

ACOUSTIC ASSESSMENT

On behalf of

M4nchester One Ltd

For the site at:

Land at Spear Street, Manchester, M1 1AW

REPORT DATE: 19th April 2023

REPORT REF: AA/23/04/NG/SPS/AAV2.0



CLIENT: M4nchester One Ltd

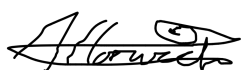
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1. INTRODUCTION

1.1. General

Amber Acoustics has been commissioned by M4nchester One Ltd to carry out an Acoustic assessment to discharge a pre commencement condition from a planning decision (Ref: : 117280/FO/2017) dated 20th January 2023 granted for the erection of a five-storey mixed use building, comprising 6 apartments to the upper four levels and commercial space to the ground floor at “Land at Spear Street”.

1.2. Assessment Scope

Although an initial acoustic assessment was submitted with the planning application (REF:AA/22/10/NG/SPS/AA dated 14th October 2022), and further information provided by email correspondence (3rd January 2023), there was concern regarding the acoustic impact of the plant noise from the nearby commercial premises known as the Koffee Pot on the proposed development.

Following telephone correspondence with Sue Jones, the Environmental Protection Officer at Manchester City Council, (15th February 2023) it was established that the concerns related to the new extractor and air conditioning unit serving the Koffee Pot, and that a Noise Impact assessment was required to establish the mitigation required. A methodology of 30 minutes with the plant performing at full capacity and a 30 minute background sample was approved by the Environmental Protection Officer.

This report will combine the contents of the existing report (REF:AA/22/10/NG/SPS/AA dated 14th October 2022, with the results from the Noise assessment carried out, and will seek to demonstrate that, the internal ambient noise levels in the newly formed habitable rooms within the dwellings will meet the acceptable standards of the Council, as well as the relevant British Standards.

Amber Acoustics have completed this report for the benefit of the individuals referred to in Section 1.1 and any other relevant statutory authority which may require reference in relation to approvals for the proposed development. Other third parties should not use, or rely upon, the contents of this report unless explicit written approval has been gained from Amber Acoustics.

Amber Acoustics accepts no responsibility or liability for the consequences of this documentation being used for any purpose or project other than that for which it was commissioned. It should also be noted herein that the issue of this document to any third party with whom approval for use has not been agreed.



2. SITE DESCRIPTION

The development site is the Land at Spear Street which is found in the Northern Quarter district of Manchester City Centre.

The street fronted development site is flanked by a retail outlet to its North-eastern (The Koffee Pot) and North-western Boundaries and will be bordered by "The Quarters" residential development to its South West boundary which is in the process of being constructed.

The site is highly acoustically shielded from the nearby roads, with only a single vehicle road (Spear Street) to its front (South Easterly) border.

3. PLANNING CONDITION

Condition 11 of the planning decision (Ref: : 117280/FO/2017) dated 20th January 2023 stated:

11) Notwithstanding the recommendations within the Amber Acoustics ACOUSTIC ASSESSMENT On behalf of M4nchester One Ltd For the site at: Land at Spear Street, Manchester, M1 1AW, REPORT DATE: 14th October 2022, REPORT REF: AA/22/10/NG/SPS/AA and e-mail from Amber Acoustics dated 03-01-23 prior to commencement of development details of the following shall be submitted:

(a) a scheme for acoustically insulating and mechanically ventilating the residential accommodation against local road traffic network, any local commercial/industrial premises, plant and equipment on adjacent premises and the insulation requirements and specification for plant room service risers /lift shafts; and

(b) following an assessment of the potential for overheating (AVO Assessment) any details of any additional noise mitigation measures to deal with equipment to mitigate overheating

The approved noise insulation scheme and mitigation measures shall be completed before any of the dwelling units are occupied

shall be submitted to and approved in writing by the City Council as local planning authority.

The following noise criteria will be required to be achieved:

Bedrooms (night time - 23.00 - 07.00) 30 dB LAeq (individual noise events shall not exceed 45 dB L_{Amax,F} by more than 15 times)

Living Rooms (daytime - 07.00 - 23.00) 35 dB LAeq

(c) Prior to occupation a post completion report to verify that all of the recommended mitigation measures have been installed and effectively mitigate any potential adverse noise impacts in the residential accommodation (within at least 10% of the apartments) shall be submitted and agreed in writing by the City Council as local planning authority. Prior to occupation any non compliance shall be suitably mitigated in accordance with an agreed scheme.

