

UoM Student Residences

Noise Impact Assessment Report

John Graham Construction Ltd

Job No: 1040595
Doc ref: UMRP-CDL-XX-XX-RP-O-45010
Revision: P03
Revision date: 06 May 2025

Project title	UoM Student Residences	Job number
Report title	Noise Impact Assessment Report	1040595

Document revision history

Revision ref	Issue date	Purpose of issue / description of revision
P01	13 December 2024	First Issue
P02	13 January 2025	Revised following Deloitte comments
P03	06 May 2025	Serial no. for Microphone 3557 corrected in Table 3-3

Document validation (latest issue)

	06/05/2025	 Removable Signature
		
Principal author: Simon Everett	Checked by: Neil Bodsworth	Verified by: Michael Pimlott
Signed by: s.everett	Signed by: Neil Bodsworth	Signed by: S-1-12-1-2915518587-1329012378-1656101852-1915414511926e88e-e3c7-48cd-9b72-d2a077dc8a5

© Cundall Johnston & Partners LLP ("Cundall") owns the copyright in this report and it has been written for the sole and confidential use of John Graham Construction Ltd. It must not be reproduced in whole or in part or relied upon by any third party for any use whatsoever without the express written authorisation of Cundall. If any third party whatsoever comes into possession of this report, they rely on it at their own risk and Cundall accepts no duty or responsibility (including in negligence) to any such third party.

Executive summary

Cundall has been commissioned by John Graham Construction Ltd to prepare a Noise Impact Assessment (NIA) in relation to the Reserved Matters Application pursuant to Outline Planning Application Ref. 138126/00/2023. Ref. 138126/00/2023 was for the redevelopment of the Site to deliver up to 3,300 purpose built student accommodation bedrooms, alongside associated facilities and ancillary uses.

This Noise Impact Assessment has been produced to specifically address Conditions 33a, 34a and 35a attached to the Outline Planning Application which relate to noise.

Key legislation and guidance relevant to the assessment of noise for a development of this type has been presented herein.

Noise surveys at the site have been undertaken by Buro Happold and Cundall to inform the existing noise environment, with results presented herein.

In order to determine road traffic noise propagation across the proposed development site, a 3D model has been produced using SoundPLAN v9.1 acoustic modelling software.

Based on predicted noise levels, suitable specifications have been provided for façade / glazing elements. The assessment has found that standard double glazing will be suitable, and thermal requirements of proposed glazing systems should see acoustic criteria achieved by default.

It is understood that the current proposed ventilation strategy to control for overheating to satisfy the requirements of Approved Document O (ADO) will be satisfied with windows fully closed between the hours of 11pm and 7am. As such, since the noise requirements for ADO apply only during night-time hours (23:00 – 07:00), this element of the Building Regulations will be complied with by default.

An assessment of daytime noise levels due to overheating has been undertaken in line with the AVO guide, and this has found that predicted levels are below the “SOAEL” level, and below a level at which noise causes a material change in behaviour in Table 3-3 of the AVO Guide.

External noise levels in outdoor spaces has been modelled. This has found the majority of external areas across the development are less than 50 dBA which is considered a suitable acoustic environment for external amenity.

Based on the noise data from the surveys undertaken, plant noise limits have been set in line with the requirements of the Local Authority.

An initial noise assessment based on preliminary plant selection has been undertaken. This has found slight exceedances of current external plant, and therefore further mitigation is required through the design process. The mitigation measures outlined herein are considered achievable through design, and it is therefore considered that the assessment of plant noise feasibility demonstrates plant noise can be controlled to suitable levels to nearby receptors.

Based on the noise data from the surveys undertaken, entertainment noise limits have been set in line with the requirements of the Local Authority.

An assessment of entertainment noise has been undertaken based on worst case levels measured at the existing Squirrel's Bar on site and assumptions of breakout noise for the newly proposed venue on site. This assessment shows that levels comply with the Local Authority requirements for entertainment noise limits.

Contents

1.0	Introduction	2	5.1	Nearest noise sensitive receptor	29
1.1	Objectives of report	2	5.2	Representative background levels	29
1.2	Project description	2	5.3	Limiting noise levels	31
2.0	Relevant policy and guidance	5	5.4	Plant noise feasibility	31
2.1	National Planning Policy Framework	5	6.0	Entertainment noise	35
2.2	Noise Policy Statement for England	5	6.1	Limiting noise levels	35
2.3	Planning Practice Guidance	6	6.2	Entertainment noise feasibility assessment	35
2.4	BS 8223:2014 'Guidance on sound insulation and noise reduction for buildings'	7	6.3	Noise limiter device	36
2.5	Approved Document O (ADO)	7	7.0	Conclusions	38
2.6	ANC AVO Design Guide	8	Appendices		41
2.7	Manchester City Council - Planning & Noise: Technical Guidance (October 2022)	8	Appendix A	Time history graphs	41
2.8	Manchester's Local Development Framework - Core Strategy	9			
2.9	Citywide Development Control Policies	9			
2.10	Draft Places for Everyone Joint Development Plan Document Submission Version (2021)	10			
2.11	Outline planning decision notice (Ref: 138126/00/2023)	11			
3.0	Environmental noise survey	13			
3.1	Site context	13			
3.2	Buro Happold noise survey (2023)	13			
3.3	Cundall noise survey (2024)	15			
3.4	Squirrel's bar survey	18			
4.0	Noise impact assessment	20			
4.1	Environmental noise model	20			
4.2	Ventilation systems (whole dwelling ventilation)	23			
4.3	Required glazing systems	23			
4.4	Overheating assessment	24			
4.5	External amenity	26			
5.0	Plant noise	29			

1.0

Introduction

1.0 Introduction

Cundall has been commissioned by John Graham Construction Ltd to prepare a Noise Impact Assessment (NIA) in relation to the Reserved Matters Application pursuant to Outline Planning Application Ref. 138126/00/2023. Ref. 138126/00/2023 was for the redevelopment of the Site to deliver up to 3,300 purpose-built student accommodation bedrooms, alongside associated facilities and ancillary uses.

This Noise Impact Assessment has been produced to specifically address Conditions 33a, 34a and 35a attached to the Outline Planning Application which relate to noise.

1.1 Objectives of report

The primary aims of the acoustic design are outlined as follows:

- Document the external ambient noise climate at the site, based on long-term unattended noise monitoring surveys undertaken by other consultants and further surveys undertaken by Cundall conducted over both weekday and weekend periods.
- Assess the anticipated level of external noise intrusion through the building's external façade to ensure that internal ambient noise levels, resulting from external environmental sources, are appropriate for the intended use of the Development.
- Set limiting noise levels for any new items of emergency and non-emergency external services plant.
- Undertake noise impact assessment of external plant items based on current selections to confirm suitability in relation to compliance with proposed noise limits, advising on appropriate mitigation measures where necessary.
- Set limiting noise levels for entertainment breakout noise associated with the Venue located in the Central Hub of the development.
- Undertake noise impact assessment of entertainment breakout noise from Venue located in Central Hub, based on estimated levels from noise survey undertaken at existing on site entertainment venue. Comment on compliance with proposed noise limits, advising on appropriate mitigation measures where necessary.

1.2 Project description

The Development is located at the existing University of Manchester Fallowfield Campus. The project will see the demolition of Owen's Park, Oak House (including the Squirrels bar) and Woolton Hall residences to be replaced with new-build residences. These will comprise a total of 29 buildings blocks, comprising 3300 bedrooms, spread across 5 'Neighbourhood' sections each with a localised satellite amenity students' hub and one central amenity hub for the whole Development.

The ground floor masterplan is shown in Figure 1-1 overleaf.

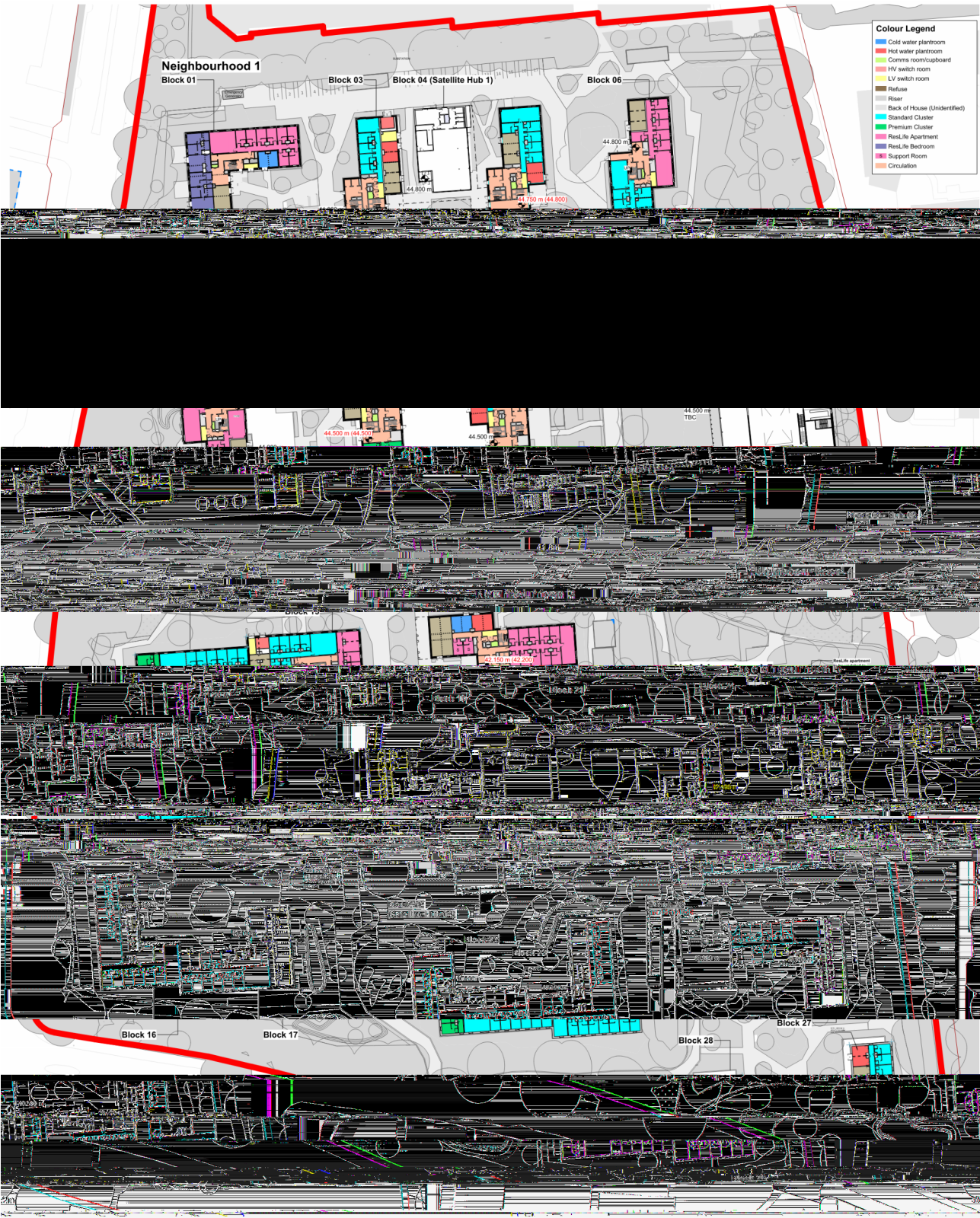


Figure 1-1: Ground floor masterplan

2.0

Relevant policy and guidance

2.0 Relevant policy and guidance

This section of the report outlines the key legislation and guidance relevant to the assessment of noise for a development of this type.

