

First Street Plot 10b

Noise Impact Assessment

First Street Developments Limited

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1.0

Introduction

1.0 Introduction

This document has been prepared on behalf of First Street Developments Ltd in support of a full planning application for development to Plot 10b First Street.

Proposals are for the erection of a sixteen-storey building to provide student accommodation, with food and drink amenity spaces located on ground and mezzanine level.

The purpose of this assessment is to evaluate the findings of the acoustic surveys in relation to the proposed scheme being brought forward and, if required, to provide recommendations for mitigation measures in order to achieve a comfortable internal acoustic environment, in line with the relevant Standards and local and national Planning Policy.

The following Cundall noise surveys have been undertaken to determine the prevailing noise climate at the site:

- **2018/2019 Surveys:**
Attended short term and long-term measurements undertaken on 21 – 22 June 2018, 10 – 12 December 2018 and 4 November 2019. Surveys originally undertaken in support of planning application for adjacent Plot 9a Development¹.
- **2022 Survey:**
Additional long-term monitoring undertaken on the 25 August – 2 September 2022 to validate 2018/2019 survey results.

The scope of the assessment is based on the technical guidance provided by the Local Planning Authority, good practice techniques and extensive previous experience of similar projects.

¹ Cundall Noise Impact Assessment Ref: PLOT-9A-CDL-XX-XX-RP-Y-45001 (P04) in support of Planning Application Ref: 132600/FO/2021

2.0

Assessment criteria

2.0 Assessment criteria

The proposed development has been assessed for suitability in terms of noise, based on the following policy, standards and guidance documents:

- The National Planning Policy Framework (2021) (NPPF)
- The Noise Policy Statement for England (2010) (NPSE)
- The Planning Practice Guidance - Noise (2019) (PPG Noise)
- BS 8233:2014 – Guidance on sound insulation and noise reduction for buildings (BS 8233)
- BS 4142:2014+A1:2019 – Methods for rating and assessing industrial and commercial sound (BS 4142)
- Building Regulations Approved Document O: Overheating (2022)
- Manchester City Council's Planning & Noise: Technical Guidance (June 2022)
- Manchester's Local Development Framework – Core Strategy Development Plan Document 2012 to 2027
- Manchester Citywide Development Control Policies

2.1 National Planning Policy Framework

The revised National Planning Policy Framework was updated on 20 July 2021 and sets out the government's planning policies for England and how these are expected to be applied.

The NPPF states:

134. *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.*
174. *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;*
186. *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; [...]*
187. *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

Perception	Examples of outcomes	Increasing effect level	Action
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 8233:2014 ‘Guidance on sound insulation and noise reduction for buildings’

British Standard 8233:2014 provides guidance on maximum internal ambient noise levels in residential and non-residential spaces, based on guidelines issued by the World Health Organisation (WHO). The following table summarise the guidance relevant to internal noise levels in residential spaces.

Activity	Location	Daytime (07:00 to 23:00 hrs)	Night-time (23:00 – 07:00 hrs)
Resting	Living room	35 dB L _{Aeq,16hour}	-
Dining	Dining room/area	40 dB L _{Aeq,16hour}	-
Sleeping	Bedroom	35 dB L _{Aeq,16hour}	30 dB L _{Aeq,8hour}

Table 2—2 - Summary of BS8233 criteria for internal noise levels in dwellings

The following notes should be considered when following the guidance above:

If relying on closed windows to meet the guide values, there needs to be an appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level

In relation to the noise guidelines in Table 2—2 above, BS 8233 states:

Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved

2.5 BS 4142:2014+2019 ‘Methods for rating and assessing industrial and commercial sound’

The BS 4142 assessment method involves comparing the rating level (the ‘specific’ sound level plus a range of potential feature corrections) of a sound source to the measured background sound level in order to estimate its initial impact, as follows:

Typically, the greater this difference, the greater the magnitude of the impact.

a) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

b) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

c) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

The standard suggests that the sound source of interest will have a ‘low impact’ when the ‘rating level’ of a source is less than the existing background sound level. It is also important to note that the standard requires that any quantitative assessment results are assessed in light of the context in which the sound occurs.

With regard to background sound levels, BS 4142 states:

In using the background sound level in the method for rating and assessing industrial and commercial sound it is important to ensure that values are reliable and suitably represent both the particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods.

2.6 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 guidance 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 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.

2.7 Manchester City Council - Planning & Noise: Technical Guidance (June 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 5dB (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 Structure-borne entertainment noise

Should there be the potential for amplified music within the ground-floor of the development, Section 3.7.1.2 of the MCC Planning & Noise Technical Guidance document states the following criteria with respect to "new residential developments that are structurally connected to entertainment venues" in order to achieve a condition of 'inaudible' / 'virtually inaudible':

'Music noise levels in the 63Hz and 125Hz octave centre frequency bands (L_{eq}) should be controlled so as not to exceed (in habitable rooms) 47dB and 41dB (L_{eq}) respectively'.

2.7.4

2.7.4 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 5dB 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:

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 Vita Student brand standards

2.10.1 External noise intrusion

Vita Student brand standards (Ref: PR0632-rep01A-mpf November 2019) set requirements for noise intrusion for both residential and non-residential rooms as shown in Table 2—3 and Table 2—4 respectively:

Period	Noise intrusion limits
Daytime (0700 – 2300)	35 dB LAeq,16 hours
Night time (2300 – 0700)	30 dB LAeq,1 hour 45 dB LAfMax,1 minute (not to be exceeded more than 10 times per night)

Table 2—3 - Residential room noise intrusion limits

Room use	Daytime noise intrusion limit
Movie room	35 dB L _{Aeq,16 hours}
Study room	35 dB L _{Aeq,16 hours}
Reception	40 dB L _{Aeq,16 hours}
Management office	40 dB L _{Aeq,16 hours}
Private dining rooms	40 dB L _{Aeq,16 hours}
Main hub space	40 dB L _{Aeq,16 hours}
Common corridors	45 dB L _{Aeq,16 hours}
Gym	45 dB L _{Aeq,16 hours}

Table 2—4 - Non-residential space noise intrusion limits

Where these requirements are more stringent than those laid out in the previous sections, the requirements here supersede those in the earlier sections.

