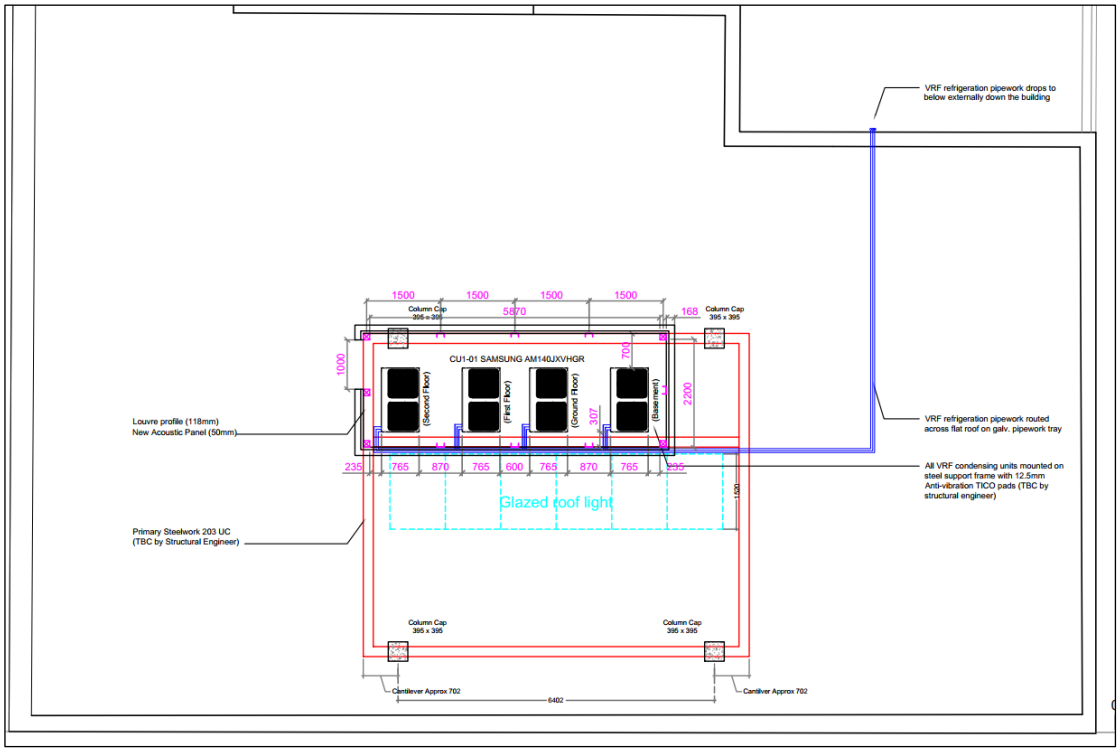
Receptor	Location
R1	Residential windows of 96-100 Oldham Street
R2	Residential windows of 65 Tib Street
R3	Residential skylight windows in the roof of 143-147 Oldham Street.
R4	Residential windows in the light well to the rear of 143-147 Oldham Street.

5.0 Project Proposals

5.1 Proposed Plant

The proposed development will be served by air handling units at each level, two of which will be ducted into to the light well and the remaining two will be ducted to Tib Street. Condenser units also serving the development are located at roof level.

A layout showing the location of the rooftop plant locations is indicated below.



The building services plant installation includes the following proposed plant items:

- 4No. Samsung condenser units, model AM140JXVHGR/ET
- 4No. Air Handling Units AHU, model Misubishi Lossnay LGH-150RVX-E

The following table presents the manufacturer's sound power level data for the above

Plant	Noise Level
Condensers (Samsung Outdoor Units)	61 dBA @ 1m

Description	In-duct Sound Power Level (dB) at Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
AHU (Misubishi Lossnay)	72	76	74	69	70	70	65	53

A 2.8m high acoustic louvre (Bespoke Acoustic Solutions BASL AP50) is proposed to surround the rooftop plant area. The sound reduction performance of the acoustic louvre is provided in the table below:

Description	SRI (dB) at Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Acoustic Louvre (BASL AP50)	15	18	21	29	40	48	53	46

Attenuators are proposed to the AHU units. We understand that these attenuators have been selected to achieve the following insertion losses.

