Azymuth Acoustics UK

Professional Acoustic Services

RIBA Stage 4
Acoustic Design Review
Ref:Z8999

Land West of Barnhill Street
Manchester,
M14 4TE

On behalf of

Caddick

Chepstow House,

Trident Business Park,

Warrington,

WA3 6BX





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Contents

1.0 Introduction 4
2.0 Design / Assessment Criteria 5
2.1 British Standard 8233:2014 5
2.2 World Health Organisation Environmental Guidelines (ENG) 2018 5
2.3 Internal Acoustics and Sound Insulation 6
3.0 External Building Envelope 9
3.1 NIA Recommendations 9
3.2 External Walls 12
3.3 Roof 12
4.0 Separating Elements 13
4.1 Separating Walls (party walls) 13
4.2 Separating walls (communal) 15
4.3 Separating Floors 16
4.4 Internal Walls 18
4.5 Junction Details 18
4.6 Internal Doors 19
4.7 Electrical Sockets 19
4.8 Notes on Workmanship 19
5.0 Reverberation Control 20
5.1 Reverberation Control in Corridors 20
6.0 Summary 23
7.0 Design Checklist 24
Appendix A – Glossary of Acoustic Terms 25
Appendix B – Documents Reviewed by Azymuth 26

1.0 Introduction

Azymuth Acoustics UK (henceforth Azymuth) has been contracted by Caddick Construction / MSV Housing to perform a Acoustic Design Report in relation to a new build development site located at the land West of Barnhill Street, Manchester. The development shall consist of 2no. housing blocks(A and B).

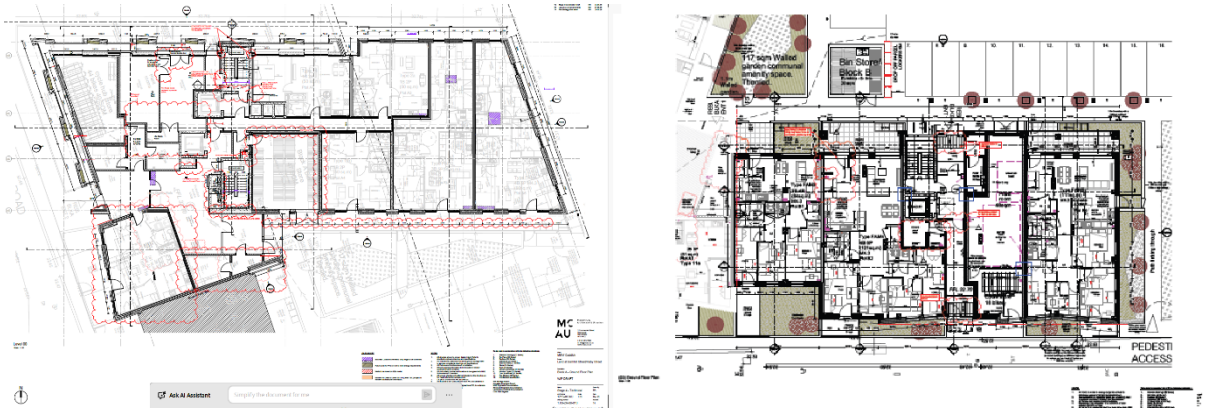


Figure 1 – Ground floor plan of proposed block A and B

The site is adjacent to both the Heineken factory to the north and the West Indian Sports & Social Club (WISSC) which is located to the east of the site.

An initial planning stage Noise Impact Assessment (NIA) was undertaken by Azymuth in 2023 and has been most recently updated in October 2025.

Azymuth NIA report ref: Z58999 Land at Barnhill Street/Raby Street Manchester NIA Report – 28102025

2.0 Design / Assessment Criteria

In order to assess the extent of any measures required in order to comply with suitable conditions relating to potential noise sources, Azymuth has reviewed various guidance documents and standards, these include:

- British Standard 8233:2014
- World Health Organisation Environmental Guidelines (ENG) 2018
- Approved Document E

2.1 British Standard 8233:2014

BS 8233 provides a code of practice for the sound insulation of a variety of building types affected by general environmental noise. It provides recommendations for control of noise in and around buildings and suggests appropriate internal ambient noise level criteria / limits for a variety of different situations.

The following table summarises the noise limits suggested by BS 8233 applying to residential properties:

Activity	Room	Good Design Range $L_{Aeq,\,T}$ dB	
		07:00-23:00hrs	23:00-07:00hrs
Resting	Living rooms	35	-
Dining	Dining room / area	40	-
Sleeping (daytime resting)	Bedroom (at night)	35	30
Working	Office	35 – 40	-

Table 1 - Noise Limits for Residential Properties Suggested in BS 8233

2.2 World Health Organisation Environmental Guidelines (ENG) 2018

The main purpose of the 2018 WHO guidelines is to provide recommendations for protecting human health from exposure to environmental noise originating from the following sources: transportation (road traffic, railway and aircraft), wind turbines and leisure activities.

