

Appendix 7-F

Site Suitability Assessment

Introduction

This appendix to the noise chapter of the Environmental Statement (ES) provides an initial assessment of the suitability of the site in terms of the proposed noise-sensitive uses, namely the new student accommodation, with respect to the existing noise environment. Details of the proposed development, including location and other plans, can be found in Chapter 2 of the ES. The site is currently used for the same purpose, i.e., student accommodation, which will be demolished as part of the proposed development.

The assessment includes details of relevant policy and guidance, the existing ambient noise levels on the site based on the results of a baseline noise survey undertaken at the site, and an outline assessment of suitability of the site with respect to external noise, which includes details of indicative acoustic measures that could be incorporated into the design of the proposed development and highlights where further consideration will be required as the design progresses.

In urban environments, the primary source of groundborne vibration is usually overground or underground railway lines. The nearest railway line to site is around 650 m to the east. On this basis, the site is not expected to be significantly affected by groundborne vibration and it is not considered as part of the assessment.

The assessment relates to the consideration of existing noise at the site, which is primarily from transportation sources. It does not consider noise sources that may be introduced as part of the proposed development, such as fixed plant installations or entertainment premises, as sufficient details of these elements with which to undertake a meaningful assessment are at not known at this time. However, noise emissions from these sources will be assessed and incorporated into the acoustic design of the proposed development as the design is progressed.

Policy and Guidance

The policy and guidance described below focuses on what is most relevant to the assessment of site suitability for student accommodation. Further discussion of policy and guidance relating to noise and vibration is included in Chapter 7 of the ES.

National Planning Policy Framework (2021)¹

The potential effects of noise on new developments are discussed in the following paragraph of the National Planning Policy Framework (NPPF):

- Paragraph 174e: *'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. ...'*

Manchester Core Strategy 2012 to 2027 (2012)²

Manchester City Council's local policies regarding planning are defined within the Core Strategy. In relation to noise, Policy DM 1 of the Core Strategy which deals with development management, states the following:

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

MCC Planning and Noise: Technical Guidance (2022)³

Further guidance on MCC's approach to the consideration of noise in a planning context is provided within its technical guidance document "Planning and Noise." The document contains various information; of particular relevance is the following list of criteria for residential developments from section 3.7.1.1:

"The Council has adopted the following 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 10 times) |
| • Living Rooms (daytime - 07.00 - 23.00) | 35 dB L_{Aeq} |
| • Gardens and terraces (daytime) | 55 dB L_{Aeq} " |

These criteria have formed the basis of this assessment.

¹ Ministry of Housing, Communities & Local Government (2021), National Planning Policy Framework

² Manchester City Council, 2012, Manchester's Local Development Framework – Core Strategy and Development Plan Document

³ Manchester City Council, 2022, Planning and Noise Technical Guidance

While the scope of this assessment considers the existing ambient noise environment, as the development may also include entertainment venues in addition to new student accommodation, the following criterion from section 3.7.1.2 is also noted and will be incorporated into the design of the new student accommodation as the design is progressed, both in terms of structurally connected and separate accommodation:

'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 ($L_{eq,5min}$), respectively.'

Professional Practice Guidance on Planning & Noise: New Residential Development (2017)

This document, referred to as ProPG, was produced to provide guidance on a recommended approach to the management of noise within the planning system in England with reference to new residential development.

The document includes a process for an initial site noise risk assessment based on the existing external free-field noise levels at the site (assuming they relate to transportation sources), which is intended to provide an indication of the likely risk of adverse effects from noise were no subsequent mitigation to be included as part of a development proposal. Intended as a method to be used pre-planning, this can provide useful context to the potential acoustic design requirements, but should not be the basis for any decision in itself.

The document provides a sliding scale for the different risk categories. For the purpose of this assessment, the following categories and corresponding external free-field noise levels have been derived from the scale:

Table 1: ProPG site noise risk categories

Site noise risk category	Day: noise levels dB $L_{Aeq,16hr}$	Night: noise levels dB $L_{Aeq,8hr}$	ProPG pre-planning application advice
Negligible	≤ 50	≤ 40	Indicates development site is likely to be acceptable from a noise perspective.
Low	51 – 60	41 – 50	Indicates development site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and demonstrated.
Medium	61 – 70	51 – 60	Indicates the development site is less suitable from a noise perspective. A subsequent application may be refused unless a good acoustic design process is followed and demonstrated.
High	> 70	> 60	Indicates an increased risk that the development would be refused on noise grounds. However, this risk may be reduced following a good acoustic design process.