2.10.2 Building services noise

Vita Student brand standards (Ref: PR0632-rep01A-mpf November 2019) set requirements for building services noise for both residential and non-residential rooms as shown in Table 2—5 and Table 2—6, respectively:

Room type	Spatially averaged noise level (L _{eq})
Studios/ Bedrooms (MVHRs or continuously operating extract fans in trickle and boost mode)	NR 25
Bathrooms (MVHRs or continuously operating extract fans in trickle and boost mode)	NR 40

Table 2—5 - Residential room building services noise limits

Room use	Daytime noise intrusion limit
Common Corridors	NR 40
Movie Room	NR 30
Private Dining Room	NR 35
Show Studio	NR 25
Study rooms	NR 35
Reception	NR 40
Management Office	NR 35
Gym	NR 40
Main Hub space	NR 40
Laundry	NR 40
WCs	NR 40
Plant rooms	NR 65

Table 2—6 - Non-residential space building services noise limits

2.10.3 Entertainment noise

Intrusive noise levels within residential rooms due solely to music noise egress from entertainment or hospitality venues shall not exceed the values identified in Table 2—7.

	Sound Pressure Level (dB L _{eq} , 1 min) @ Octave Band Centre Frequency (Hz)						
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
Maximum allowable internal noise level	40	30	22	17	13	10	9

Table 2—7 - Maximum allowable music noise level in residential rooms due to entertainment venues

The more stringent requirement between these and those outlined by MCC will take precedent.

3.0

Site context

3.0 Site context

The site is located at the south-eastern edge of Manchester city centre and is located within the First Street Strategic Development Framework (SDF) 2018 area. It is part of a wider vision to create a mixed-use neighbourhood in the area, supported by a mixture of leisure, office, and residential blocks. The site is known as Plot 10b and is bound by River Street to the north and east, a future development site known as Plot 10a to the west and Hulme Street to the south. The Site is currently mostly hardstanding, reflecting its recent use as a temporary car parking area ahead of the plot's permanent redevelopment.

The figure below indicated the red line site boundary and the nearest noise sensitive receptor, Macintosh Mills.

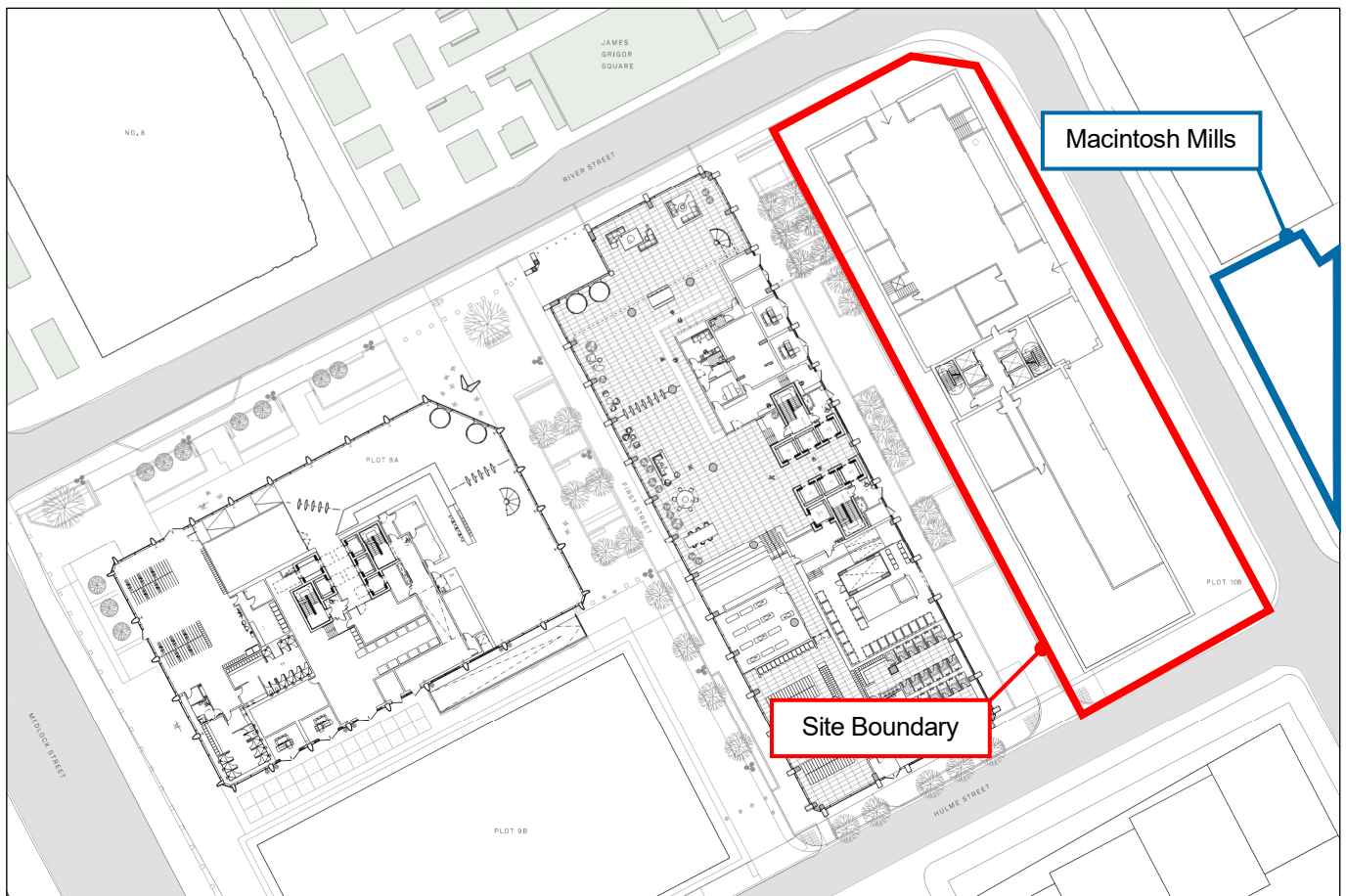


Figure 3—1 - Proposed development site location

The wider area is characterised by a mix of uses including primarily office and leisure uses to the north, residential to the east and west, and student residential to the south.

4.0

Environmental noise survey

4.0 Environmental noise survey

4.1 Cundall 2022 survey

In order to assess the prevailing levels of environmental noise affecting the proposed development, unattended long-term noise surveys were undertaken between the dates of 25 August and 2 September 2022. Details of these two positions are provided in Table 4—1.

Monitoring location	Time period	Comments
MP1	25/08/2022 11:20 – 30/08/2022 13:30	Selected to establish worst case likely worst case noise levels, as this corner of the site is closest to the two primary noise sources: Medlock Street and Mancunian Way
MP2	30/08/2022 13:40 – 02/09/2022 08:30	Selected in order to establish noise levels from River Street and background noise levels at Macintosh Mills and the future Plot 10b site, the nearest noise-sensitive receptors to the proposed development.

