

First Street Plot 10a

Noise Impact Assessment

First Street Developments Limited

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Contents

1.0	Introduction	1
2.0	Assessment criteria	3
2.1	Noise Policy Statement for England	3
2.2	National Planning Policy Framework	3
2.3	Local Authority Noise Policy Guidance	4
2.4	BREEAM	4
2.5	British Council for Offices Guide to Specification 2019 (BCO 2019)	5
2.6	BS 8223:2014 'Guidance on sound insulation and noise reduction for buildings'	5
3.0	Site context	7
4.0	Environmental noise survey	9
4.1	2022 survey	9
4.2	Results discussion	11
4.3	2018 survey	11
5.0	Noise impact assessment	15
5.1	Environmental noise model	15
5.2	Noise break-in	16
5.3	Natural ventilation assessment	17
6.0	External plant noise limits	21
6.1	Nearest noise sensitive receptor	21
6.2	Representative background levels	21
6.3	Results discussion	22
6.4	Limiting noise levels	22
6.5	Plant noise in terrace area	22
7.0	Conclusions	24

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 10a First Street.

Proposals are for the erection of a thirteen-storey building with basement comprising:

- 20,155m² of office space in a 28,222m² (GIA) building.
- Commercial office (Use Class E(c)),
- Target net zero carbon building.
- 204 double stacked cycle racks provided at ground floor with associated changing, locker and shower facilities.
- Landscaping, and public realm works.
- 11th floor terrace and 12th floor terrace/pavilion for tenants' use.
- Winter gardens for office accommodation.

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

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 (June 2022).

Section 3.7.1.5 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: 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
- 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 BS 8233:2014 – Guidance on sound insulation and noise reduction for building.

2.5 British Council for Offices Guide to Specification 2019 (BCO 2019)

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):

Type of space	Upper limit for external noise intrusion	Upper limit for building services noise
Speculative offices*	NR 38 $L_{eq,T}$ 55 dB $L_{A01,1hour}$	NR 38
Entrance lobbies	-	NR 40
Circulation spaces	-	NR 40
Toilets	-	NR 45
Loading bays	-	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 8233:2014³ 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 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.

³ BS 8233:2014 – Guidance on sound insulation and noise reduction for building.

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 10a and is bound by River Street to the north, a future development site known as Plot 10b to the east, Hulme Street to the south and a future development site known as Plot 9a 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.



Figure 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 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.

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 – 2022 summary of noise measurement locations

The approximate measurement locations are shown in Figure 2 below:



Figure 2 – 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 5. 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	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

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}
		01/09/2022 23:00 – 02/09/2022 07:00	53	80	51 - 58	44 - 55

Table 5 – 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 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 noise impact assessment on 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 used to calibrate these noise models corresponded to worst case noise levels on Saturday 27 August of the 2022 survey. As such, it was concluded that calibrating to these levels was a reasonable worst-case assessment where calibrating to construction noise levels would be overly onerous.

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 2018 survey

Attended and unattended environmental noise surveys were undertaken at four different locations in 2018, as detailed in Table 6.

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 6 – 2018 summary of noise measurement locations

The approximate measurement locations are shown in Figure 3 below:

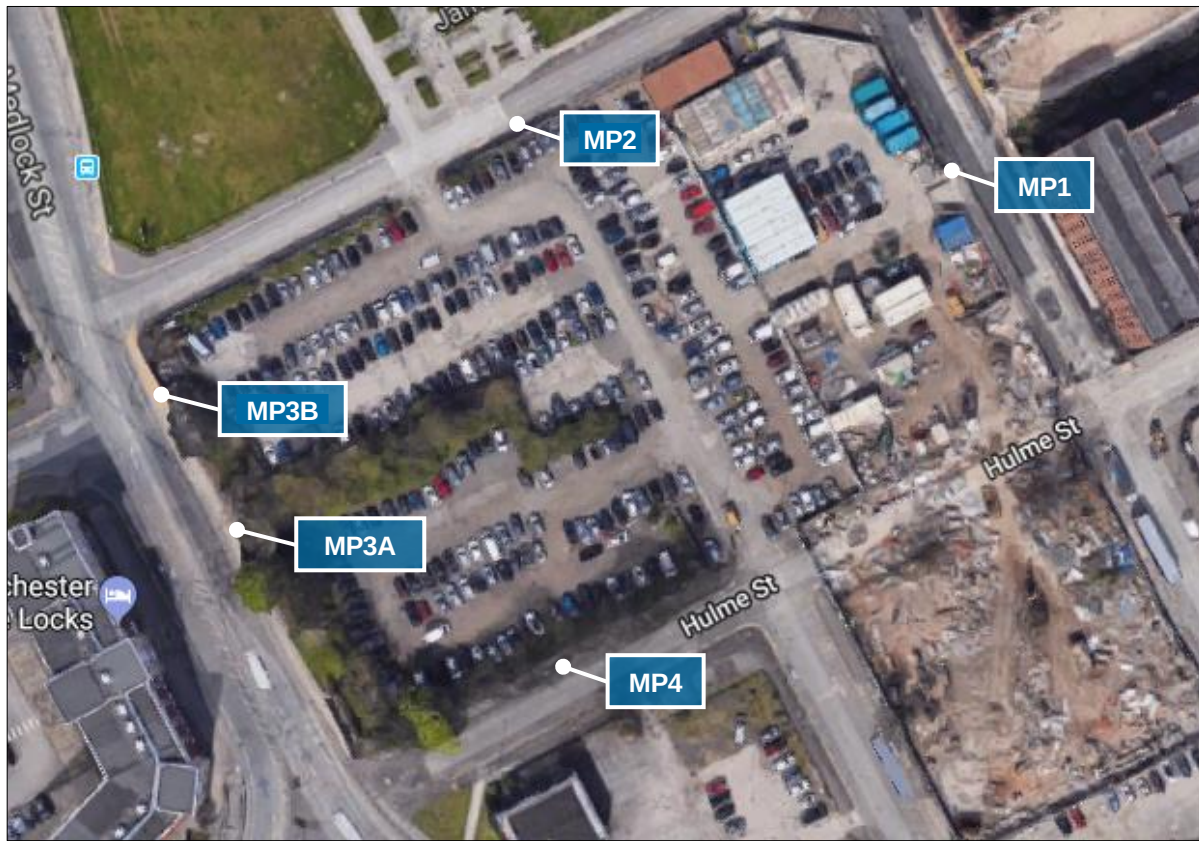


Figure 3 – 2018 approximate noise measurement positions

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 7. 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

Monitoring location	Assessment period	Period	Average dB $L_{Aeq,15min}$	Maximum dB $L_{AFMax,15min}$	Range dB $L_{A10,15min}$	Range dB $L_{A90,15min}$
		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 7 – 2018 summary of noise measurement data

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)	$L_{A01,1h}$ 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 as per the worst-case hourly levels discussed in Section 4.1.2.

At the time of creating the model, accurate information was available on the size and extent of the Plot 9a development to be constructed to the east of the site, so this was included in the model. The size and extents of the Plot 10b development to be constructed to the west of the site were however not available at the time of modelling. It should however be noted that this is only likely to shield noise from other noise sources and as such not including the development means the following noise maps are worst case, with actual levels likely to be lower due to effects of shielding from Plot 10b.

5.1.1 Noise modelling results

Façade noise maps for each elevation 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.