Reason - To secure a reduction in noise in order to protect future residents from noise nuisance, pursuant to policies SP1, H1 and DM1 of the Core Strategy.

4. ASSESSMENT STANDARDS

This section of the report outlines the context of the proposed development with respect to noise.

4.1. National Planning Policy Framework and Planning Practice Guidance

The NPPF, published in March 2012, sets out the Government's planning policies for England and how these are to be expected to be applied. The NPPF must be taken into account in the preparation of local and neighbourhood plans and is to be a material consideration in planning decisions.

Paragraph 123 of the NPPF advises that, with respect to noise emissions, planning policies and decisions should aim to:

- Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
- Mitigate and reduce to a minimum, other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions

Planning Practice Guidance, published in March 2014, advises on how planning can manage potential noise impacts in new development. The guidance states that noise needs to be considered when *"...new developments would be sensitive to the prevailing acoustic environment."* Although noise can override other planning concerns, *"neither the NPSE1 nor the NPPF expects noise to be considered in isolation from the economic, social and other environmental dimensions of the proposed development."*



When making decisions, local planning authorities should take account of the acoustic environment and in doing so consider:

- Whether or not a significant adverse effect is likely to occur;
- Whether or not an adverse effect is occurring or likely to occur; and
- Whether or not a good standard of amenity can be achieved.

In line with the Explanatory Note of the NPSE this would include identifying whether the overall effect of the noise exposure would be above or below the significant observed adverse effect level. The guidance points to the Explanatory Note for Noise Policy Statement for England 2010 for further information.

4.2. Noise Policy Statement for England 2010

The NPSE sets out the long-term vision of Government noise policy. The Noise Policy Vision is supported by the following Noise Policy Aims:

- Avoid significant impacts on health and quality of life;
- Mitigate and minimise adverse effects on health and quality of life; and
- Where possible, contribute to the improvement of health and quality of life.

The NPSE categorises noise exposure through the concept of observed effect levels:

No Observed Effect Level (NOEL): The level below which no effect can be detected.

Lowest Observed Adverse Effect Level (LOAEL): the level above which adverse effects on health and quality of life can be detected.

Significant Observed Adverse Effect Level (SOAEL): the level of noise exposure above which significant adverse effects on health and quality of life occur.

The second Noise Policy Aim refers to the situation where the noise impact lies between the LOAEL and the SOAEL. It requires that, “...all reasonable steps should be taken to mitigate and minimise effects on health and quality of life... This does not mean that such adverse effects cannot occur.”

The NPSE does not contain specific noise level limits to define the SOAEL as it is likely to be different for different noise sources and parameters. In the absence of national LOAEL and SOAEL noise level criteria, noise levels have been assessed against criteria contained within BS8233:2014 and WHO Guidelines.

4.3. The World Health Organisation Guidelines

The WHO Guidelines for Community Noise 1999 consolidate scientific knowledge on the health impacts of community noise and provide guidance to protect people from the harmful effects of noise in non-industrial environments.

Although this guidance was updated in 2018, the specific references to noise levels were omitted, and have still, to the best of the authors' knowledge, not been updated or clarified by the WHO. Therefore, the 1999 guidelines are referenced herein as they contain the specific noise level targets which tie in nicely with those listed in other British Standards.

The WHO Guidelines for Community Noise set out health-based guideline values for community noise, including recommended noise level values for the onset of sleep disturbance, annoyance and speech interference for the general population. Guideline values are provided for outdoor living areas, living rooms and bedrooms, for both continuous noise and discrete noise events. These are:

$L_{Aeq,T}$ - the A-weighted equivalent continuous noise energy level over a given period of time T, applied to fluctuating noise levels to give single figure descriptor and sometimes referred to as the 'average'; and

L_{AFmax} - the maximum A-weighted noise instantaneous sound pressure level recorded during a measurement period using a fast time response.

