



Ancoats Dispensary, Manchester

Stage 4 Acoustic Design Report

dBx Acoustics Ltd
Beehive Mill
Jersey Street
Manchester
M4 6JG
0161 711 0320

21002 – Ancoats Dispensary, Manchester R04E

Client: Eric Wright Construction

Date: 24-10-2022

Contents

Introduction.....	3
Assessment Criteria.....	4
Site Description	8
Noise Climate.....	10
Building Envelope Sound Insulation	12
Building Services Noise Emissions	17
Internal Acoustics / Approved Document E	18
Acoustic Detailing.....	21
Reverberation in Common Areas	22
Conclusions.....	23
Appendix A – Glossary of Acoustic Terminology.....	24
Appendix B – Correspondence With MCC Environmental Health	26

Revision History

Revision	Date	Revision Details	Author	Checked
R04	6 May 2022	Original Issue	Ben Tomlin BSc MIOA	Susan Witterick BSc MIOA
R04A	13 May 2022	Updated based on client and architect comments	Ben Tomlin BSc MIOA	Susan Witterick BSc MIOA
R04B	19 May 2022	Minor amendments to proposed constructions.	Susan Witterick BSc MIOA	
R04C	25 May 2022		Susan Witterick BSc MIOA	
R04D	9/6/2022	Updated based on architect comments	Ben Tomlin BSc MIOA	Joseph Tony BTech MIOA
R04E	24/10/2022	Updated based on new roof construction	<i>Ben Tomlin</i> Ben Tomlin BSc MIOA	Joseph Tony Joseph Tony BTech MIOA

Introduction

dBx Acoustics Ltd has been appointed by Eric Wright Construction (EWC) to carry out a Stage 4 acoustic design review of the proposed residential development at the Ancoats Dispensary, Old Mill Street, Manchester, M4 6EB, which comprises 39 apartments over 5 floors.

This report considers the acoustic requirements of the external envelope, to meet Local Authority planning requirements, and internal sound insulation and reverberation control for common areas, which need to comply with the requirements of Approved Document E (ADE) of the Building Regulations.

The development is understood to be considered a Material Change of Use (refurbishment) in terms of the acoustic criteria within ADE.

A glossary of acoustic terminology has been supplied in Appendix A in order to assist the reader.

Assessment Criteria

Manchester City Council: 'Planning & Noise Technical Guidance' (December 2015)

This document sets out MCC's requirements with regard to current guidance and policy, with the aspiration that new developments achieve the highest standards without compromising the health and wellbeing of residents. The guidance refers to the WHO Guidelines for Community Noise 1999, BS 8233:2014, BS 4142:2014, NPPF and NPSE as described below.

MCC has adopted the following internal noise limits for residential properties. These are assumed to also be applicable to hotels:

- Bedrooms (night-time 23:00-07:00) 30 dB L_{Aeq} (individual noise events should not normally exceed 45 dB L_{Amax} more than 15 times);
- Living Rooms (daytime – 07:00-23:00) 35 dB $L_{Aeq,16h}$; and
- Gardens and terraces (daytime) 55 dB L_{Aeq} .

For potential noise emissions from 'entertainment sources' such as bars or commercial units with amplified music, the requirements are as follows;

"Where entertainment noise is proposed the L_{Aeq} (entertainment noise) shall be controlled to 10 dB below the L_{A90} (without entertainment noise) in each octave band at the façade of the nearest noise sensitive location, and internal noise levels at structurally adjoined residential properties in the 63 Hz and 125 Hz octave frequency bands shall be controlled so as not to exceed (in habitable rooms) 47 dB and 41 dB respectively."

Finally, limits for noise emissions from building services plant are set as follows;

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 $L_{Ar,Tr}$ below the typical background L_{A90} level at the nearest noise sensitive location.

More information on these requirements is presented below.

BS 8233:2014: 'Guidance on sound insulation and noise reduction for buildings'

Internal Noise Level Limits

BS 8233 gives guidance for noise levels within residential properties. It discusses appropriate criteria for reasonable rest and sleep conditions and provides noise levels which are considered to provide appropriate conditions in accordance with WHO guidelines. The guidance on limits from the standard is reproduced in Table 1, below;

Table 1: Internal Ambient Noise Limits, BS8233

Activity	Location	07:00 – 23:00 hrs	23:00 – 07:00 hrs
Resting	Living room	35 dB $L_{Aeq,16h}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16h}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16h}$	30 dB $L_{Aeq,8h}$

It should be noted that these levels represent the average noise level over the 16-hour day or 8-hour night period. This potentially means that higher noise levels may be experienced internally over a shorter period of time (e.g. individual passing trams or vehicles). These equivalent noise levels over a period of time are the best representation of the average noise level and are generally the main focus when it comes to evaluating noise exposure.

Under the updates to BS 8233 in 2014, for both day and night time cases, a relaxation of up to 5 dB is considered to provide "reasonable internal conditions" where development is considered necessary or desirable.

To assess the maximum noise levels, the World Health Organisation (WHO) document "*Guidelines for Community Noise: 1999*" recommends that maximum noise levels ($dB L_{Amax,F}$) do not exceed $45dB L_{Amax,F}$ more than 10-15 times a night.

BS 8233 also states that for traditional external amenity areas, such as gardens and patios, it is desirable that the external ambient noise level does not exceed an upper guideline of 55 dB $L_{Aeq,T}$. It is also recognised in BS 8233 that this may not be achievable in higher noise environments.

BS 4142:2014 'Methods for Rating and Assessing Industrial and Commercial Sound'

BS 4142:2014 sets out a procedure for assessing noise impact whereby a Noise Rating is determined and compared with the existing local Background Sound Level.

The Rating Level ($\text{dBL}_{\text{Ar,Tr}}$) is evaluated from the Specific Noise Level by including several, cumulative corrections to account for factors such as distinguishable tone, impulse, intermittency or other readily distinguishable sound characteristics.

