

Plot 9a, First Street

Noise Impact Assessment

First Street Developments Limited

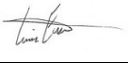
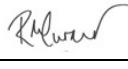
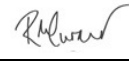
Job No: 1031888
Doc Ref: PLOT9A-CDL-XX-XX-RP-Y-45001
Revision: P03
Revision Date: 15 December 2021

Project title	Plot 9a, First Street	Job Number
Report title	Noise Impact Assessment	1031888

Document Revision History

Revision Ref	Issue Date	Purpose of issue / description of revision
P01	01 October 2021	First Issue
P02	08 October 2021	Updated following comments from Chroma
P03	03 December 2021	Updated in accordance with design changes
P04	15 December 2021	Updated in accordance with design changes

Document Validation (latest issue)

15/12/2021	15/12/2021	15/12/2021
		
X	X	X
Principal author	Checked by	Verified by
Signed by: Everett, Simon	Signed by: Turner, Rob	Signed by: Turner, Rob

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1.0

Introduction

1.0 Introduction

This report is prepared by Cundall in support of a planning application for the development of a commercial office on Plot 9a of the First Street Regeneration Area.

Proposals are for the erection of a 9-storey building with basement comprising office accommodation (Use Class E(c)), car parking, cycle parking and associated facilities, landscaping and associated works.

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.

To establish the prevailing noise climate across the existing site, noise surveys have been undertaken on the 21 – 22 June, 10 – 12 December 2018 and 4 November 2019. 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.

1.1 BREEAM

It is understood that points may be targeted for BREEAM credits Hea 05 and Pol 05. Both these credits call for evidence to be submitted by a suitably qualified acoustician (SQA).

Cundall is a member of the Association of Noise Consultants (ANC) and is registered to carry out sound insulation testing under their pre-completion testing accreditation scheme.

The lead acoustic engineer and author of this report has over 20 years' practice in acoustic engineering and consultancy, demonstrating experience in accordance with BREEAM's requirement for an SQA.

Furthermore, Cundall Acoustics employs 19 consultants at various global locations, most of whom hold corporate membership of the Institute of Acoustics (IOA).

2.0

Assessment criteria

2.0 Assessment criteria

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 Noise Policy Statement for England

The Noise Policy Statement for England (NPSE) was published by Defra in March 2010. This 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 of health and quality of life.”

2.2 National Planning Policy Framework

The National Planning Policy Framework (NPPF) was originally published in March 2012 and amended in July 2021. The NPPF is part of government reform to make the planning system less complex and more accessible, and to promote sustainable growth. It replaces existing national planning policies such as Planning Policy Guidance PPG24: Planning and Noise.

Specifically, on the subject of noise, paragraph 185 of NPPF states:

“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;”

Further to this, paragraph 174 states that planning policies and decisions should contribute to and enhance the natural and local environment by:

“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”

2.3 Local Authority Noise Policy Guidance

Manchester City Council's guidance on planning and noise are outlined in section 3.0 of Manchester City Council's Planning & Noise Technical Guidance document (December 2015).

Section 3.6.1.5.1 of the document relates to noise limits for building services plant and states:

“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.”

2.4 BREEAM

2.4.1 Hea 05

The second credit available under BREEAM (2018) Hea 05 states:

Criteria: Achieve indoor ambient noise levels that comply with the design ranges given in Section 7 of BS 8233:2014.

BS 8233: 2014¹ gives criteria for internal ambient noise levels (IANLs) within all types of office space which contribute to providing:

- Reasonable speech and telephone communications;
- Reasonable acoustic privacy in shared spaces;
- Reasonable acoustic conditions for study and work requiring concentration; and
- Reasonable listening conditions.

Table 1 lists spaces relevant to this development with their recommended internal noise levels. It should be noted that the recommended values are a combination of noise from both internal and external noise sources. These values form the basis of the BREEAM (2018) credit Hea 05.

Type of space	Design range for indoor ambient noise levels dB $L_{Aeq,T}$
Open plan offices	45 – 50

Table 1 – BS 8233: 2014 internal noise levels

In mechanically ventilated spaces, noise from services within rooms should be designed such that the indoor ambient noise levels range given above will not be exceeded when combined with noise ingress through the building envelope.

It should be noted that the indoor ambient noise level requirements for open plan office is set out in a range and therefore noise levels should not generally fall below 45 dB $L_{Aeq,T}$ in this type of space.

