

SANDY BROWN

Consultants in Acoustics, Noise & Vibration

20291-R05-G

6 December 2022

Ancoats Mobility Hub

Acoustic planning report

London, Manchester, Edinburgh, Birmingham, Belfast, Leeds

Sandy Brown Ltd

Registered in England & Wales

No. 13227735

post@sandybrown.com

www.sandybrown.com

Registered Office: 55 Charterhouse Street, London EC1M 6HA

SANDY BROWN

Consultants in Acoustics, Noise & Vibration

Version	Date	Comments	Author	Reviewer
A	31 Mar 21		Jessica Wright	Mark Howarth
B	16 Apr 21	Updated smoke extract proposals and minor text amendments	Jessica Wright	Mark Howarth
C	10 May 21	Minor text amendment to Summary	Jessica Wright	Mark Howarth
D	27 May 21	Addition of Section 8	Jessica Wright	Mark Howarth
E	3 Nov 22	Addition of delivery noise assessment. Updates to Sections 2.2, 3, 9.3, 10.3.	Tom Stephenson Jessica Wright	James Atha
F	25 Nov 22	Revised delivery noise assessment. Updates to Summary and Sections 1, 5.1 and 10.3	Jessica Wright	James Atha
G	6 Dec 22	Updates following comments from MCC	Jessica Wright	James Atha

Disclaimer

This report has been prepared for the sole benefit and use of our client based on their instructions and requirements. Sandy Brown Ltd extends no liability in respect of the information contained in the report to any third party.

Summary

Sandy Brown has been commissioned by Manchester City Council (MCC) to provide acoustic advice in relation to the proposed development at Ancoats Mobility Hub, Manchester. The Applicant for this site is Manchester City Council (MCC).

An environmental noise survey has been carried out to determine the existing sound levels in the area. The noise survey was carried out on 6 and 10 August 2020. Due the current restrictions due to the Covid-19 pandemic, measured noise levels have been compared to historic noise data in the vicinity of the site.

The assessment undertaken provides a robust estimate of the environmental noise climate and is in line with the *“Joint Guidance on the Impact of COVID-19 on the Practicality and Reliability of Baseline Sound Level Surveying and the Provision of Sound & Noise Impact Assessments”* produced by the Association of Noise Consultants and the Institute of Acoustics.

Data from the survey will be used to inform the design of the development with respect to atmospheric noise emissions from building services plant and environmental noise ingress through the building envelope.

Based on the requirements of the Local Authority, the relevant plant noise limits at the worst affected existing noise sensitive premises are set out below.

Table 1 Plant noise limits at 1 m from the nearest noise sensitive premises

NSP ref from Section 2.2	Maximum sound pressure level at 1 m from noise sensitive premises, $L_{Aeq,15min}$ (dB)	
	Daytime (07:00-23:00)	Night-time (23:00-07:00)
2, 4-6, 8	43	35 ^[1]
1	42	31
3, 9	44	38

^[1] Only considered applicable to residential receiver NSP 2. The commercial units (NSP ref 4-6) are only considered to be noise sensitive during the daytime.

If plant items contain tonal or attention catching features, a penalty based on the type and impact of those features will be applied, and the limits will be more stringent than those set. Noise limits for emergency plant noise and amplified sound have been recommended. A plant noise assessment for both emergency and normally operating plant will need to be carried out to ensure that the plant noise limits are met.

An assessment of delivery noise has been presented within the report, along with discussion on acceptable limits and noise management guidance.

Contents

1	Introduction.....	5
2	Site description	5
3	Development proposals	7
4	Building services noise egress criteria.....	8
5	Delivery noise criteria	8
6	Noise survey method	9
7	Noise survey results	11
8	Historic noise climate estimation	14
9	Noise from road traffic.....	16
10	Plant noise	17
11	Delivery noise assessment	19
12	Noise management plan	24
13	Amplified sound limits	24
14	Conclusion	25
	Appendix A	27
	Survey details.....	27
	Appendix B	30
	BS 4142 corrections for attention catching features	30
	Appendix C	32
	Predicted noise level at noise sensitive premises.....	32

1 Introduction

Sandy Brown has been commissioned to provide acoustic advice in relation to the proposed development at Ancoats Mobility Hub. The Applicant for this site is Manchester City Council (MCC).

As part of this, an environmental noise survey is required, the purpose of which is to establish the existing sound levels on and around the site.

A noise survey has been undertaken by Sandy Brown and the results used alongside historic noise data to establish representative background noise levels in the vicinity of the nearby noise sensitive receptors.

This report presents the survey method and results, and a discussion of acceptable limits for noise emissions from building services plant.

An assessment of delivery noise has been presented within the report, along with discussion on acceptable limits.

2 Site description

2.1 The site and its surroundings

The Site is bounded by Poland Street to the west, the City Court Trading Estate to the south, Crown Industrial Estate to the north and Ancoats Green to the east. The Site can be accessed by pedestrians and vehicles via Poland Street. The Site is currently occupied by low-rise, multi-tenanted industrial estate units and hardstanding. Security fencing runs along the eastern boundary where the Site meets Ancoats Green.

Modern industrial units lie to the north and south of the Site with the residential neighbourhood of Miles Platting further beyond to the east. The Rochdale Canal is located 0.2 km south of the Site.