The guidelines set out to define recommended exposure levels for environmental noise in order to protect population health. Exposure limits are average levels defined over a period of one year, measured outdoors in free field at the most exposed façade. It should be noted that the document does not provide guideline limit values for multiple noise sources in combination.

The 2018 guidelines supersede the Community Noise Guidelines from 1999. Nevertheless, the document recommends that all CNG indoor guideline values and any values not covered by the current guidelines should remain valid. As such, the following guidance would remain appropriate:

For protection against sleep disturbance inside dwellings, night-time noise levels should not exceed 30dB L_{Aeq} for continuous noise and 45dB L_{Amax} for single sound events.

To protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady, continuous noise (interpreted as noise from all sources combined) should not exceed 55dB L_{Aeq} on balconies, terraces and in outdoor living areas.

It should be noted that exposure levels defined in ENG and CNG are for guidance purposes as relates potential adverse health impacts and should not be interpreted as absolute limits or regulations.

2.3 Internal Acoustics and Sound Insulation

2.3.1 Building Regulations Requirement E1 – Separating Elements

Table 2 below contains the requirements for separations between dwelling houses and flats as recommended by Building Regulations Approved Document E (henceforth ADE). The table gives the minimum $D_{nt,w} + C_{tr}$ (on-site measurement) required for airborne sound insulation (walls and floors) and the maximum L'_{nTw} required for impact sound insulation (floors only).

Separating Surface	Minimum $D_{nT,w} + C_{tr}$ (dB)	Maximum Impact Level $L'_{nT,w}$ (dB)
Wall	45	N/A
Floor	45	62

Table 2 – ADE airborne and impact sound insulation requirements for separating walls and floors.

2.3.2 Employers Requirements – Separating Elements

Azymuth understands that the employer requires a 5dB uplift on building regulations targets. The table below identifies the minimum required performance for airborne sound insulation (walls and floors) and the maximum L'_{nTw} required for impact sound insulation (floors only).

Separating Surface	Minimum $D_{nT,w} + C_{tr}$ (dB)	Maximum Impact Level $L'_{nT,w}$ (dB)
Wall	50	N/A
Floor	50	57

Table 3 – Employers airborne and impact sound insulation requirements for separating walls and floors.

2.3.3 Building Regulations Requirement E2 – Internal Sound Insulation

Below in Table 4 is the minimum laboratory airborne sound insulation values for internal walls between a bedroom or room containing a water closet and all internal floors in dwelling houses and flats.

Separating Surface	Minimum R_w (dB)
Wall (internal wall)	40
Floor (internal floor)	40

Table 4 – ADE Airborne sound insulation for internal walls in dwelling flats and houses.

2.3.4 Employers Requirements – Internal Sound Insulation

The table below identifies the minimum employers' requirements required for airborne sound insulation values for internal walls between a bedroom or room containing a water closet and all internal floors in dwelling houses and flats.

Separating Surface	Minimum R_w (dB)
Wall (internal wall)	45
Floor (internal floor)	45

Table 5 – Employers airborne sound insulation requirements for internal walls in dwelling flats and houses.

2.3.5 Building Regulations Requirement E3 – Reverberation in Common Areas

Requirement E3 of Building Regulations states that:

"The common internal parts of buildings which contain flats or rooms for residential purposes shall be designed and constructed in such a way as to prevent more reverberation around the common parts than is reasonable."

To achieve compliance with this requirement, targets are laid out in Section 7 of Building Regulations Approved Document E. In section 7, targets for the amount of additional absorption that should be used in corridors, hallways, stairwells and entrance halls that give direct access to flats can be determined via two different methods.

In section 7 corridors or hallways are defined as:

"A space for which the ratio of the longest to the shortest floor dimension is greater than three."

Entrance halls are defined as:

"A space for which the ratio for which the longest to the shortest floor dimension is three or less."

In Method A, a specified area is covered with absorbent material of a specific class.

In entrance halls, corridors or hallways an area equal to or greater than the floor area must be covered with a Class C absorber or better.

For stairwells or stair enclosure, the combined area of:

- The stair treads
- The upper surface of the intermediate landings,
- The upper surface of the landings (excluding the ground floor)
- The ceiling area

is calculated. An area equal to this must be covered with a Class D absorber, or an area equal to 50% of this area must be covered in Class C or better.