2.4.2 Pol 05

The credit available under BREEAM (2018) Pol 05 states:

Where there are noise-sensitive areas within the assessed building or noise-sensitive areas within 800 m radius of the assessed site, a noise impact assessment compliant with BS 4142: 2014 is commissioned. Noise levels must be measured or determined for:

The noise level from the assessed building, as measured in the locality of the nearest or most exposed noise-sensitive development, must be at least 5 dB lower than the background noise throughout the day and night.

2.5 BCO Guidance

The BCO 2019 Guide to Specification also contains guidance on acoustics in offices. Table 2 shows BCO recommendations for internal noise limits (split between noise intrusion from external sources and building services noise):

¹ BS 8233:2014 – Guidance on sound insulation and noise reduction for building.

Type of space	Upper limit for external noise intrusion	Upper limit for building services noise
Speculative offices	NR 38 Leq,T 55 dB L _{A01,1hour}	NR 38
Entrance lobbies	-	NR 40
Circulation spaces	-	NR 40
Toilets	-	NR 45
Loading bays	-	NR 55
Underground car parks	-	NR 55
Note: *For the purpose of Cat A fit out stage, the noise rating for 'speculative offices' should be achieved in the main open plan office spaces.		

Table 2 – BCO internal noise levels

BS 8233 states that dBA levels are approximately equivalent to NR + 6. It can therefore be seen from the tables above that compliance with detailed BCO guidance on internal noise levels would see broad compliance with the credit available under Hea 05.

It is therefore suggested that the BCO target noise levels be used as the basis for contractual internal noise level limits for the office elements of the development.

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

BS 8233: 2014² gives criteria for internal ambient noise levels (IANLs) within all types of office space which contribute to providing:

- Reasonable speech and telephone communications;
- Reasonable acoustic privacy in shared spaces;
- Reasonable acoustic conditions for study and work requiring concentration; and
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Table 1 lists spaces relevant to this development with their recommended internal noise levels. It should be noted that the recommended values are a combination of noise from both internal and external noise sources. These values form the basis of the BREEAM (2018) credit Hea 05.

Type of space	Design range for indoor ambient noise levels dB L _{Aeq,T}
Open plan offices	45 – 50

Table 3 – BS 8233: 2014 internal noise levels

In mechanically ventilated spaces, noise from services within rooms should be designed such that the indoor ambient noise level range given above will not be exceeded when combined with noise ingress through the building envelope.

It should be noted that the indoor ambient noise level requirements for open plan office is set out in a range and therefore noise levels should not generally fall below 45 dB L_{Aeq,T} in this type of space.

2.7 Government Property Agency (GPA) Design Guide

The government workplace design guide (Version 1.1 August 2020) sets out the standards for government workplace spaces. The document 'Employers requirements checklist', provides a checklist with identification of specific GPA

² BS 8233:2014 – Guidance on sound insulation and noise reduction for building.

Employers Requirements for capital projects in relation to Category A procurement and design, gives the following requirements in relation to internal noise levels.

12.0 THE ACOUSTIC ENVIRONMENT		
	Hub Standard Comments	Description
12.2	External Noise Intrusion	Internal ambient noise levels are influenced by external noise ingress, predominantly from road traffic, and by noise from within the building, such as from building services. The following levels (assumed $L_{Aeq,T}$ dB) shall be achieved within the various spaces: Boardroom: 35 Meeting rooms: 40 Open plan office: 45 Circulation/ entrance lobby: 45 WCs: 50
12.3	Building Services Noise to Internal Areas	To current and appropriate BCO guide specification and BS /ISO /EN Standards. Services should be designed to accommodate partitioning on an agreed planning grid.

Table 4 - GPA Design Guide Acoustic Requirements

The most onerous criteria relating to the current layouts is for open plan offices or circulation / entrance lobbies. The noise break in criteria for BCO compliance with speculative spaces is approximately 43 dB $L_{Aeq,T}$ and as such complying with BCO sees the GPA Design guide requirements achieved by default.

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 9a and is bound by River Street to the north, a future development site known as Plot 10 to the east, future development Plot 9b to the south, and Medlock Street to the west. The Site is currently mostly hardstanding, reflecting its recent use as a temporary car parking area ahead of the plot's permanent redevelopment. There is limited vegetation on site, limited to small shrubbery to the edge of Medlock Street.