2.1 National Planning Policy Framework

The revised National Planning Policy Framework was updated in December 2024 and sets out the government's planning policies for England and how these are expected to be applied.

The NPPF states:

139. *Development that is not well designed should be refused, especially where it fails to reflect local design policies and government guidance on design, taking into account any local design guidance and supplementary planning documents such as design guides and codes. Conversely, significant weight should be given to:*
- a) *development which reflects local design policies and government guidance on design, taking into account any local design guidance and supplementary planning documents such as design guides and codes; and/or*
 - b) *outstanding or innovative designs which promote high levels of sustainability, or help raise the standard of design more generally in an area, so long as they fit in with overall form and layout of their surroundings.*
187. *Planning policies and decisions should contribute to and enhance the natural and local environment by;*
- [...]*
- e) *preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;*
198. *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; [...]*
200. *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.*

2.2 Noise Policy Statement for England

The noise policy statement for England (NPSE) was published by Defra in March 2010. The NPSE sets out the long-term vision of Government noise policy.

Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

The NPSE long term vision is supported by the following aims:

Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

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

2.3 Planning Practice Guidance

The Department for Communities and Local Government (DCLG) launched a planning practice guidance in March 2014 (last updated July 2019) which is a web-based resource and includes a section on Noise. This resource provides guidance on how to determine the noise impact in terms of whether a significant adverse effect is likely to occur and/or whether a good standard of amenity can be achieved.

In line with the NPSE, PPG Noise introduces the concept of:

- Significant observed adverse effect level (SOAEL): This is the level of noise exposure above which significant adverse effects on health and quality of life occur.
- Lowest observed adverse effect level (LOAEL): this is the level of noise exposure above which adverse effects on health and quality of life can be detected.
- No observed effect level (NOEL): this is the level of noise exposure below which no effect at all on health or quality of life can be detected.

Table 2-1 summarises the noise exposure hierarchy, based on the likely average response.

Perception	Examples of outcomes	Increasing effect level	Action
Not noticeable	No effect	No Observed Effect	No specific measures required
Noticeable but not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid where possible
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

Table 2-1: PPG noise exposure hierarchy

2.4 BS 8223:2014 'Guidance on sound insulation and noise reduction for buildings'

British Standard 8233:2014 provides guidance on internal ambient noise levels in residential spaces. The following table summarises this guidance:

Location	Day (07:00 – 23:00 hours)	Night (23:00 – 07:00 hours)
Living room	≤ 35 dBA $L_{Aeq,16\text{hour}}$	N/A
Dining room	≤ 40 dBA $L_{Aeq,16\text{hour}}$	N/A
Bedroom	≤ 35 dBA $L_{Aeq,16\text{hour}}$	≤ 30 dBA $L_{Aeq,8\text{hour}}$

Table 2-2: BS 8223:2014 Indoor ambient noise levels in unoccupied spaces

BS 8233:2014 does not provide internal noise criteria for individual events in terms of L_{AFmax} . However, it does state:

“Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values.”

In relation to design criteria for external noise, BS 8233:2014 states:

“For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable.

Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available, i.e. in flats, apartment blocks, etc. In these locations, specification of noise limits is not necessarily appropriate. Small balconies may be included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses. However, the general guidance on noise in amenity space is still appropriate for larger balconies, roof gardens and terraces, which might be intended to be used for relaxation. In high-noise areas, consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of 55 dB $L_{Aeq,T}$ or less might not be possible at the outer edge of these areas, but should be achievable in some areas of the space.”

2.5 Approved Document O (ADO)

It is understood that Manchester City Council have generally requested that as part of determining appropriate internal ambient noise levels, that in addition to the above requirements an assessment of noise levels during periods of overheating is undertaken.

Recently published draft guidance for consultation from the ANC / IOA relates to achieving newly introduced limits for noise during periods of overheating as specified in Approved Document O - 'Guide to Demonstrating Compliance with the Noise Requirements of Approved Document O (July 2022)'

This guidance will form the basis of assessing the overheating ventilation strategy in the student accommodation block, with regards to compliance with the set noise limits, and though Approved Document O is Building Regulations legislation, this indicates to the Local Authority that should overheating strategies wish to be considered at the planning stage that compulsory legislation is in place to consider this throughout the design.

Approved Document O mandates that night-time internal noise levels should be limited to see that should open windows be required to control overheating, this does not come at the cost of adverse overnight noise levels to occupants. The limiting levels are as follows:

- 40 dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am)
- 55 dB L_{AFmax} , more than 10 times a night (between 11pm and 7am)

2.6 ANC AVO Design Guide

Approved Document O considers noise levels during the night-time period only. For analysis of noise levels under overheating conditions during the daytime period, reference is made to the Association of Noise Consultants (ANC) Acoustics Ventilation and Overheating Residential Design Guide (AVO) (published in January 2020) which provides guidance on internal noise levels and overheating. The AVO Guide seeks to:

- *encourage an assessment of noise that recognises the interdependence between the acoustics, ventilation and overheating designs;*
- *provide a means of assessment to satisfy the need to consider acoustics, ventilation and overheating at the planning stage;*
- *assist in educating clients, environmental health/planning officers and other stakeholders of the interdependence of design for acoustics, ventilation and overheating.*

As the ProPG emphasises the importance and principles of good acoustic design, the AVO Guide is intended to “contribute to the practice of good acoustic design”. In particular, it is noted that the over-arching aspiration of good acoustic design is that residents may open windows without any adverse acoustic impact (ProPG paragraph 2.33) and the AVO Guide provides a practical method to address these requirements

2.7 Manchester City Council - Planning & Noise: Technical Guidance (October 2022)

2.7.1 Fixed mechanical services plant

With respect to noise from fixed mechanical services plant items, this document states that:

Any noise assessment needs to consider not only the overall level of noise emitted but also its particular characteristics. 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 5 dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location’.

2.7.2 Residential developments

Section 3.7.1.1 of the document relates to internal / external ambient noise limits for residential properties and adopts the following criteria based on BS 8233 guidance:

Manchester City Council has adopted the following internal noise limits for residential properties:

- ***Bedrooms (night-time – 23.00 – 07.00) 30 dB L_{Aeq} (individual noise events should not normally exceed 45 dB $L_{Amax,F}$ by more than 15 times)***
- ***Living Rooms (daytime – 07.00 – 23.00) 35 dB L_{Aeq}***
- ***Gardens and terraces (daytime) 55 dB L_{Aeq}***

2.7.3 Airborne entertainment noise

Section 3.7.1.2 of the MCC document also makes reference to airborne entertainment noise from new entertainment venues that are structurally detached from other buildings. Music noise from the proposal will not be ‘audible’ in nearby properties, assuming that the residential properties in question have their windows open. The criterion here is:

Entertainment noise (L_{Aeq}) should be controlled to 5 dB below the background noise level (L_{A90}) without the entertainment noise present, in each octave band at the nearest noise sensitive location.

2.8 Manchester's Local Development Framework - Core Strategy

The Core Strategy was adopted by Manchester City Council in July 2012. It is the key document in Manchester's Local Development Framework and outlines the Council's vision for Manchester in 2027 along with the planning policies which will be used to deliver that vision. Section of Policy DM1 of the Core Strategy which are relevant to noise and good acoustic design are reproduced below:

Policy DM 1

Development Management

All development should have regard to the following specific issues for which more detailed guidance may be given within a supplementary planning document:

- *Appropriate siting, layout, scale, form, massing, materials and detail.*

[...]

- *Effects on amenity, including privacy, light, noise, vibration, air quality, odours, litter, vermin, birds, road safety and traffic generation. This could also include proposals which would be sensitive to existing environmental conditions, such as noise.*
- *Design for health.*

[...]

2.9 Citywide Development Control Policies

Item DC26 of the Manchester City Council 'Citywide Development Control Policies' document is relevant to noise and is taken into regard when considering whether permission should be granted.

26. DEVELOPMENT AND NOISE

DC26.1 The Council intends to use the development control process to reduce the impact of noise on people living and working in, or visiting, the City. In giving effect to this intention, the Council will consider both:

- a. the effect of new development proposals which are likely to be generators of noise; and*
- b. the implications of new development being exposed to existing noise sources which are effectively outside planning control*

DC26.2 New noise-sensitive developments (including large-scale changes of use of existing land or buildings), such as housing, schools, hospitals or similar activities, will be permitted subject to their not being in locations which would expose them to high noise levels from existing uses or operations, unless the effects of the noise can realistically be reduced. In giving effect to this policy, the Council will take account both of noise exposure at the time of receiving a planning application and of any increase that may reasonably be expected in the foreseeable future.

DC26.3 Developments likely to result in unacceptably high levels of noises will not be permitted:

- a. in residential areas;*
- b. near schools, hospitals, nursing homes and similar institutions;*
- c. near open land used frequently for recreational purposes.*

DC26.4 Where the Council believes that an existing noise source might result in an adverse impact upon a proposed new development, or where a new proposal might generate potentially unacceptable levels of noise, it will in either case require the applicant to provide an assessment of the likely impact and of the measures he proposes to deal satisfactorily with it. Such measures might include the following:

- a. engineering solutions, including reduction of noise at source, improving sound insulation of sensitive buildings or screening by purpose-built barriers;*
- b. layout solutions, including consideration of the distance between the source of the noise and the buildings or land affected by it; and screening by natural barriers or other buildings or non-critical rooms within a building; and*

- c. *administrative steps, including limiting the operating times of the noise source, restricting activities allowed on the site or specifying an acceptable noise limit. Any or all of these factors will be considered appropriate for inclusion in conditions on any planning permission.*

DC26.5 The Council will control noise levels by requiring, where necessary, high levels of noise insulation in new development as well as noise barriers where this is appropriate.

DC26.6 Exceptions to the general policy will be considered on their merits. The Council accept, as an example, that the occasional use of outdoor facilities such as sports stadia for concerts can be acceptable in certain circumstances. Any such proposal will be considered in the light of consultation with local residents and others, and the practicability of appropriate conditions on any approval.

Reasons :-

It has become increasingly accepted that noise is a major source of environmental pollution, affecting peoples' physical and mental health. The Council considers that the planning process has a role to play in reducing noise levels generally and, through the development control system, to consider carefully the relationship between different land-uses from the point of view of noise generation and impact. Reaching judgments on what is or is not an acceptable amount or type of noise is a complex matter, consideration of which will depend on the particular circumstances on the ground.

(NOTE: The Council will issue more detailed advice on the subject as supplementary guidance, and this will have regard to current Government policy. The UDP policies therefore are limited to broad principles. Two key areas are:

- i) *a presumption against allowing highly "noise sensitive" uses (such as housing and schools) so close to existing noise sources that problems would be likely to result. An existing noisy factory, for example, is entitled to some protection from objection about its activities from future residential neighbours, who would themselves feel entitled to a reasonable degree of residential amenity; and*

the reverse situation, where there would be an equal presumption against allowing noisy, or potentially noisy, activities into an area with low ambient noise levels, and where people would have a reasonable expectation that no significant increase in those background levels would be allowed. Where the relationship is difficult to predict, the Council will place the onus for assessing the noise impact of, or upon, a proposed new development on the developer, and will consult (in particular) with the Director of Environmental Health. The policy sets out the range of measures which are available to help to reduce the noise effect to acceptable levels. As well as conditions on any planning permission, a "planning obligation" (for example, an Agreement under Section 106 of the Town and Country Planning Act 1990) may be appropriate to ensure key measures are taken effectively).