In Method B, an amount of absorbent area is required per cubic metre of volume. This absorption area is calculated in octave bands from 250 to 4000Hz inclusive.

The targets below reference total absorption area. This is defined as:

"The hypothetical area of a totally absorbing surface, which if it were the only absorbing element in the space would give the same reverberation time as the space under consideration."

For entrance halls that give access to flats, a minimum of 0.2m^2 of total absorption area per cubic metre of volume is required.

For corridors or hallways that give access to flats, a minimum of 0.25m^2 of total absorption area per cubic metre of volume is required.

The additional material required to meet the target in method B should be distributed over the available surfaces.

Method B is not suitable for stairwells or stair enclosures.

2.3.6 Planning Condition 22(a)

Notwithstanding the Noise report submitted with the application, prior to any above ground works a noise insulation and ventilation scheme for acoustically insulating the residential accommodation against any external and internal noise sources, together with details of the performance of any glazing, shall be submitted to and approved in writing by the Local Planning Authority. The noise insulation and ventilation scheme shall take the potential for overheating into account. Noise survey data shall include measurements taken during a rush-hour period and nighttime to determine the appropriate sound insulation measures necessary. The following noise criteria shall be achieved when providing adequate ventilation as defined by Approved Document F of the Building Regulations (whole dwelling ventilation):

-Bedrooms (nighttime - 23.00-07.00) 30 dB L_{Aeq} (individual noise events shall not exceed 45 dB L_{AFmax}, by more than 15 times) -Living Rooms (daytime - 07.00-23.00) 35 dB L_{Aeq}

The development shall then be carried out in accordance with the approved noise insulation and ventilation scheme

3.0 External Building Envelope

In line with planning condition 22a Azymuth has undertaken a noise impact assessment covering all time periods listed the full results can be found in:

Azymuth NIA report ref: Z58999 Land at Barnhill Street/Raby Street Manchester NIA Report – 25102025

3.1 NIA Recommendations

The below recommendations have been taken from the NIA undertaken by Azymuth and revised in October 2025. These recommendations will satisfy Planning condition 22a. This is due to the recent receipt of the elevation drawings with facades requiring a higher level of insulation if consisting mostly of floor to ceiling windows (glass).

Azymuth NIA report ref: Z58999 Land at Barnhill Street/Raby Street Manchester NIA Report – 25102025

Specifications have been colour coded relating to Figure 2.

3.1.1 Glazing

The table below outlines the glazing specifications Azymuth would recommend in order to achieve the target indoor ambient noise levels. The recommendations are colour coded with reference to Figure 2.

Location (Habitable Spaces)	Glazing Specification	Current Glazing Spec	Complaiant (Y/N)
Princess Road elevation and on Moss Lane East within 40m of Princess Road junction	High quality glazing system certified to provide min. **48dB R_W** and **41dB R_W+C_{tr}**	13.5mm/24mm cavity/ 8.8mm Lamiglass (NorDan) to achieve **51dB R_W** and **44dB R_W+C_{tr}**	Y
Moss Lane East elevation	High quality glazing system certified to provide min. **43dB R_W** and **36dB R_W+C_{tr}**	9.5mm/20mm cavity/ 12.8mm Lamiglass (NorDan) to achieve **44dB R_W and 36dB R_W+C_{tr}**	Y
All other elevations	Thermal double glazing system to provide min. **40dB R_W** and **33dB R_W+C_{tr}**	9.5mm Lamiglass(PVB) /16mm cavity/ 6mm Floatglass (NorDan) to achieve **39dB R_W and 34dB R_W+C_{tr}**	Y

Table 6 – Azymuth recommended glazing specification for the proposed site

Azymuth has reviewed the manufacturer's (NorDan's) data sheets for the glazing specifications and agrees they are satisfactory for use on site.

3.1.2 Ventilation

Table 12 outlines the recommended ventilation that should be paired with the glazing specifications to ensure the appropriate sound insulation targets are met. With reference to the AVO and ProPG guidance, Azymuth recommends the following ventilation specifications to ensure sufficient air flow to dwellings whilst also achieving internal noise level targets.

Specifications apply to whole dwellings that have any single elevation that faces onto any of the mentioned roads.

The recommendations are colour coded with reference to Figure 3.