Description	In-duct Sound Power Level (dB) at Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
AHUs venting to the light well (1st & 2nd floor)	9	13	20	28	33	30	24	16
AHUs venting to Tib Street (Basement & Ground floor)	6	9	16	20	23	18	14	8

We understand that the operational times of all plant items will be 07:00 – 19:00 weekdays and occasional weekends.

6.0 Acoustic Standards & Guidelines

6.1 Local Authority (Condition 3a)

It is understood that the application for external alterations and plant equipment has been approved for the development. The Local Authority have included a condition relating to noise from building services plant in Condition 3a, as detailed below:

"3) a) The building and any 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 (LAeq) below the typical background (LA90) level at the nearest noise sensitive location.

Before installation of any externally mounted ancillary plant, equipment and servicing (including associated louvres and the proposed substation) the scheme shall be submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the site. The approved scheme shall be implemented and completed before the premises is occupied."

6.2 National Planning Policy Framework

The following paragraphs are from the NPPF (revised February 2019):

180. 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 life;

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.

182. 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."

Paragraph 180 also references the Noise Policy Statement for England. This document does not refer to specific noise levels but instead sets out three aims:

- Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

- Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
- Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development."

6.3 BS4142:2014

BS 4142: 2014 describes methods for rating and assessing the effects of outdoor sound levels, of an industrial and/or a commercial nature, "*on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident*".

The impact of a specific sound is indicated by subtracting the existing background noise level from the rating level (i.e. noise level from the proposed items of plant/machinery/etc plus any acoustic feature corrections). The standard states that:

- *"a difference of around +10dB or more is likely to be an indication of a significant adverse impact"*;
- *"a difference of around +5dB is of marginal significance is likely to be an indication of an 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"*.

The noise from the new development is expressed in terms of a rating level and given as a $L_{Aeq, T}$ noise level. The existing background noise level is expressed in terms of a $L_{A90, T}$ noise level. T is the assessment time interval, which is 1-hour for operations during daytime hours (07:00 to 23:00 hr) and 15-minutes for operations during night-time hours (23:00 to 07:00 hr).

BS 4142:2014 states that if a noise source contains an 'acoustic feature', such as tonality, intermittency or impulsiveness, an appropriate penalty should be applied.

7.0 Previous Noise Survey

7.1 Overview

A previous survey was undertaken by Hann Tucker Associates and is presented in our noise impact assessment report ref:*2019_1101 - 25636 - NIA1 (Rev03).*

Upon review of the above and the proposed fixed plant design, it was deemed necessary to supplement the previous survey with an additional survey to obtain representative data for all receptors. The results of the previous survey and the supplementary survey shall be combined to provide representative data at all receptors.

7.2 Measurement Positions

Free-field noise level measurements were undertaken at two (2No.) positions around the development site, as described below. And illustrated in Section 8.3.

Position	Description
1	Free-field measurement at approximately 3 metres above ground level on Oldham Street, approximately 1m from the roadside edge.
2	Free-field measurement at approximately 3 metres above ground level on Tib Street, approximately 1m from the roadside edge.

7.3 Results

A summary of the results from the baseline environmental noise survey, as used to inform subsequent assessments against current guidelines, is presented in the table below, all results are free-field levels.

Position	Weekday Daytime (07:00-19:00 hrs)		Weekend Daytime (07:00-19:00 hrs)	
	Typical. $L_{A90,15min}$ (dB)	Minimum. $L_{A90,15min}$ (dB)	Typical. $L_{A90,15min}$ (dB)	Minimum. $L_{A90,15min}$ (dB)
1	56	53	55	50
2	53	51	49	45

8.0 Supplementary Noise Survey

8.1 Procedure

Fully automated environmental noise monitoring was undertaken from Thursday 20 August 2020 at 13:00 hours until Tuesday 25 August 2020 at 12:00 hours in order to establish continuous noise readings during typical weekday and weekend periods.