With respect to noise from individual noise events during the night, the ProPG states that *"the initial site noise risk assessment should include the consideration of the individual noise events when the external $L_{Amax,F}$ exceeds 60 dB. A site should not be regarded as negligible risk if the $L_{Amax,F}$ exceeds, or is likely to exceed 60 dB more than 10 times a*

night. A site should be regarded as high risk if the $L_{Amax,F}$ exceeds, or is likely to exceed 80 dB more than 20 times a night.” It is assumed that these refer to noise levels including a façade correction.

Regarding recommended internal noise levels, the ProPG states the same as referenced in the MCC Planning and Noise document detailed above, although it notes that they are based on annual average data and do not have to be achieved in all circumstances. It also states that where development is considered necessary or desirable, the noise level criteria can be relaxed by up to 5 dB and reasonable internal conditions still achieved.

The ProPG states that where these noise levels can only be practically achieved with windows closed, then consideration must be given to any alternative methods of ventilation and overheating that may be required. It also clarifies that the internal noise level guidelines are generally not applicable to “*purge ventilation*”, e.g., the removal of odours or fumes; rather, they apply to “*whole dwelling ventilation*”, which is the normally continuous ventilation of rooms at a relatively low rate to remove pollutants and water vapour and supply outdoor air into the dwelling.

With respect to noise levels in external amenity spaces, the ProPG again states the same upper guideline value as the MCC Planning and Noise document. However, it does recognise that the guideline values may not be achievable in all circumstances where development might be desirable, and that development should be designed to achieve the lowest practicable noise levels in such external amenity spaces.

The Building Regulations: Approved Document O, Overheating (2021)

While the Building Regulations are separate to the requirement of planning, Approved Document O (ADO) contains information regarding noise with respect to the overheating condition during the night that is considered relevant to consider during the planning stage.

ADO states that windows are likely to be kept closed during the night, and therefore unable to be used to mitigate overheating, if the noise level within bedrooms exceeds the following limits:

- 40 dB $L_{Aeq,8hr}$ between 23:00 and 07:00; and
- 55 dB L_{AFmax} more than ten times a night between 23:00 and 07:00.

It should also be noted that, for the purpose of ADO, it is assumed that an open window reduces external free-field noise levels by 9 dB when considering the resulting noise level inside bedrooms. This reduction is applicable to moderate risk areas, which the proposed development falls within. On this basis, open windows could be used to mitigate overheating if external free-field noise levels do not exceed 49 dB $L_{Aeq,8hr}$ and 64 dB L_{AFmax} more than ten times a night.

Acoustics, Ventilation and Overheating (AVO) Residential Design Guide (2020)

This document, referred to as AVO Guide, was produced to provide guidance on the consideration of internal noise levels with respect to the requirements of ventilation and the mitigation of overheating. It should be noted that it was published before ADO was released and therefore has been effectively superseded with respect to specifying suitable noise levels during the night.

The AVO Guide provides several useful assumptions that can be referred to in the initial consideration of internal noise levels resulting from external noise, including:

- Notional room characteristics, with LWH dimensions of 2.0 x 2.5 x 2.4 m, glazing to 25% of the façade area and a 0.5 second reverberation time;

- Use of two trickle vents per room, with each vent providing an approximate equivalent area of 2,500 mm², being appropriate when considering passive methods of ventilation (i.e., whole building ventilation provided using passive background ventilators); and
- A partially open window reducing external free-field noise levels by 13 dB when considering the resulting internal noise level.

The AVO Guide also includes a method for a site risk assessment, similar to that found in ProPG, but with the specific aim of providing an indication of whether the use of opening windows as the primary means of mitigating overheating is likely to result in adverse effect due to external noise from transportation sources. Again, this uses a sliding scale for the different risk categories, but for the purpose of this assessment, the following external free-field noise levels have been derived for the daytime (ADO has been referenced for the night-time).