The assessment of the impact depends upon the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level. An initial estimate of the impact of the specific sound is made by subtracting the Background Sound Level from the Rating Level, while considering the following points:

- a) Typically, the greater this difference, the greater the magnitude of the impact.
- b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

Building Regulations 2010 – Approved Document E Requirements

The development falls under the classification of dwelling houses/flats formed by a material change of use, per the Building Regulations 2010 Approved Document E (ADE). The criteria set out within Approved Document E relevant to the development are presented below.

Table 2: Sound insulation criteria set out in Approved Document E.

Description		Minimum Airborne Sound Insulation $D_{nT,w} + C_{tr}$ dB	Maximum Impact Sound Pressure Level $L'_{nT,w}$ dB
Dwelling Houses and Flats formed by material change of use	Walls	43	-
	Floors and stairs	43	64

It should be noted that for airborne sound insulation, the higher the value, the better the performance. For impact sound insulation, the lower the value, the better the performance.

Internal partitions

In all cases for ADE, internal partitions are required to achieve an airborne sound insulation performance of R_w 40 dB, with no impact sound insulation requirements. This will also apply to internal floors within the duplexes. It should be noted that the performance of internal partitions is demonstrated using laboratory test data for the chosen construction(s).

Apartment Entrance Doors

Doors to apartments from common circulation areas should be specified to achieve a minimum sound reduction index of R_w 29dB. This performance must be achieved by the overall doorset including frames and seals.

Acoustic Absorption in Common Areas

Reverberation control in common areas of residential buildings (e.g. lobbies and hallways) is prescribed in Approved Document E. Two methods of compliance are presented. The simplest means of compliance is to provide a Class C acoustically absorptive ceiling throughout all common areas.

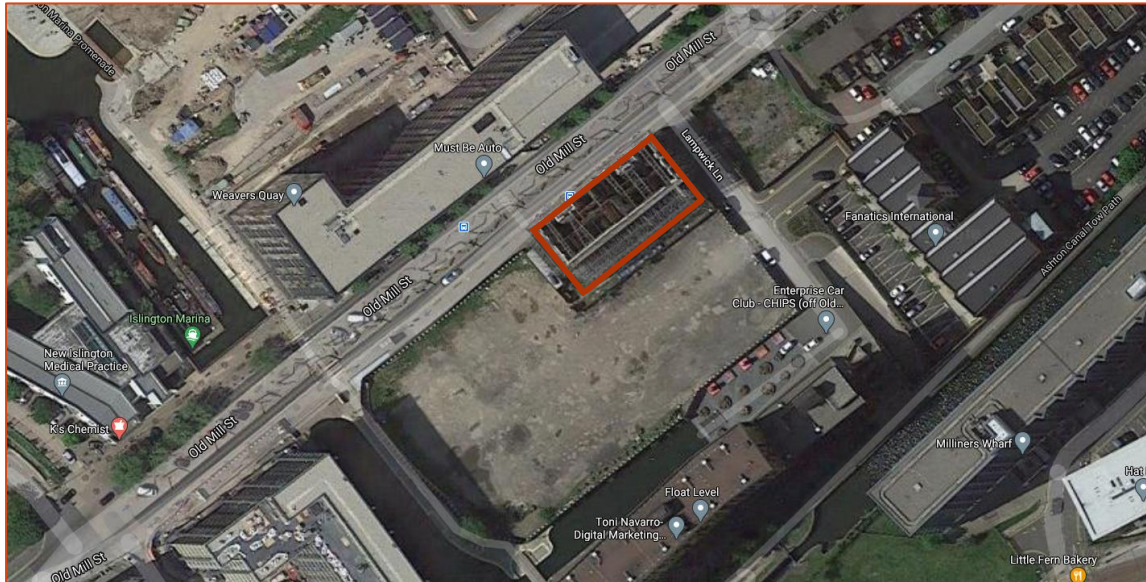
An alternative methodology is available where calculations take into account the absorption provided by e.g. carpet, to identify the area of additional absorption which is required.

Site Description

Site Description

Ancoats Dispensary is located on Old Mill Street, Manchester, as outlined in Figure 1, below. The building is currently derelict.

Figure 1: Site Location Plan



The site lies directly adjacent to Old Mill Street, which is a busy through road. To the north east lies Lampwick Street, an access road that serves residential properties. An apartment building (Lampwick) is immediately adjacent to the site to the west and south. Further afield, the Ashton Canal lies to the south east and the nearest major road is Great Ancoats Street, some 300m to the south west.