Table 4—1 – 2022 summary of noise measurement locations

The approximate measurement locations are shown in Figure 4—1 below:



Figure 4—1 – 2022 approximate noise measurement positions

Weather conditions during all surveys were calm and dry, with temperatures around 15 °C during attended surveys and around 5 °C for the unattended survey, with wind speeds below 5 m/s during both surveys. Monitoring equipment was set up by competently trained Cundall staff.

Noise measurements were made using a Casella CEL 633 (serial number 1211404) precision sound level meter, generally in accordance with BS 7445:2003. The meter was field-calibrated before and after with no significant drift witnessed. Laboratory calibration certificates for all equipment are available upon request.

4.1.1 2022 results summary

A summary of the average ambient noise levels recorded is detailed within Table 4—2. The values are the logarithmically averaged $L_{Aeq,15min}$, the maximum $L_{AFmax,15min}$ and the range of $L_{A90,15min}$ and $L_{A10,15min}$ values measured. All values have been rounded to the nearest integer value (as fractions of a decibel are imperceptible) and are given in dBA.

Monitoring location	Assessment period	Period	Average $dBL_{Aeq,15min}$	Maximum $dBL_{AFMax,15min}$	Range $dBL_{A10,15min}$	Range $dBL_{A90,15min}$
MP1	Daytime	25/08/2022 11:20 – 25/08/2022 23:00	68	96	58 - 79	54 - 64
		26/08/2022 07:00 – 26/08/2022 23:00	65	97	57 - 75	54 - 66
		27/08/2022 07:00 – 27/08/2022 23:00	60	89	57 - 69	53 - 61
		28/08/2022 07:00 – 28/08/2022 23:00	56	76	56 - 59	51 - 56
		29/08/2022 07:00 – 29/08/2022 23:00	56	78	56 - 59	51 - 55
		30/08/2022 07:00 – 30/08/2022 13:30	75	95	67 - 84	56 - 83
	Night-time	25/08/2022 23:00 – 26/08/2022 07:00	54	73	54 - 62	45 - 58
		26/08/2022 23:00 – 27/08/2022 07:00	54	75	55 - 58	48 - 54
		27/08/2022 23:00 – 28/08/2022 07:00	55	74	55 - 59	48 - 55
		28/08/2022 23:00 – 29/08/2022 07:00	53	76	54 - 58	47 - 53
		29/08/2022 23:00 – 30/08/2022 07:00	53	81	51 - 59	43 - 55
MP2	Daytime	30/08/2022 07:00 – 30/08/2022 23:00	63	92	56 - 72	52 - 61
		31/08/2022 07:00 – 31/08/2022 23:00	64	90	57 - 74	53 - 62
		01/09/2022 07:00 – 01/09/2022 23:00	64	89	57 - 74	52 - 65
		02/09/2022 07:00 – 02/09/2022 08:30	66	94	62 - 74	56 - 62
	Night-time	30/08/2022 23:00 – 31/08/2022 07:00	55	95	51 - 59	45 - 56
		31/08/2022 23:00 – 01/09/2022 07:00	54	80	51 - 59	45 - 56
		01/09/2022 23:00 – 02/09/2022 07:00	53	80	51 - 58	44 - 55

Table 4—2 – 2022 summary of noise measurement data

4.1.2 Results discussion

It was noted on site that significant construction on sites to the western and southern boundaries of the site were present, meaning these may be an unreliably dominant noise source. Subsequently it was noted that that on the dates 27 – 29 August at Position MP1, levels were noticeably lower than for other dates, which corresponded to the bank holiday weekend days. In particular, L_{AFmax} levels were generally very high across both positions, and due to the position in relation to road noise sources it was concluded that these were being driven by construction noise.

As such, data from days on which construction was not taking place were compared with noise surveys and modelling undertaken as part of Cundall's previous noise impact assessment for the adjacent Plot 9a development (full details of which can be found in Cundall's Noise Impact Assessment Ref: PLOT-9A-CDL-XX-XX-RP-Y-45001 in support of Planning Application Ref: 132600/FO/2021). It was found that worst-case hourly levels in 2018 corresponded to worst-case noise levels on Saturday 27 August of the 2022 survey. As such, it was concluded that calibrating to levels measured in 2018 would still be representative of reasonable worst-case assessment whilst avoiding unduly onerous contributions from ongoing construction works in 2022.

The noise data collected in 2018 (before significant contributions from construction noise were present) have therefore been used as the basis of this noise assessment. The 2018 surveys and data are summarised in the following sub-sections.

4.2 Cundall 2018 survey

Attended and unattended environmental noise surveys were undertaken at four different locations in 2018, as detailed in Table 4—3.

Monitoring location	Survey type	Date / period	Comments
MP3	Attended short-term measurements	21/06/2018 15:00 – 18:00 hrs 21/06/2018 23:00 hrs – 22/06/2018 02:00 hrs 22/06/2018 06:00 – 10:00 hrs	Selected in order to establish road traffic noise impacts from River Street incident on the rear façade of the proposed development, as well as representative background noise levels at nearest noise-sensitive receptor at MacIntosh Mills, 4 Cambridge Street.
MP4		21/06/2018 15:00 – 18:00 hrs 22/06/2018 06:00 – 10:00 hrs	Selected in order to establish road traffic noise impacts from Medlock Street
MP6A		21/06/2018 15:00 – 18:00 hrs 22/06/2018 06:00 – 10:00 hrs	Selected in order to establish road traffic noise impacts from Medlock Street
MP6B	Unattended logging measurements	10/12/2018 11:45 hrs – 11/12/2018 11:45 hrs	Selected in order to establish road traffic noise impacts from Medlock Street
MP5		11/12/2018 12:45 hrs – 12/12/2018 12:45 hrs	Selected in order to establish road traffic noise impacts from Hulme Street

Table 4—3 – 2018 summary of noise measurement locations

The approximate measurement locations are shown in Figure 4—2 below:

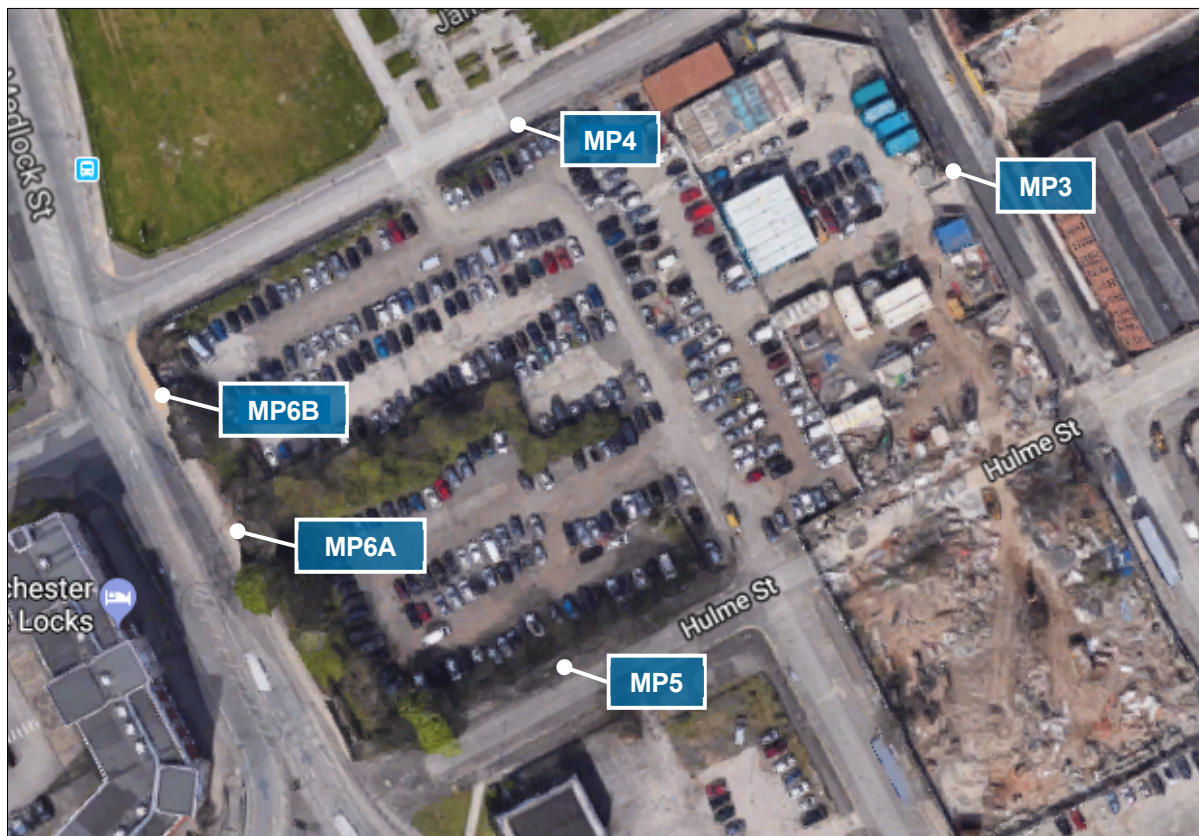


Figure 4—2 – 2018 approximate noise measurement positions

Weather conditions during all surveys were calm and dry, with temperatures around 15 °C during attended surveys and around 5 °C for the unattended survey, with wind speeds below 5 m/s during both surveys.

Noise measurements were made using a Casella CEL 633 (serial number 1211404) precision sound level meter, generally in accordance with BS 7445:2003. The meter was field-calibrated before and after with no significant drift witnessed. Laboratory calibration certificates for all equipment are available upon request.

Monitoring equipment was set up by competently trained Cundall staff. Attended measurements at MP1, MP2 and MP3A were taken under façade conditions whereas logging measurements at MP3B and MP4 were carried out in free-field conditions. Subjective impressions from site were that the noise climate was generally dictated by road traffic on local roads, primarily from Medlock Street.

4.2.1 2018 results summary

A summary of the average ambient noise levels recorded is detailed within Table 4—4. The values are the logarithmically averaged $L_{Aeq,15min}$, the maximum $L_{AFmax,15min}$ and the range of $L_{A90,15min}$ and $L_{A10,15min}$ values measured. All values have been rounded to the nearest integer value (as fractions of a decibel are imperceptible) and are given in dBA.

Monitoring location	Assessment period	Period	Average dB $L_{Aeq,15min}$	Maximum dB $L_{AFmax,15min}$	Range dB $L_{A10,15min}$	Range dB $L_{A90,15min}$
MP3	Daytime	15:00 – 18:00 hrs	62	79	61 - 66	54 – 55
		07:00 – 10:00 hrs	61	79	63 - 66	54 – 55
	Night-time	23:00 – 02:00 hrs	47	73	49 - 54	42 – 45
		06:29 – 06:44 hrs	57	72	58	54
MP4	Daytime	15:00 – 18:00 hrs	64	82	64 - 67	55 – 57
		07:00 – 10:00 hrs	65	94	67 only	55 – 56
	Night-time	06:45 – 07:00 hrs	65	90	67	54
MP6A	Daytime	15:00 – 18:00 hrs	71	90	73 - 76	62 – 64
		07:00 – 10:00 hrs	73	90	76 - 77	55 - 56
	Night-time	06:10 – 06:25 hrs	66	79	70	58
MP6B	Daytime	11:45 – 23:00 hrs	71	93*	68 - 76	60 – 66
		07:00 – 11:45 hrs	71	90*	73 - 75	63 – 66
	Night-time	23:00 – 07:00 hrs	67	91	65 - 75	51– 65
MP5	Daytime	12:45 – 23:00 hrs	62	80	63 – 66	56 – 62
		07:00 – 12:45 hrs	63	81	64 – 66	61 – 63
	Night-time	23:00 – 07:00 hrs	60	80	67	50 - 62

* Following analysis of unattended logging data, $L_{AF,max}$ results of over 100 dB have been discounted from the noise impact assessment as these are attributable to erroneous sources.

Table 4—4 – 2018 summary of noise measurement data

4.3 Fisher Acoustics survey

Furthermore, a review of the survey positions detailed above was undertaken by Fisher Acoustics. It was suggested that additional acoustic measurements previously undertaken by Fisher Acoustics at heights of 20 m and 30 m above local ground level were included in calibrating the model to ensure a robust assessment to model noise from Mancunian Way as accurately as possible, particularly due to effects from this noise source at higher floor levels.

The approximate measurement position, provided by Fisher Acoustics is shown below. This is herein referred to as measurement position 7a and 7b, located in the below pin at 20m and 30m respectively.