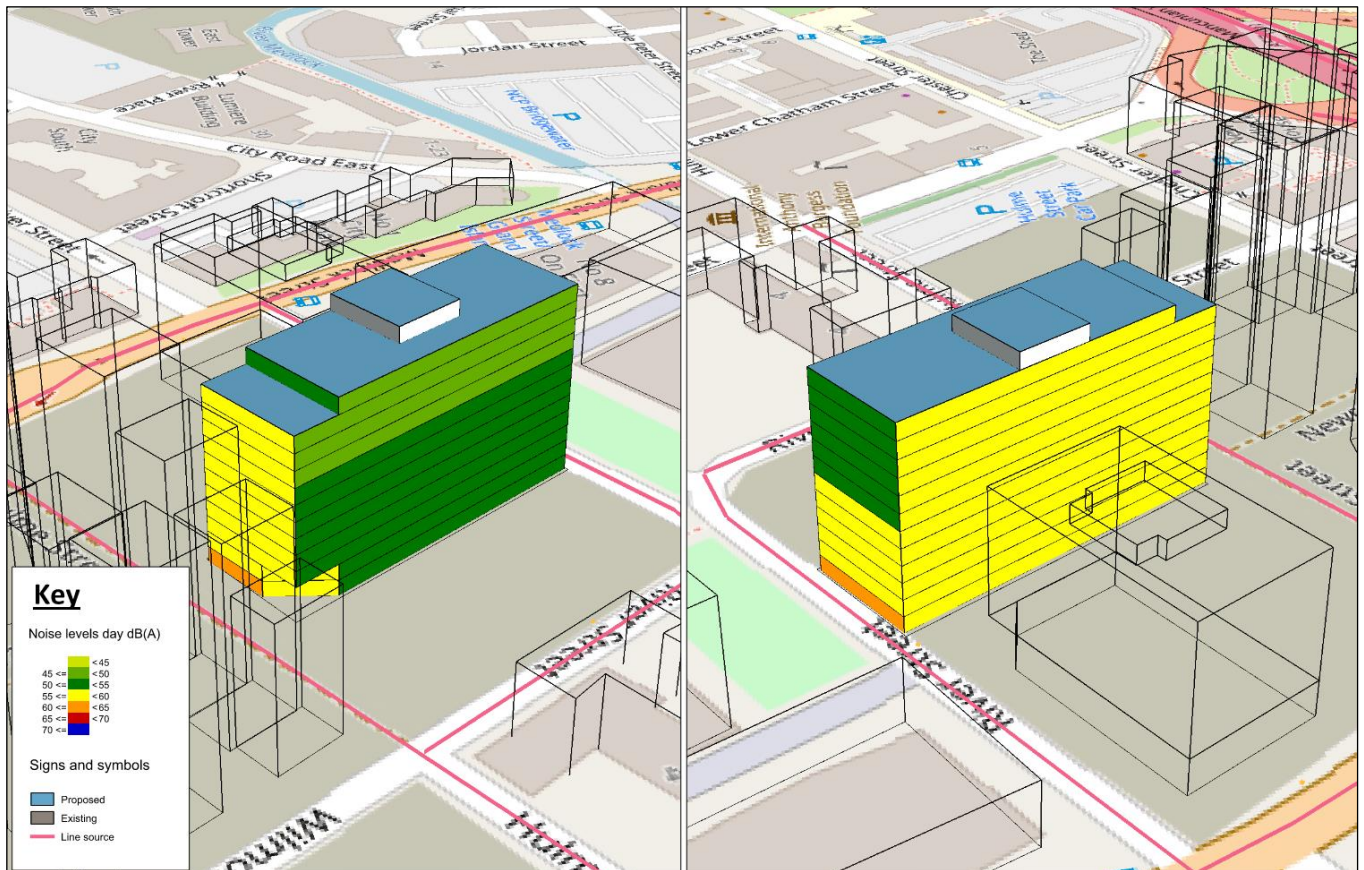


Figure 4 – Façade noise levels – road traffic impact

5.1.2 Discussion

The predicted worst case hourly day-time noise levels are at the façades directly overlooking Medlock Street that are not shielded by Plot 9a, and lower floor levels that directly overlook River Street where levels are predicted to be up to approximately 60 dB $L_{Aeq,T}$. At the rear, noise levels impacting the façade reduce to 45 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	$L_{Aeq,T}$ 59 dBA	$L_{Aeq,T}$ 44 dB (NR 38)	15
	$L_{A01,T}$ 81 dBA	$L_{A01,1hour}$ 55 dB	26
River Street	$L_{Aeq,T}$ 60 dBA	$L_{Aeq,T}$ 44 dB (NR 38)	16
	$L_{A01,T}$ 77 dBA	$L_{A01,1hour}$ 55 dB	22
River Street (Rear)	$L_{Aeq,T}$ 54 dBA	$L_{Aeq,T}$ 44 dB (NR 38)	10
	$L_{A01,T}$ 76 dBA	$L_{A01,1hour}$ 55 dB	21

Note: L_{A01} levels based on levels used in Cundall's Noise Impact Assessment Ref: PLOT-9A-CDL-XX-XX-RP-Y-45001 in support of Planning Application Ref: 132600/FO/2021 due to adverse construction noise dictating unreliable L_{A01} data for newer survey – these are closer to Medlock Street so can be considered worst case

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 , BCO guidance states that for naturally ventilated buildings, it may be appropriate to accept an occasional relaxation of noise intrusion levels of +5 dB when windows are open, depending on character. 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 facade 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.