The site is highlighted is circled in red in Figure 1. The adjacent premises are highlighted in the figure with descriptions provided in Section 2.2.

SANDY BROWN

Consultants in Acoustics, Noise & Vibration



Figure 1 Aerial view of site (courtesy of Google Earth Pro)

A site plan is set out in Figure 2.



Figure 2 Screenshot of drawing 9032-BA-XX-00-DR-A-(04)030-Ground Floor GA Plan

2.2 Adjacent premises

The nearby premises are mixed use with residential and commercial units. A summary of the nearby premises are set out below in reference to Figure 1:

1. Residential premises at 11 Radium Street (highlighted in yellow)
2. Residential premises at 2 Poland Street (highlighted in brown)
3. Residential premises at Tribe Ancoats (highlighted in navy blue)
4. Trading estate at City Court (highlighted in orange)
5. Crown industrial estate (highlighted in green)
6. Commercial area including site offices and depot (highlighted in pink) This is proposed to be a residential development called Phoenix Ironworks which is understood to be at pre-application stage
7. Factories on George Leigh St and Naval St (highlighted in purple) – these are not considered to be noise sensitive
8. Residential premises at Eliza Yard (highlighted in light blue). This scheme has planning permission.
9. Residential premises at Rodney Street (highlighted in lilac). This scheme has planning permission

3 Development proposals

3.1 Uses

The Ancoats Mobility Hub is proposed to have the following uses:

- Car park
- Ground floor cafe
- Cycle storage and cycle hub
- Central delivery hub for parcel deliveries in the area, with an external delivery area.

3.2 Potential noise sources

The potential noise sources associated with the scheme can be broadly divided into three categories:

- Building services plant
- Internal activity in commercial units
- Deliveries.

The potential impact of these sources has been assessed and mitigation measures have been proposed to minimise impact on existing noise sensitive premises around the development.

4 Building services noise egress criteria

4.1 Standard guidance

BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound* (BS 4142) provides a method for assessing noise from items such as building services plant against the existing background sound levels at nearby noise sensitive premises.

BS 4142 suggests that if the noise level is 10 dB or more higher than the existing background sound level, it is likely to be an indication of a significant adverse impact. If the level is 5 dB above the existing background sound level, it is likely to be an indication of an adverse impact. If the level does not exceed the background level, it is an indication of having a low impact.

If the noise contains 'attention catching features' such as tones, bangs etc, a penalty, based on the type and impact of those features, is applied.

4.2 Local Authority criteria

Manchester City Council (MCC) provides guidance in relation to plant noise emissions in *Planning and Noise Technical Guidance* document dated December 2015 states the following in relation to plant noise egress:

'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.'

Appropriate corrections will need to be made for any attention catching features in line with BS 4142: 2014.

For emergency plant items, Manchester City Council (MCC) typically allow for noise egress limits to be set at 10 dB above the typical background levels at the nearest noise sensitive premises. This will need to be confirmed.

5 Delivery noise criteria

5.1 Local Authority criteria

Manchester City Council (MCC) provides guidance in relation to industrial and commercial developments in *Planning and Noise Technical Guidance* document dated May 2022. This has been taken to apply to delivery noise. It is noted that BS 4142 should be used to carry out assessments. The guidance sets out that 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 document states the following design in relation to new industrial or commercial developments:

'The development should be 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.'

It is noted that maximum noise levels should also be adequately controlled, particularly where high noise levels of a short duration (eg loud bangs) will occur on a regular basis. These should aim to be controlled so as not to exceed 60 dB (L_{Amax}) at the facade of noise sensitive premises nearby.

Deliveries and collections are typically controlled by restricting operating hours.

It is stated that where this criterion cannot be achieved, the various noise control measures considered as part of the assessment should be fully explained and the achievable noise level identified.

6 Noise survey method

6.1 Attended measurements

Attended sample measurements were taken by Jessica Wright on 6 August 2020 during the night time and Jessica Wright and Daniel Shaw on 10 August 2020 during the daytime at 3 locations around the site. These are indicated in Figure 1 as positions 1 to 3. The measurement positions were chosen as being representative of the nearby existing noise sensitive premises.

At each position the microphone was mounted on a tripod approximately 1.2 m above the ground level and at least 3 m from any other reflective surface. Details of the equipment used and the noise indices measured are provided in Appendix A.

Dominant noise sources occurring during the measurements were noted.

Photographs of the measurement positions are set out in Figure 3 to Figure 5.



Figure 3 Photograph of Position 1



Figure 4 Photograph of Position 2



Figure 5 Photograph of Position 3

6.2 Weather conditions

Weather conditions during the survey are described in Appendix A.

7 Noise survey results

7.1 Observations

The dominant noise sources observed at the site during the survey were from occasional road traffic noise and constant plant noise from the commercial unit site to the north (reference 4 in Figure 1).

Less significant noise sources included construction noise and distant plant noise from other locations.

7.2 Noise measurement results

7.2.1 Daytime attended measurement results – 10 August 2020

Noise levels and key sources recorded during the attended measurements are summarised in Table 2.