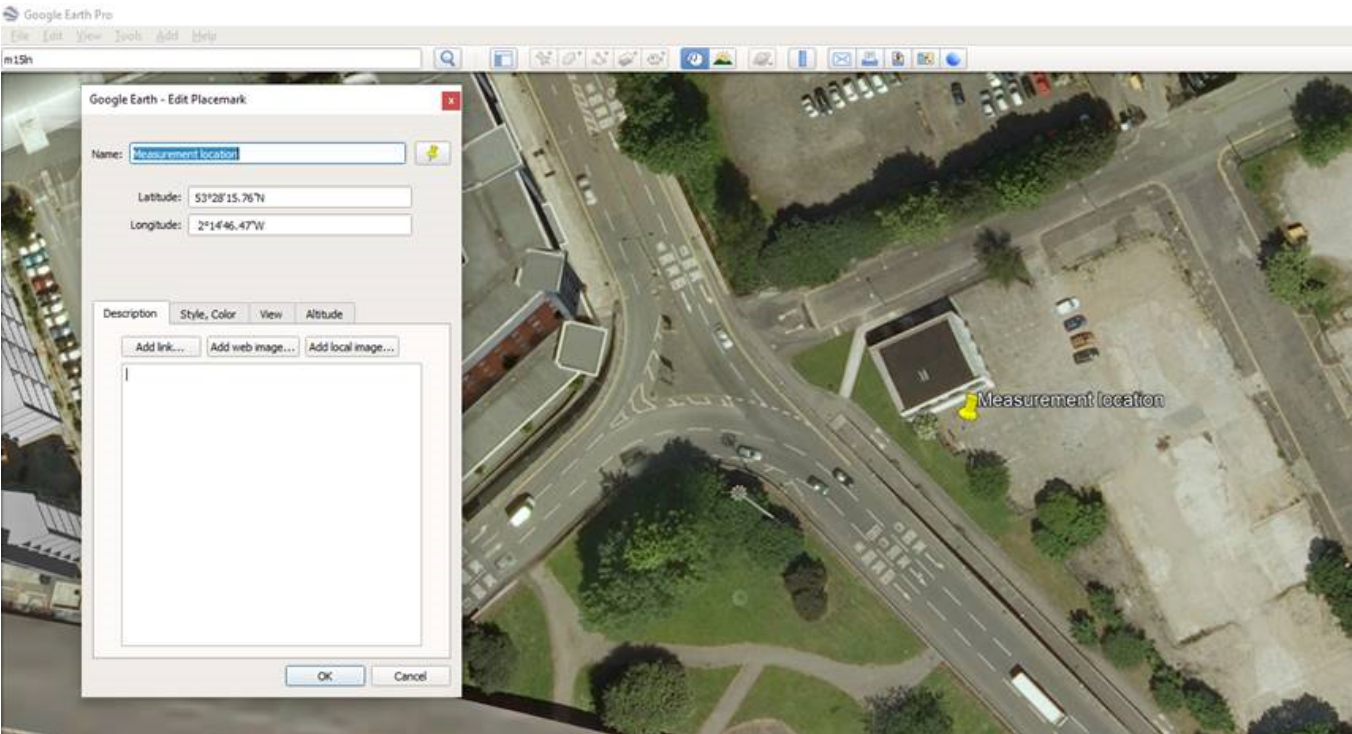


Figure 4—3 - Noise measurement location - Fisher Acoustics survey

A summary of data provided by Fisher Acoustics is given below.

Monitoring location	Assessment period	Period	Average dB L _{Aeq,15min}
MP7a	Daytime	Not reported	73
MP7b	Daytime	Not reported	64

Table 4—5 - Summary of Fisher Acoustics Results

5.0

Noise impact assessment

5.0 Noise impact assessment

5.1 Environmental noise model

In order to determine road traffic noise propagation across the proposed development site, a model has been produced using SoundPLAN v8.2 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.

Once plant selection is confirmed, this will be reviewed in order to populate noise emission data in the model.

Road traffic noise sources within the 3D model have been calibrated based on the worst-case hourly noise levels measured at each position during the 2018 noise survey.

The scenario calculated has also considered situations where the proposed Plot 10a is a completed build or not. Given that the constructed Plot 10a building would provide acoustic screening from noise sources (primarily River Street and Medlock Street), the modelling has indicated that noise levels incident at Plot 10b would be higher when excluding the massing of Plot 10a from the calculations. As such these worst-case levels have formed the basis of subsequent break in calculations.

Other projects around the site however have construction programmes in place which will see them completed prior to the completion of Plot 10b. The adjacent Plot 9a and the First Street South Sites are the primary example of these and have been included within the noise model.

The noise levels from Mancunian Way have been independently calibrated to the Fisher Acoustics data.

5.1.1 Noise modelling results

Daytime and night-time façade noise maps for each elevation are presented below. Levels shown in these figures and referred to in the following sub-sections are dB $L_{Aeq,T}$ 'free-field values' at 1 m from the building façade.