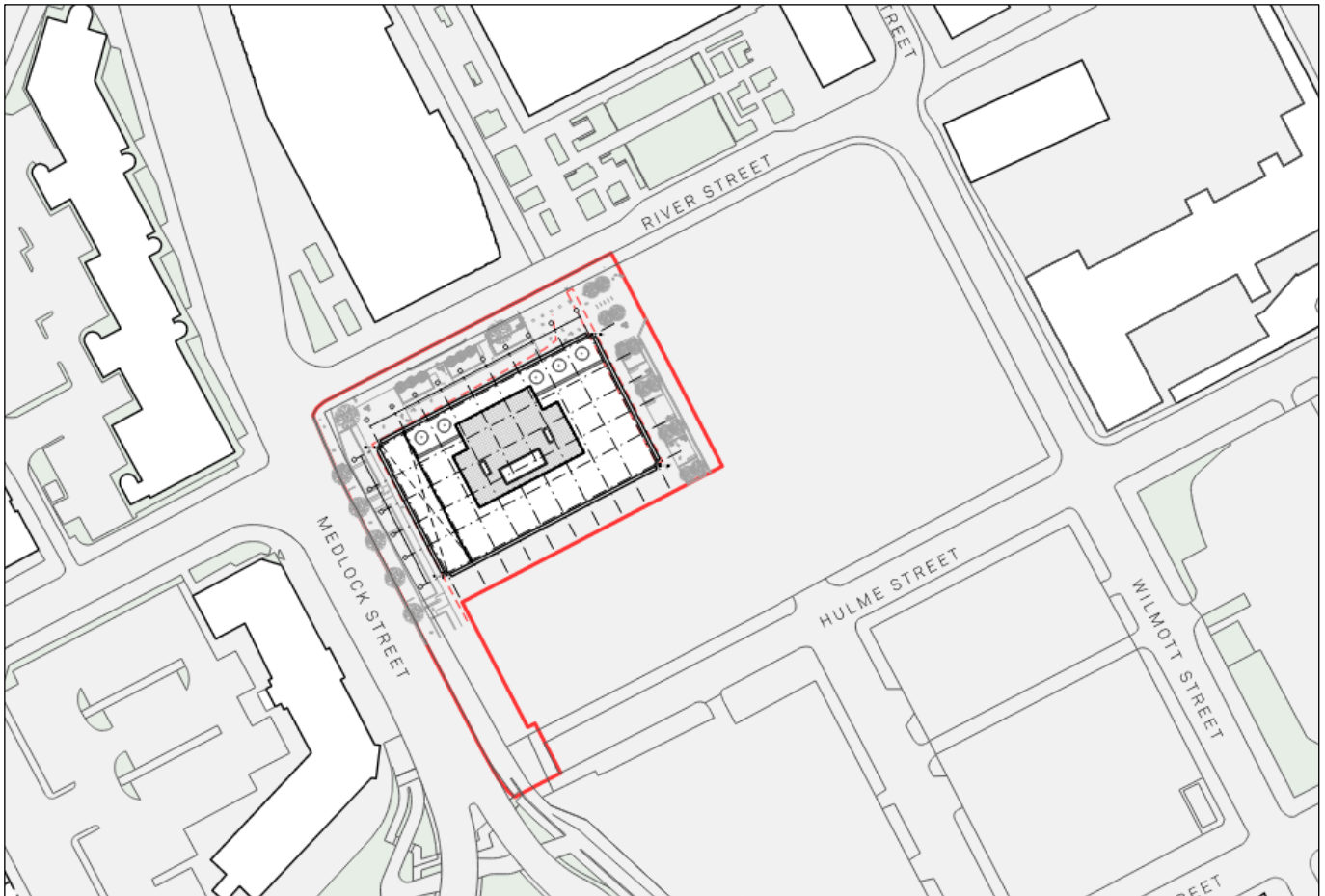


Figure 1 - Proposed development site boundary location

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 Survey Methodology

In order to assess the prevailing levels of environmental noise affecting the proposed development, attended and unattended environmental noise surveys were undertaken at four different locations, as detailed in Table 5.

Monitoring location	Survey type	Date / period	Comments
MP1	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.
MP2		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
MP3A		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
MP3B	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
MP4		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 5 – Summary of noise measurement locations

The approximate measurement locations are shown in Figure 2 below:

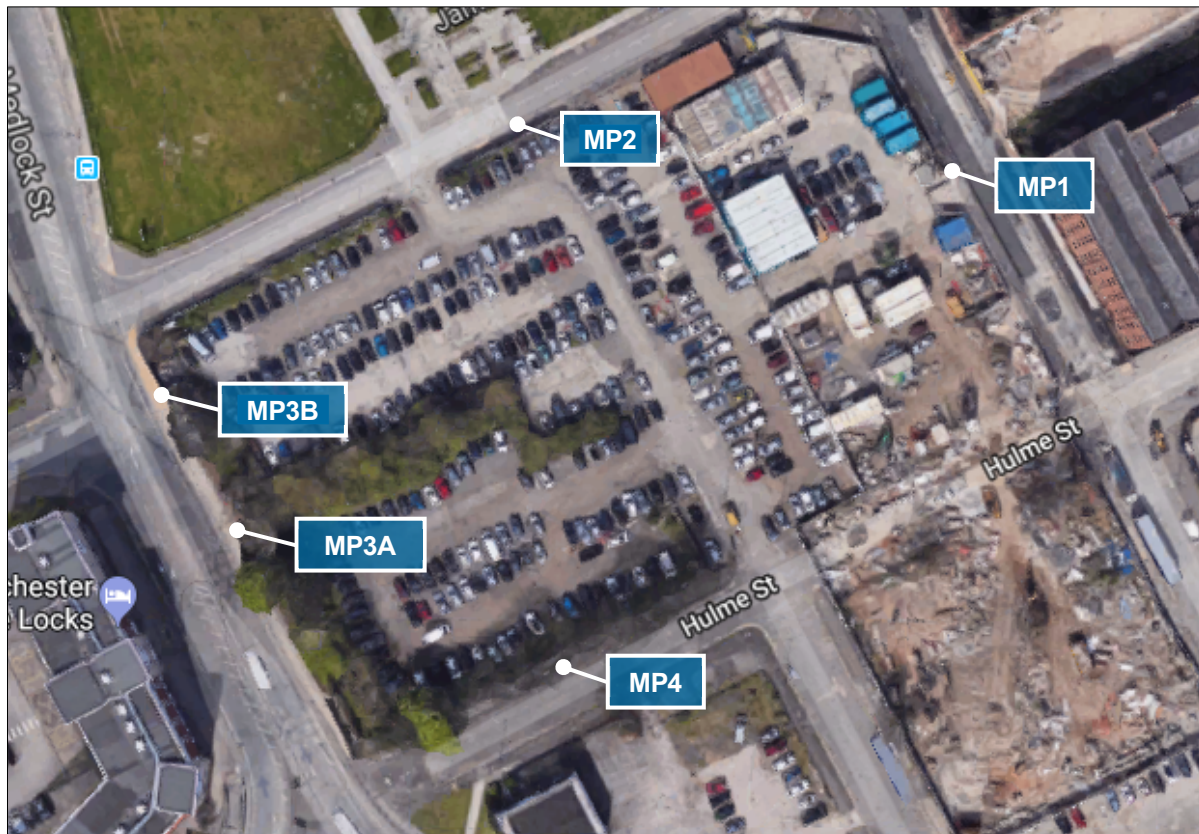


Figure 2 – Approximate noise measurement positions

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 Results summary

A summary of the average ambient noise levels recorded is detailed within Table 6. 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 $L_{A90,15min}$
MP1	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
MP2	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
MP3A	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
MP3B	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
MP4	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 6 – Summary of noise measurement data

4.3 Additional Survey November 2019

In order to reflect updates in the BCO guidance for offices between the initial noise surveys and the issuing of this report, additional survey measurements were taken on 4 November 2019 in order to assess the $L_{A1,T}$ levels on site, which have

superseded the role of $L_{AF,max}$ levels in the most recent BCO guidance. Attended measurement positions were replicated from the first survey and so are unchanged from those shown in Figure 2, and the full set of results are shown below.

Monitoring location	Start Time	$L_{Aeq,15min}$	$L_{A01,15min}$
MP1	09:44	66	76
	10:35	62	73
MP2	09:27	67	77
	10:18	64	76
MP3A	09:09	72	81
	10:02	73	80
	10:54	72	80

Table 7- Summary of additional survey

5.0

Noise impact assessment

5.0 Noise impact assessment

Based on guidance summarised in Section 2.0, the external building fabric should be designed such that the following internal noise limits can be achieved during any daytime period (07:00 – 23:00 hours):

Space	Averaged noise level	Instantaneous noise level
Speculative offices (all facades)	NR 38 (approx. equivalent $L_{Aeq,T}$ 43 dB)	$LA_{01,1h}$ 55 dB

Table 8 – Summary of internal noise level targets

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 upon the average L_{Aeq} results obtained during the attended daytime noise survey.

5.1.1 Noise modelling results

Façade noise maps for each elevation, initially for the worst-case daytime hourly level, are presented below. Levels shown in these figures and referred to in the following sub-sections are ‘free-field values’ at 1 m from the building façade.