Table 2 Daytime noise levels and key noise sources from attended measurements – 10 August 2020

Position	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,15min}$	$L_{AFmax,15min}$	$L_{A90,15min}$	
1	16:55	55	78	45	Road traffic from Oldham Road, distant construction noise, car idling on Poland St.
1	18:10	53	72	46	Constant road traffic on Oldham Road is distant, some distant plant noise from the commercial unit on Poland Street, some helicopter noise
2	16:55	49	70	44	General commercial noise from adjacent units on George Leigh Street, some road traffic noise, some noise from pedestrians, distant construction noise
2	18:10	52	72	44	Similar noise sources, with more car activity at commercial units. Helicopter noise noted.
3	17:20	49	64	46	Road traffic noise from Oldham Road is dominant with occasional construction noise

Position	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,15min}$	$L_{AFmax,15min}$	$L_{A90,15min}$	
3	18:30	49	63	46	Road traffic noise from Oldham Road is dominant

7.2.2 Night time attended measurement results – 6 August 2020

Noise levels and key sources recorded during the attended measurements are summarised in Table 3.

Table 3 Night time noise levels and key noise sources from attended measurements – 6 August 2020

Position	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,15min}$	$L_{AFmax,15min}$	$L_{A90,15min}$	
1	00:10	49	81	40	Distant road traffic noise on Oldham Road, very distant alarm noise and plant noise, max likely caused by squeaky brakes of car turning onto George Leigh Street.
1	02:05	45	71	37	Distant road traffic noise on Oldham Road, very distant alarm noise and plant noise, max likely caused by car pass by on Poland Street.
2	00:25	40	68	35	Distant road traffic on Oldham Road, distant siren.
2	02:25	40	60	33	Distant road traffic on Oldham Road, distant siren, very distant plant noise, pedestrian talking, max likely caused by car on George Leigh Street.

Position	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,15min}$	$L_{AFmax,15min}$	$L_{A90,15min}$	
3	00:50	44	61	41	Intermittent road traffic from Oldham Road, distant plant noise
3	02:45	44	58	40	Intermittent road traffic from Oldham Road, distant plant noise, cars having to brake and accelerate from traffic lights. Max likely caused by speeding car braking on Oldham Road.

8 Historic noise climate estimation

The survey has been carried out during a period of restricted movements due to the Covid-19 pandemic and consequently background noise levels are lower than they would be under usual conditions.

A robust estimate of the environmental noise climate is therefore required, in line with the “Joint Guidance on the Impact of COVID-19 on the Practicality and Reliability of Baseline Sound Level Surveying and the Provision of Sound & Noise Impact Assessments” produced by the Association of Noise Consultants and the Institute of Acoustics.

Historic noise data from other surveys in the vicinity of the site has therefore been reviewed. This is from acoustic reports available of the Manchester City Council planning portal.

The details of these surveys are summarised below.

8.1 Survey details

A) New Little Mill (Arup)	8 and 21 October 2014 and 11 November and 1 December 2016
B) 162-166 Oldham Street (Hoare Lea)	11 to 15 August 2016
C) Bengal Street (ADT)	2 to 7 February 2017
D) Blossom Street (Arup)	14 to 21 July 2015

The approximate measurement location and for each survey are shown in Figure 6.