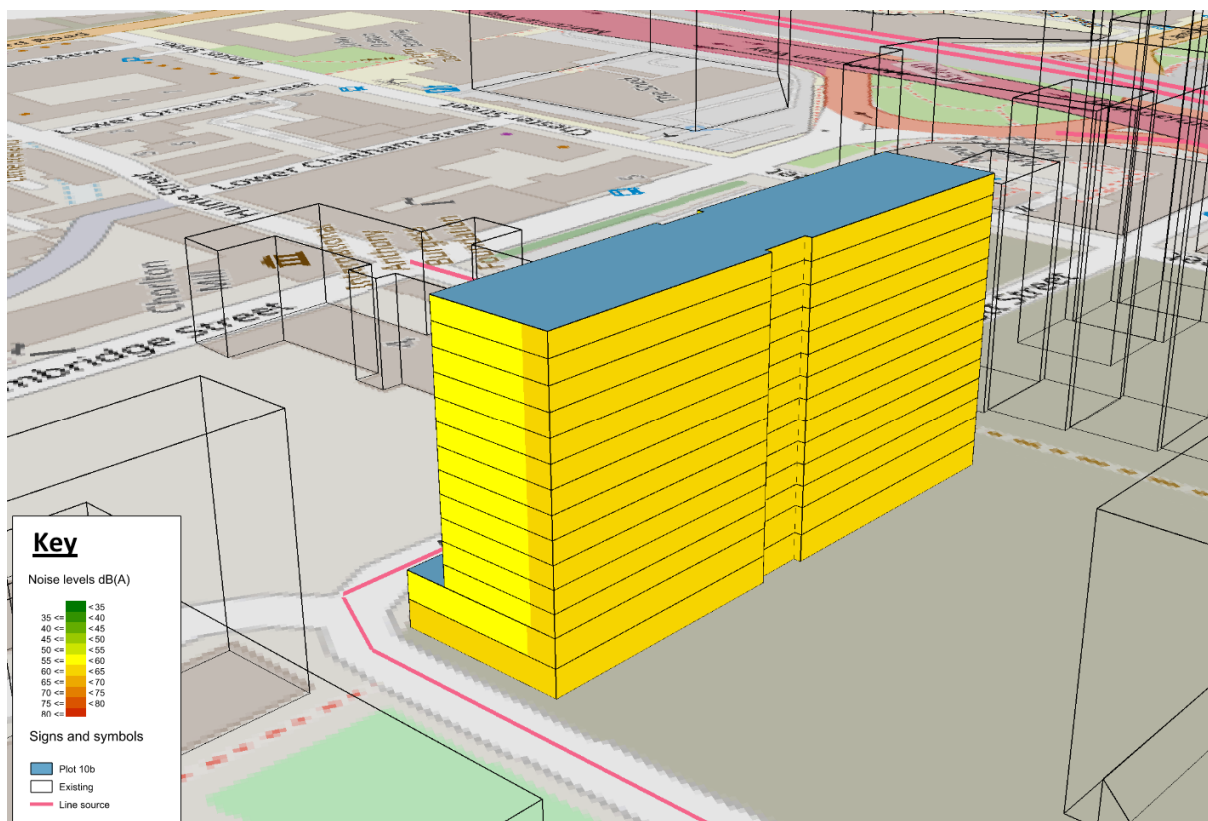


Figure 5—1 – Daytime façade noise levels – road traffic impact from north west

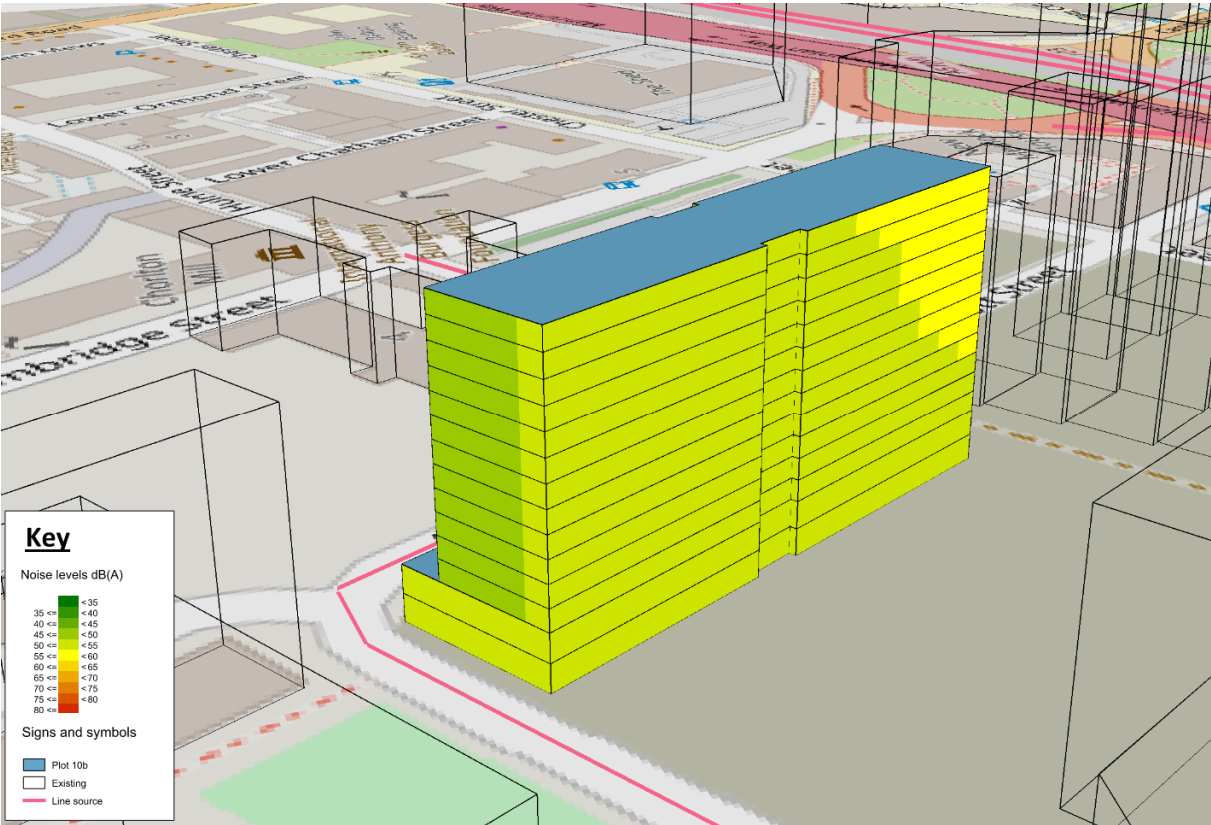


Figure 5—2 – Night-time façade noise levels – road traffic impact from north west