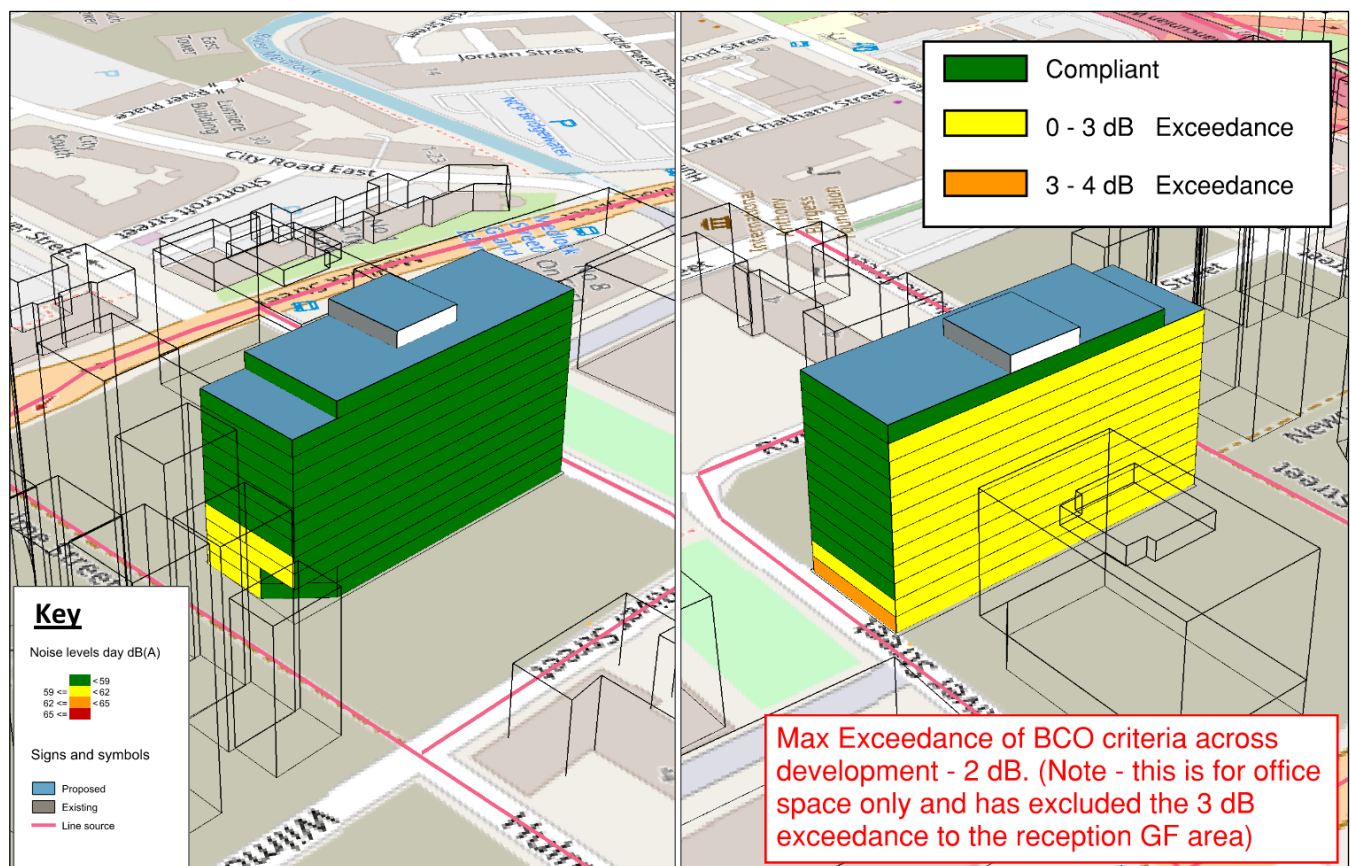


Figure 5 - BCO natural ventilation compliance study

It should be noted that in practice, noise levels due to external noise intrusion via a partially open window will vary significantly across the CAT A speculative office floor plate. The façade values above present an assessment of expected conditions for working areas in reasonable proximity to the window; noise levels immediately adjacent to the open window or located further towards the central core are expected to be higher and lower, respectively. 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^[4]'.