2.10 Draft Places for Everyone Joint Development Plan Document Submission Version (2021)

Places for Everyone is a long-term plan of nine Greater Manchester districts for jobs, new homes, and sustainable growth. It has been published by the GMCA on behalf of the nine districts.

The plan:

- sets out how the nine boroughs should develop up until 2037;
- identifies the amount of new development that will come forward across the 9 districts, in terms of housing, offices, and industry and warehousing, and the main areas in which this will be focused;
- supports the delivery of key infrastructure, such as transport and utilities;
- protects the important environmental assets across the city region;
- allocates sites for employment and housing outside of the existing urban area; and
- defines a new Green Belt boundary for Greater Manchester

Whilst the plan includes several references to noise, these are relatively generic when referring to specific policies or allocations and do not include any quantifiable targets or requirements.

2.11 Outline planning decision notice (Ref: 138126/00/2023)

The proposed development has been granted outline planning permission by Manchester City Council (Ref: 138126/00/2023). Conditions 33, 34 and 35 of the decision notice related to noise and state the following.

33) a) Prior to the commencement of development within each phase, with the exception of demolition and site clearance, a scheme for the acoustically insulation of buildings to limit the breakout of noise in accordance with a noise study of the buildings and a scheme of acoustic treatment shall be submitted to and approved in writing by the City Council as local planning authority. The scheme shall be implemented in full before the use commences.

b) Prior to the occupation of the relevant phase of development a verification report shall be submitted to and agreed in writing by the City Council as local planning authority to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved scheme. The report shall also undertake post completion testing to confirm that acceptable criteria have been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria.

Reason - To safeguard the amenities of the occupiers of the building and occupiers of nearby properties pursuant to policy DM1 of the Core Strategy and saved Unitary Development Plan policy DC26.

34) a) Prior to the commencement of development within each phase, with the exception of demolition and site clearance, a scheme for acoustically insulating the proposed residential accommodation against noise from Wilmslow Road and Moseley Road in relation to that phase shall be submitted to and approved in writing by the City Council as local planning authority. There may be other actual or potential sources of noise which require consideration on or near the site, including any local commercial/industrial premises. The potential for overheating shall also be assessed and the noise insulation scheme shall take this into account. The approved noise insulation and ventilation scheme shall be completed before any of the dwelling units are occupied within each relevant phase. Noise survey data shall include measurements taken during a rush-hour period and nighttime to determine the appropriate sound insulation measures necessary.

b) Prior to first occupation of the residential units within each phase, a verification report shall be submitted to and approved in writing by the City Council as local planning authority to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved scheme. The report shall also undertake post completion testing to confirm that the internal noise criteria have been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the internal noise criteria.

Reason: To secure a reduction in noise from traffic or other sources in order to protect future residents from noise disturbance and to reduce the potential for overheating pursuant to policy DM1 of the Core Strategy and saved Unitary Development Plan policy DC26.

35) a) 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. Prior to the first use of any phase of development, the scheme for that phase 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 scheme shall be implemented in full before the use commences.

b) Prior to the operation of the relevant phase of development a verification report shall be submitted to and approved in writing by the City Council as local planning authority to validate that the work undertaken throughout the phase of development conforms to the recommendations and requirements in the approved scheme. The report shall also undertake post completion testing to confirm that the noise criteria have been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria.

Reason - To minimise the impact of the development and to prevent a general increase in pre-existing background noise levels around the site pursuant to policy DM1 of the Core Strategy and saved Unitary Development Plan policy DC26.

3.0

Environmental noise survey

3.0 Environmental noise survey

3.1 Site context

The existing Fallowfield Campus is situated within a larger cluster of University accommodation and provision within the south Manchester suburb of Fallowfield. The site is approximately 3 miles south of the city centre immediately adjacent to one of the busiest bus corridors in Europe linking the campus into the Oxford Road corridor and the University of Manchester and Manchester Metropolitan University sites. The site is bordered by Ashburne Hall and Sheavyn House to the north, Moseley Road to the south, Wilmslow Road to the east and Whitworth Lane to the west.

The application boundary and ownership boundary of the site are shown in Figure 3-1 below.

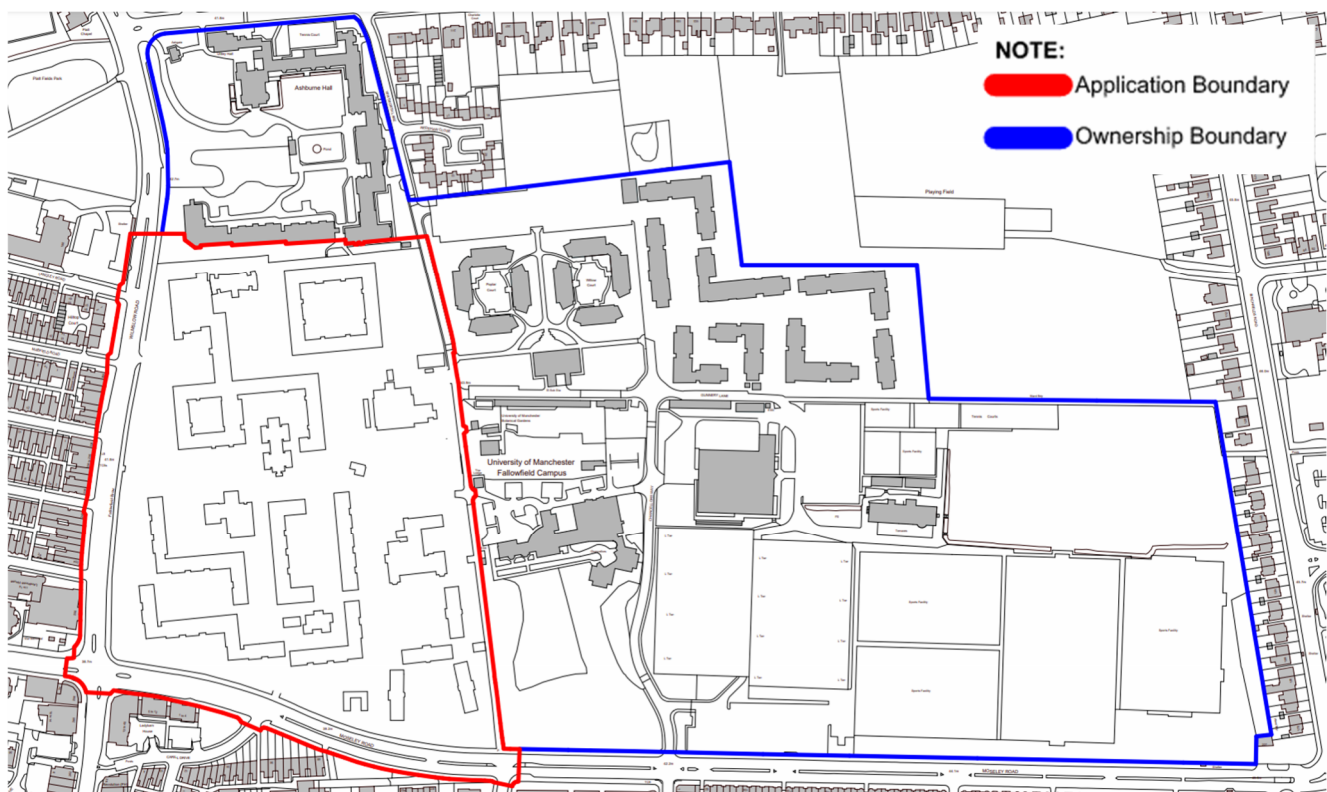


Figure 3-1: Application boundary

3.2 Buro Happold noise survey (2023)

In order to determine noise incident on the site and existing representative background sound levels, a noise survey was previously undertaken by Buro Happold in 2023 in support of the outline planning application as detailed in Chapter 7 of the ES Chapter supporting the application (Ref: 0053454).

The survey was conducted at 5 measurement positions between Friday 19th and Wednesday 24th May 2023.

The locations of these position is reproduced in Figure 3-2 overleaf. Three positions consisted of continuous unattended monitoring (L2, L3 and L5), supplemented by short-term attended monitoring during the morning of Friday 19th May 2023 at the L1 position. Position L4 on the eastern side of the boundary between L1 and L3; however, this was found to be dominated by noise from local fixed plant, which would be removed as part of the proposed development, and therefore this measurement location was not used. Technical issues with positions L1 and L2 mean results from these locations were also considered invalid.

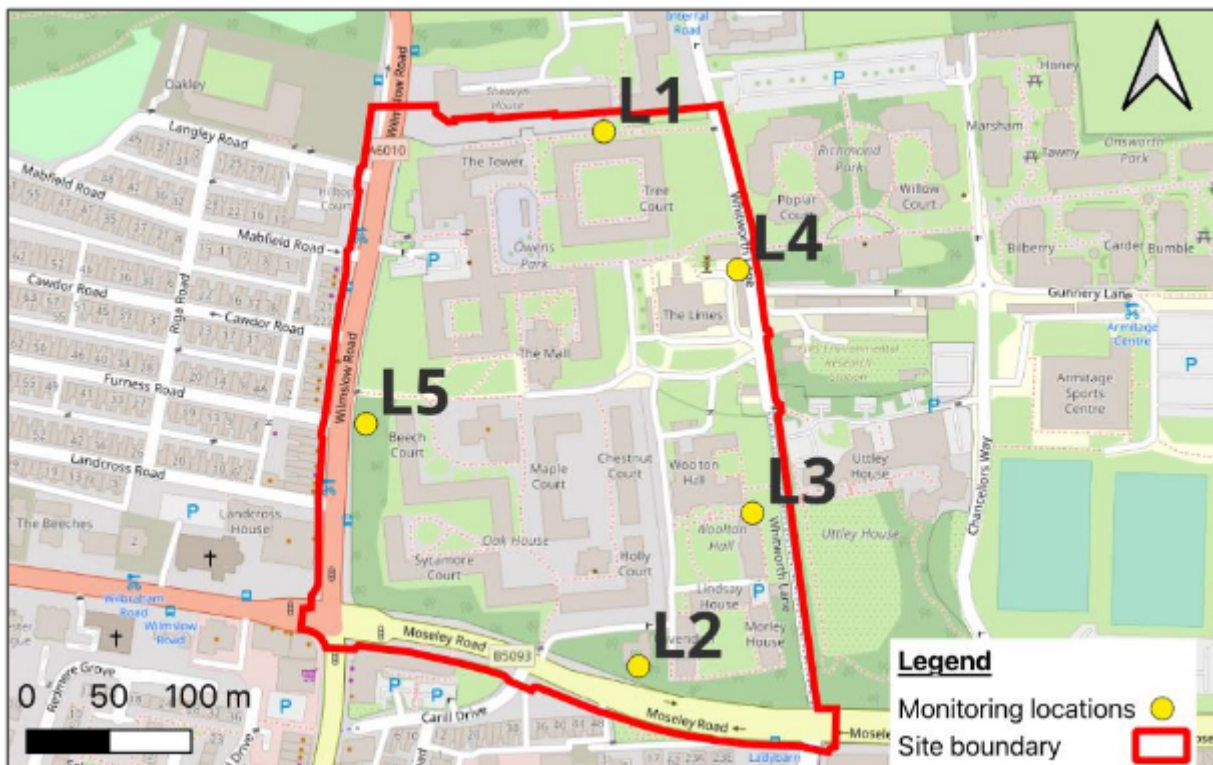


Figure 3-2: Buro Happold baseline noise survey measurement locations

The results from positions L3 and L5 presented within the ES Chapter are reproduced below. These are the time history graphs for both positions and table of representative background levels at each position.