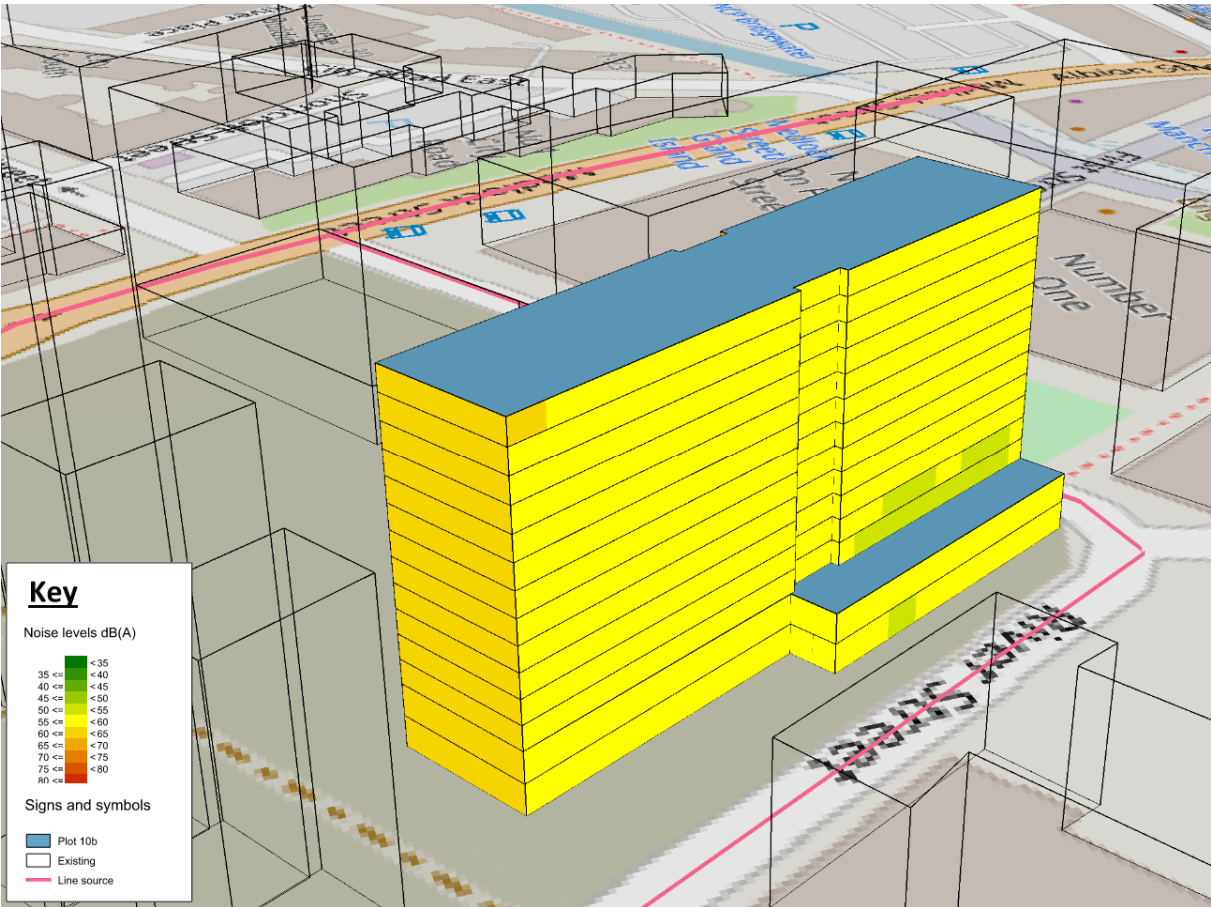


Figure 5—3 – Daytime façade noise levels – road traffic impact from south east

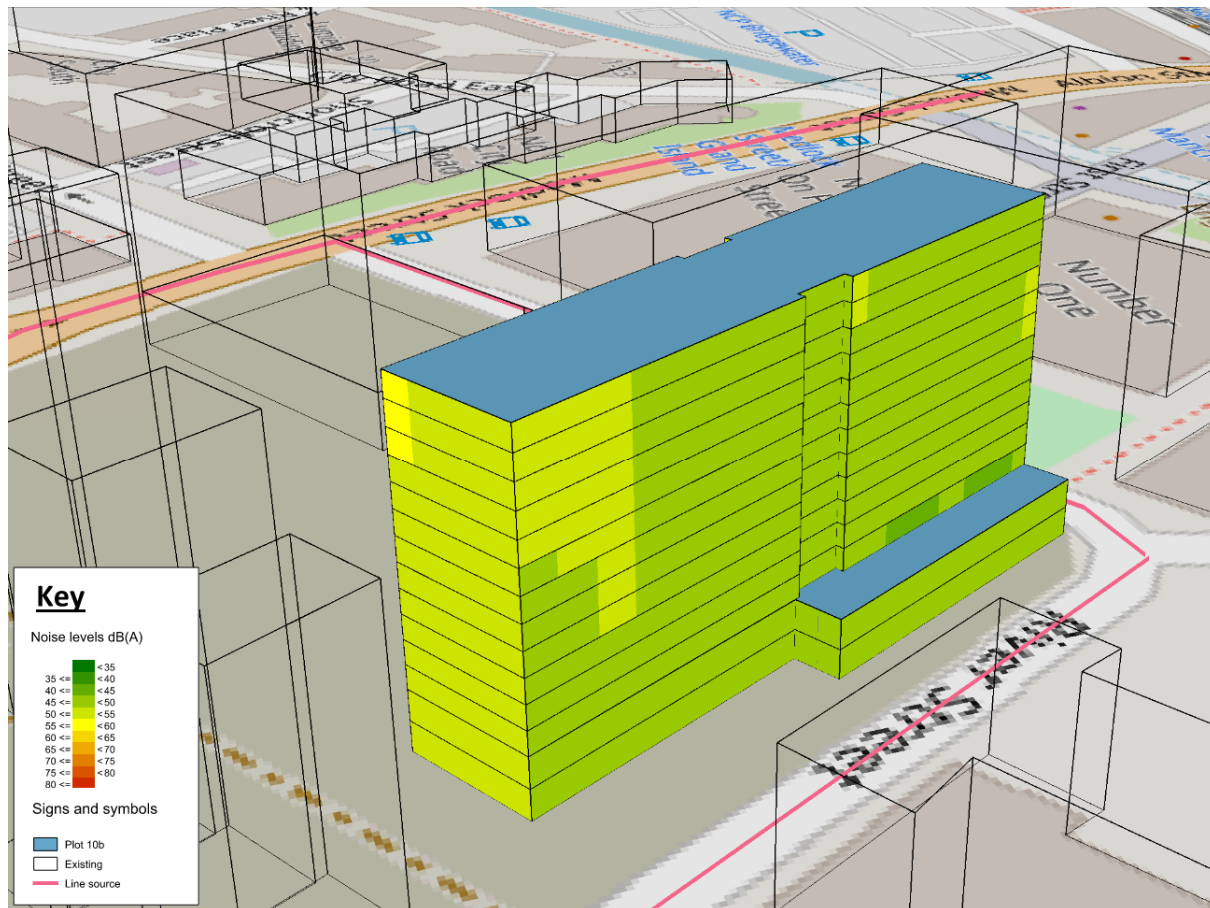


Figure 5—4 – Night-time façade noise levels – road traffic impact from south east

5.2 Noise break-in

Based on the calculated noise levels detailed above, the following sub-sections give recommendations for the external building fabric attenuation in order that target internal noise levels can be achieved.

5.2.1 Glazing systems requirements

It is understood that whole-dwelling ventilation to student accommodation throughout the development is to be provided via Mechanical Ventilation Heat Recovery (MVHR) units. 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.

Based on meeting the requirements of the brand standards as detailed in Section 2.10 of this report, the minimum façade sound reduction requirements identified for façades at Plot 10b are presented below.