Measurements were taken of the A-weighted (dBA) L_{90}, L_{eq} and L_{Fmax} sound pressure levels over discrete periods.

Measurements were undertaken in accordance with BS 7445-1:2003 Description and Measurement of Environmental Noise.

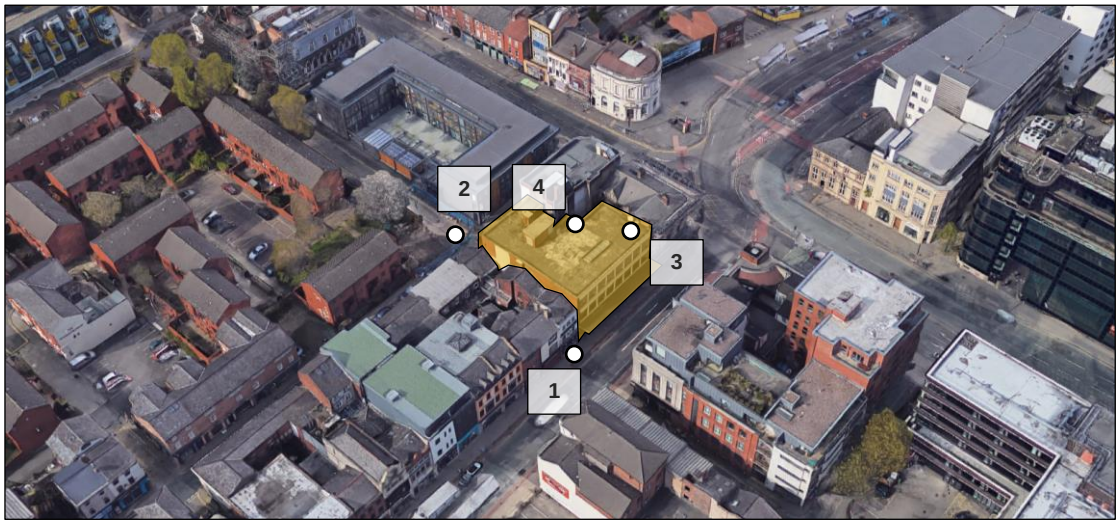
8.2 Weather Conditions

During the survey period the weather conditions were calm and the sky was generally overcast. These conditions are considered suitable for obtaining representative measurement results.

8.3 Measurement Positions

Free-field noise level measurements were undertaken at two (2No.) positions around the development site, as described/illustrated below. Note the measurement positions from the previous survey have been included on the site plan below for clarity.

Position	Description
3	Free-field measurement at roof level, approximately 3m from the building edge.
4	Free-field measurement at approximately 2 metres above ground level within the light well area of the development.



Site Plan (© maps.google.co.uk)

8.4 Instrumentation

The instrumentation used during the survey is presented in the Table below.

Description	Manufacturer	Type	Serial Number	Calibration
Type 1 Sound Level Meter *(Position 3)*	Larson Davis	LxT	4569	28/07/2020
Type 1 Sound Level Meter *(Position 4)*	Larson Davis	LxT	5104	28/07/2020
Type 1 Calibrator	Larson Davis	CAL200	3083	16/04/2018

Each sound level meter was located in an environmental case with the microphone mounted on a pole and connected to the sound level meter via an extension cable. All equipment was calibrated prior to and on completion of the survey. No significant deviations occurred (no more than 0.1 dB).

8.5 Results

A summary of the results from the additional environmental noise survey, as used to inform subsequent assessments against current guidelines, is presented in the table below, all results are free-field levels.

Position	Weekday Daytime (07:00-19:00 hrs)		Weekend Daytime (07:00-19:00 hrs)	
	Typical. $L_{A90,15min}$ (dB)	Minimum. $L_{A90,15min}$ (dB)	Typical. $L_{A90,15min}$ (dB)	Minimum. $L_{A90,15min}$ (dB)
3	53	49	47	45
4	44	40	40	38

9.0 Plant Noise Impact Assessment

9.1 Overview

Hann Tucker Associates have undertaken an assessment of atmospheric plant noise egress based on manufacturers' noise data for the proposed plant items and proposed attenuation as presented in Section 5.0. The following sections outline the basis of the plant noise egress assessment and our findings.