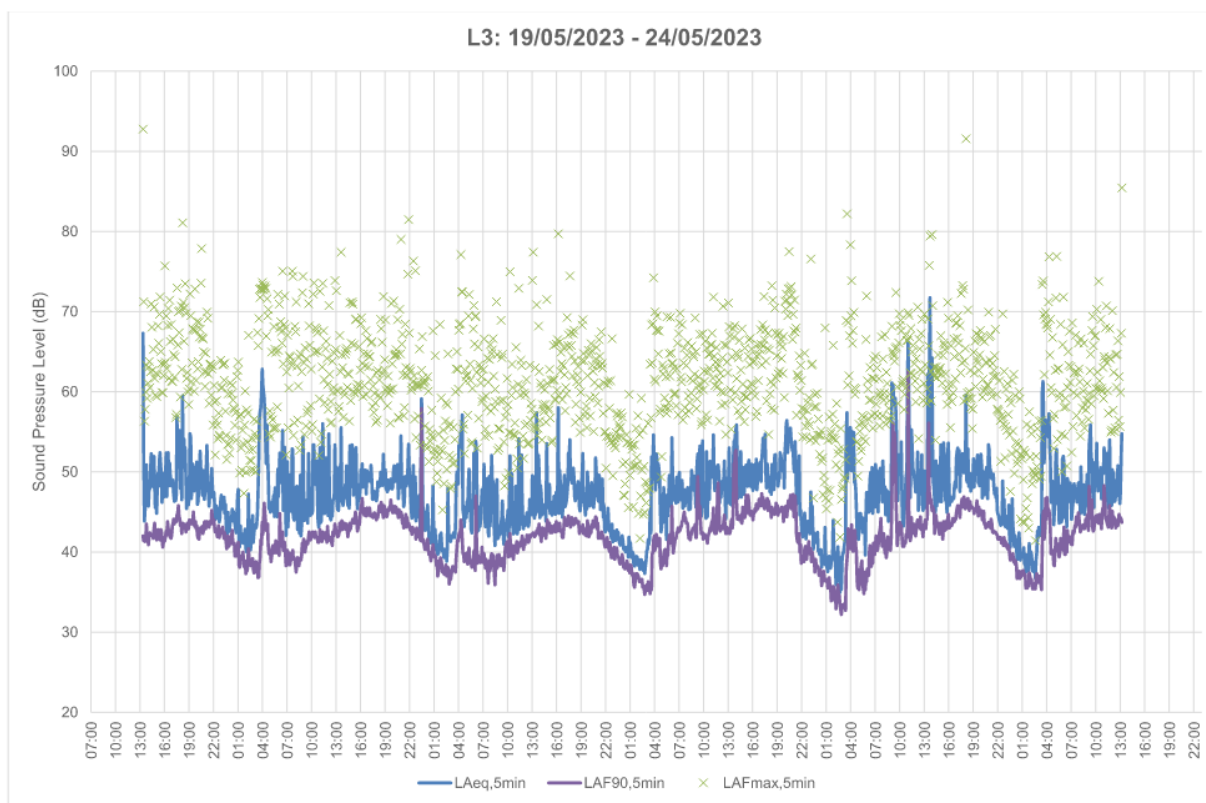


Figure 3-3: Buro Happold noise data - L3 Time History Graph

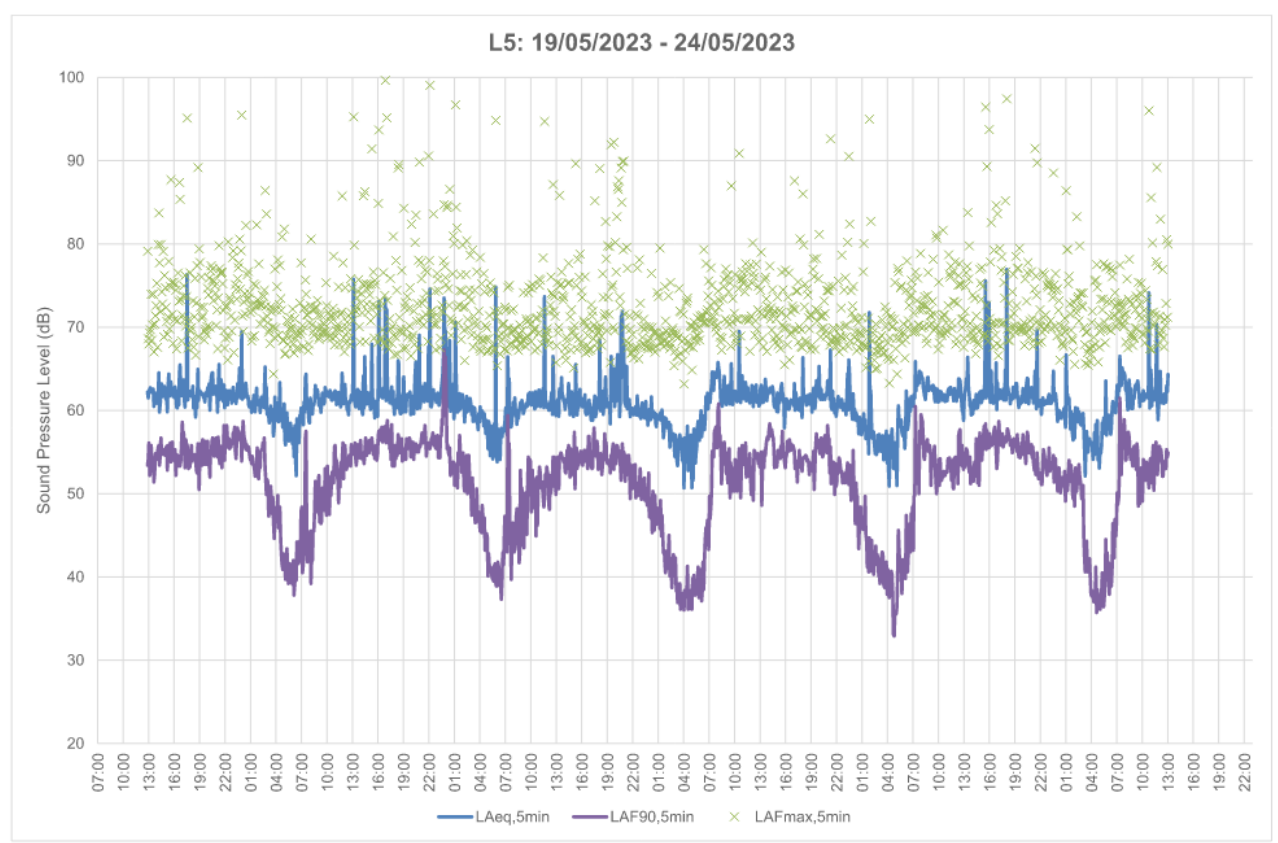


Figure 3-4: Buro Happold noise data - L5 Time History Graph

Location	Period	Typical background sound level ¹ (dB LA90,5min free-field)
L3	Day	37
	Night	33
L5	Day	46
	Night	38
Note: ¹ Derived based on method detailed in Appendix A of the MCC Planning and Noise Technical Guidance		

Table 3-1: Buro Happold typical background levels

3.3 Cundall noise survey (2024)

In order to supplement the 2023 Buro Happold survey and gather further noise data across the sit, another noise survey was undertaken by Cundall in 2024. The primary objective was to capture prevailing ambient noise levels from dominant noise sources (primarily Mosley Road to the south of the site where position L2 of Buro Happold’s survey experienced technical issues) and capture key representative background sound levels.

3.3.1 Measurement locations

Two measurement locations were chosen at representative positions as described in Table 3-2 and marked in Figure 3-5. The observations at the measurement positions are also summarised in Table 3-2.

No.	Description	Observations
MP1	Out of a first floor window of Woolton Hall, overlooking Mosley Road	Road traffic along Mosley Road was the dominant noise source
MP2	Out of a first floor window of Richmond Park to the north east of the proposed development boundary	Distant road traffic from the surrounding network, primarily Wilmslow Road and Mosley Road was the dominant noise source

Table 3-2: Measurement locations and observations



Figure 3-5: Cundall noise survey measurement locations

3.3.2 Utilised equipment

The equipment listed below were used for the noise survey. Calibration certificates for all equipment are available upon request.

Equipment	Type	Serial No.	Last calibration date
Casella Sound Level Meter	633	1211404	07/07/2023
Casella Pre-amp	495	1180	
Casella Microphone	251	3557	
Casella Calibrator	120/1	3574169	18/07/2024
Casella Sound Level Meter	633	1211405	22/07/2021
Casella Pre-amp	495	001211	
Casella Microphone	251	2626	
Casella Calibrator	120/1	4921893	24/07/2024

Table 3-3: Utilised equipment

3.3.3 Measurement procedure

The weather during the surveys was cold, dry, and overcast with minimal wind throughout – suitable for the measurements undertaken.

Noise measurements were made in accordance with BS EN 60651:1994 and BS 7445:1993. The sound level meters were calibrated prior and post to site measurements using the appropriate calibrators to a reference tone of 114 dB at 1 kHz.

The measurements were carried out unattended. Audio triggers were set as 65 dB(A) to identify unusual noise events with a level higher than this during the unattended periods.

3.3.4 Measurement results

A summary of the average ambient noise levels recorded at positions MP1 and MP2 is detailed within Table 3-4. The values are the logarithmically averaged $L_{Aeq,T}$, the 10th highest night-time maximum L_{AFmax} , and the range of $L_{A90,15min}$ values measured. All values have been rounded to the nearest integer value (as fractions of a decibel are imperceptible) and have been corrected from façade levels to free-field levels.

Position	Data	Period	Average $L_{Aeq,T}$ dB	10th highest night-time L_{AFmax} dB	Range $L_{A90,15min}$ dB
MP1	10/09/2024	Daytime (13:30 – 23:00 hours)	60	-	46 – 54
	10/09/2024–11/09/2024	Night-time (23:00 – 07:00 hours)	60	75	34 – 49
	11/09/2024	Daytime 07:00 – 09:15 hours)	62	-	48 – 54
MP2	10/09/2024	Daytime (14:00 – 23:00 hours)	48	-	38 – 47
	10/09/2024–11/09/2024	Night-time (23:00 – 07:00 hours)	43	63	36 – 41
	11/09/2024	Daytime 07:00 – 09:00 hours)	52	-	42 – 48

Table 3-4: Summary of Position MP1 and MP2 noise measurement data

Graphs of the full continuous time history measurements at positions MP1 and MP2 are presented in Appendix A.