Location (Habitable Spaces)	Ventilation Specification	Current Ventilation Types	Complaiant (Y/N)
Dwellings with Princess Road and Moss Lane East Elevations	System 4 MVHR with boost function. Windows closed night-time and very limited opening times daytime (see below)	No trickle vents. Any air inlets/outlets for MVHR should be appropriately attenuated.	Y
Dwellings with elevations facing only onto (former) Barnhill Street	System 4 MVHR or System 3 with acoustically rated trickle vents or air-bricks rated at min. 38dB D_{new}	Where needed Titon TALH&M '9x6' Acoustic AirLiner (achieves up to 40dB D_{new}) or other similar acoustic vents	Y

Table 7 – Azymuth recommended ventilation specification for the proposed site

TWC Consulting has confirmed that openable windows can be used for specific hours of the days in August below is the summary of their data.

- Open windows for short periods during the day, up to a maximum of 2hours 40mins per day in August as the worst affected month.
- Keep windows closed at night-time
- This info covers West façade only and clarity needed on the other façade orientations.

Based on the over-heating calculations carried out by the energy assessor a ventilation strategy has been developed which satisfactorily addresses the Approved Document O over-heating / noise related issues (assuming windows being closed for the majority of the daytime and night-time periods on the Princess Road and Moss Lane East elevations which experience the higher levels of noise). Ventilation on worst-affected elevations shall be via boosted mechanical ventilation rates to satisfy Approved Document O.

In terms of the calculated entertainment noise levels (on Barnhill Street elevation) windows would generally remain closed at night to manage noise, although this is not necessarily every night and would only be applicable during nights where there are amplified music events on at the WISSC.

Azymuth understands that dwellings with elevations facing onto Barnhill Street are likely to be installed with MVHR units which would be more than acceptable to mitigate the effects of both noise and overheating.

3.1.3 Mitigation Specifications

The following sketch summarises the recommended glazing and ventilation specifications for the proposed scheme (applicable to dwellings on all relevant floor levels):

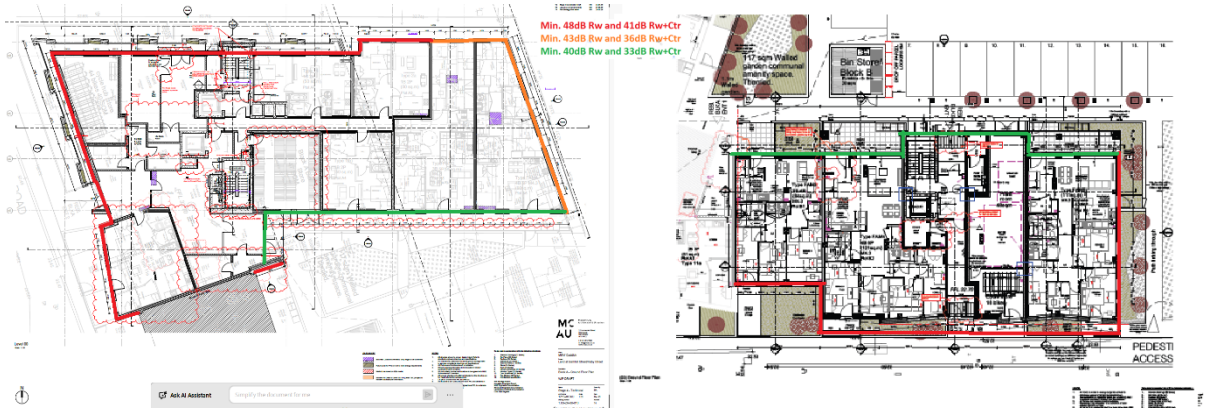


Figure 2 – Glazing Specifications for blocks A and B (all habitable floor levels)

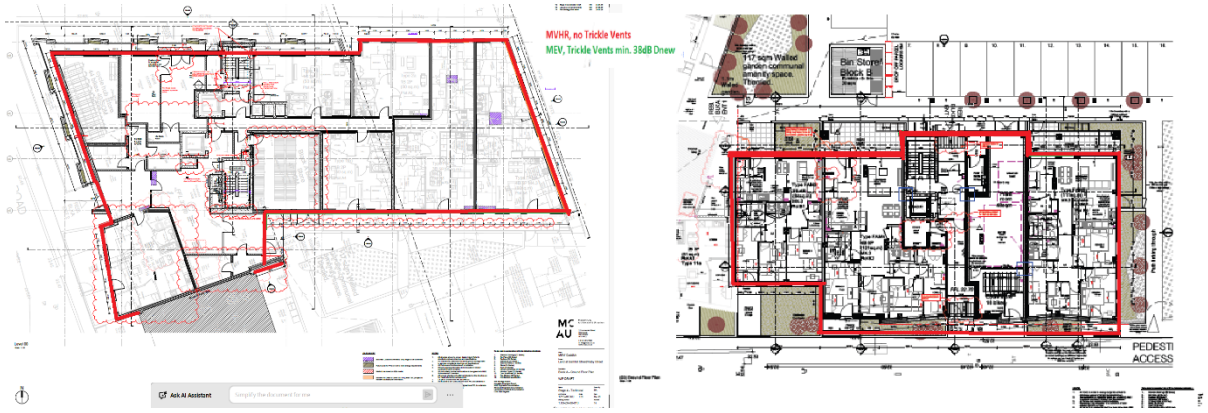


Figure 3 – Ventilation Specifications for blocks A and B (all habitable floor levels)

3.2 External Walls

External Walls: minimum sound insulation 58dB R_W.