With regard to outdoor living areas, the WHO Guidelines for Community Noise state that, "... in order to protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55dB(A) L_{Aeq} on balconies, terraces, and in outdoor living areas".



Table 1: WHO Guideline Values for Community Noise

Specific Environment	Critical Health Effect (s)	L _{Aeq} dB(A)	Time base (hours)	L _{AFmax} fast dB(A)
Outdoor living area	Serious annoyance, daytime and evening.	55	16	-
	Moderate annoyance, daytime evening.	50	16	-
Dwelling indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	-
Inside bedroom	Sleep disturbance night-time	30	8	45
Outside bedroom	Sleep disturbance, window open (outdoor values)	45	8	60

Source: World Health Organisation 1999

4.4. BS8233:2014

BS8233:2014 contains suggested criteria for common situations, such as resting and sleeping, and proposes noise levels that normally satisfy those criteria for most people. For dwellings, the main considerations are:

- For bedrooms, the acoustic effect on sleep; and
- For other rooms, the acoustic effect on resting, listening and communicating.

Suggested noise levels reflect those contained within the WHO Guidelines. BS8233:2014 advises that the time period T, should be appropriate for the activity involved, in this case the daytime L_{Aeq,16hr} (07:00-23:00) and night-time L_{Aeq,8hr} (23:00-07:00).

Table 2 below details guideline values for dwellings as recommended within BS8233:2014.

Table 2: BS8233:2014 Recommended Noise Levels

Criterion	Typical situations	Time		
		Daytime 07:00 to 23:00 (L_{Aeq})	Night-time 23:00 to 07:00 (L_{Aeq})	Night-time 23:00 to 07:00 (L_{Amax})
Resting	Living room	35	-	
Sleeping (daytime resting)	Bedroom	35	30	45

Source: BS8233:2014

With regard to external noise levels in amenity spaces such as gardens, the guidance advises that "...it is desirable that the external noise level does not exceed 50dB $L_{Aeq,T}$, with an upper guideline value of 55dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces but should not be prohibited."

4.5. Assessment Methodology Part 1

As per the initial acoustic assessment which was submitted with the planning application (REF:AA/22/10/NG/SPS/AA dated 14th October 2022), the approved background level from which mitigation measures for the local road traffic network and any local commercial/industrial premises will be modelled, are sought from the Noise Impact Assessment produced by Hann Tucker Associates (dated 11th June 2018) for the discharge of planning condition relating to the development of the adjoining site.

The results of the measurements taken as part of the Hann Tucker report for the adjoining site are tabulated below. All mitigation will be based on those results.

Position	L_{Aeq} 16hr (dB)	L_{Aeq} 8hr (dB)	L_{Amax} (dB)
1	58	53	74

Table 3: Measurement Summary of Noise Survey Results.

4.6. Assessment Methodology Part 2

As reference earlier in this report, following correspondence with Sue Jones, the Environmental Protection Officer at Manchester City Council, (15th February 2023) it was established that there were concerns relating to the new extractor and air conditioning unit serving the Koffee Pot. Based upon these concerns, it was felt that a further NIA was required in order to establish a) the extent of the concerns and b) what, if any further mitigation was required.

A methodology of 30 minutes with the plant performing at full capacity and a 30-minute background sample was approved by the Environmental Protection Officer.

4.7. Measurement Location

The Measurement location was as follows:

MP1 – A meter was at or near to the proposed rear wall of the development in free field conditions. See image below.

The assessment took place on 27th February 2023 between 14:30 and 15:45.



MP1 – Spear Street

Meteorological Conditions

No excessive precipitation was noted during the survey, and the general wind speed in all directions was less than 5m/s, which is suitable for a noise survey. Detailed weather conditions are given in **Appendix C**.

4.8. Measurement Equipment

$L_{Aeq,T}$ and L_{AFmax} sound levels were recorded using a Type 1 Svantek SV307 Sound Analyser (serial number 100907). Measurements were A-weighted and recorded using a fast time response.

The sound level meter was calibrated using a Svantek SV36 Sound Calibrator (serial number 83149) at the start and finish of the monitoring period. No significant calibration drifts were observed. A detailed equipment list is given in **Appendix B** with calibration information in **Appendix D**.