9.2 Proposed Limits

A single site-wide plant noise limit was set during the planning submission and was based on the minimum measured level across all positions during the 07:00-23:00 period. A more detailed approach has been taken below with reference to the operational hours of the equipment and the noise level at each individual receptor.

On the basis of the Manchester City Council's guidance and the results of the bassline environmental noise survey, we propose that the following cumulative plant noise emission limits be achieved at 1 metre from the nearest noise sensitive windows.

Receptor	Plant Noise Rating Level Limit, $L_{Ar,Tr}$ *07:00-19:00 hrs*
R1	45
R2	40
R3	40
R4	35

For design purposes, any plant which could emit noise of a tonal, irregular or intermittent nature should be subject to an "acoustic feature" penalty in accordance with BS 4142:2014.

9.3 Assessment

The sound pressure level at each affected noise sensitive receptor has been calculated, accounting for attenuating factors such as distance attenuation and barrier attenuation provided by the existing site geometry. The full calculations are not presented for brevity but are available upon request.

The table below presents the predicted incident noise levels from fixed plant items at the nearest receptors.

Description	Receptor			
	R1	R2	R3	R4
Type	Residential	Residential	Residential	Residential
Predicted Noise Level at Receptor (L_{eq})	26 dB	32 dB	33 dB	32 dB
Criteria	45 dB	40 dB	40 dB	35 dB
Compliance	✓	✓	✓	✓

In summary, our calculations have indicated that the current proposals should be capable of achieving the proposed plant noise criteria.

10.0 Conclusions

A detailed baseline environmental noise survey has been undertaken in addition to a supplementary noise survey, in order to establish the prevailing noise climate at the development site.

Our assessment of the proposed development considers the potential noise impact on its surroundings from noise relating to the operation of fixed items of building services in line with criteria set out in Condition 3a.

Our assessment of the development indicates that the current proposals should be capable of achieving the proposed plant noise criteria.

Appendix A

The acoustic terms used in this report are defined as follows:

dB — Decibel - Used as a measurement of sound level. Decibels are not an absolute unit of measurement but an expression of ratio between two quantities expressed in logarithmic form. The relationships between Decibel levels do not work in the same way that non-logarithmic (linear) numbers work (e.g. 30dB + 30dB = 33dB, not 60dB).

dBA — The human ear is more susceptible to mid-frequency noise than the high and low frequencies. The 'A'-weighting scale approximates this response and allows sound levels to be expressed as an overall single figure value in dBA. The $_A$ subscript is applied to an acoustical parameter to indicate the stated noise level is A-weighted

It should be noted that levels in dBA do not have a linear relationship to each other; for similar noises, a change in noise level of 10dBA represents a doubling or halving of subjective loudness. A change of 3dBA is just perceptible.

$L_{90,T}$ — L_{90} is the noise level exceeded for 90% of the period *T* (i.e. the quietest 10% of the measurement) and is often used to describe the background noise level.

$L_{eq,T}$ — $L_{eq,T}$ is the equivalent continuous sound pressure level. It is an average of the total sound energy measured over a specified time period, *T*.

L_{max} — L_{max} is the maximum sound pressure level recorded over the period stated. L_{max} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the L_{eq} noise level.

L_p — Sound Pressure Level (SPL) is the sound pressure relative to a standard reference pressure of 2×10^{-5} Pa. This level varies for a given source according to a number of factors (including but not limited to: distance from the source; positioning; screening and meteorological effects).