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.

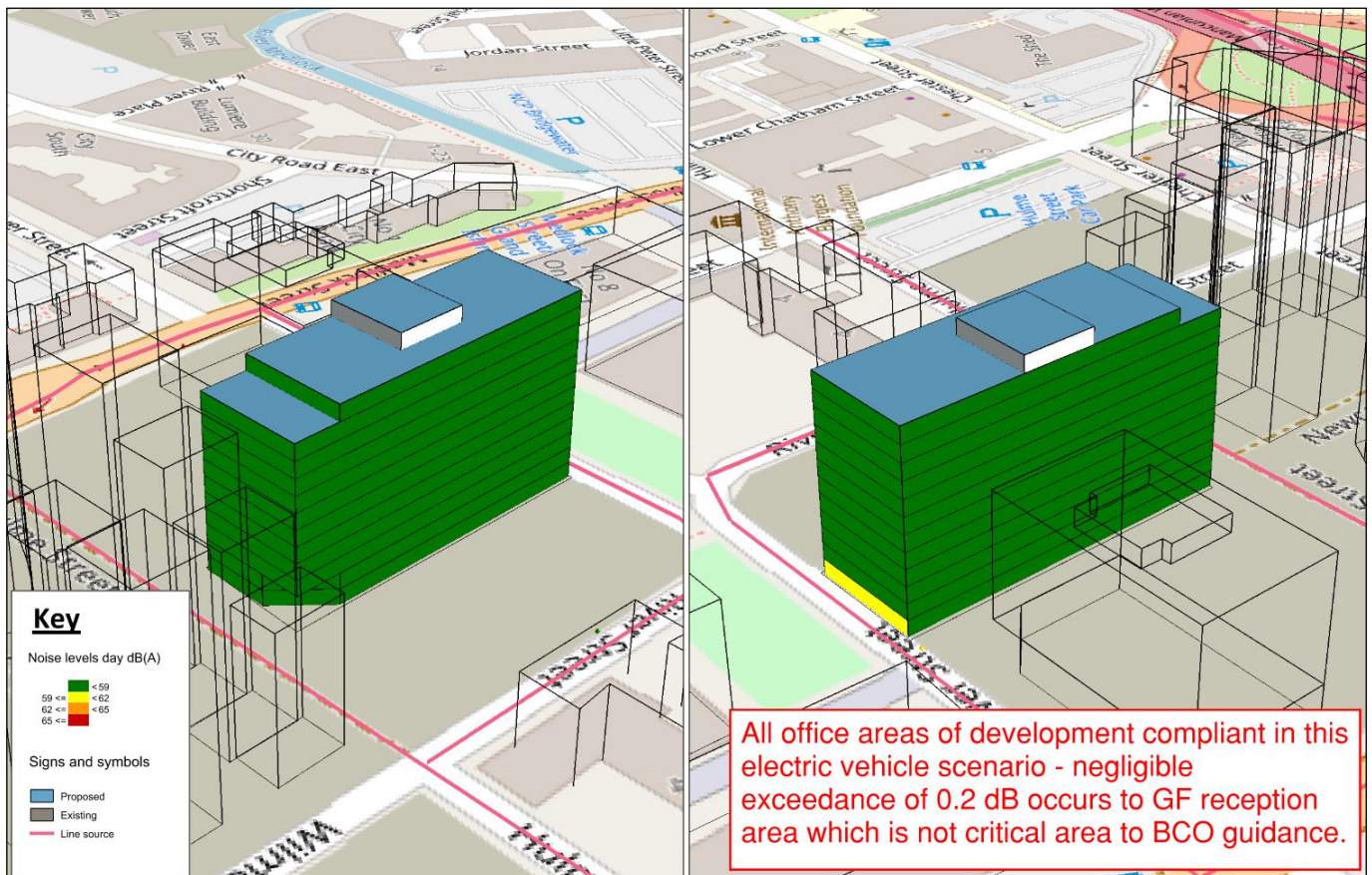


Figure 6 - BCO natural ventilation compliance study - future electric car scenario

The conclusions from this modelling process are:

- For the existing scenario, all facades other than the rear faced facing River Street will see an exceedance of suggested internal noise limits with open windows
- For the theoretical future electric car scenario, these exceedances will be entirely eliminated in office use spaces and suggested BCO limits for natural ventilation will be complied with

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.