The proposed External wall construction is as follows:

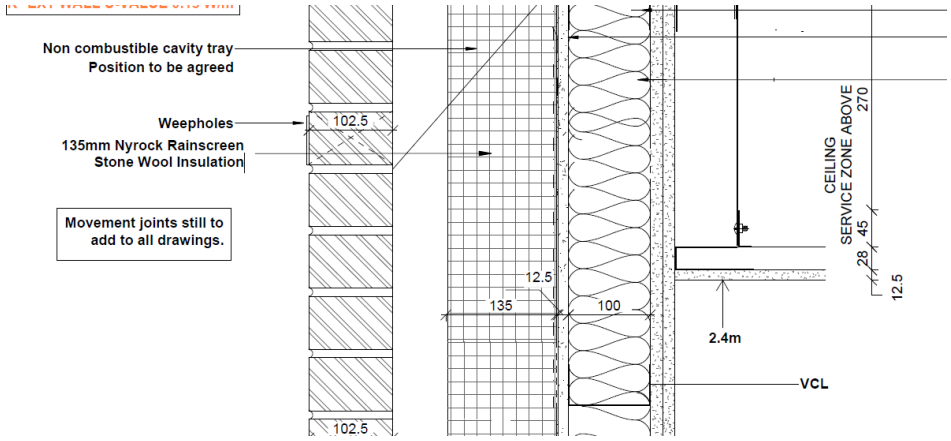


Figure 4 – External wall construction

The external wall taken from drawing T-A-21-013 will comply with the Rw 58dB rating with wall.

3.3 Roof

Roof: minimum sound insulation 50dB R_W.

Azymuth have reviewed the roof details in:

- 1215-MCAU-T.04-ZA-112-T1-Block A - Section's D-D - Flat Roof Details 1
- 1215-MCAU-T.04-ZB-110-T1 Block B - Fifth Floor Roof Terrace Sections
- 1215-MCAU-T.04-ZB-111-T1 Block B - Green Roof & First Floor Warm Roof Sections
- 1215-MCAU-T.27-ZB-101-T1 Roof Terrace Technical Details
- 1215-MCAU-T.27-ZB-102-T1 Green Roof Technical Details
- 1215-MCAU-T.27-ZB-103-T1 Warm Roof to First Floor Technical Details
- 1215-MCAU-T.27-ZB-105-T3 - Ballast Roof - Details.pdf

Azymuth has calculated that all roof's (Concrete, Green and warm) will exceed the 50dB R_w set out by the scheme.

4.0 Separating Elements

4.1 Separating Walls (party walls)

All walls separating dwellings should have a minimum airborne sound insulation of 50dB $D_{nTw}+C_{tr}$ (~57dB R_w+C_{tr}) as per ADE plus 5dB to meet the employers requirements. Azymuth would recommend a target rating of 53dB $D_{nTw}+C_{tr}$ (~60dB R_w+C_{tr}) to ensure that no walls fail any pre-completion tests or fail to meet the employers requirements.