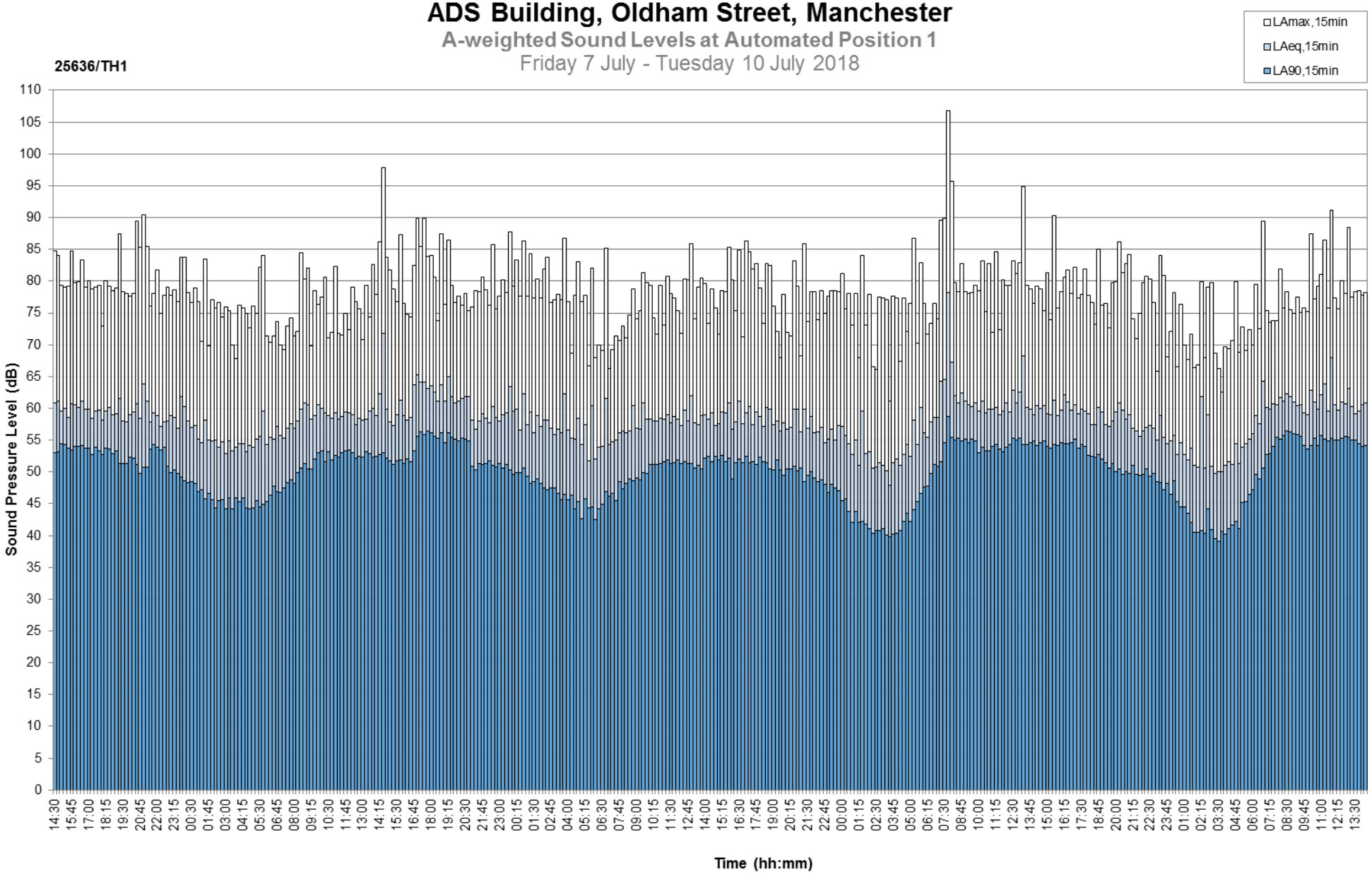
L_w — Sound Power Level (SWL) is the total amount of sound energy inherent in a particular sound source, independent of its environment. It is a logarithmic measure of the sound power in comparison to a specified reference level (usually 10^{-12} W).