Table 2: AVO Guide overheating site risk categories for daytime

Overheating site risk category	Day: external noise levels
	dB L_{Aeq,16hr}
Negligible	≤ 53
Low	54 – 58
Medium	59 – 63
High	> 63

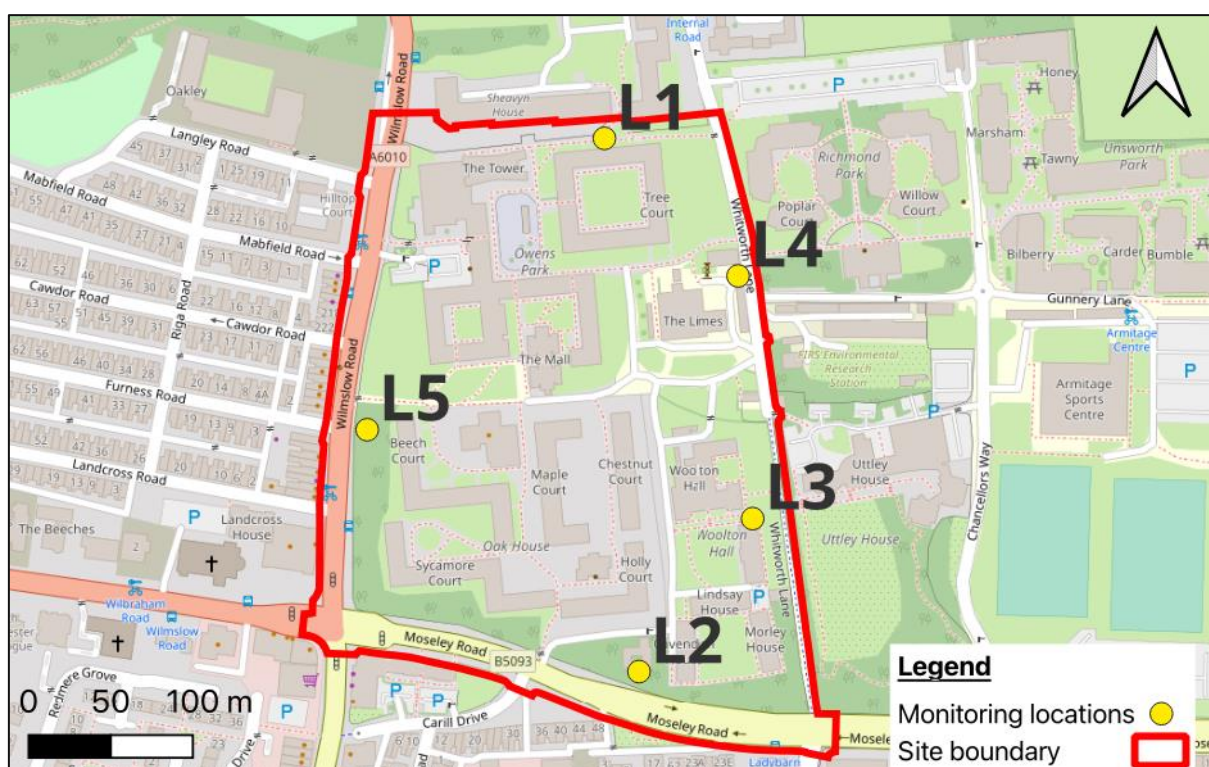
Where the site risk category is negligible, it can be assumed that the use of partially open windows to mitigate overheating inside rooms will not result in adverse effects due to external noise. For higher categories, further consideration may be required, such as the frequency and duration of the overheating condition, to identify a suitable method for the mitigation of overheating while avoiding significant effects associated with external noise.

Existing Noise Levels at the Site

Details of the baseline noise survey undertaken at the site can be found in Chapter 7 of the ES as well as Appendix 7-B and Appendix 7-E.

To summarise, unattended noise monitoring was undertaken at the locations marked L3 and L5 in the figure below between Friday 19th and Wednesday 24th May 2023 (the other positions shown were not used). L5, in a free-field location at a height of 1.5 m, was considered to be representative of the west and southern edges of the site, with L3, in a façade location on the north side of one of the existing building, representative of the eastern and northern sides.

Figure 1: Baseline noise survey monitoring locations



The baseline noise environment, as observed during the noise survey, was dominated by road traffic noise, with the A6010 Wimslow Road dominant on the north and west sides of the site, the B5093 Moseley Road at the south of the site, and contributions from both roads at the east of the site. Other noise sources noted included occasional aircraft overhead and fixed plant noise. It is expected that road traffic noise will continue to dominate in the future, and as the roads are busy, it is unlikely that future changes in traffic flows will significantly affect the level of noise compared to the current situation.

With respect to the site suitability assessment, it is considered that the noise levels measured at L5 represent the highest that are likely to occur on the site and therefore a worst-case in terms of noise exposure of any new buildings or external areas, with the noise levels measured at L3 likely to represent the lowest, particularly as the monitoring location was screened to some degree by the building it was positioned next to. Being at the edge of the site also means the monitoring locations represent the areas most exposed to external noise; noise levels within the site will be strongly affected by the final layout of the proposed development.