Noise Sources

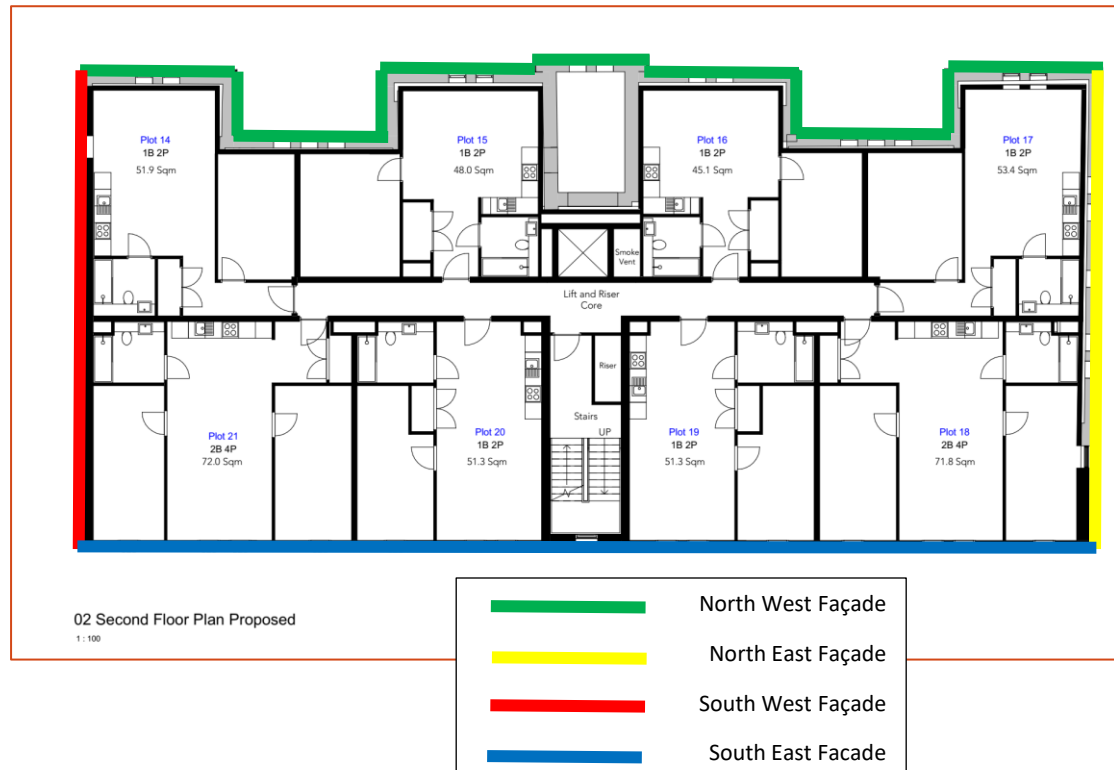
According to all of the available noise reports, including reference to a noise survey made at the site by dBx Acoustics in 2017, the primary source of noise affecting this site is road traffic along Old Mill Street as well as more distant road traffic from the surrounding road network.

With regards to any proposed external plant, the nearest noise sensitive receptors for the purposes of this assessment are the neighbouring properties in the new Lampwick development.

Proposed Development

The proposed development comprises 39 apartments shared over five floors. Figure 2, below, show a sample layout of the building and the façade references as identified throughout this report.

Figure 2: Typical Floor Plan Showing Façade Identifications



Noise Climate

Due to the Covid-19 lockdown/local restriction tiers and its effect on road traffic, as well as noise from ongoing construction works on the adjacent site during the subsequent period, it has not been possible to carry out a reliable noise survey. This assessment is therefore based on available information regarding the surrounding area, in accordance with current guidance issued by the Institute of Acoustics and Association of Noise Consultants.¹

This methodology was discussed and agreed with Laura Miller, an Environmental Health Officer at Manchester City Council. This correspondence is reproduced in Appendix B.

The noise impact assessment is based on the following noise surveys encompassing the site:

- dBx Acoustics report '17041 Ancoats Dispensary R01a', dated 8 June 2017 (MCC Planning reference 116665)
- Arup report 'Old Mill Street Site AAC\235055-55\R01,' dated 20 June 2016 (MCC Planning reference 112658)
- Arup report 'Manchester Life, Lampwick 235055-95,' dated May 2017 (MCC Planning reference 116190)

The data presented within these reports has been found to be consistent, and has been used to establish the typical day- and night- time noise levels impacting on the façade of the Ancoats Dispensary, as presented in Table 3, below.

Table 3: Facade Noise Levels Used In Assessment

Facade	Daytime Ambient Noise Level (dBL _{Aeq,16hr})	Night-time Ambient Noise Level (dBL _{Aeq,8hr})	Typical Maximum Noise Level (night time) (dBL _{AF,max})
North West	65	58	78
North East	62	55	72
South West	59	47	66
South East	62	55	72

¹ <https://www.association-of-noise-consultants.co.uk/wp-content/uploads/2021/01/Joint-Guidance-On-the-Impact-of-Covid.IOA-ANC-V6.pdf>

Background noise levels for the nearest noise sensitive receptors for the daytime and night-time are derived from Arup's report for the Lampwick development. These noise levels are detailed in Table 4.

Table 1: Background Noise Levels at NSR

Receptor	Typical Daytime Background Noise Level (dBL _{A90})	Typical Night-time Background Noise Level (dBL _{A90})
Lampwick Development (Old Mill Street Façade)	49	46
Lampwick Development (Ashton Canal Façade)	42	41

Building Envelope Sound Insulation

Internal Ambient Noise Criteria

The internal noise criteria which have been adopted for the proposed development in accordance with MCC requirements are outlined in Table 5, below.

Table 2: Internal Ambient Noise Criteria

Daytime (07:00 – 23:00 hrs)	Night-time (23:00– 07:00 hrs)	
$L_{Aeq, 16h}$	$L_{Aeq, 8h}$	L_{Amax}
35 dB	30 dB	45 dB ¹
¹ It is generally agreed that this limit would not apply to atypical night-time maximum events. The previous version of BS 8233:1999 stated that, “...individual noise events should not normally exceed 45 dB L_{Amax} .”		

External Noise Break-In Assessment

Glazing

Based on a reduction in external noise levels to internal noise levels of 15dB for a partially opened window (based on WHO 1999), external noise levels should not exceed 50dB $L_{Aeq,T}$ outside living rooms in the day, and 45dB $L_{Aeq,T}$ and 60dB $L_{Amax,F}$ outside bedrooms at night, if windows are to be open to provide background ventilation.

It can be seen from Table 3 that the **required internal ambient noise levels cannot be achieved using open windows for background ventilation**. Ventilation will therefore need to be provided by alternative means. For this project, ventilation using MVHR units is proposed.

Based on the predicted noise levels at each elevation with windows, the acoustic requirements for the glazing has been calculated, and are presented in Table 6, below.

Table 3: Glazing and Ventilator Sound Insulation Requirements

Façade	Required Glazing Sound Insulation Performance, $dBR_w (+ C_{tr})$	Proposed Glazing Sound Insulation Performance, $dBR_w (+ C_{tr})$	Requirement Met?
North West (Old Mill Street)	38 (-6)	38 (-6)	Y
North East and South East	30 (-4)	30 (-4)	Y
South West			

Windows may be openable at the resident's discretion for purge ventilation purposes, however, must be well sealed when closed. The frames should not downgrade the sound insulation performance of the glazing.