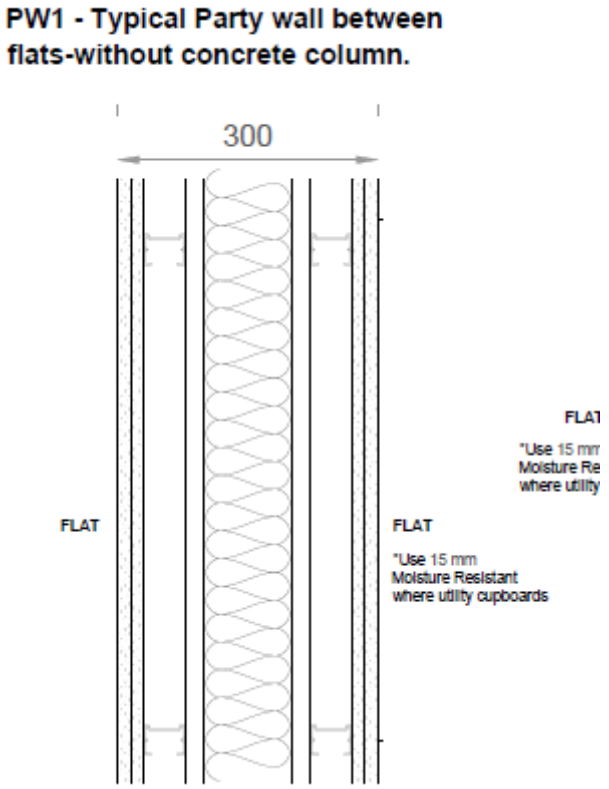


Figure 5 – Example Party wall construction

Azymuth anticipates that the proposed party wall construction shall achieve a minimum airborne sound insulation rating of 50-51dB $D_{nTw}+C_{tr}$ (~57-58dB R_w+C_{tr}).

Azymuth understands the wall build up to be as follows:

- 2 layers of 15mm Gyproc SoundBloc plasterboard fixed with British Gypsum screws at 300mm centres
- Gypframe 'C' studs fixed through board to stud with British Gypsum screws at 600mm centres
- 200mm centres at external angles
- Two lines of Gypframe 'C' studs at specified centres Cross-braced with Gypframe 99 FC 50 Fixing Channels at 1200mm centres
- 100mm Isover insulation
- 2 layers of 15mm Gyproc SoundBloc plasterboard fixed with British Gypsum screws at 300mm centres