As discussed above, the noise criteria relating to new residential development are based on an annual average with respect to the “average” noise levels during the day and night ($L_{Aeq,T}$), while the individual noise event criterion states that the level should not “normally” be exceeded by more than ten times. The noise survey collected noise levels from four full 16 hour daytime periods, and five full 8 hour night-time periods. As this constitutes a relatively limited dataset, the highest measured noise levels for the day, night, and 10th highest individual noise event from a single night have been selected to inform the site suitability assessment. These are summarised in the following table.

Table 3: Results of baseline noise survey relevant to site suitability assessment

Monitoring location	Representative of	Measured external noise levels (free-field) ^		
		Day: 07:00-23:00, dB $L_{Aeq,16hr}$	Night: 23:00-07:00, dB $L_{Aeq,8hr}$	Night: 23:00-07:00, dB $L_{AFmax,1min}$, 10 th highest
L3*	North/east of site	51	48	58
L5	South/west of site	64	63	81

^The noise levels presented are the highest measured during the noise survey for the stated periods.
*The results for L3 have been corrected by -3 dB so that they represent free-field noise levels.

Assessment

Initial Site Noise Risk Assessment

Using the results of the baseline noise survey from the previous section, the initial site noise risk assessment as described in the ProPG is presented in the following table.

Table 4: Results of initial site noise risk assessment

Area of the site	Site noise risk category	
	Day (07:00-23:00)	Night (23:00-07:00)
North/east sides	Low	Low
South/west sides	Medium	High

On the north and east sides of the site, the initial site noise risk assessment suggests a low risk, indicating that the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and demonstrated.

On the south and west sides of the site, which are both adjacent to busy roads, the initial site noise risk assessment indicates a medium risk during the day and high risk during the night, based on the worst-case measured noise levels during the survey. This emphasises the importance of following a good acoustic design process to reduce the risk and mitigate and minimise the potentially adverse effects of noise. It should be noted that the stated risk levels would be relevant to rooms or external amenity areas that face/are directly exposed to the adjacent roads.

Internal Noise Levels (Open Windows and Ventilation)

Using the results of the baseline noise survey, the MCC criteria for residential properties, and the assumptions from the AVO Guide relating to the sound reduction performance of a partially open window and characteristics of a typical room, the following table presents predicted internal noise levels in the stated areas of the site as well as the MCC criteria for reference.

Table 5: Predictions of internal noise levels with a partially open window

Area of the site	Predicted internal noise levels with a partially open window [^]		
	Day: 07:00-23:00, dB L _{Aeq,16hr}	Night: 23:00-07:00, dB L _{Aeq,8hr}	Night: 23:00-07:00, dB L _{AFmax,1min} , 10 th highest
MCC criteria	35	30	45
North/east sides	38	35	45
South/west sides	51	50	68
[^] Assuming a 13 dB reduction between external and internal noise levels from a partially open window.			

From Table 5, it can be seen that with an open window, the only criterion predicted to be achieved is the night-time individual noise event threshold on the north and east sides of the site. However, it should be noted that the other predicted internal levels on the north and east sides of site exceed the MCC criteria by only 3-5 dB, and as

discussed above, the ProPG considers exceedances of up to 5 dB to represent reasonable internal conditions where development is considered to be desirable.

Potential options for glazing and ventilation which achieve the MCC criteria for residential properties relating to internal noise levels are as follows. It should be noted that for the north and east sides, this criteria could be achieved by typical glazing and trickle vents.

Table 6: Indicative glazing and ventilation requirements to achieve internal noise criteria

Area of the site	Indicative glazing and ventilation requirements [^]		
	Glazing performance, dB R _w (C _{tr})	Ventilation system	Trickle vent performance, dB D _{n,e,w} (C _{tr})
North/east sides	29 (-4)	Trickle vents (2 no. per room)	33 (-1)
South/west sides	44 (-6)	Trickle vents (1 no. per room) and continuous mechanical extract	44 (-3)
[^] The stated performances have been predicted based on detailed noise break-in calculations undertaken using the assumptions for notional room characteristics stated in the AVO Guide (see above).			

From Table 6, the indicative glazing and ventilation requirements indicate that for rooms on the south/west sides of the site directly exposed to the adjacent roads, a ventilation system with continuous mechanical extract is necessary to reduce the number of trickle vents in a room to one to reduce the transmission of external noise via these elements. Example types of glazing and trickle vents that achieve these acoustic performances are presented in the following table.