⁴ '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 Pol 05 credit as discussed in Section 2.4.2.

6.1 Nearest noise sensitive receptor

The nearest existing 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. The future Plot 10b development will be the nearest noise sensitive receptor once it is constructed.

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’.

Histograms of the $L_{A90,15min}$ values captured at position MP2 (considered representative of nearest noise sensitive receptors at Macintosh Mill) in the 2022 survey have been produced. Representative levels for each period are highlighted in **RED** on the histograms presented below.

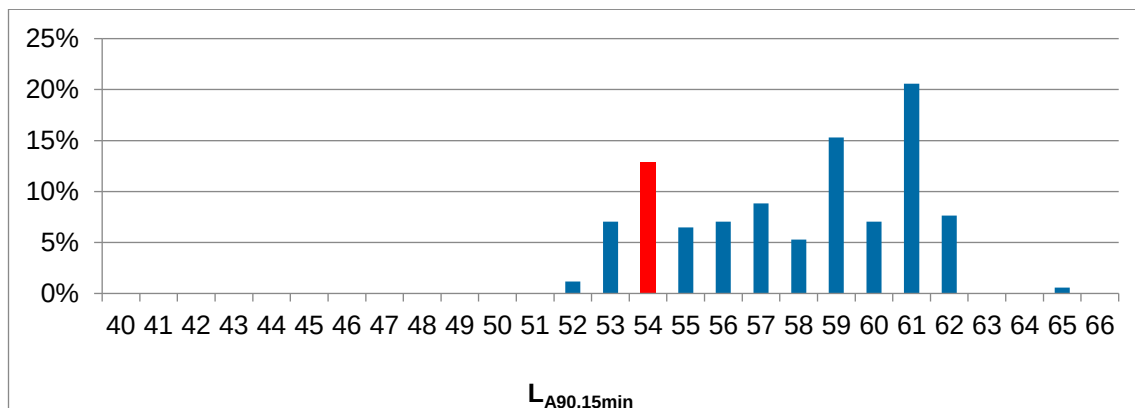


Figure 7 – 2022 daytime representative background noise levels

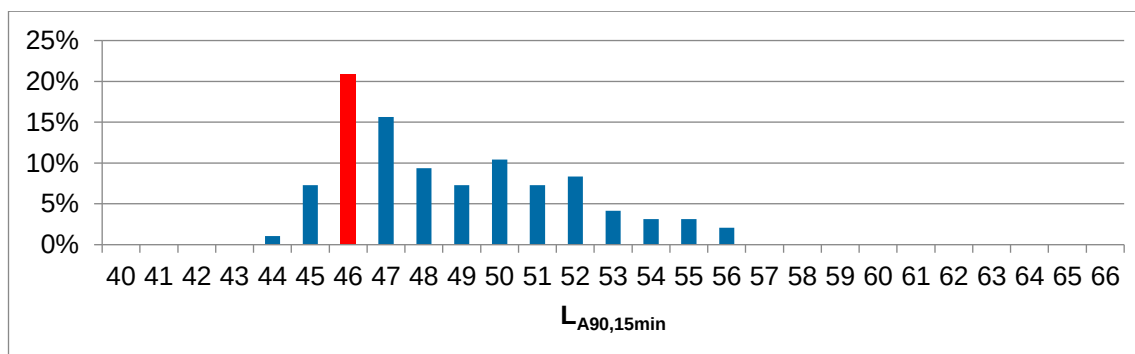


Figure 8 – 2022 night-time representative background noise levels

6.3 Results discussion

A review of data documented above has been carried out to compare it against previously measured background levels in 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 levels measured in the 2022 survey are significantly higher than those measured in 2018. In order to provide a robust set of limiting plant noise levels, the representative background levels measured in 2018 have been used. These are shown in the following sub-section.

6.4 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 _{A,r,Tr}
Daytime (07:00 – 23:00 hrs)	45	40
Night-time (07:00 – 23:00 hrs)	42	37

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).

6.5 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 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, 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 Hea 05.

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 Pol 05 credit.

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