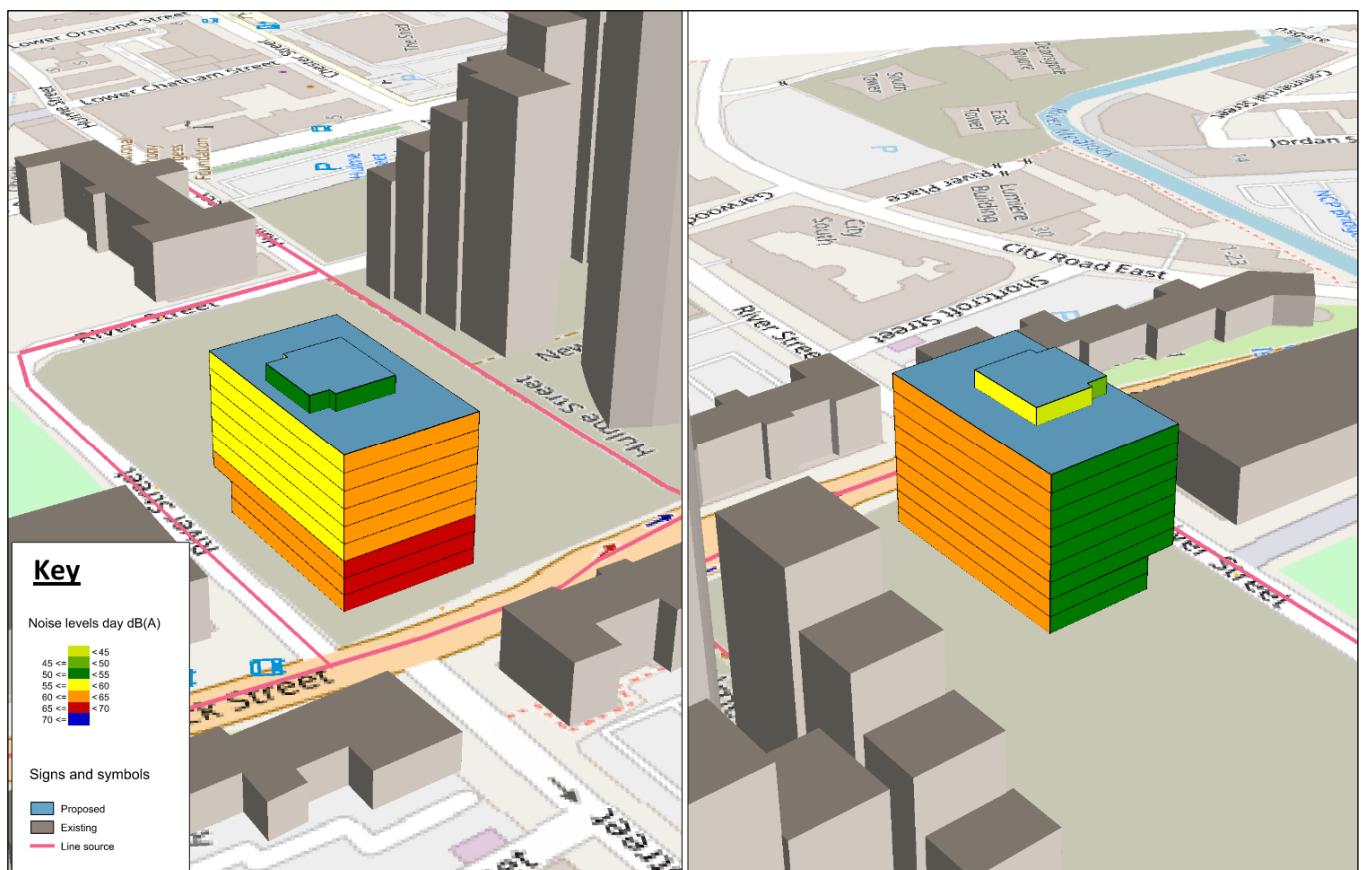


Figure 3 – Façade noise levels – road traffic impact

5.1.2 Discussion

It can be seen from the façade noise maps presented in Figure 3 that the predicted worst case hourly day-time noise levels at façades directly overlooking Medlock Street are approximately 67 dB $L_{Aeq,T}$ at lower floor levels, reducing to 63 dB $L_{Aeq,T}$ at higher floor levels. At the rear, noise levels impacting the façade reduce to 53 dB $L_{Aeq,T}$.

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

For mechanically ventilated buildings, the weakest elements of the external elevation are 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 BCO, the minimum façade sound reduction requirements identified for façades at Plot 9 are presented below.

Calculation procedures for determining the glazing attenuation ($R_w + C_{tr}$) are as follows:

$$R_w + C_{tr} = \text{External Façade Level dBA} - \text{Internal Design Target dBA}$$

Table 9 presents a summary of the highest daytime noise levels predicted at each façade, along with a comparison against the proposed BCO internal ambient noise level criteria.