4.9. Observations

The general dominant background noise in the immediate vicinity of the site was the nearby traffic noise from Great Ancoats Street and the A62 (Oldham Road), with a minor contribution from pedestrians passing the property. The plant was barely discernible to the acoustician on site.

5. RESULTS

The results of the Plant assessment can be seen in the table below.

Sample	Time	Level
Background Level	15:15 -15:45	46.1 dBA L_{A90} 30 Mins
All Plant On	14:30 - 15:00	53.9 dBA L_{Aeq} 30 Mins

Table 4: Measurement Summary of the Plant Noise Survey.



6. ASSESSMENT

6.1. Existing Noise Climate

BS8233: 2014 and WHO Guidelines Assessment

A summary of the relevant internal sound levels to be achieved at the proposed development is provided below:

Living rooms (daytime)	$L_{Aeq,T}$ 35dB(A);
Bedrooms(daytime)	$L_{Aeq,T}$ 35dB(A)
Bedrooms(night-time)	$L_{Aeq,T}$ 40dB(A); and
Bedrooms (night-time)	L_{AFmax} 45dB(A);

With regard to internal sound levels, from the site measurement data, it may be extrapolated that, in order to achieve BS8233: 2014 and WHO criteria, the building fabric of the external façade will need to provide a minimum sound reduction of up to 23dB(A) during the daytime, and up to 23dB(A) during the night-time.

With regard to L_{AFmax} sound levels in bedrooms during the night-time, the building fabric of the external façade will need to provide a minimum sound reduction of up to 29dB(A).

BS4142: 2014 Assessment

The plant from the nearby commercial premises, measured 7.8dBA above the Background level, and when a 2db penalty for tonality is added to the noise rating for a tone which is just perceptible, in accordance with section 9.2 of BS4142:2014, then the resulting impact of the plant is a total of 9.8 dBA above the background level.

When this is added to the background level of 58.0 referenced in section 4.5, then the required noise level to be mitigated against is 32.8dB.

6.2. AVO Assessment

Part b) of the planning condition referenced above states

details of the following shall be submitted:.....

(b) following an assessment of the potential for overheating (AVO Assessment) any details of any additional noise mitigation measures to deal with equipment to mitigate overheating



In accordance with the AVO guidelines and the new Approved Document O: Overheating, thermal dynamic modelling utilising CIBSE's TM59 methodology for predicting overheating risk was carried out.

Based on the mitigation set out below, the site achieved the standards required to reduce solar gain and to remove excess heat.

7. MITIGATION

A façade specification (glazing and ventilation) has been identified, with the overall aim of reducing the incident external to internal noise ingress to within desirable criteria, as given in *BS8233:2014 – Guidance on sound insulation and noise reduction for buildings*.

As windows are typically the acoustically weakest point in a façade, requisite sound reduction to be provided by glazing and ventilation systems to achieve the guideline values has been considered.

The assessment indicates that a sound reduction of up to 32.8 dB sound reduction (R_w) will be required overall to meet the requirements of BS8233:2014.

The sound insulation properties of the proposed external wall build up has been determined utilising the INSUL software programme. This implements a number of papers and standards in its calculations including BS EN 12354-3:2000 "Building acoustics – Estimation of acoustic performance of buildings from the performance of elements – Part 3: Airborne sound insulation against outdoor sound", BS EN ISO 140-3:1995 "Acoustics Measurement of sound insulation in buildings and of building elements - Part 3: Laboratory measurement of airborne sound insulation of building elements" and BS EN ISO 140-6:1998 "Acoustics Measurement of sound insulation in buildings and of building elements - Part 6: Laboratory measurements of impact sound insulation of floors" and using standard acoustic formulae.

Thermal double glazing, of the following specification (8-(6-16)-4) is generally capable of providing a typical sound reduction of approximately 33 dB R_w . (BS EN 12354-3:2017).

Background ventilation must be provided in accordance with the Building Regulations Approved Document F. In order to provide a sound reduction equivalent to that of the specified glazing, the $D_{n,e,w}$ value of the vent (when open) should be at least 7dB higher than the specified performance of the glazing.