External Walls

In order that the sound insulation performance of the glazing is not compromised, the external wall and roof must achieve a sound insulation performance of at least 10dB greater than the glazing – i.e. 40-48dBR_w.

The external walls are either based on the existing structure, or new build elements.

The existing structure comprises a 500mm masonry construction at ground floor level, reducing above second floor level to 225-300mm (TBC). An inner lining is proposed comprising 30mm Diathonite/ 170mm Foamglas T3+ Slab/ 60/ 70mm Cavity & Stud Zone (this varies from floor to floor)/ 15mm Plasterboard. This will comfortably meet the requirements.

The new build wall comprises 100mm brick, a 175mm cavity with 125mm Duoslab mineral fibre insulation, a 100mm cavity formed by the SFS, and an inner lining comprising one layer of 15mm Fireline board each side of a 25mm cavity. This has a predicted sound insulation performance of at least 60dBR_w, and hence would comfortably meet the requirements.

Roofs

The roof should achieve a sound insulation performance of 35-43dB_{Rw}.

There are a number of roof types proposed, assessed below.

Roof types 1 and 4 comprise an Alumasc Mono membrane on rigid insulation, on a steel deck, with a plasterboard ceiling below (assumed 12.5mm Fireline with mineral fibre, forming a cavity of at least 200mm). This roof has a predicted sound insulation performance of 46dB_{Rw} and hence meets the requirement.

Roof types 2 and 3a comprise an Alumasc Mono membrane on rigid insulation, on a concrete deck, with a plasterboard ceiling below (assumed 12.5mm Fireline with mineral fibre, forming a cavity of at least 200mm). This roof has a predicted sound insulation performance of 55dB_{Rw} and hence meets the requirement.

Roof type 3b comprises an Alumasc Mono membrane on rigid insulation, on 15mm plywood on timber joists, with a plasterboard ceiling below (assumed 12.5mm Fireline with mineral fibre, forming a cavity of at least 200mm). This roof has a predicted sound insulation performance of 50dB_{Rw} and hence meets the requirement.

Roof type 4 is the lift over-run roof and hence has no acoustic criteria.

Roof type 5 is the pitched roof, and comprises slate tiles, 12.5mm sheathing board, 140mm mineral fibre between 150mm joists, 100mm mineral wool insulation between 100mm counter joists, and one layer of 12.5mm plasterboard. This construction has a predicted sound insulation performance of around 47dB_{Rw} and is therefore acceptable acoustically.

Although not a planning or building control requirement, all the above roofs will also adequately control rain noise.

Overheating

It is understood that the apartment buildings could potentially overheat at some times in the year.

Guidance is provided in the Association of Noise Consultants' document '*Acoustics, Ventilation and Overheating Guide*' (2020) (AVO), although this guidance is not definitive.

Initially, a Stage 1 assessment is undertaken by considering the external noise levels. External daytime noise levels of 50dB_{LAeq,T} are considered 'negligible risk', while a noise level of 65dB_{LAeq,T} is considered 'high risk'. At night, these limits are reduced to 45-55dB_{LAeq,T} respectively.

As can be seen from Table 3, above, in the day, the north west elevation is just at the upper limit, and the south east and north east elevations are only 3dB below the 'high risk' upper limit. At night all three of these elevations are at or above the upper limit. On this basis, AVO recommends that a Level 2 assessment should be undertaken.

For the Level 2 assessment, again, there are no definitive criteria proposed, only a sliding scale of *'Increasing likelihood of impact on reliable speech communication during the day or sleep disturbance at night'*. However, internal noise level limits of $50\text{dB}_{\text{LAeq},16\text{hour}}$ in the day, and $42\text{dB}_{\text{LAeq},8\text{hour}}$ and $65\text{dB}_{\text{LAmax,F}}$ at night are the levels at which *'Noise causes a material change in behaviour e.g. having to keep windows closed most of the time....Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep.'* These limits would therefore appear to represent a worst-case upper limit for noise levels during the overheating condition. However, adverse effects relating to noise are affected by both the noise level itself, and the duration (how long overheating occurs) and frequency (how many times per year/month) of the overheating condition.

The AVO guide also states that the reduction in external noise levels via a partially opened window is 13dB, slightly more cautious than the WHO guidance of 15dB which is used in the façade noise impact assessment presented above.

This therefore relates to worst case allowable external noise levels of $63\text{dB}_{\text{LAeq},16\text{hour}}$ in the day, and $55\text{dB}_{\text{LAeq},8\text{hour}}$ and $78\text{dB}_{\text{LAmax,F}}$ at night.

With reference to Table 3, above, therefore, it can be seen that with windows open during an overheating condition, the suggested upper noise limits would be exceeded on the north western elevation at all times of day or night, and are very close to the upper limits on the south eastern and north eastern elevations at all times. However, the limits are presented in terms of the 16-hour daytime and 8-hour night-time average noise levels and therefore, the percentage of time the windows are required to be open to mitigate overheating will influence the overall long term average noise levels.

For example, if the windows are only required to be open for half of each period (no more than 8 hours during the day, and/or 4 hours at night), then the average noise levels would reduce by 3dB – this would just meet the upper limits on all elevations and openable windows would be sufficient to mitigate overheating while still achieving the required upper limits for the north east and south east elevations.

- The assessment for the south east and north east elevations will therefore need to be developed when the M&E overheating assessment is available to provide more detail on the likely frequency and duration of overheating events.
- A correction for duration would not affect assessment based on maximum noise levels, and therefore it is recommended that rooms on the north west façade should not rely on open windows to control overheating.
- For rooms on the south western elevation, control of overheating using open windows would be acceptable.

It should be noted that the overheating condition is not formal guidance, and hence there are no strict requirements to be met. The implications of the noise levels under overheating conditions will need to be discussed and agreed with the design team (and possibly the Local Authority) once full details of the overheating review are known.