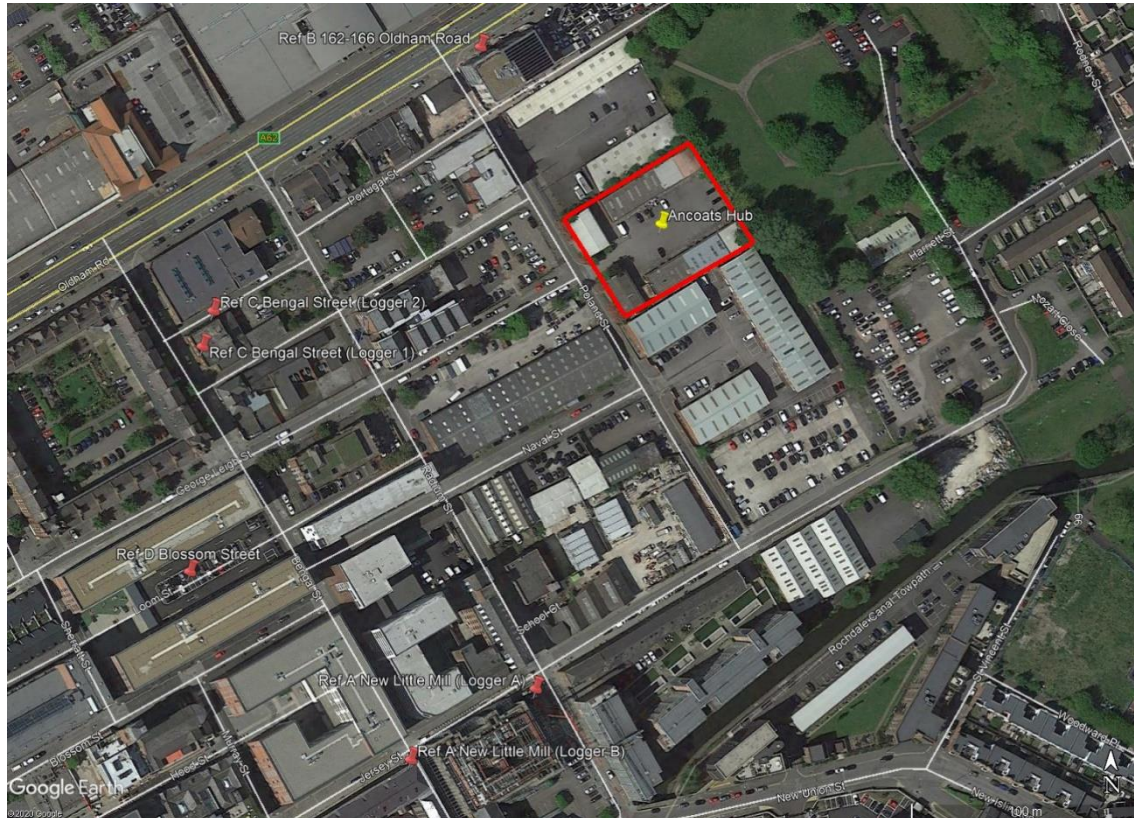


Figure 6 Historical noise survey measurement locations

8.2 Minimum background noise levels

The minimum background noise levels recorded during each survey are summarised in Table 4.

Table 4 Minimum background noise levels

Location	Daytime	Night
	(07:00 – 19:00)	(23:00 – 07:00)
	(dB)	(dB)
A) New Little Mill (Arup) Logger A	$L_{A90,T}$ 45	$L_{A90,T}$ 38
A) New Little Mill (Arup) Logger B	$L_{A90,T}$ 44	$L_{A90,T}$ 41
B) 162-166 Oldham Street (Hoare Lea)	$L_{A90,1hr}$ 49	$L_{A90,15min}$ 47
C) Bengal Street (ADT) Logger 1	$L_{A90,16 hr}$ 50-59	$L_{A90,8 hr}$ 43-47
C) Bengal Street (ADT) Logger 2	$L_{A90,16 hr}$ 49-57	$L_{A90,8 hr}$ 42-46
D) Blossom Street (Arup)	$L_{A90,15min}$ 42	$L_{A90,15min}$ 37

8.3 Discussion

Based on the results summarised in Table 4, the background noise levels measured during the survey are mostly in line with previous measurements in the vicinity.

9 Noise from road traffic

9.1 Road traffic noise

A review of road traffic data received from Hydrock on 26 January 2021, document *16857 - Hydrock Traffic Flow Calculations*, has been carried out to determine the change in road traffic noise due to the development.

The predicted change in noise level from road traffic near to residences in the vicinity of the site is set out in Table 5. This is based on 'Base 2025' road traffic count in comparison to '2025 Base + DEV (CP+P)' road traffic count.

Table 5 Predicted change in noise level from road traffic

Location	Change in noise level during observed weekday peak hour		Comment
	AM 08:30-09:30	PM 17:00-18:00	
Poland Street (near to NSP 2)	+6 dB	+5 dB	The predicted change in noise level from road traffic will likely be noticeable at peak hours
George Leigh Street (near to NSP 1)	0	0	No change in noise level is predicted during peak hours
Jersey Street (near to apartments at Flint Glass Wharf)	+1 dB	+1 dB	The predicted change in noise level from road traffic noise is unlikely to be discernible during peak hours

9.2 Construction road traffic noise

When the site is in construction, it is likely that there will be an increase in road traffic noise due to construction vehicles. It is expected that this will be managed by controlling operation hours of the construction and with a construction management plan. This will need to be developed by the contractor.

9.3 Operational activities

The operation of the development includes a centralised delivery point for parcel lockers. This has been assessed in line with MCC guidance within Section 5.

There will also be noise from cars driving within the car park. However, is not expected to be significantly different from the existing open car park on the site.

10 Plant noise

10.1 Basic limits

Based on the above criteria and the measurement results, the cumulative noise level from the operation of all new plant should not exceed the limits set out in Table 6.

The limits apply at 1 m from the worst affected windows of the nearest noise sensitive premises and are presented as facade levels. These have been corrected relative to the measured free-field background noise levels by the addition of 3 dB where necessary. In this case these limits would apply at locations set out in Section 2.2.

Table 6 Plant noise limits at 1 m from the nearest noise sensitive premises

NSP ref from Section 2.2	Maximum sound pressure level at 1 m from noise sensitive premises, $L_{Aeq,15min}$ (dB)	
	Daytime (07:00-23:00)	Night-time (07:00-23:00)
2, 4-6, 8	43	35 ^[1]
1	42	31
3, 9	44	38

^[1] Only considered applicable to residential receiver NSP 2 and 8. The commercial units (NSP ref 4-6) are only considered to be noise sensitive during the daytime.

The limits set out in Table 6 do not include any attention catching features. Penalty corrections for attention catching features may be significant and will need to be considered as the building services design progresses. This is discussed in Appendix B.

10.2 Emergency plant noise egress limits

On the basis that this criterion is adopted as set out in Section 4.2 the emergency plant noise limits applicable at 1 m from the worst affected windows of the nearest noise sensitive are set out in Table 7. These have been corrected relative to the measured free-field background noise levels by the addition of 3 dB where necessary.

Table 7 Emergency plant noise limits at 1 m from the nearest noise sensitive premises

NSP ref from Section 2.2	Maximum sound pressure level at 1 m from noise sensitive premises, $L_{Aeq,15min}$ (dB)	
	Daytime (07:00-23:00)	Night-time (07:00-23:00)
2, 4-6, 8	58	50 ^[1]
1	57	46
3, 9	59	53

^[1] Only considered applicable to residential receiver NSP 2 and 8. The commercial units (NSP ref 4-6) are only considered to be noise sensitive during the daytime.