3.4 Squirrel’s bar survey

As part of the new Development, it is proposed to have an entertainment venue within the central hub. It is understood that this new venue is intended to have the same function and operational capacity as the existing Squirrel’s Bar on the Fallowfield site.

In order to assess entertainment noise, a survey was therefore undertaken within the bar over Fresher’s weekend to establish likely worst case noise levels from entertainment noise within the venue.

The sound level meter was located on the mezzanine level of the bar overlooking the occupants and loudspeaker. Measurements were undertaken from 13:00 hours on 20th September 2024 to 13:30 hours on 24th September 2024. The octave band data for the loudest 15 minute period measured across the whole survey (found to be at 23:15 hours on 20th September 2024) is presented below.

Sound pressure level L_{eq} (dB) at Octave band centre frequency (Hz) – Loudest measured 15 minute period of Entertainment Noise at Squirrel’s Bar						
63	125	250	500	1k	2k	4k
76	80	81	87	86	81	73

Table 3-5: Loudest measured 15 minute period of Entertainment Noise at Squirrel’s Bar

4.0

Noise impact assessment

4.0 Noise impact assessment

The following section addresses the requirements of Planning Condition 34a.

4.1 Environmental noise model

In order to determine road traffic noise propagation across the proposed development site, a 3D model has been produced using SoundPLAN v9.1 acoustic modelling software. This model is capable of accurately determining sound propagation by taking into account variations in topography, barrier attenuation provided by existing landscaping and buildings, and distance attenuation.

Road traffic noise sources within the 3D model have been calibrated based upon the daytime L_{Aeq} levels obtained at positions as per the table below.

Road	Measurement position	Calibration method
Wilmslow Road	Buro Happold L5	Calibrated to average of all daytime L_{Aeq} levels measured during survey for daytime assessment and all night-time L_{Aeq} levels measured during survey for night-time assessment
Mosley Road	Cundall MP1	Calibrated to average of both daytime L_{Aeq} levels for daytime assessment and the single night-time $L_{Aeq,8hour}$ measured for the night-time assessment

Table 4-1: Road noise source calibration method

Based on the calibrated road traffic noise levels, the predicted daytime and night-time façade noise maps for proposed buildings across the development site have been calculated and are presented in Figure 4-1 and Figure 4-2 on the following pages. Levels referred to in the following graphics are 'free-field' values at 1 m from the building façade.

Daytime noise levels incident on proposed buildings are up to 59 dBA for facades facing primary noise sources, and these levels reduce the further away and/or more shielded from primary noise sources proposed buildings are. Noise levels reduce to below 30 dBA for the façades least affected by the surrounding noise sources.

Night-time noise levels incident on proposed buildings are up to 58 dBA for façades facing Mosley Road, as the survey found noise levels along this road do not significantly drop off over the night-time period. These levels reduce the further away and/or more shielded from primary noise sources proposed buildings are. Noise levels reduce to 25 dBA for the façades least affected by the surrounding noise sources.



Figure 4-1: Daytime facade noise map



Figure 4-2: Night-time facade noise map

4.2 Ventilation systems (whole dwelling ventilation)

It is a requirement of the building regulations that 'whole dwelling ventilation' (previously known as 'background' ventilation) is provided in dwellings. For detailed application elements it is proposed that Mechanical Ventilation and Heat Recovery (MVHR) units will be used to provide necessary whole dwelling ventilation rates to all dwellings.

This will mean that where MVHR units are used, no façade openings (e.g. trickle vents) are required directly into habitable rooms. MVHR ventilation systems tend to have inherently high sound attenuation and rarely results in intrusive noise issues via supply / extract duct paths. However, where air inlets and outlets associated with the system are located on noisy façades, this will be examined in detail during the design of the scheme. Additionally, if necessary, appropriate mitigation measures will be applied (silencers) so IANL design criteria are met.

In addition, any mechanical ventilation system used will need to be appropriately designed so that noise generated by the system itself does not result in significant adverse effects. It is understood the project will be following design standards to demonstrate compliance with the Passivhaus standards – and as such the following table details Passivhaus criteria for the generation of noise from building services noise.

Location	Noise limits (dBA)
Kitchen / Living / Dining room	30
Bedroom	25

Table 4-2: Summary of Passivhaus noise limiting criteria in dwellings when providing 'whole dwelling' ventilation

As 'whole dwelling ventilation' will be provided by a mechanical system, the only time windows will be required to be open for the purposes of ventilation will be for occasional 'purge' ventilation. With respect to noise levels during purge ventilation the ProPG states the following:

'It should also be noted that the internal noise level guidelines are generally not applicable under "purge ventilation" conditions as defined by Building Control Approved Document F, as this should only occur occasionally (e.g. to remove odour from painting and decorating or from burnt food).'

It is therefore not considered necessary to further consider noise levels during purge ventilation conditions and using windows for this purpose is unlikely to result in any significant adverse effects.

4.3 Required glazing systems

For mechanically ventilated buildings, the weakest elements of the external elevation are typically the glazing. The specification of glazing is therefore considered to be the primary factor in determining the internal ambient noise level within noise sensitive areas due to noise ingress from outside.

Calculation procedures for determining the glazing attenuation ($R_w + C_{tr}$) are as described in the "more rigorous calculation method" outlined in BS 8233. Full details of the external noise intrusion calculations are available at request.

Calculations have been undertaken based on the worst-case incident noise night-time levels, as complying with night-time criteria see all other requirements of BS 8233 achieved by default.

Initially the worst case rooms have been used in the calculation process – these are identified as bedrooms on the façade of Block 28 overlooking Mosley Road. A summary of the required minimum glazing sound insulation calculated is presented below.

Description	Worst case predicted external free-field noise level on façade (dB)	Internal noise criteria (dB)	Required minimum glazing sound insulation
Worst case bedroom	59 $L_{Aeq,T}$	$\leq 30 L_{Aeq,T}$	$R_w + C_{tr}$ 28 dB

Table 4-3: Required minimum sound insulation performances

Examples of a suitable glazing construction is provided in Table 5-3 to achieve the sound insulation requirements are provided below.

Minimum required glazing sound reduction index, dB $R_w + C_{tr}$	Example glazing construction
28	6 mm Glass / 12 mm gap / 4 mm Glass

Table 4-4: Examples of glazing constructions for achieving minimum glazing sound insulation performance requirements

The above glazing specification represented standard double glazing, and thermal requirements of proposed glazing systems should see the above achieved by default. As this assessment was for worst case bedrooms with worst case external noise levels, it follows that standard thermal double glazing will be a suitable specification across the whole development.

All glazing should be well sealed when closed. It is imperative that frames / non-glazed curtain walling components do not compromise the performance of the glazing. No gaps should be visible around the frame from the exterior.

To control noise break-in from outside, it is considered good practice for the external wall construction to provide a sound reduction at least 10 dB above that of the glazing values given above. Standard façade systems should see this level of performance achieved by default.

4.4 Overheating assessment

4.4.1 Approved Document O (ADO)

It is understood that the current proposed ventilation strategy to control for overheating to satisfy the requirements of Approved Document O will be satisfied with windows fully closed between the hours of 11pm and 7am.

As such, since noise requirements for ADO apply only during night-time hours (23:00 – 07:00), this element of the Building Regulations will be complied with by default.

4.4.2 AVO Guide assessment

Where an AVO Guide Level 2 assessment is required for transport noises sources, Table 3-3 of the document presents a summary of the assessment of adverse effect based on internal ambient noise level and duration. The AVO Guide risk criteria are summarised below, with corresponding external free-field façade levels also defined. This is based on a partially open window affording approximately 10 dB attenuation.

AVO risk category	Internal ambient noise levels	Corresponding external free-field façade level if windows are partially open
	$L_{Aeq,day}$ (07:00 – 23:00)	$L_{Aeq,daytime}$ (07:00 – 23:00)
RED High Risk	>50 dB	>63 dB
AMBER Medium to Low	36 to 50 dB	49 to 63 dB
GREEN Negligible	≤35 dB	≤48 dB

Table 4-5: AVO Guidance for noise assessment of noise from transport noise sources relating to overheating condition.

Based on the above external free field façade criteria, external façade noise maps are presented in Figure 4-3 overleaf which detail the AVO guide risk categories across the site if relying on opening window ventilative cooling. It can be seen from the markup noted that there is a mix of medium to low and negligible risk areas across the development, with no areas of the development are subject to the highest risk category.



Figure 4-3: AVO Guide risk categories across the scheme based on openable windows

Whilst Table 3-3 of the AVO guide provides no quantitative guidance regarding the combined effect of level and duration for the overheating condition, it is summarised qualitatively in Figure 3-2 of the AVO Guide, as reproduced below.

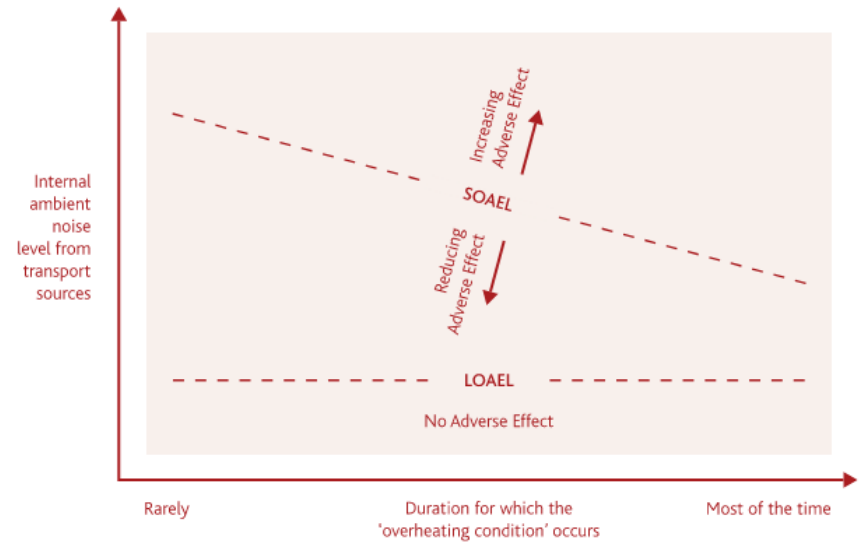


Figure 4-4: Figure 3-2 of AVO Guide

Considering that no areas across the development are in the highest risk category, the predicted levels are below the “SOAEL” level, and below a level at which noise causes a material change in behaviour in Table 3-3 of the AVO Guide. They are therefore considered to be suitable for occupants, and hence limited periods of time that windows are required to be open to mitigate overheating during the day are considered acceptable (and with no requirement to open windows to mitigate cooling at night).

4.5 External amenity

The SoundPLAN model has been used to calculate the likely noise levels in external spaces across the development. The below graphic indicates the expected daytime noise levels at a height of 1.6m.