Table 7: Example glazing and trickle vent types to achieve internal noise criteria

Area of the site	Example glazing and trickle vent specifications	
	Glazing type	Trickle vent type
North/east sides	4/(6-16)/4 mm (standard double glazing)	Standard slot ventilator
South/west sides	10/16/8.8 mm (acoustic double glazing with acoustic interlayer)	Acoustic slot ventilator with canopy

While outside the scope of this assessment, when using mechanical methods of ventilation, the noise produced by operation of such systems inside rooms must be considered in addition to noise from external sources.

While it has been demonstrated how the internal noise criteria could be achieved while providing sufficient ventilation for the worst-case rooms in terms of their noise exposure to the busy roads on the south and west sides of the site, the approach will be developed and finalised during the detailed design process including for the central areas of the proposed development, away from the perimeter.

Internal Noise Levels (Overheating)

Using the results of the baseline noise survey from the previous section, the overheating site risk assessment as described in the AVO Guide is presented in the following table for the daytime.

Table 4: Results of overheating site risk assessment

Area of the site	Overheating site risk category
	Day (07:00-23:00)
North/east sides	Negligible
South/west sides	High

On the north and east sides of the site, the overheating site risk assessment suggests a negligible risk, indicating the use of partially open windows to mitigate overheating inside rooms will not result in adverse effects due to external noise. However, on the south and west sides of the site the overheating site risk category is high, suggesting that it is unlikely that partially open windows could be used to mitigate overheating.

Similarly, when considering the ADO requirements for the mitigation of overheating during the night-time as detailed above, the use of open windows is predicted to be acceptable on the north and east sides of the site, but not on the south and west sides.

Potential options for the mitigation of overheating on the south and west sides of the site include the use of attenuated vents / louvres, i.e., ventilation openings with an integral means of attenuating sound, and mechanical cooling systems. The approach to the mitigation of overheating will be developed and finalised during the detailed design process.

External Amenity Area Noise Levels

In terms of the MCC criterion for noise levels in gardens and terraces of 55 dB $L_{Aeq,T}$ during the day, it can be seen from the results of the baseline noise survey this would likely be achieved at the north and east sides of the site where the measured noise level was 51 dB $L_{Aeq,T}$, but not at the south and west sides of the site where the level measured was 64 dB $L_{Aeq,T}$.

If external amenity areas were located next to the roads to the south and west of the site, noise from road traffic could be reduced using solid perimeter fencing with a minimum mass per unit area of 10 kg/m².

Unlike private residences, it is not anticipated that individual student flats will have their own gardens. Therefore, with careful planning of the final layout of the proposed development and use of fencing if required, it is expected that sufficient external amenity areas for the use of the students that achieve the noise criterion can be provided. This will be developed and finalised during the detailed design process.

Good Acoustic Design

In the preceding assessments of internal and external noise, potential solutions have focused on “direct” methods of mitigation where required, such as acoustically rated glazing and trickle vents.

Prior to the final selection of such measures, the principles of good acoustic design will be employed to reduce noise levels as far as is practicable through the layout of proposed development, such as situated buildings further back from the roads to the south and west of the site, and using the buildings screen external amenity areas from the roads. Furthermore, internal building layouts could be designed to minimise the number of sensitive rooms (e.g., bedrooms and living rooms) directly facing the busy roads. Orientation of buildings can also be used to mitigate overheating and therefore reduce the need for the use of open windows or other methods of cooling, as can the use of trees and other measures incorporated into the façade design to provide shading.

Conclusions

An initial assessment has been undertaken of the suitability of the site in terms of the proposed noise-sensitive uses, namely the new student accommodation, with respect to the existing noise environment.

Using the results of a baseline noise survey undertaken at the site, this has indicated that noise levels on the southern and western sides of the site are high. Any student accommodation or external amenity areas located along these sides of the site will require careful design with respect to the mitigation of noise from the adjacent roads. Indicative options for the acoustic performance and type of glazing and provision of ventilation as well as methods of mitigating overheating have been provided to demonstrate how this could be addressed, but the approach will be developed and finalised during the detailed design process.

Noise levels on the northern and eastern sides of the proposed development are relatively low, and the assessment has indicated that minimal mitigation measures are required with respect to both noise levels inside rooms and in external amenity areas in these areas.

The detailed design process will also include consideration of the potential effects of noise sources that may be introduced as part of the proposed development, such as fixed plant installations or entertainment premises, with suitable design measures to be employed as required.

It is concluded the site is suitable for the proposed development from a noise perspective, subject to a good acoustic design process being followed that includes consideration of the layout and orientation of buildings to minimise noise levels in more noise-sensitive locations.