10.3 Plant noise assessment

All building services plant will be designed to achieve the noise limits set out above, including any corrections for attention catching features.

There are two main areas for plant proposed at the development:

- Plant terminations to roof
- Ground floor plant rooms.

It is proposed that most plant will be located within ground floor plant rooms and two smoke extract fans located at roof level.

The proposed rooftop plant locations and terminations are shown in Figure 7. The generator is to be located within a ground floor plant room as confirmed by Buttress via email on 13 October 2022. It is considered only for life safety so would only run in an emergency or during daytime testing.

Two smoke extract fans, one to each core, are proposed which terminate on to the roof. Typical noise data for the smoke extracts fans is set out in Table 8, as received from the building services engineer, Buro Happold.

Table 8 Smoke extract fan noise levels

Smoke extract fan	Sound power level, L_w (dB)							
	Octave-band centre frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
Inlet	95	96	94	92	91	90	89	86
Outlet	95	96	94	91	91	90	89	86

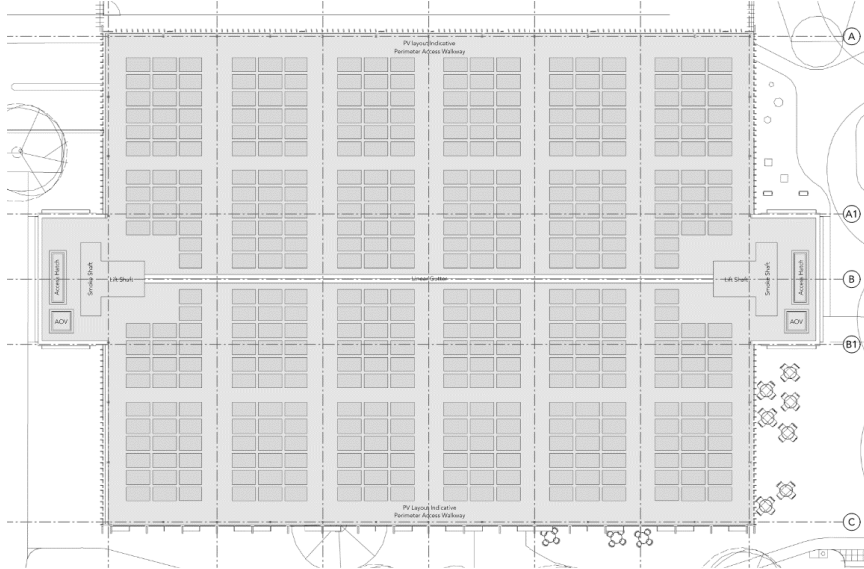


Figure 7 Screenshot of proposed rooftop plant layout termination locations

An initial, outline plant noise egress assessment has been carried out for the emergency plant, without the generator as limited information is available regarding this at this stage. It is recommended that the sound power level to each smoke extract fan louvre is limited to L_{WA} 90 dB. Acoustic attenuation is expected to be required to meet the proposed plant noise egress limits. This could be provided by a proprietary attenuator or one of the following options:

- a) Acoustic louvre (typically 150 mm depth) and lined bend within shaft (minimum 25 mm sound absorbent lining)
- b) Lined bend within shaft (minimum 50 mm sound absorbent lining)

A plant noise assessment for both emergency and normally operating plant will need to be carried out, once the plant selections have been made, to ensure that the plant noise limits are met.

11 Delivery noise assessment

11.1 MCC guidance

Based on the above criteria and the measurement results, the cumulative noise level from deliveries, should not exceed the limits set out in Table 9. These have been based on not exceeding the background noise level outside the receptors. It is acknowledged that the MCC planning guidance suggests that the design objective should be 5 dB lower than these levels

but where this cannot be achieved the noise control measures considered as part of the assessment should be explained. This is also discussed later within the assessment.

MCC also set out that maximum noise levels should be adequately controlled as to not exceed L_{AFmax} 60 dB at the facade of the noise sensitive premises. Refer to Section 11.1.1 for discussion on this.

The limits apply at 1 m from the worst affected windows of the nearest noise sensitive premises and are presented as facade levels. These have been corrected relative to the measured free-field background noise levels by the addition of 3 dB where necessary. In this case these limits would apply at locations set out in Section 2.2.

Table 9 Delivery noise limits at 1 m from the nearest noise sensitive premises

NSP ref from Section 2.2	Maximum sound pressure level at 1 m from noise sensitive premises (dB)	
	$L_{Aeq,15min}$ Daytime (07:00-23:00)	$L_{Aeq,15min}$ Night-time (07:00-23:00)
2, 4-6, 8	48	40 ^[1]
1	47	36
3, 9	49	43

The limits set out in Table 9 do not include any attention catching features. Penalty corrections for attention catching features may be significant and are discussed within the assessment.

11.1.1 Discussion on maximum noise level criteria

The maximum noise level criterion is based on night time maximum noise level to reduce noise disturbance to a bedroom with an open window from WHO Community Noise Guideline Values 1999. This is not considered to be appropriate for commercial receptors, and may not be appropriate for assessing impact on residential receptors as all deliveries are proposed to take place during the daytime.