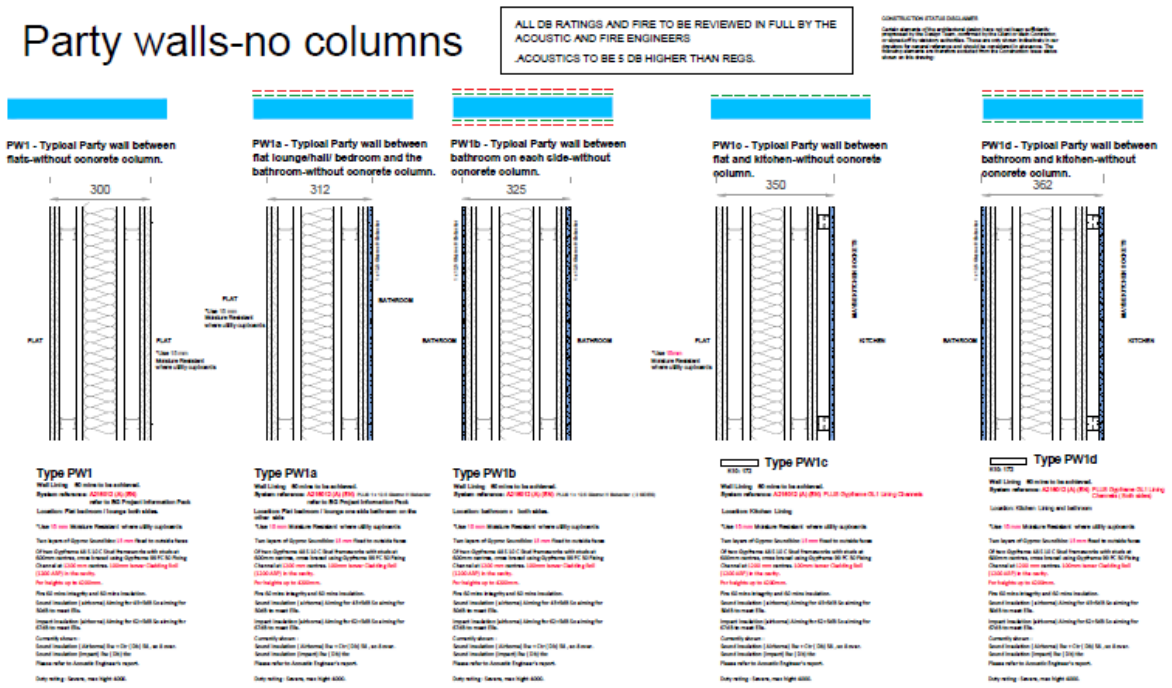


Figure 6 – Party wall construction without columns

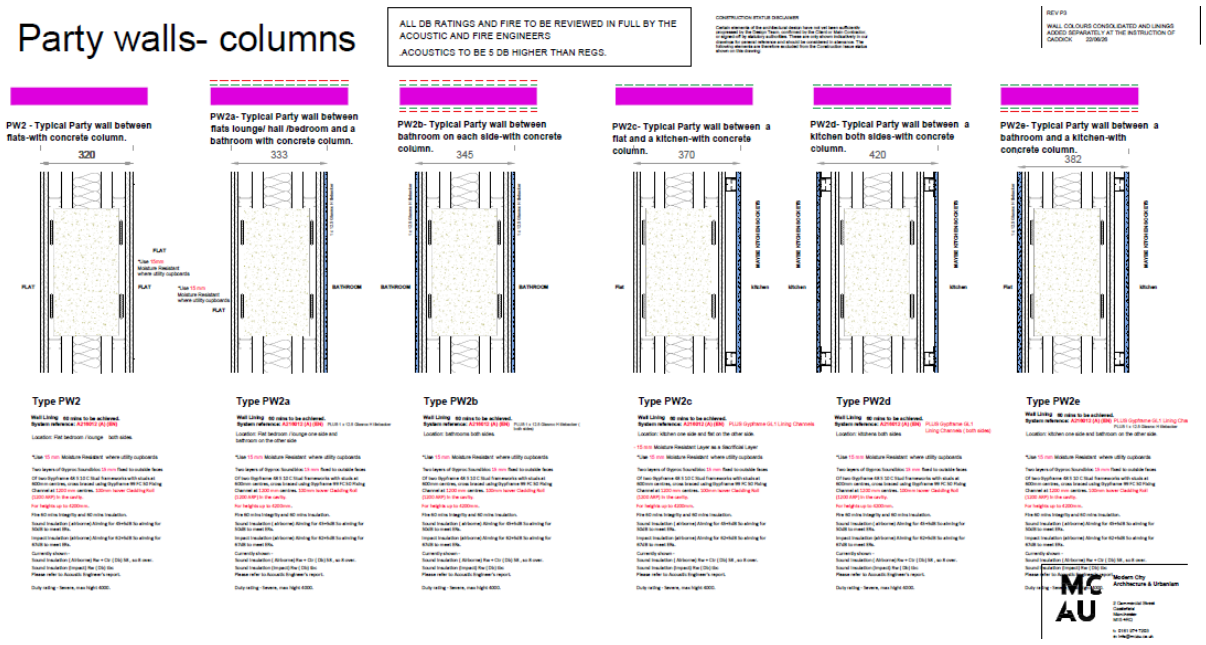


Figure 7 – Party wall construction with columns

Azymuth expects all party walls in figure 6/7 to comply with the target of 50-51dB $D_{nTw}+C_{tr}$