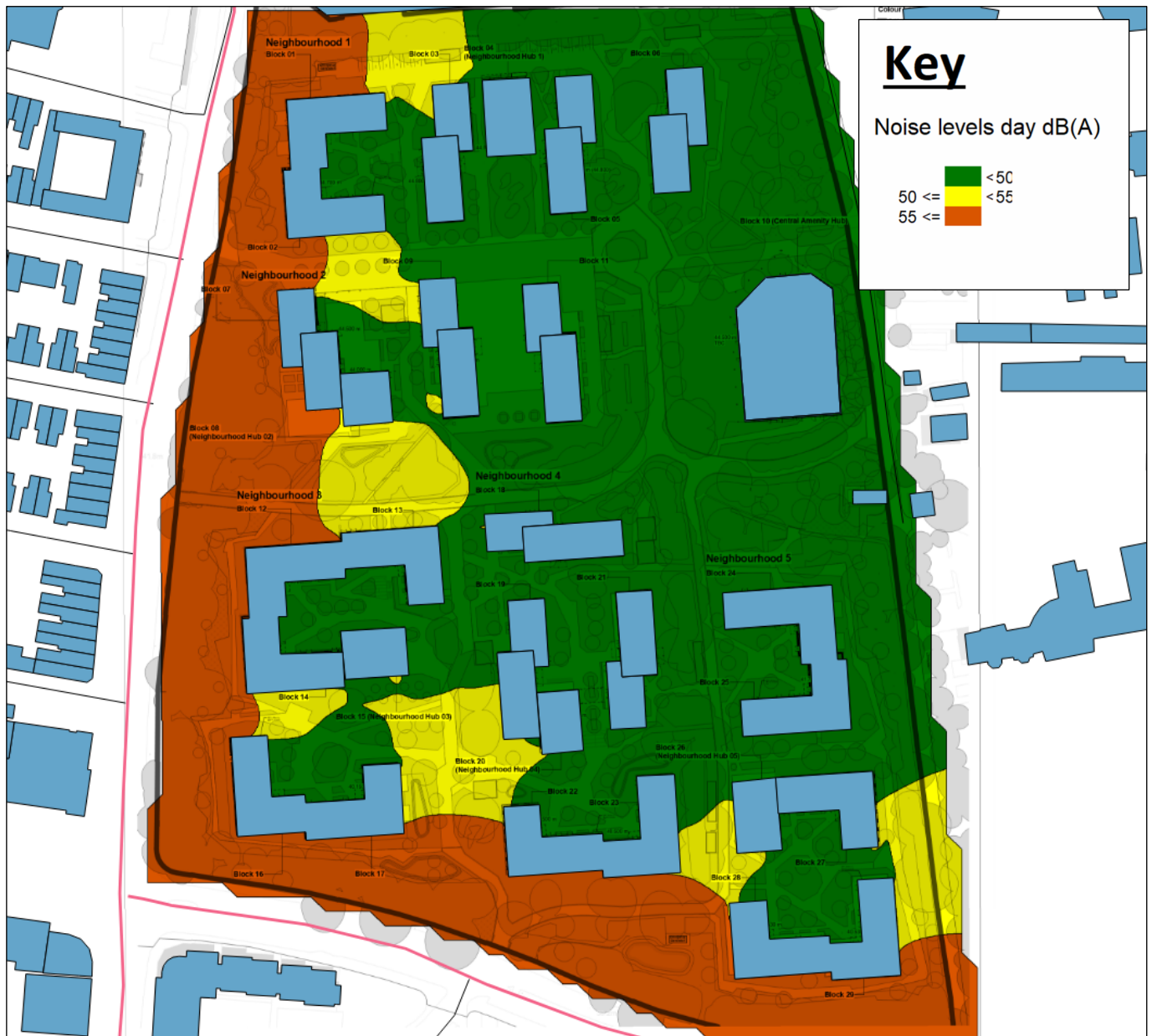


Figure 4-5- Outdoor amenity space - Grid Noise Map @ 1.6m

It can be seen that the majority of external areas have noise levels of less than 50 dBA. Some areas are between 50 dBA and 55 dBA, with some areas immediately facing Wilmslow and Mosley Road exceeding 55 dBA.

Guidelines given in BS 8233:2014 states the following;

“In high-noise areas, consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of 55 dB $L_{Aeq,T}$ or less might not be possible at the outer edge of these areas, but should be achievable in some areas of the space.”

Given the proposed development is in an urban location close to transportation routes, it is expected that some areas will exceed 55 dBA. The majority of external areas across the development are less than 50 dBA which is considered a suitable acoustic environment for external amenity.

5.0

Plant noise

5.0 Plant noise

The following section addresses the requirements of Planning Condition 35a.

5.1 Nearest noise sensitive receptor

When assessing the level of adverse impact upon existing dwellings to the introduction on new industrial and commercial sound sources, the relevant British Standard (BS 4142:2014) requires that the predicted level of new impact (Rating Level) be compared against the existing 'representative' background sound level'.

The identified representative measurement positions for each receptor is outlined in the table below.

Receptor	Measurement position
Residential properties Wilmslow Road	Buro Happold L5
Residential properties off Mosley Road	Cundall MP1
Richmond Park	Cundall MP2
Ashburne Hall	Cundall MP2
Sheavyn House	Cundall MP2

Table 5-1: Representative background measurement positions

5.2 Representative background levels

When assessing the level of adverse impact upon existing dwellings to the introduction on new industrial and commercial sound sources, the relevant British Standard (BS 4142:2014) requires that the predicted level of new impact (Rating Level) be compared against the existing 'representative' background sound level'.

Histograms of the $L_{A90,15min}$ values measured at position MP1 and MP2 are provided in Figure 5-1 to Figure 5-4 for daytime and night-time periods. The L_{A90} values deemed representative of the background sound level for the purposes of the BS 4142 assessment are highlighted red.

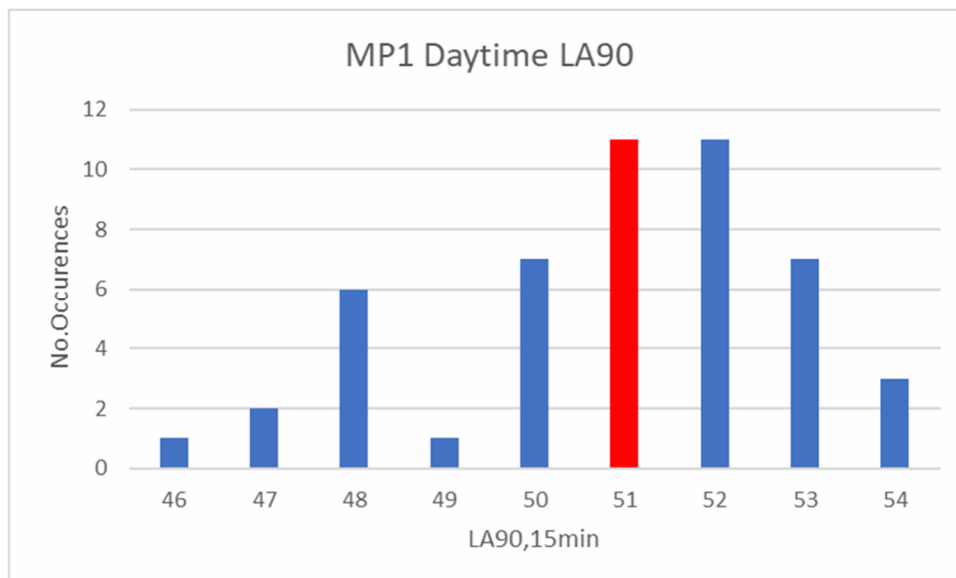


Figure 5-1: MP1 Daytime representative background noise levels

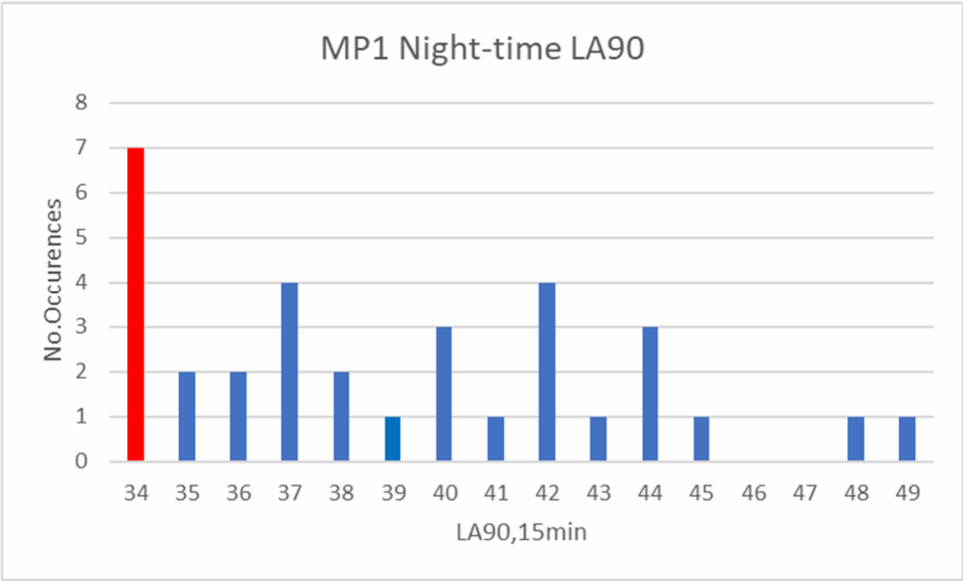


Figure 5-2: MP1 Night-time representative background noise levels

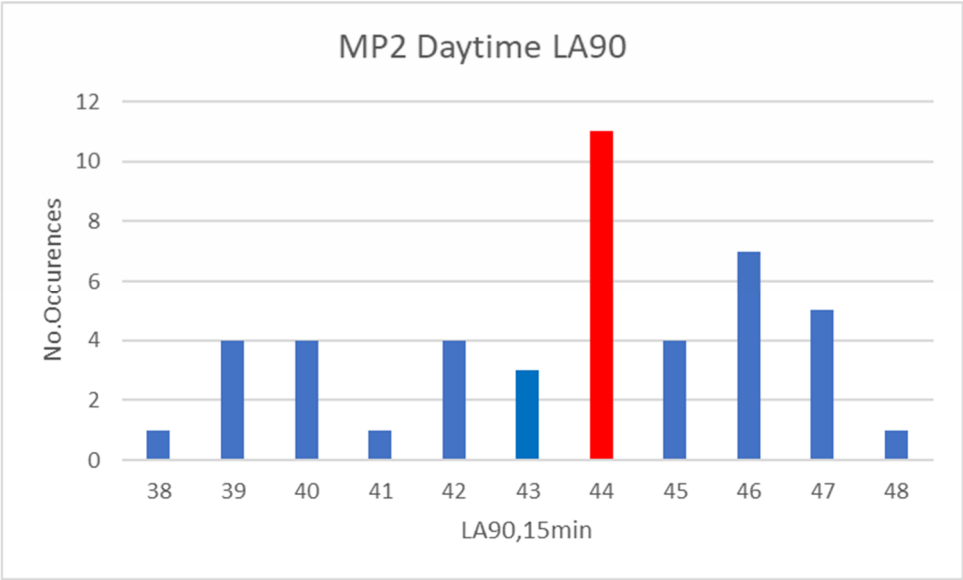


Figure 5-3: MP2 Daytime representative background noise levels

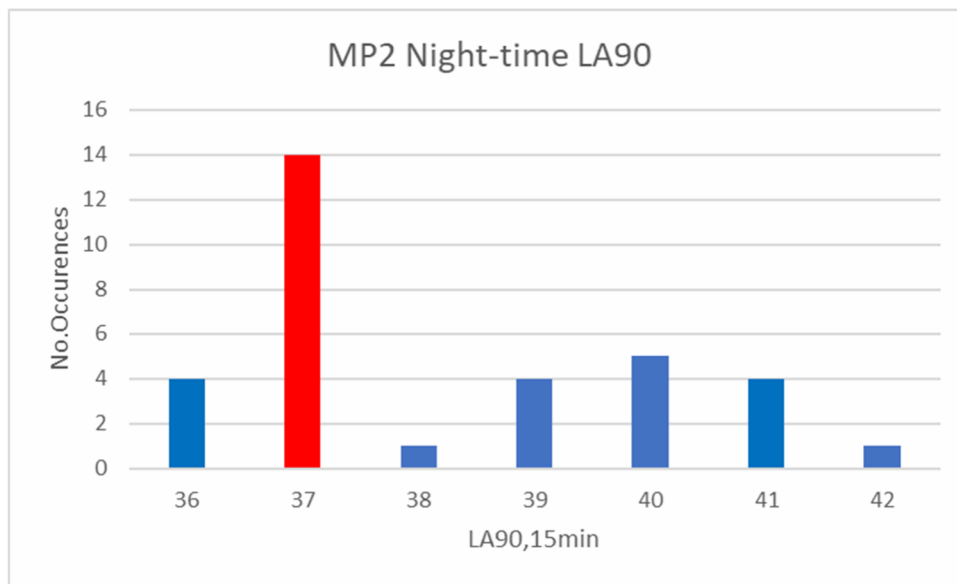


Figure 5-4: MP2 Night-time representative background noise levels

5.3 Limiting noise levels

Table 5-2 below summarises the existing representative background sound levels measured at the site along with limiting noise levels for all new items of services plant, when measured at 1 m from the nearest noise sensitive receptor.