Building Services Noise Emissions

Manchester City Council typically requires a plant noise limit of a rating level 5 dB below the background noise levels during the period of operation. The rating level is defined in BS4142 and described above. Based on the background noise levels presented in Table 4, and assuming potential 24/7 operation of building services plant, the rating levels at the nearest noise sensitive receptor can be determined. These are presented in Table 7, below.

Table 4: Building Services Noise Emission Limits

Receptor	Daytime Rating Noise Level ($\text{dBL}_{\text{Ar,Tr}}$)	Night-time Rating Noise Level ($\text{dBL}_{\text{Ar,Tr}}$)
Lampwick Development (Old Mill Street Façade)	44	41
Lampwick Development (Ashton Canal Façade)	37	36

These limits are cumulative for all plant associated with the development.

Internal Acoustics / Approved Document E

Separating (Party) Floors

The floor separating apartments is understood to comprise;

- 3mm Regupol Sonus Multi 3 resilient layer
- 150mm concrete slab (solid not profiled)
- 230mm cavity
- Plasterboard ceiling supported on a MF system.

Assuming the concrete is of normal weight (i.e. around $2,300\text{kg/m}^3$), this construction has a predicted sound insulation performance in the order of $52\text{dB}R_w + C_{tr}$, which with a typical allowance for sound flanking would be expected to achieve an on-site performance in the order of $45\text{dB}D_{nT,w} + C_{tr}$. This construction would therefore achieve the airborne sound insulation performance requirements of ADE.

The resilient layer (Regupol Sonus Multi 3) has a minimum impact sound insulation improvement of $17\text{dB}\Delta L_w$ ('delta L_w ') which should therefore achieve the required impact sound insulation performance. There are no impact sound insulation requirements in corridors, although the carpeted floor finish would control impact sound well.

Separating (Party) Walls

Existing Walls

No internal walls are to be retained.

New Walls

The relevant proposed walls are detailed in Table 8, below, along with the laboratory tested sound insulation performances (SIP) detailed in the Siniat technical submittal. Non acoustically rated walls are not considered.

The performance of the new walls to the entrance lobby has been predicted using the Insul software package.

Table 8 – Proposed Walls

Wall Ref.	Construction	Siniat SIP, dBR_w	Expected On-site SIP, $dBD_{nT,w}+C_{tr}$	Required SIP	Criteria Met?
WT-1A	One layer of 12.5mm GTEC Standard each side of 70mm metal stud, with 25mm mineral fibre in the cavity.	42	N/A	40dBR _w	Y
WT-1B	One layer of 15mm GTEC dB each side of 70mm metal stud, with 25mm mineral fibre in the cavity.	47	N/A	40dBR _w	Y
WT2	Two layers of 15mm GTEC dB each side of twin 50mm metal studs, with 25mm mineral fibre in the cavity.	63	48	43dBD _{nT,w} +C _{tr}	Y
WT-3B	Two shaftwall constructions each side of a riser. Each shaftwall comprises one layer of 15mm GTEC Fire each side of 70mm metal stud, with 25mm mineral fibre in the cavity.	45 per shaftwall	Overall >50	43dBD _{nT,w} +C _{tr}	Y
Entrance Lobby	Brick, 100mm cavity, 15mm sheathing board, 100mm mineral wool between SFS studs, 15mm plasterboard. Lining L01 beyond.	n/a	Overall >50	43dBD _{nT,w} +C _{tr}	Y

Lift Shafts

BS 8233:2014 provides guidance on maximum recommended noise levels within residential accommodation due to lift operation. This should not exceed 25dB_{L_{Amax}} in bedrooms.

The German standard VDI 2566-2:2004 (commonly used by lift manufacturers) specifies a maximum sound pressure level in the hoistway of 75dBA.

The lift shafts are to be constructed from 215mm block, with an independent lining comprising two layers of 15mm GTEC dB plasterboard, with a cavity of 60mm and mineral fibre insulation.

This construction has a predicted sound insulation performance of over 75dBR_w. It should therefore control lift noise to well below the required limits, as well as controlling vibration and structure-borne sound.

It is not possible for practical reasons to measure sound insulation between the lift shaft and guest rooms on site, but if required it would be possible to measure noise in a guest room with the lift in operation during commissioning.

Doors

The apartment front doors are specified at 33dBR_w, 4dB better than the minimum performance standard stipulated within ADE, and hence acceptable. Doors should have good perimeter sealing, including threshold seals where practical.

Acoustic Detailing

dBx Acoustics has reviewed the proposed detailing drawings, and specifically the following drawings;