ADS Building, Oldham Street, Manchester

A-weighted Sound Levels at Automated Position 1

Friday 7 July - Tuesday 10 July 2018

25636/TH1

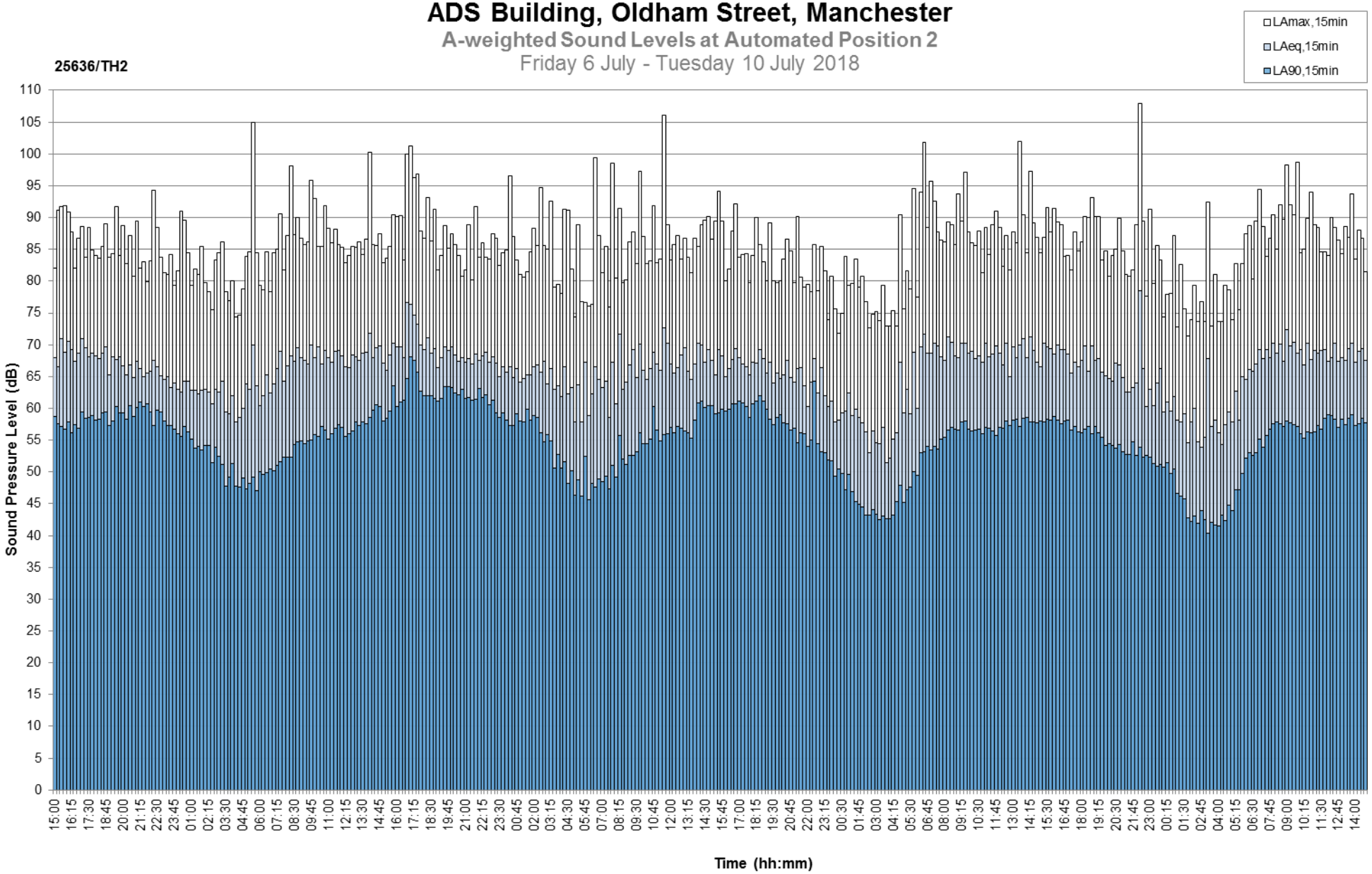


ADS Building, Oldham Street, Manchester

A-weighted Sound Levels at Automated Position 2

Friday 6 July - Tuesday 10 July 2018

25636/TH2