Calculation procedures for determining the glazing attenuation ($R_w + C_{tr}$) are as described in the “more rigorous calculation method” outlined in BS 8233:2014. Based on the worst case incident noise levels and considering rooms with the internal ambient noise level targets (IANL), the following table presents the worst-case glazing configuration capable of achieving the required facade sound reduction index to see the IANL are achievable. Full details of the external noise intrusion calculations are available at request.

Minimum required glazing sound reduction index - $R_w + C_{tr}$ (dB)	Example suitable glazing specification
≥ 28	6 mm pane 6 to 16 mm airgap 4 mm pane Rated at $R_w + C_{tr}$ 28 dB*
* Based on values given in 'BS EN 12354-3:2000 Building acoustics. Estimation of acoustic performance in buildings from the performance of elements. Airborne sound insulation against outdoor sound'	

Table 5—1 – Minimum glazing sound insulation performance requirements

A standard thermal double glazing (e.g. 6-12-4 configuration or better) which typically provides 28 dB $R_w + C_{tr}$ would be considered acceptable on all façades from an acoustic perspective.

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.

6.0

External plant noise limits

6.0 External plant noise limits

As detailed in Section 2.9, Manchester City Council stipulate the following criteria with respect to noise emissions from new building services plant installations:

“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.”

6.1 Nearest noise sensitive receptor

The nearest existing noise-sensitive properties are apartments at the Macintosh Mill development to the east of the site on the opposite side of Wilmott Street. If constructed, the future Plot 10a development will become the nearest building although this building will not include any residential accommodation.

6.2 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’.

A review of background sound levels acquired during the 2022 survey has been compared to the previously measured background levels from 2018 (fully documented in Cundall’s noise impact assessment on the adjacent Plot 9a development (Ref: PLOT-9A-CDL-XX-XX-RP-Y-45001 in support of Planning Application Ref: 132600/FO/2021). This review has shown that the “representative” background sound levels measured in the 2022 survey are significantly higher than those measured in 2018 due to adjacent construction works on site in 2022.

In order to provide a robust set of limiting plant noise levels, the lowest L_{A90} background sound levels measured across all positions in 2018 have therefore been used.

6.3 Limiting noise levels

Table 6—1 below summarises the lowest background sound levels measured at the site (in 2018) along with limiting rating levels for all new items of services plant, when measured at 1 m from the nearest noise sensitive receptor.

Time period	Lowest background sound level dB L_{A90}	Plant rating level not to be exceeded at 1 m from nearest noise-sensitive receptor dB $L_{Ar,Tr}$
Daytime (07:00 – 23:00 hrs)	45	40
Night-time (07:00 – 23:00 hrs)	42	37

Table 6—1 – 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).

7.0

Entertainment noise

7.0 Entertainment noise

7.1 Limiting noise levels

7.1.1 Airborne entertainment noise at sensitive receptors

It is understood that amplified music may be included within the food and drink amenity spaces located on ground and mezzanine level. 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 at Macintosh Mills, the lowest $L_{A90,15min}$ period measured at position MP3 has been used as an onerous limiting level.

Period	MCC limiting amplified noise criterion – dB $L_{eq,T}$						
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
Daytime (07:00 – 23:00)	55	48	45	34	46	38	26
Night-time (23:00 – 07:00)	45	38	38	34	33	25	16

Table 7—1 Limiting entertainment noise levels at Macintosh Mills

7.1.2 Structureborne entertainment to adjoining student accommodation

For amplified noise directly to student accommodation rooms above, music noise levels in the 63Hz and 125Hz octave centre frequency bands (L_{eq}) should be controlled so as not to exceed 47 dB and 41 dB (L_{eq}), respectively, as per the MCC requirements.

7.1.3 Vita students entertainment noise limits

The noise limits as part of the Vita Students Brand Standards are discussed in Section 2.10.3 of this report. It is noted that these are more onerous than the requirements for structure borne noise that comply with the MCC criteria. As such meeting the brand standards will see the requirements of MCC met by default. These have been reproduced below for ease of reference.

	Sound Pressure Level (dB L_{eq} , 1 min) @ Octave Band Centre Frequency (Hz)						
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
Maximum allowable internal noise level	40	30	22	17	13	10	9

Table 7—2 - Maximum allowable music noise level in residential rooms due to entertainment venues

7.2 Noise management plan

The noise from the external portion of the proposed ground floor restaurant may have an impact on the surrounding residential and offices that have overlooking windows. As such it is recommended that measures to manage the restaurant noise are documented in a suitable Noise Management Plan (NMP) as part of the restaurant tenancy agreement. As there are currently no national standards or guidelines that provide noise limits for entertainment noise from uses such as restaurants, bars, and cafes the NMP may include measures such as those detailed in the British Beer & Pub Association “Effective Management of Noise from Licenced Premises”, examples provided below:

- Appropriate setting of operational hours.

- All amplified music should be brought under control of an automatic volume control system to see that the noise limits are not exceeded. The installed noise limited should be capable of limiting noise at 1/3-octave band frequencies. An example system that may be appropriate is as follows: Cesva LF010.
- Review the location, direction, and number of speakers.
- To see that any noise limiting equipment operates effectively, it is advised that the installation of such equipment should be overseen by an appropriately experienced noise consultant. Furthermore, due to the uncertainty of factors such as on-site workmanship, it is advised that the process of establishing acceptable limiting values for the system (i.e. values compliant with the Local Authority criteria) should be determined via in-situ testing of the PA system.
- Doors should not be opened unnecessarily and should ideally be lobbied doorsets to assist with limiting noise breakout.
- Provide an effective acoustic screen to boundaries with noise-sensitive premises getting expert advice on what constitutes “effective”.

8.0

Conclusions

8.0 Conclusions

Prevailing noise levels at a proposed development site have been measured, and an assessment of the site has been made in accordance with Local and National Planning Policy.

Based on predicted façade noise impacts at the proposed development, sound insulation performance requirements for glazed elements of the façade have been provided to see that suitable internal ambient noise levels, compliant with both MCC and the Vita Student Employer's Requirements.

Limiting noise levels have been provided for external noise impacts at existing nearby noise-sensitive receptors. These limits will see compliance with the relevant Local Planning Authority policy.

It is understood that there is potential for an entertainment noise installation for the food and drinks amenity areas on the ground and mezzanine floor of the development, which could have an impact on noise sensitive receptors. Limits to structurally detached and structurally attached properties have been provided based on the requirements of the local Authority and the Brand Standards of the structurally attached receptors. Suggestions have been provided to assist with the development of a noise management plan to ensure that the potential for any noise impact is mitigated against.

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