- 210005-BA-XX-XX-DR-A-06201-Proposed GA Section A-Construction-P0-2
- 210005-BA-XX-XX-DR-A-06202-Proposed GA Section B-Construction-P0-2
- 210005-BA-XX-XX-DR-A-06203-Proposed GA Section C-Construction-P0-2
- 210005-BA-XX-XX-DR-A-06204-Proposed GA Section D-Construction-P0-2
- 210005-BA-XX-XX-DR-A-06205-Proposed GA Section E-Construction-P0-2
- 210005-BA-XX-XX-DR-A-06206-Proposed GA Section F-Construction-P0-2
- 210005-BA-XX-XX-DR-A-06207-Proposed GA Section G-Construction-P0-2
- 210005-BA-XX-XX-DR-A-06208-Proposed GA Section H-Construction-P0-2
- 210005-BA-XX-XX-DR-A-06209-Proposed GA Section J-Construction-P0-2
- 210005-BA-XX-XX-DR-A-06210-Proposed GA Section K-Construction-P1-3
- 210005-BA-XX-XX-DR-A-21116-External Wall Section Detail 16-Construction-P0-3
- 210005-BA-XX-XX-DR-A-21120-Proposed Third Floor Slab Edge Detail-Construction-P1-3
- 210005-BA-XX-XX-DR-A-21524-External Wall Plan Detail 24-Construction-P0-3
- 210005-BA-XX-XX-DR-A-22100-Internal Partition Type 1A-Construction-P2-0
- 210005-BA-XX-XX-DR-A-22101-Internal Partition Type 1B-Construction-P2-0
- 210005-BA-XX-XX-DR-A-22102-Internal Partition Type 2-Construction-P3-0
- 210005-BA-XX-XX-DR-A-22103-Internal Partition Type 3A-Construction-P3-0
- 210005-BA-XX-XX-DR-A-22104-Internal Partition Type 3B-Construction-P2-0
- 210005-BA-XX-XX-DR-A-22106-Internal Lining Type 1-Construction-P02-0
- 210005-BA-XX-XX-DR-A-22107-Internal Lining Type 2-Construction-P02-0
- 210005-BA-XX-XX-DR-A-47305-Terrace Roof Section Detail 05-Construction-P0-3
- 210005-BA-XX-XX-DR-A-47601-Dormer Section Detail 01-Construction-P0-3
- 210005-BA-XX-XX-DR-A-47602-Dormer Section Detail 02-Construction-P0-3
- 0000-BUT-XX-XX-DR-A-22105-Internal Partition Type 3C-S2 For Information-P0
- 210005-BA-XX-00-DR-A-21507-Curtain Wall to Existing Wall Detail-Construction-P0-3
- 210005-BA-XX-00-DR-A-22109-Internal Lining Type L03-Construction-P1-0
- 210005-BA-XX-02-DR-A-21514-External Wall Plan Detail 14-Construction-P0-3
- 210005-BA-XX-RF-DR-A-47102-Roof Type Plan-Construction-P2-3

All of the details drawn are appropriate to maintain the expected sound insulation performance in all areas.

Curtain Walling

In order that flanking via the curtain walling does not compromise the expected sound insulation performance of the separating floor, the curtain walling should achieve a flanking performance 10-15dB greater than the required on site performance – i.e. 53-58dB_{nf,w}.

The curtain walling is specified with a flanking sound insulation performance of at least 60dB_{nf,w}. This is therefore sufficient to control flanking via the curtain walling.

Reverberation in Common Areas

Reverberation control in common areas of residential buildings (e.g. lobbies and hallways) is prescribed in Approved Document E. Two methods of compliance are presented.

The simplest means of compliance is to provide a Class C acoustically absorptive ceiling throughout all common areas (Method A). An alternative methodology is available where calculations take into account the absorption provided by e.g. carpet, to identify the area of additional absorption which is required (Method B).

The proposed ceiling is an Armstrong Dune Microlook BP2020M, with a carpeted floor finish. The Dune ceiling tile is Class D, and, in conjunction with the proposed carpet, Method B shows that the proposed finishes are acceptable.

A plasterboard ceiling is proposed within stairwells; these are separated by doors from the main corridors and entrances to apartments. There is no acoustic benefit to providing an absorptive ceiling to the staircores, as they are separated from apartments doors. This has been agreed with Socotec, the Building Control assessors.

Conclusions

dBx Acoustics Ltd has been appointed by Eric Wright Construction to carry out a Stage 4 acoustic design review for the proposed residential development at the Ancoats Dispensary, Manchester. The proposed development comprises of 39 apartments over five floors.

The proposed external envelope constructions have been assessed, and will achieve the required internal ambient and maximum noise levels.

A review of the proposed floor and wall constructions has been undertaken, in terms of meeting the requirements of Approved Document E of the Building Regulations, and are considered to be acoustically appropriate.

All proposed details and flanking paths have also been assessed, and the proposals are all appropriate to achieve the expected performances.

An assessment of the proposed finishes has been undertaken, which has determined that they are acceptable in terms of meeting the reverberation time requirements for common areas.

Appendix A – Glossary of Acoustic Terminology

Decibel, dB	A unit of level derived from the logarithm of the ratio between the value of a quantity and a reference value. For sound pressure level (L_p) the reference quantity is 2×10^{-5} N/m ² . The sound pressure level existing when microphone measured pressure is 2×10^{-5} N/m ² is 0 dB, the threshold of hearing.
L	Instantaneous value of Sound Pressure Level (L_p) or Sound Power Level (L_w).
Frequency	Number of cycles per second, measured in hertz (Hz), related to sound pitch.
A-weighting	Arithmetic corrections applied to values of L_p according to frequency. When logarithmically summed for all frequencies, the resulting single "A weighted value" becomes comparable with other such values from which a comparative loudness judgement can be made, then, without knowledge of frequency content of the source.
$L_{eq,T}$	Equivalent continuous level of sound pressure which, if it actually existed for the integration time period T of the measurement, would possess the same energy as the constantly varying values of L_p actually measured.
$L_{Aeq,T}$	Equivalent continuous level of A weighted sound pressure which, if it actually existed for the integration time period, T, of the measurement would possess the same energy as the constantly varying values of L_p actually measured.
$L_{n,T}$	L_p which was exceeded for n% of time, T.
$L_{An,T}$	Level in dBA which was exceeded for n% of time, T.
L_{Fmax}	The instantaneous maximum sound pressure level which occurred during the measurement. F indicates that the fast time-weighting is used.
L_{AFmax}	The instantaneous maximum A weighted sound pressure level which occurred during the measurement. F indicates that the fast time-weighting is used.
$L_{Ar,Tr}$	The rating level: the equivalent continuous A-weighted sound pressure level of the noise, plus any adjustment for the characteristic features of the noise.
Reverberation Time, T	The time that would be required for the sound pressure level to decrease by 60 dB after the sound source has stopped. The descriptor T, often includes other nomenclature to describe the type of reverberation time measurement or if the reverberation time is an average taken for specific frequencies. For example, a T_{mf} is the mid-frequency reverberation time.
Absorption Coefficient, α	The fraction of reverberant sound energy absorbed by a material. It is expressed as a value between 1.0 which equates to perfect absorption and 0 which equates to zero absorption.
Acoustic Class, A - E	Classification of sound absorbers into Sound Absorption Classes A-E, according to BS EN ISO 11654, including frequencies 200-5000 Hz
NRC	A single-number rating system used to compare the sound-absorbing characteristics of building materials. A measurement of the acoustical absorption performance of a material, calculated by averaging its Sound Absorption Coefficients at 250, 500, 1000 and 2000 Hz
STI	Speech Transmission Index , Metric ranging between 0 and 1 representing the transmission quality of speech with respect to intelligibility by a speech transmission channel
R	Sound Reduction Index , the laboratory measured sound insulation properties of a material or building element in octave or third octave bands.
R_w	Weighted Sound Reduction Index , a single number which represents the sound reduction of a material. It is derived by plotting the sound reduction index against a set of reference curves. The curves are shifted until a best-fit is established and the curve which best fits the sound reduction spectrum is used to represent the single figure value.
D_w	Weighted Level Difference , the weighted level difference between a pair of rooms, stated as a single figure.
D_{nT}	Standardised Level Difference , a frequency-dependent measurement of airborne sound insulation, calculated using the following formula: $D_{nT} = L_1 - L_2 + 10 \log(T/T_0)$ dB