To assist in identifying appropriate ventilators, a guide to the sound reduction performance delivered by example window mounted trickle ventilators is provided in the Table below.

Example Ventilator	Standard Vent	Titon TA5225 (V75) + TA5206 (C75) 2500EA
Sound Reduction (Dn,e,w)	23	44

An alternative approach to satisfying the ventilation requirements would be through the implementation of Mechanical Ventilation.

8. CONCLUSION

Amber Acoustics has been commissioned by M4nchester One Ltd to carry out an Acoustic assessment to discharge a pre commencement condition from a planning decision (Ref: : 117280/FO/2017) dated 20th January 2023 granted for the erection of a five-storey mixed use building, comprising 6 apartments to the upper four levels and commercial space to the ground floor at “Land at Spear Street”.

This Acoustic Assessment has sought to establish both the existing daytime and night-time sound levels at the site as well as the plant noise levels in the proximity of the site, and then determine specific mitigation requirements based on the external and internal sound level criteria as set out within BS8233:2014 ‘Guidance on sound insulation and noise reduction for buildings’ and World Health Organisation ‘Guidelines for Community Noise’.

Noise survey results and assessment indicate that mitigation of local sound sources (roads) and plant noise will be required in order to achieve the requisite internal sound level criteria in all areas of the proposed development.

The proposed mitigation strategy for the development comprises the installation of new thermal double glazing, with a typical minimum sound reduction of R_w 33 dB, and suitable acoustically attenuated passive ventilation.

It is considered that, with implementation of the specified mitigation strategy, sound levels will be attenuated to achieve recommended internal sound level criteria for new dwellings.

APPENDICES

APPENDIX A - Measurement Details

Measurement	Kit	Start Date	Start Time	End Date	End Time
MP1	AA1	27th February 2023	14:30	27th February 2023	15:45

APPENDIX B - Equipment Details

Kit	Equipment	Make	Model	Class	Serial Number
AA12	Sound Meter	Svantek	SV307	1	100907
AA2	Calibrator	Svantek	SV36	1	83149

APPENDIX C - Meteorology Details

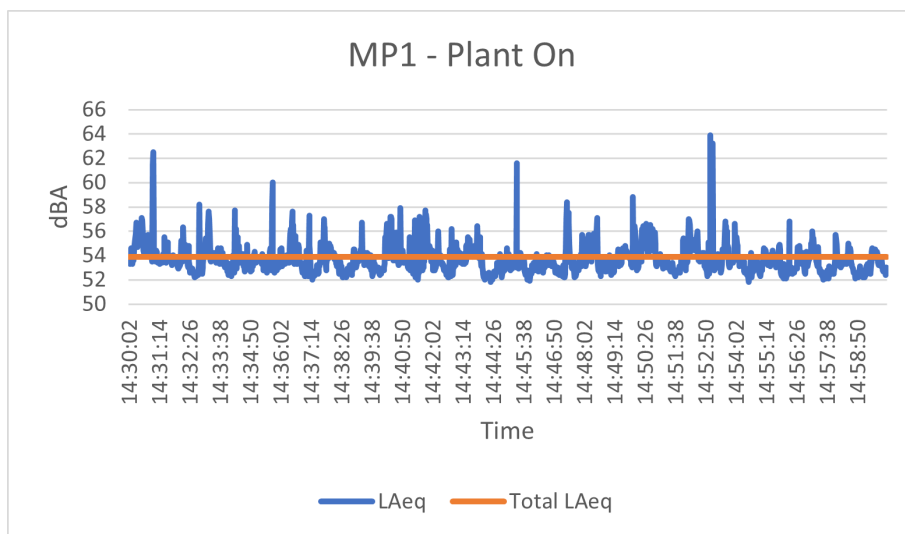
Measurement	Temp C (Average)	Wind Speed m/s	Humidity %
MP1	21.2	2.3	53

APPENDIX D - Calibration Details

Measurement	Calibrator Ref Level (dB)	Level Before (dB)	Deviation Before (dB)	Level After (dB)	Deviation After (dB)
MP1	114	114.2	-0.2	114.1	-0.1

APPENDIX E – Survey Data

Plant Noise Data



Background Level Data