Facade	External façade noise level	BCO / BS 8233 Internal noise criteria	Required sound insulation, dB $R_w + C_{tr}$
Medlock / Hulme Street	$L_{Aeq,T}$ 65 dBA	$L_{Aeq,T}$ 44 dB (NR 38)	21
	$L_{A01,T}$ 81 dBA	$L_{A01,1hour}$ 55 dB	26
River Street	$L_{Aeq,T}$ 61 dBA	$L_{Aeq,T}$ 44 dB (NR 38)	17
	$L_{A01,T}$ 77 dBA	$L_{A01,1hour}$ 55 dB	22
River Street (Rear)	$L_{Aeq,T}$ 58 dBA	$L_{Aeq,T}$ 44 dB (NR 38)	14
	$L_{A01,T}$ 76 dBA	$L_{A01,1hour}$ 55 dB	21

Table 9 – Summary of office glazing conditions

Based on the above, the following table presents a glazing configuration capable of achieving the minimum required facade sound reduction index values detailed above:

Minimum required glazing sound reduction index - $R_w + C_{tr}$ (dB)	Example suitable glazing specification
≥ 26	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 10 – 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 facades 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.

5.3 Natural ventilation assessment

5.3.1 Existing noise levels

As stated in Section 2.0, BCO guidance states that for naturally ventilated buildings, it may be appropriate to accept a relaxation of noise intrusion levels of +5 dB when windows are open. It is widely accepted that open windows/louvers can provide attenuation from outside noise sources of approximately 10 dB. As such, the table below indicates the suggested maximum permissible noise levels at building façades when considering this relaxation in criteria.

Description	Noise levels
BCO internal noise criterion	$L_{Aeq,T}$ 44 dB (NR 38)
Natural ventilation relaxation	+ 5 dB
Open window / louver attenuation	+ 10 dB
Maximum suggested façade noise levels	$L_{Aeq,T}$ 59 dB

Table 11 - Maximum façade noise levels for naturally ventilated solution

Using the limit indicated above, the existing façade noise maps have been split into categories of exceedances and areas of compliance with this 59 dB $L_{Aeq,T}$ limit, hence indicating where open windows would result in exceedance or compliance with the suggested BCO internal noise criterion.