	Where: L_1 is the energy-averaged sound pressure level due to the pink noise source measured in the source room using a sweep technique. L_2 is the energy-averaged sound pressure level measured in the receiving room using a sweep technique. T is the mean receiving room reverberation time (derived from T_{30} measured in seconds). T_0 is the reference reverberation time (= 0.5s for dwellings).
$D_{nT,w}$	Weighted Standardised Level Difference , a single-figure value of airborne sound insulation performance, derived according to procedures in BS EN ISO 717-1, based on the D_{nT} values at different frequencies (100-3150 Hz third octave bands).
D_{nFw}	Weighted, Normalised Flanking Level Difference , the normalised, weighted difference in sound level between a pair of rooms via a flanking element, such as mullion or ceiling detail. The level difference in octave bands is first normalized to a reference amount of absorption and then plotted against a set of reference curves to establish a single figure value.
D_{ne}	Normalised Element Level Difference , The normalised difference in sound level between a pair of rooms via a small element such as a trickle ventilator. The level difference in octave bands is normalized to a reference amount of absorption.
D_{new}	Weighted, Normalised Element Level Difference , The normalised, weighted difference in sound level between a pair of rooms via a small element such as a trickle ventilator, stated as a single figure. The level difference in octave bands is normalized to a reference amount of absorption and then plotted against a set of reference curves to establish a single figure value.
C_{tr}	Spectrum Adaptation Term , a correction term applied to the sound insulation single-number values (R_w , D_w , and $D_{nT,w}$) in accordance with BS EN ISO 717-1. Applying the C_{tr} penalises a construction's performance if its low frequency performance is poor in relation its performance at higher frequencies.
Impact Sound	The noise generated by an impact on a structure. This is normally used to describe the noise created by people walking or moving furniture on a floor structure.
L_{nT}	Standardised Impact Sound Pressure Level, a frequency dependent measurement of impact sound insulation, calculated using the following formula: $L_{nT} = L_1 + 10\log(T/T_0) \text{ dB}$ Where: L_1 is the mean sound pressure level due to the tapping machine measured in the receiving room using a sweep technique. T is the mean receiving room reverberation time (derived from T_{30} measured in seconds). T_0 is the reference reverberation time (0.5s for dwellings)
$L'_{nT,w}$	Weighted Standardised Impact Sound Pressure Level , a single-figure value (@ 500 Hz) of impact sound insulation, performance, derived according to BS EN ISO 717-2, based on the L_{nT} values at different frequencies (100Hz- 3150 Hz third octave bands).
Insertion Loss, IL	The reduction of noise level due to the presence of a noise control device such as an attenuator, excluding any regeneration noise created by its presence.
NR	The Noise Rating level . This is a single figure value derived by plotting a noise spectrum against a set of curves. The curve under which the spectrum fits is the resulting NR level.

Appendix B – Correspondence With MCC

Environmental Health

From: Laura Miller <laura.miller@manchester.gov.uk>
Sent: 26 February 2021 11:17
To: Ben Tomlin <ben@dbxacoustics.com>
Subject: Re: Noise surveys for planning, COVID

Hi Ben,

Thank you for confirming the site, I suspected it would be as I had been contacted by planning a few days ago about the acoustic report.

This area is undergoing a lot of regeneration to residential, as such traffic is the predominant noise and there are no entertainment venues nearby. I am happy therefore that the referenced reports should give a good representation of the 'normal' background for this area.

If you have any further questions about this site or any others in the nearby area, please contact me.

Kind Regards

Laura

Laura Miller (MRes, MA, BSc(Hons))

Please note that due to working compressed hours Wednesdays are a non-working day for me, I will respond to your email when I return to the office

Environmental Protection Section

Environmental Health
Neighbourhoods Directorate

Manchester City Council

Telephone: 0161 234 5004
email: laura.miller@manchester.gov.uk

website: www.manchester.gov.uk

From: Ben Tomlin <ben@dbxacoustics.com>
Sent: 25 February 2021 16:32
To: Laura Miller <laura.miller@manchester.gov.uk>
Cc: Chatfield, Jennifer <jchatfield@deloitte.co.uk>; Wray, Katie <kawray@deloitte.co.uk>
Subject: RE: Noise surveys for planning, COVID

Hi , thanks for the reply.

The job is called Ancoats dispensary, excerpt from report below;

The proposed site is in the existing Ancoats Dispensary building, Old Mill Street, Manchester, as outlined in Figure 1, below. The site is currently not in use.

Figure 1 – Site Location Plan



dBx acoustics did a survey there in 2017. We also considered Arup Acoustics reported measured data.