11.2 Assessment

11.2.1 Basis

The following assessment is based on:

- Delivery frequency information received from Buttress via email on 7 October 2022
- GAs received via email on 19 October 2022
- BS 4142 2014+A1 2019
- Previous measurements of trolleys.

The location of the proposed delivery bay is presented in Figure 8.

The floor plan shows a large building with a red outline. A red arrow points to a 'Delivery bay' area on the left side. The plan includes dimensions and room numbers. The rooms are color-coded: Commons (pink), Cafeteria (orange), Library (blue), Computer Center (purple), Gymnasium (green), and Theater (yellow). The plan also shows a large Commons area (pink) and a Cafeteria (orange). The plan includes dimensions and room numbers.

It is proposed that a soft wheeled trolley will be used for the deliveries. This will be provided by Ancoats Hub for use by the delivery drivers. The trolley will be kept in good condition ie without rattling wheels/main body of the trolley. The pavement outside of the Hub is proposed to be Yorkstone flags which is a smooth surface. The pavement will need to be kept in good condition.

- 30 seconds for the trolley movement to and 30 seconds from the delivery hub, as stated by MCC. As the maximum distance from the drop off point to the hub is around 30 m, the 30 second assumption may be onerous/worst-case.
- 1 minute for unloading the parcels from the van to a trolley
- The deliveries will be carried out with a van and trolleys (as described above), as confirmed by MCC and Buttress.
- The parcels are delivered to lockers located inside the delivery hub building.

Noise from vehicles themselves associated with the deliveries (ie van doors opening and closing) have not been included as this is expected to be typical within the context of local noise climate.

Use of reversing alarms on delivery vehicles should be avoided and engines should be switched off to minimise the risk of disturbance.

11.2.3 3D modelling

A computer model of the site and the surrounding area has been created using CadnaA software by Datakustik. The software carries out calculations using a ray tracing technique. This takes account of the effects of topography, reflections, screening and distance attenuation for noise sources to predict noise levels in three dimensions. Calculations are carried out in accordance with ISO 9613 *Attenuation of sound during propagation outdoors*. From this model, the distance and screening corrections from the delivery bay to the nearby noise sensitive receivers has been determined.

The location of delivery activity has been assessed at five points to assess the worst-case noise levels at nearby noise sensitive premises. These locations are shown in Figure 8.

11.2.4 Specific noise levels for single delivery

The noise level for a single delivery has been calculated based on measurements of a sack truck type trolley with large rubber wheels on a pavement. This has been taken to be similar to the trolleys that are proposed to be used on the site.

Based on the above, the noise level for a single delivery event at 1 m over a 2 minute period is approximately $L_{Aeq,2min}$ 70 dB. The maximum value at 1 m is L_{AFmax} 88 dB. This has been used as the basis on the assessment presented below.

It is noted that there will be variation over the noise level of each delivery event due to use of different trolleys.

11.2.5 Assessment at nearby receptor over worst case peak hour

The assessment of delivery noise was based upon BS 4142. The noise level of a single delivery has been predicted based on typical noise data for a delivery. This has been extrapolated for the worst-case hour given in the information received from Buttress (ie 7 deliveries between 11:00 and 12:00 on Tuesday).

An assessment has been carried out over the worst-case peak hour which is understood to be 7 deliveries.

The calculations for the worst-case receiver, commercial premises on Trading estate at City Court (reference 4 in Section 2.2), are presented in Table 10. This is based on the delivery location to be position 4 as per Figure 8.

Table 10 Assessment of delivery noise over an hour to worst-case receiver

Description	Noise level
Predicted noise level for single delivery at 1 m	$L_{Aeq,2min}$ 70 dB
Noise level corrected for 7 deliveries over a 1 hour period at 1 m	$L_{Aeq,1hr}$ 65 dB
Worst case distance/barrier attenuation from source to receiver calculated in 3D model	20 dB
Specific sound level at NSP ref 4	$L_{Aeq,1hr}$ 45 dB
Acoustic feature correction ^[1]	3 dB
Rating level at facade of receptor	48 dB
Background noise level at facade of receptor	L_{A90} 48 dB

^[1] This correction is based on the source being impulsive as is expected for unloading a delivery

The rating level predicted for deliveries to the proposed development does not exceed the background noise level at the worst-case nearby noise sensitive receptor. This is an indication of the specific sound source having a low impact in line with BS 4142. MCC planning guidance does suggest that the design objective should be to achieve levels 5 dB lower than this to prevent noise creep. However, MCC state that where this cannot be achieved the noise control measures considered should be fully explained. The proposals for the deliveries, as set out in Section 11.2.2, show the proposed use of soft wheeled trolleys on a maintained smooth pavement surface to manage the noise level from the trolleys. Recommendations for noise management are also presented in Section 12.

It is predicted that the maximum noise limit of L_{AFmax} 60 dB as suggested by MCC could be exceeded up to 7 times an hour, with levels up to L_{AFmax} 68 dB at the receptor (including for a 3dB facade correction). As set out within Section 11.1.1, as this is a commercial receptor, and the maximum noise level criteria is based on night time disturbance to bedrooms, this may not be appropriate. In addition, the maximum noise levels of L_{AFmax} 72-78 dB were measured during the survey within close proximity of the receptor. As such, despite the criteria suggested by MCC being exceeded, given the context of the site in terms of the existing noise climate and receptor sensitivity, this is unlikely to pose a significant risk of noise disturbance in practice.