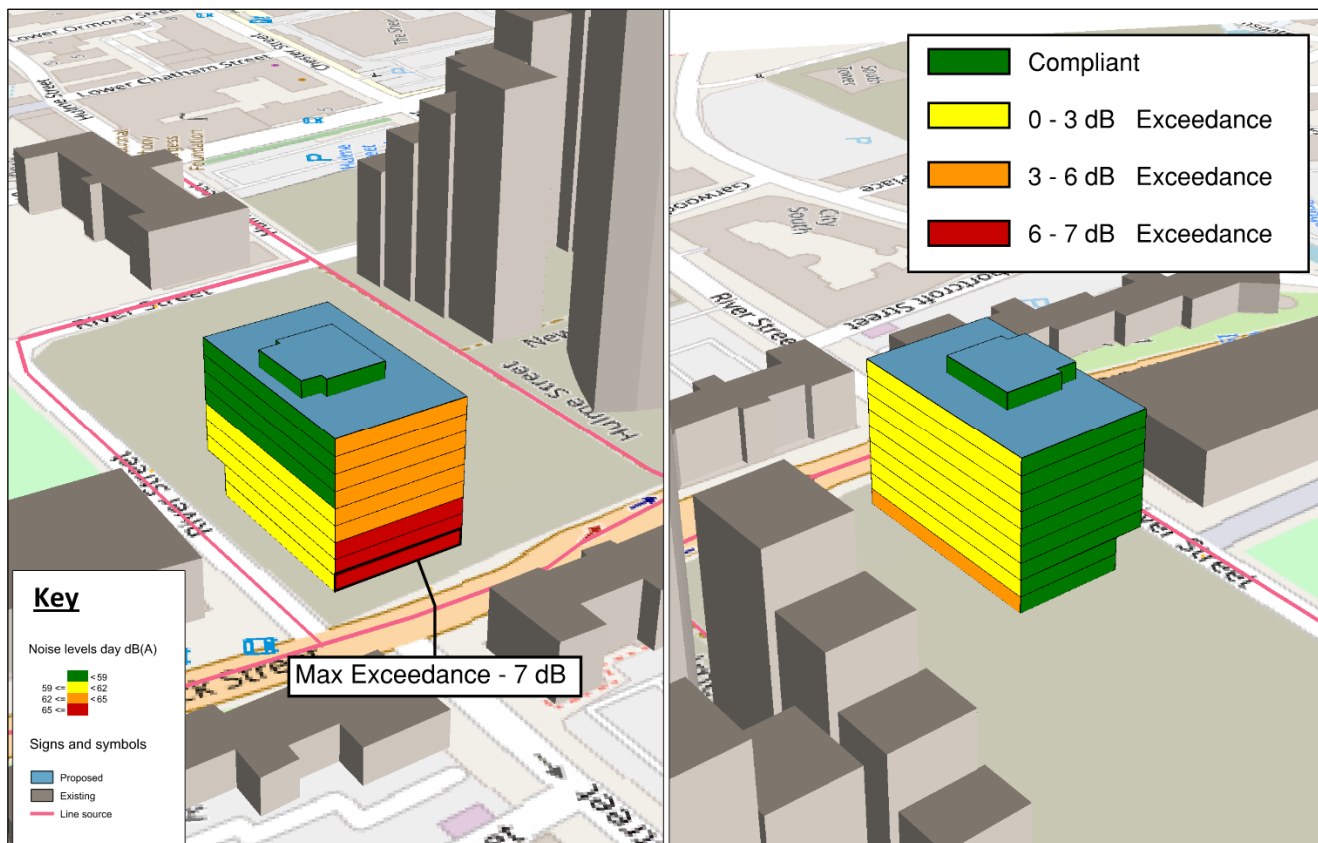


Figure 4 - BCO natural ventilation compliance study

5.3.2 Potential future levels – electric car study

It has been proposed that in order to assess future noise levels in the context of a sustainability assessment, consideration should be made for future noise levels being the result of mostly electric cars in lieu of current petrol and diesel combustion vehicles.

Whilst it is not possible to predict the exact reduction in noise emissions, studies have indicated that '90 % electrified car fleet will reduce average urban noise levels by at least 3 dB^[3]'.

As such, the noise model has been recalibrated for roads to emit a sound power level of 3 dB less than the existing scenario. The resulting noise maps indicating the acceptability of the naturally vented solution in relation to suggested internal noise levels are shown below.