Time period	Receptor	Representative background sound level, dB L_{A90}	Plant noise rating level not to be exceeded at 1 m from receptor, dB $L_{Aeq,T}$
Daytime (07:00 – 23:00 hrs)	Wilmslow Road	46	41
	Mosley Road	51	46
	Richmond Park	44	39
	Ashburne Hall	44	39
	Sheavyn House	44	39
Night-time (07:00 – 23:00 hrs)	Wilmslow Road	38	33
	Mosley Road	34	30*
	Richmond Park	37	32
	Ashburne Hall	37	32
	Sheavyn House	37	32

* In situations where external background sound levels are low, BS 4142 suggests that absolute sound levels may be more appropriate to consider. Accordingly, and in line with BS8233 guidance, it is considered that rating levels below 30 dB $L_{Aeq,T}$ are acceptable outside bedroom windows at night

Table 5-2: Limiting rating noise levels for building services plant

The above limit is applicable to the cumulative noise level from all new items of plant when running under normal operation. Where applicable, acoustic feature corrections should be applied to the specific plant noise level to account for any distinguishable acoustic characteristics (e.g. tonality, impulsivity, intermittency).

5.4 Plant noise feasibility

At this stage of the design process, exact technical information on plant noise selections and locations is not fully realised – however the following section undertakes an assessment based on the most current information on the

approach to the external plant design to determine the feasibility of the strategy for external plant across the proposed development.

5.4.1 Plant proposals

The primary items of noise generating external building services plan will be roof level Air Handling Units (AHUs) and Air Source Heat Pumps (ASHPs) to serve each residential block.

Table 5-3 details proposed quantities of each plant item included in the noise modelling process. These quantities have been assumed based on high level rooftop concept drawings provided to Cundall by the MEP consultants on the project and are to form the plant noise feasibility assessment only. They are subject to more detailed review as the project progresses.

Blocks			Plant and Quantity
Block 1/2	Block 16/17	Block 22/23	2 x AHUs
Block 24/25	Block 28/29		6 x ASHPs
Block 3	Block 5	Block 9	1 x AHUs
Block 11	Block 18	Block 19	8 x ASHPs
Block 21			
Block 6	Block 7	Block 27	1 x AHUs
			6 x ASHPs
Block 12/13/14			3 x AHUs
			8 x ASHPs

Table 5-3: Rooftop plant items

The broadband sound power data for the ASHPs has been provided to Cundall by the MEP consultants on the project and is provided in the table below. Also provided is the proposed sound pressure level at 1 m to be achieved by atmosphere side attenuators for all AHU supply and extracts.

Plant item	Sound level type	Level dBA
ASHPs	Sound Power Level SWL	70
AHU Supply / Extract	Sound Pressure Level SPL @1m	55

Table 5-4: Plant noise data

5.4.2 Plant noise modelling results

The information provided in Section 5.4.1 above was included in the Sound PLAN model described in Section 0 and calculations run to predict plant levels at the nearest NSRs assuming all plant operate simultaneously. The predicted results and presented in Table 5-5 below.

Time period	Receptor	Plant noise rating level not to be exceeded at 1 m from receptor, dB $L_{A,r,T}$	Calculated specific sound level, $L_{Aeq,T}$
Daytime (07:00 – 23:00 hrs)	Wilmslow Road	41	35
	Mosley Road	46	34
	Richmond Park	39	34
	Ashburne Hall	39	36
	Sheavyn House	39	37

Time period	Receptor	Plant noise rating level not to be exceeded at 1 m from receptor, dB L_{A,r,T_r}	Calculated specific sound level, $L_{Aeq,T}$
Night-time (07:00 – 23:00 hrs)	Wilmslow Road	33	35
	Mosley Road	30	34
	Richmond Park	32	34
	Ashburne Hall	32	36
	Sheavyn House	32	37

Table 5-5: Plant noise impact assessment results

It can be seen from the plant noise impact assessment results that all items of plant operating simultaneously would see daytime limit complied with at all receptors. However, at night-time, exceedances of up to 5 dB have been calculated.

Following interrogation of the results, it has been determined that the ASHPs are contributing to these exceedances and therefore a 5 dB reduction in contributions from these units would see night-time plant noise limits complied with. There are several options for mitigating measures, and these are as follows;

- A review of required plant duties to confirm whether the worst case assumption that ASHPs will run at 100% capacity overnight is correct or whether ASHPs can run at reduced duties/noise levels during night-time hours.
- Alternate model/manufacturer selection to units that can operate 5 dB quieter at maximum operational duty.
- Provide acoustic screening in form of solid barriers and/or acoustic louvres around ASHP compounds.
- Provide bespoke acoustic enclosures to ASHPs to reduce noise levels accordingly.

The mitigation measures outlined above are considered achievable through design, and it is therefore considered that the assessment of plant noise feasibility has demonstrated plant noise can be controlled to suitable levels to nearby receptors.

6.0

Entertainment noise

6.0 Entertainment noise

The following section addresses the requirements of Planning Condition 33a.

6.1 Limiting noise levels

6.1.1 Airborne entertainment noise at sensitive receptors

It is understood that amplified music may be included within the venue located at the central hub to the east side of the development. The noise system should be calibrated so as not to exceed a level of -5 dB relative to the prevailing octave-band background sound levels at the nearest and / or most exposed noise sensitive receptors. For the nearest noise sensitive receptor (identified as Richmond Park to the north east of the proposed central hub), the arithmetic average values of octave band $L_{A90,15min}$ for each measurement period at position MP2 has been calculated, with this spectrum then shifted to match the representative background levels as discussed in Section 5.2.

Period	MCC limiting amplified noise criterion – dB $L_{eq,T}$						
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
Daytime (07:00 – 23:00)	43	35	34	34	36	32	23
Night-time (23:00 – 07:00)	38	31	30	28	29	23	14

Table 6-1: Limiting entertainment noise levels

6.2 Entertainment noise feasibility assessment

In order to predict the sound level from the central hub at the nearest noise-sensitive receptor during daytime and night-time, an assessment has been undertaken using the model described in Section 0, with assumed parameters detailed as follows.

To assess the level of noise break-out from the central hub venue, the sound attenuation provided by the existing proposed construction has been estimated. It is understood the proposal is to have rooflights and these have been assumed to consist of 'standard' double-glazing. The sound reduction indices for the rooflights are provided in Table 6-2 below.

Element	Octave band centre frequency (Hz)							
	63	125	250	500	1K	2k	4K	R_w
4 mm / 6 to 20 mm / 4 mm double glazing (as rated in BS 12354)	14	18	17	24	34	41	35	29

Table 6-2: Assumed sound reduction indices for façade elements

Exact details of the façade are not available at the time of writing, however these have been onerously assumed to be a minimum of 10 dB greater performing than the glazing performance provided above. In practice façade and/or roof systems are likely to afford greater sound attenuation than this.

The assessment of noise break-out from the central hub has been undertaken based on noise levels measured within the existing Squirrel's bar on the Fallowfield Campus site as detailed in Section 3.4.

It is understood the new proposed venue in the central hub is intended for similar usage and capacity as the existing bar, hence it is assumed noise levels at the existing bar will be representative of operational new levels at the new venue. The internal noise levels utilised in the model have therefore assumed the worst case levels measured at Squirrel's Bar as described in Table 3-5.

Based on these levels and the sound insulation afforded by the façade, the calculated octave band noise levels at the worst case effected noise sensitive receptor are provided in Table 6-3.

	Sound pressure level L_{eq} (dB) at Octave band centre frequency (Hz)						
	63	125	250	500	1k	2k	4k
MCC limiting amplified noise criterion – dB $L_{eq,T}$	38	31	30	28	29	23	14
Calculated levels at Richmond Park - dB $L_{eq,T}$	38	28	29	28	20	8	4

Table 6-3: Entertainment noise assessment results

It can be seen the above levels comply with the MMC criteria for entertainment noise limits.

As it is not possible at this stage to review full details of finalised loudspeaker positions, it is instead advised that a further assessment will be needed to define the PA System noise limiter threshold values once the bar has been fitted out.

Guidance on the specification of the noise limiter device is outline in the following Section.

6.3 Noise limiter device

To see that amplified music noise levels do not exceed the MMC criteria at the nearest sensitive receptors, it will be necessary to install a suitable limiter within the amplified music system.

It is assumed due to the size of the bar that most music will be played via the venue owned sound system, rather than through audio equipment brought to the venue by DJs / bands.

For this scenario, Automatic Gain Control (AGC) devices are the most common type of active limiter. Once the unit is set to a pre-determined threshold, it then continually monitors the audio signal entering the amplifier stage. If the output of the programme material exceeds the threshold, the limiter automatically cuts in and gradually reduces the gain of the audio signal entering the amplifier stage until the programme output level returns below the threshold. The advantage of this type of limiter is that no break in the music ensues, should the threshold be exceeded.

It is advised that the determined threshold limits for the PA System should be calibrated by a suitably qualified sound technician / acoustician, prior to operation of the bar. This calibration process should include external noise measurements at the nearest noise-sensitive receptors to see that the MCC noise limits (as defined in 6.1.1) are not exceeded.

7.0

Conclusions

7.0 Conclusions

This Noise Impact Assessment has been produced to specifically address Conditions 33a, 34a and 35a attached to the Outline Planning Application (Ref: 138126/00/2023) which relate to noise.

7.1 Planning Condition 34a

Noise surveys at the site have been undertaken by Buro Happold and Cundall to inform the existing noise environment.

In order to determine road traffic noise propagation across the proposed development site, a 3D model has been produced using SoundPLAN v9.1 acoustic modelling software.

Based on predicted noise levels, the below suitable specification has been provided for glazing elements. The assessment has found that standard double glazing will be suitable, and thermal requirements of proposed glazing systems should see acoustic criteria achieved by default.