The overall worst case predicted noise level at each of the reported noise sensitive premises are shown in Appendix C.

12 Noise management plan

It is recommended that the following mitigation measures are implemented to reduce noise egress to the nearby receptors, to minimise the risk of noise disturbance.

12.1 Use of trolleys

If trolleys are required, sack truck type trolleys with rubber wheels should be used, as these are likely to produce the lowest noise levels. This is as proposed for the scheme. The sack trucks should be well-maintained and in good condition without any rattling parts. Metal mesh trolleys and use of hard wheels should be avoided where possible.

12.2 General mitigation strategy

The following general mitigation measures should be adopted for noise management.

- Maximising the distance and/or screening provided by vehicles/the building between the loading operations and nearest residential receptors.
- Unnecessary revving of delivery vehicles engines should be avoided.
- Delivery vehicles switched off when not required.
- Delivery vehicles to be started up sequentially rather than all together.
- Dropping of goods is to be avoided wherever possible. Drop heights to be minimised where this is unavoidable.
- Avoid use of any audible reversing warning systems and horns on vehicles.
- Deliveries to take place during the daytime only.
- Maintaining a smooth, flat path from the loading bay to the hub to reduce risk of rattling from trolleys.
- Reducing the frequency of deliveries.

13 Amplified sound limits

The Cafe is understood to not be a bar type space, however guidance on amplified sound limits is given below.

13.1 Limits for amplified sound egress

The noise level resulting from any amplified sound egress from the commercial unit at 1 m from the most affected windows of the nearest noise sensitive premises should not exceed 10 dB below the existing representative background sound level in octave bands. These limits are set out in Table 11. The limits include a facade correction.

Table 11 Octave band amplified sound limits, 1 m from the nearest noise sensitive premises

NSP ref from Section 2.2	Time of day	Maximum sound pressure level at 1 m from noise sensitive premises, $L_{eq,15min}$ (dB) Octave-band centre frequency (Hz)						
		63	125	250	500	1000	2000	4000
2, 4-6, 8	Daytime (07:00-23:00)	51	44	39	34	33	27	21
	Night-time (07:00-23:00) ^[1]	42	39	31	25	23	18	13
1	Daytime (07:00-23:00)	49	39	35	33	33	26	20
	Night-time (07:00-23:00)	40	34	26	22	20	15	10
3, 9	Daytime (07:00-23:00)	49	43	36	31	36	30	21
	Night-time (07:00-23:00)	46	42	31	27	28	22	14

^[1] Only considered applicable to residential receiver NSP 2 and 8. The commercial units (NSP ref 4-6) are only considered to be noise sensitive during the daytime.

14 Conclusion

The representative background sound levels from the noise survey were $L_{A90,15min}$ 44-46 dB during the day, and $L_{A90,15min}$ 33-40 dB during the night. The noise survey took place during travel restrictions during the Covid-19 pandemic, therefore further analysis of historic noise levels in the general area has been carried out to determine the background noise level during 'normal conditions'.

Based on the requirements of the Local Authority, the relevant plant noise limits at the worst affected existing noise sensitive premises are set out below.

Table 12 Plant noise limits at 1 m from the nearest noise sensitive premises

NSP ref from Section 2.2	Maximum sound pressure level at 1 m from noise sensitive premises, $L_{Aeq,15min}$ (dB)	
	Daytime (07:00-23:00)	Night-time (07:00-23:00)
2, 4-6, 8	43	35 ^[1]
1	42	31
3, 9	44	38

^[2] Only considered applicable to residential receiver NSP 2 and 8. The commercial units (NSP ref 4-6) are only considered to be noise sensitive during the daytime.

These limits are cumulative, and apply with all plant operating under normal conditions. If plant items contain tonal or attention catching features, the limits will be more stringent than those set out above. If plant items contain tonal or attention catching features, a penalty based on the type and impact of those features will be applied.

Noise limits for emergency plant noise and amplified sound have been recommended.

An assessment of delivery noise has been presented within the report, along with discussion on acceptable limits. Based on the results of the assessment, the proposed maximum criteria could be exceeded at some noise sensitive premises near to the site. Refer to discussion on the proposed criteria within Section 11.1. Guidance on how noise levels can be managed is presented.

Appendix A

Survey details

Equipment

The attended noise measurements were taken using Rion NL-52 sound level meters.

Calibration details for the equipment used during the survey are provided in Table A1.

Table A1 Equipment calibration data

Equipment description	Type/serial number	Manufacturer	Calibration expiry	Calibration certification number
Sound level meter	NL-52/00932326	Rion	13 Mar 21	TCRT19/1179
Microphone	UC-59/05549	Rion	13 Mar 21	TCRT19/1179
Pre-amp	NH-25/32354	Rion	13 Mar 21	TCRT19/1179
Calibrator	NC-74/34125432	Rion	13 Mar 21	TCRT19/1178
Sound level meter	NL-52/01143564	Rion	19 Dec 20	TCRT18/1993
Microphone	UC-59/10153	Rion	19 Dec 20	TCRT18/1993
Pre-amp	NH-25/43581	Rion	19 Dec 20	TCRT18/1993
Calibrator	NC-74/34257023	Rion	19 Dec 20	TCRT18/1991

Calibration of the meters used for the measurements is traceable to national standards. Calibration certificates for the sound level meters used in this survey are available upon request.