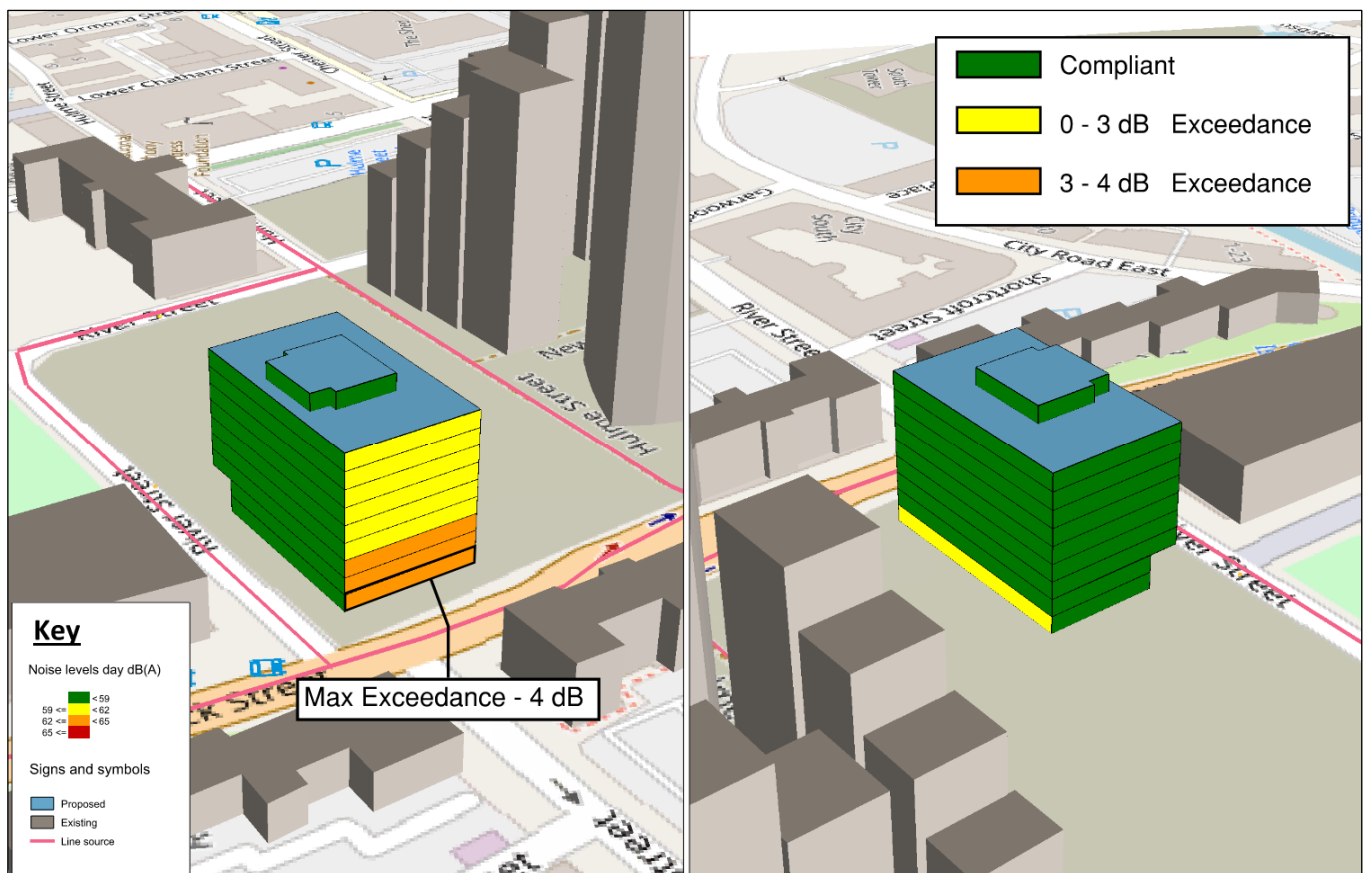


Figure 5 - BCO natural ventilation compliance study - future electric car scenario

The conclusions from this modelling process are:

- For both existing and future scenarios, all facades facing Trinity Way and Stanley Street will see an exceedance of suggested internal noise limits with open windows
- Some facades facing away from these sources will see compliance, with the number of compliant locations slightly improving in the future electric car scenario

Unlike the façade performance requirements discussed in Section 5.2, compliance for open windows/louvers are based on suggestions made in BCO guidance and so do not prohibit the use of open windows as a ventilation solution, but indicate the need for a holistic approach when balancing the needs of a sustainable solution against acoustic comfort.

³ 'Effect of electric cars on traffic noise and safety', E.N.G. Verheijen and J. Jabben, National institute for Public Health and the Environment, Report 680300009/2010

6.0

External plant noise limits

6.0 External plant noise limits

As detailed in Section 2.3, 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.”

The above limits will also see compliance with the available BREEAM Pol05 credit as discussed in Section 2.4.2.

6.1 Nearest noise sensitive receptor

The nearest noise-sensitive properties are considered to be the apartments at the Macintosh Mill development to the east of the site on the opposite side of Wilmott St.

6.2 Limiting noise levels

Table 12 below summarises the existing background noise 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	Existing background noise level* dB L_{A90}	Plant noise rating level not to be exceeded at 1 m from nearest noise-sensitive receptor dB $L_{A1,Tr}$
Daytime (07:00 – 23:00 hrs)	45	40
Night-time (07:00 – 23:00 hrs)	42	37
* Existing background noise value based on lowest measured $L_{A90,15min}$ value during attended noise surveys at MP2		

Table 12 – 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).

6.3 Emergency generator

Proposals are for an emergency generator to be located within an external roof plant area at 10th Floor. At the time of writing, generator requirements / specifications are not available, although design measures will be adopted to see that the compliance with the relevant requirements are achieved, for internal noise levels at the development and for external plant noise limits at nearby noise sensitive premises. This will require a provisional assessment of the roof build to see that this sufficiently controls noise transfer to office spaces on the 9th Floor, and an assessment of the noise levels to the nearest noise sensitive receptors to see that daytime limits as set in Table 12 are not exceeded. The current design allows for a 200mm concrete slab (on trapezoidal metal decking) at roof level to provide increased protection against the ingress of plant / generator noise.

The emergency generator should only be tested during daytime hours on a weekday.

6.4 Plant noise in terrace area

The external terrace area is located on the same level as items of external plant which will serve the development, in a layout which sees these areas immediately adjacent to one another. As selections of items of plant progress through design, provisional assessments shall be undertaken to see that the external terrace area does not experience adverse impacts as a result of noise from the external plant area.

7.0

Conclusions

7.0 Conclusions

Prevailing noise levels at a proposed development site have been predicted, 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, an initial glazing strategy feasibility study has been undertaken based on achieving internal ambient noise levels compliant with the BCO recommendations. These internal ambient noise targets will also see compliance with the credit available for BREEAM Hea05.

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 and the available BREEAM Pol05 credit.

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