Due to the Covid-19 lockdown/local restriction tiers and its effect on road traffic, it has not been possible to carry out a reliable noise survey. This assessment is therefore based on available information regarding the surrounding area.

This assessment has been undertaken in accordance with current guidance issued by the Institute of Acoustics and Association of Noise Consultants.

The noise impact assessment is based on the following noise surveys encompassing the site:

- dBx Acoustics report '17041 Ancoats Dispensary R01a', dated 8 June 2017 (MCC Planning reference 116665)
- Arup report 'Old Mill Street Site AAc\235055-55\R01,' dated 20 June 2016 (MCC Planning reference 112658)

- Arup report 'Manchester Life, Lampwick 235055-95,' dated May 2017 (MCC Planning reference 116190)

The data presented within these reports has been found to be consistent, and has been used to establish the typical day- and night- time noise levels impacting on the façade of the Ancoats Dispensary, as presented in Table 3, below.

So we are pretty happy with the data we have used.

If you have any further queries, please do not hesitate to contact me.

Thanks, regards

Ben

Ben Tomlin

Principal Acoustic Consultant



www.dbxacoustics.com : T: 0161 711 0320 : E: ben@dbxacoustics.com

p.s. Like what we do? Please leave us a review! <https://sotellus.com/r/dbx-acoustics/>

From: Laura Miller <laura.miller@manchester.gov.uk>

Sent: 25 February 2021 13:52

To: Ben Tomlin <ben@dbxacoustics.com>

Cc: Chatfield, Jennifer <jchatfield@deloitte.co.uk>; Wray, Katie <kawray@deloitte.co.uk>

Subject: Re: Noise surveys for planning, COVID

Hi Ben,

I am happy with the proposals given the current lockdown. This lockdown has not seen the same reduction in traffic compared to the one last March but levels are still not 'normal'.

You should be able to find information on nearby sites via <https://pa.manchester.gov.uk/online-applications/>

Out of interest, what site are you working on as I may have some local knowledge of the area to add to the report?

Kind Regards

Laura



Laura Miller (MRes, MA, BSc(Hons))

Please note that due to working compressed hours Wednesdays are a non-working day for me, I will respond to your email when I return to the office

Environmental Protection Section
Environmental Health
Neighbourhoods Directorate
Manchester City Council

Telephone: 0161 234 5004
email: laura.miller@manchester.gov.uk
website: www.manchester.gov.uk

For the latest support and information about the coronavirus visit www.manchester.gov.uk/coronavirus

We are now on Twitter, for latest news and updates follow us [@EnvHealthMcr](https://twitter.com/EnvHealthMcr)

I ❤️ MCR

Please consider the environment before printing an e-mail

From: Ben Tomlin <ben@dbxacoustics.com>
Sent: 25 February 2021 13:37
To: Laura Miller <laura.miller@manchester.gov.uk>
Cc: Chatfield, Jennifer <jchatfield@deloitte.co.uk>; Wray, Katie <kawray@deloitte.co.uk>
Subject: Noise surveys for planning, COVID

Hi Laura

I am working on a scheme in Ancoats.

Based on current guidance from the Association of Noise Consultants/Institute of Acoustics, we are not able to undertake noise surveys at present due to not being able to get representative data due to lower vehicle movements. On a number of similar schemes in Manchester, and elsewhere, we have therefore used published noise surveys for other planning applications in the same area, as well as Nationwide published noise maps from the Extrium website. As far as we are aware, Manchester City Council are happy with this approach (we have had no comments to say otherwise).

I am therefore just writing to check that you are happy with this approach.

If you have any queries or comments, please call or email.

Thanks, regards



Ben

Ben Tomlin
Principal Acoustic Consultant



www.dbxacoustics.com : T: 0161 711 0320 : E: ben@dbxacoustics.com

p.s. Like what we do? Please leave us a review! <https://sotellus.com/r/dbx-acoustics/>

This email and any files transmitted with it are confidential and intended solely for the use of the individual or entity to whom they are addressed.

If you have received this email in error, please notify the system manager.

The full text of the Council's email disclaimer is available at www.manchester.gov.uk/emaildisclaimer.

Your personal data is very important to us. Please refer to our privacy notice

at www.manchester.gov.uk/privacy for further information.

This footnote also confirms that this email message has been swept for the presence of computer viruses.

This email and any files transmitted with it are confidential and intended solely for the use of the individual or entity to whom they are addressed.

If you have received this email in error, please notify the system manager.

The full text of the Council's email disclaimer is available at www.manchester.gov.uk/emaildisclaimer.

Your personal data is very important to us. Please refer to our privacy notice

at www.manchester.gov.uk/privacy for further information.

This footnote also confirms that this email message has been swept for the presence of computer viruses.

Signature: Joseph Tony
Joseph Tony (Oct 24, 2022 09:51 GMT+1)

Email: joseph@dbxacoustics.com



21002 Ancoats Dispensary - Stage 4 Acoustic Design R04E

Final Audit Report

2022-10-24

Created:	2022-10-24
By:	Ben Tomlin (ben@dbxacoustics.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAA_xtpsJ7o4CO4KiHzhagwfj21uzmt1wOU

"21002 Ancoats Dispensary - Stage 4 Acoustic Design R04E" History

 Document created by Ben Tomlin (ben@dbxacoustics.com)

2022-10-24 - 8:50:42 AM GMT

 Document emailed to joseph@dbxacoustics.com for signature

2022-10-24 - 8:51:04 AM GMT

 Email viewed by joseph@dbxacoustics.com

2022-10-24 - 8:51:18 AM GMT

 Signer joseph@dbxacoustics.com entered name at signing as Joseph Tony

2022-10-24 - 8:51:52 AM GMT

 Document e-signed by Joseph Tony (joseph@dbxacoustics.com)

Signature Date: 2022-10-24 - 8:51:54 AM GMT - Time Source: server

 Agreement completed.

2022-10-24 - 8:51:54 AM GMT



Adobe Acrobat Sign