Calibration checks were carried out on the meters and their measurement chains at the beginning and end of the survey. No significant calibration deviation occurred.

Noise indices

Noise indices recorded included the following:

- $L_{Aeq,T}$ The A-weighted equivalent continuous sound pressure level over a period of time, T.
- $L_{AFmax,T}$ The A-weighted maximum sound pressure level that occurred during a given period, T, with a fast time weighting.
- $L_{ASmax,T}$ The A-weighted maximum sound pressure level that occurred during a given period, T, with a slow time weighting.
- $L_{A90,T}$ The A-weighted sound pressure level exceeded for 90% of the measurement period. Indicative of the background sound level.

Sound pressure level measurements are normally taken with an A-weighting (denoted by a subscript 'A', eg L_{A90}) to approximate the frequency response of the human ear.

A more detailed explanation of these quantities can be found in BS7445: Part 1: 2003 *Description and measurement of environmental noise, Part 1. Guide to quantities and procedures*.

Weather conditions

During the attended noise measurements, the weather was generally clear and dry and no rain occurred. Wind speeds were less than 5 m/s.

These weather conditions are considered suitable for obtaining representative measurements.

Appendix B

BS 4142 corrections for attention catching features

The following applies where plant noise is assessed in accordance with BS 4142:2014+A1:2019.

If the proposed plant noise contains attention catching features (such as tonal elements, whines, whistles, bangs etc), penalty corrections should be applied based on the type and impact of the features.

If appropriate, a subjective assessment of the plant features can be adopted. Where the plant noise contains tonal elements, the following corrections can be made depending on how perceptible the tone is at the noise receptor:

- 0 dB where the tone is not perceptible
- 2 dB where the tone is just perceptible
- 4 dB where the tone is clearly perceptible
- 6 dB where the tone is highly perceptible.

Where the plant noise is impulsive, the following corrections can be made depending on how perceptible the impulsivity is at the noise receptor:

- 0 dB where the impulse is not perceptible
- 3 dB where the impulse is just perceptible
- 6 dB where the impulse is clearly perceptible
- 9 dB where the impulse is highly perceptible.

For noise which is equally both impulsive and tonal, then both features can be accounted for by linearly summing the corrections for both characteristics.

If the plant has other distinctive characteristics, such as intermittency, then a 3 dB correction can be made.

If a subjective assessment of tonality is not appropriate, an objective assessment can be made by analysis of time-averaged, third-octave band sound pressure levels. A noise source is deemed to be tonal if the level in a third-octave band exceeds the level in adjacent third-octave bands by the level differences given below:

- 15 dB in the low frequency third-octave bands (25 Hz to 125 Hz)
- 8 dB in the mid frequency third-octave bands (160 Hz to 400 Hz)
- 5 dB in the high frequency third-octave bands (500 Hz to 10000 Hz).

If an objective assessment identifies the plant noise to be tonal then a 6 dB correction must be made.

Appendix C

Predicted noise level at noise sensitive premises

The following table sets out a summary of the predicted noise levels, and maximum noise level exceedances compared to the criteria presented in Table 13. This is based on the worst case location at each noise sensitive receiver in Figure 8.

The ambient noise level at each location includes a 3 dB correction for impulsive noises in line with BS 4142. This has not been included for the maximum noise levels.

Table 13 Summary of predicted noise levels, worst case hour

NSP	Criteria, Predicted noise level over worst case hour				Comparison to criteria
	L_{Aeq} (dB)	$L_{Aeq,1hr}$ (dB)	L_{AFmax} (dB)	Number of max exceedances	
1. Residential premises at 11 Radium Street	47	40	60	-	The criteria are not exceeded. This indicates a likelihood of low impact.
2. Residential premises at 2 Poland Street	48	43	63	7	The L_{Aeq} value meets the criterion. This indicates a likelihood of low impact. The maximum criterion is exceeded. ^[1]
3. Residential premises at Tribe Ancoats	49	24	44	-	The criteria are not exceeded. This indicates a likelihood of low impact.
4. Trading estate at City Court	48	48	68	7	The criterion is not exceeded. This indicates a likelihood of low impact. Refer to discussion in Section 11.2.5 regarding maximum noise levels.
5. Crown industrial estate	48	43	63	7	The criterion is not exceeded. This indicates a likelihood of low impact. Refer to discussion in Section 11.2.5 regarding maximum noise levels.

NSP	Criteria, Predicted noise level over worst case hour				Comparison to criteria
	L_{Aeq} (dB)	$L_{Aeq,1hr}$ (dB)	L_{AFmax} (dB)	Number of max exceedances	
6. Commercial area including site offices and depot – proposed Phoenix Ironworks site	48	38	58	-	The criteria are not exceeded. This indicates a likelihood of low impact.
8. Eliza Yard	48	34	54	-	The criteria are not exceeded. This indicates a likelihood of low impact.
9. Rodney Street	49	32	52	-	The criteria are not exceeded. This indicates a likelihood of low impact.

[1] From daytime noise measurements, the maximum levels measured where L_{AFmax} 70-72 dB which are higher than the predicted noise level from deliveries. As such, despite the criteria suggested by MCC being exceeded, given the context of the site in terms of the existing noise climate, this is may be unlikely to pose a significant risk of noise disturbance in practice.