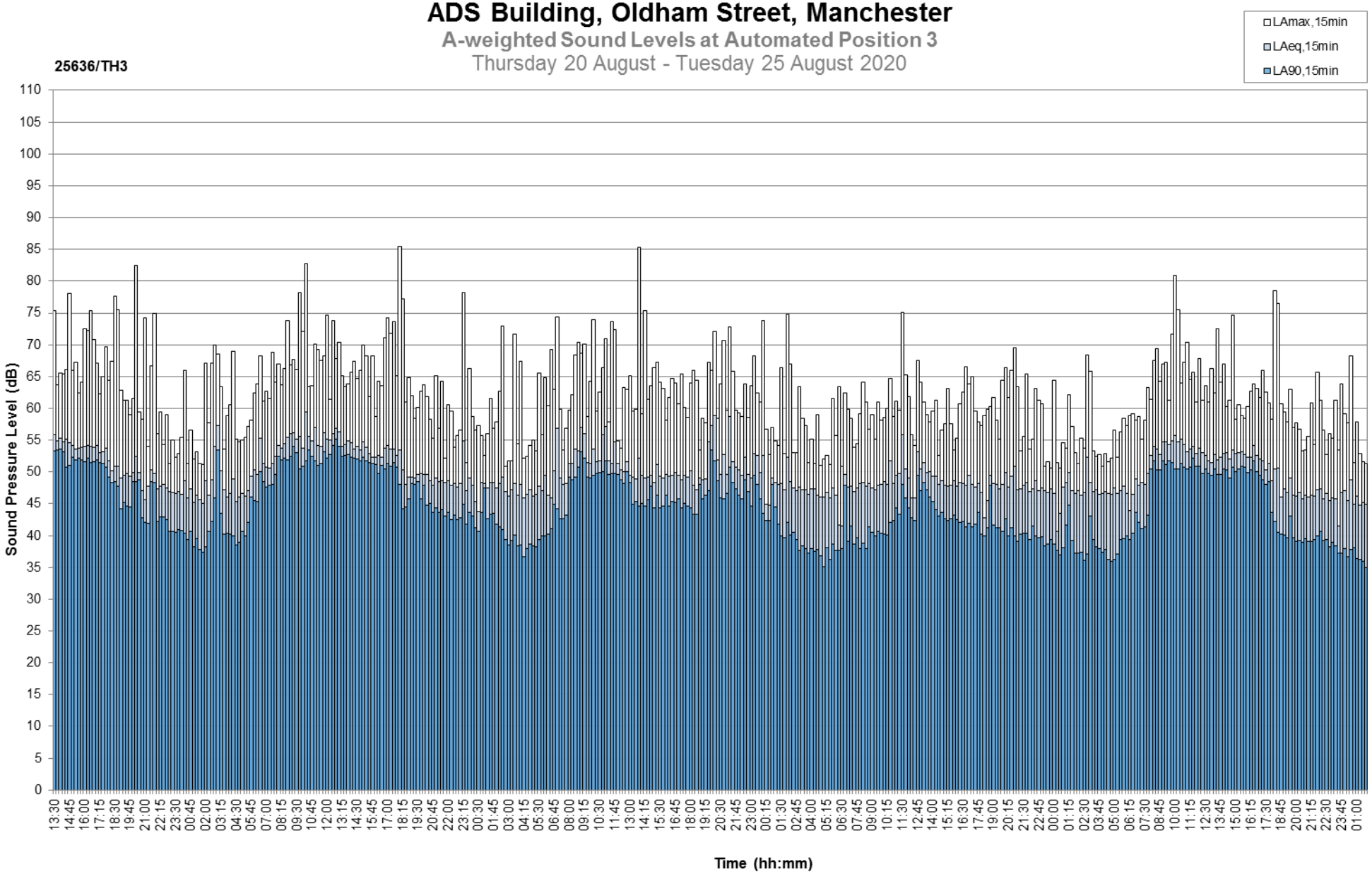


ADS Building, Oldham Street, Manchester

A-weighted Sound Levels at Automated Position 3

Thursday 20 August - Tuesday 25 August 2020

25636/TH3



ADS Building, Oldham Street, Manchester

A-weighted Sound Levels at Automated Position 4

Thursday 20 August - Tuesday 25 August 2020

25636/TH4