Minimum required glazing sound reduction index, dB $R_w + C_{tr}$	Example glazing construction
28	6 mm Glass / 12 mm gap / 4 mm Glass

Table 7-1: Examples of glazing constructions for achieving minimum glazing sound insulation performance requirements

The proposed ventilation strategy to control for overheating to satisfy the requirements of Approved Document O (ADO) will be satisfied with windows fully closed between the hours of 11pm and 7am. As such, since the noise requirements for ADO apply only during night-time hours (23:00 – 07:00), this element of the Building Regulations will be complied with by default.

An assessment of daytime noise levels related to overheating has been conducted in accordance with the AVO Guide. The results indicate that predicted levels are below the "SOAEL" threshold and below the level at which noise is likely to cause a material change in behaviour, as outlined in Table 3-3 of the AVO Guide.

External noise levels in outdoor spaces has been modelled. This has found most external areas across the development are less than 50 dBA. This is considered a suitable acoustic environment for external amenity spaces.

It is considered that the assessments undertaken of noise incident on the proposed development as detailed above demonstrate compliance with the requirements of Planning Condition 34a of the Outline Planning Application.

7.2 Planning Condition 35a

Based on the noise data from the surveys undertaken, plant noise limits have been set in line with the requirements of Planning Condition 35a.

An initial noise assessment based on preliminary plant selection has been undertaken with result presented below.

Time period	Receptor	Plant noise rating level not to be exceeded at 1 m from receptor, dB $L_{A,T}$	Calculated specific sound level, $L_{Aeq,T}$
Daytime (07:00 – 23:00 hrs)	Wilmslow Road	41	35
	Mosley Road	46	34
	Richmond Park	39	34
	Ashburne Hall	39	36
	Sheavyn House	39	37
Night-time (07:00 – 23:00 hrs)	Wilmslow Road	33	35
	Mosley Road	30	34
	Richmond Park	32	34
	Ashburne Hall	32	36
	Sheavyn House	32	37

Table 7-2: Plant noise impact assessment results

This has found slight exceedances of current external plant, and therefore further mitigation is required through the design process. The mitigation measures outlined within this report are considered achievable through design, and it is therefore considered that the assessment of plant noise feasibility demonstrates plant noise can be controlled to suitable levels to nearby receptors.

It is considered that the assessment undertaken of plant noise associated with the proposed development as detailed above demonstrate compliance with the requirements of Planning Condition 35a of the Outline Planning Application.

7.3 Planning Condition 33a

Based on the noise data from the surveys undertaken, entertainment noise limits have been set in line with the requirements of Planning Condition 33a.

An assessment of entertainment noise has been undertaken based on worst case levels measured at the existing Squirrel's Bar on site and assumptions of breakout noise for the newly proposed venue on site, the results of which are presented below.

	Sound pressure level L_{eq} (dB) at Octave band centre frequency (Hz)						
	63	125	250	500	1k	2k	4k
MCC limiting amplified noise criterion – dB $L_{eq,T}$	38	31	30	28	29	23	14
Calculated levels at Richmond Park - dB $L_{eq,T}$	38	28	29	28	20	8	4

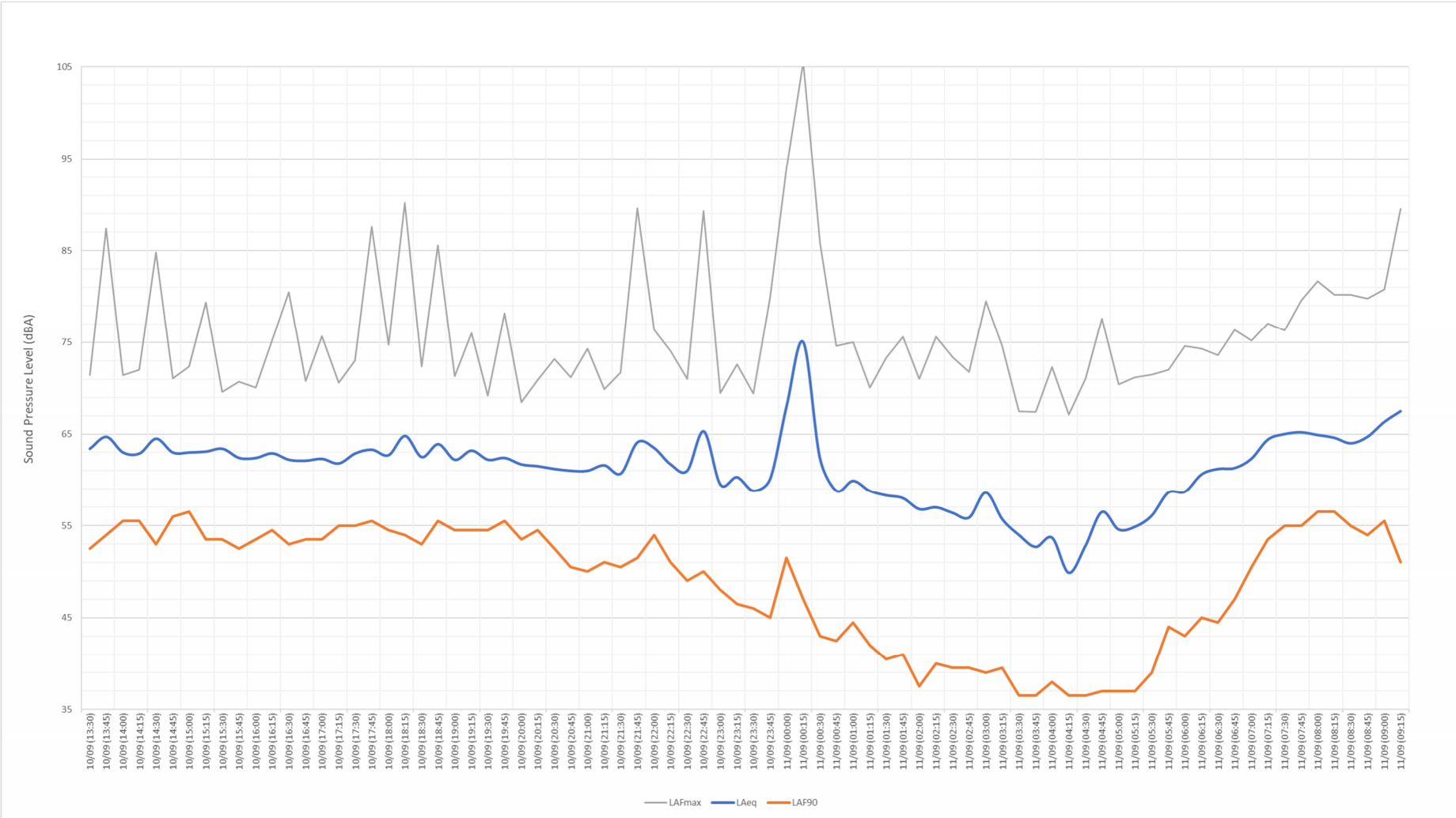
Table 7-3: Entertainment noise assessment results

It is considered that the assessment undertaken of noise propagation from the proposed development to existing receptors as detailed above demonstrate compliance with the requirements of Planning Condition 33a of the Outline Planning Application.

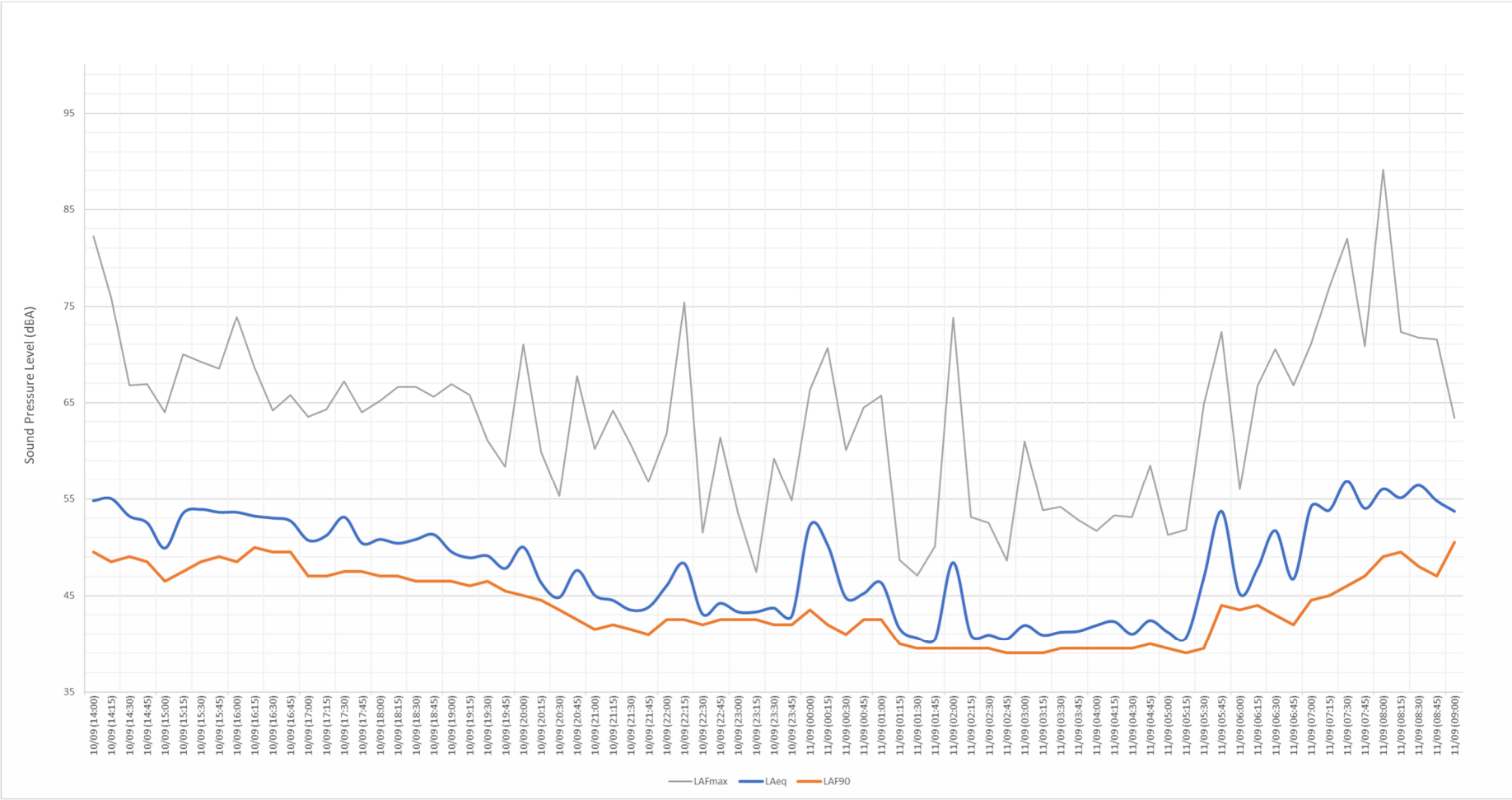
Appendices

Appendices

Appendix A Time history graphs



MP1 Survey Time History



MP2 Survey Time History

Cundall Johnston & Partners LLP

Fourways House 57 Hilton St Manchester M1 2EJ
Tel: +44 (0)161 244 5660

Asia Australia Europe MENA UK and Ireland
www.cundall.com