4.2 Separating walls (communal)

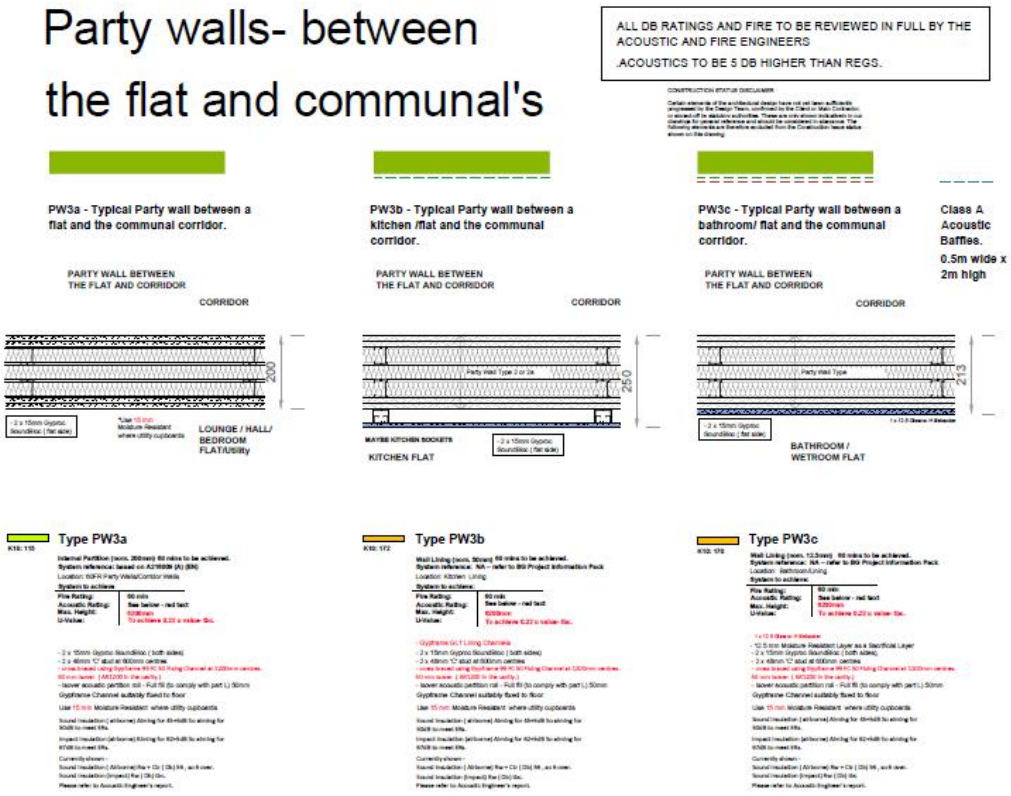


Figure 8 – Party to communal wall construction

The flat to communal wall partitions taken from drawing 22-12-BLKABCDE-DETAILS will meet the Approved Document E target of 45dB $D_{ntw}+C_{tr}$ between flats and communal spaces. Azymuth estimates these walls to achieve 50 $D_{nTw} + C_{tr}$.

4.3 Separating Floors

All floors separating dwellings should have a minimum airborne sound insulation of 50dB $D_{nTw}+C_{tr}$ (~57dB R_w+C_{tr}) as per ADE plus 5dB to meet the employers requirements. Azymuth would recommend a target rating of 53dB $D_{nTw}+C_{tr}$ (~60dB R_w+C_{tr}) to ensure that no floors fail any pre-completion tests or fail to meet the employers requirements.

Azymuth has reviewed the party floors between apartments the part floor build up is as follows:

- Rugupol 4.5mm
- 225mm concrete slab
- 353mm ceiling void
- Ceiling void to be lined with 50mm Isowool
- 12.5mm plasterboard on MF system

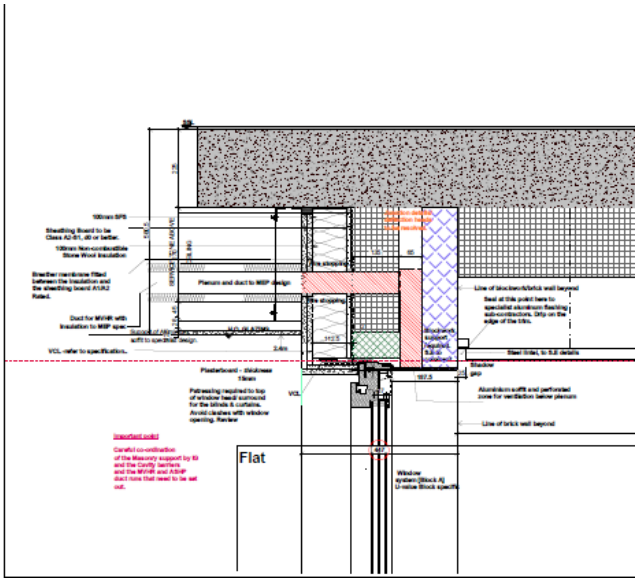


Figure 9 – Party floor detail

Other Details for the party floors are listed below it is important to note that the regupol 4.5mm thick listed in section 4.3.2 of this report is necessary to comply with insulation testing requirements.

- Slab Thickness confirmed as 225mm
- Acoustic Matting (Regupol) will be required to ensure compliance to all areas (with the exception of the bathroom) even where floor finishes are currently not included.
- Bathroom shower room slab recess – slab thickness 175mm.

4.3.1 Floor Airborne sound insulation

The concrete floor will need to be underdrawn with 1 layer 12.5mm Fireline or Wallboard suspended with a nominal 175mm or larger ceiling void, lined with 50mm Isowool.

- Azymuth understands that we are working to Approved Document E +5dB uplift (as a project specific target). This implies $D_{ntw}+C_{tr}$ 50 dB as the minimum field test will be required at completion.

- The basic concrete floor with a 12.5mm (say wallboard) MF ceiling below will result in a sound insulation of $D_{ntw}+C_{tr}$ ~44-50dB, ie just about complying with Approved Document E, but not the 5dB uplift.
- With the inclusion of 50mm Isowoool we would anticipate a field test performance in the range $D_{ntw}+C_{tr}$ 50-56dB, so just about complying with the +5dB uplift. However, even with this inclusion of the 50mm Isowool there will still be a relatively significant need to ensure very consistent levels of workmanship and minimising sound flanking or leakage paths.
- Azymuth also recommends the inclusion of the regupol listed below (floor impact sound insulation).

4.3.2 Floor impact sound insulation

Azymuth recommends the inclusion of a 4.5mm Acoustic layer bonded to the subfloor prior to installing any floor finishes as recommended below.

- REGUPOL sonus multi 4.5mm

https://acoustics.regupol.com/products/range/regupol-sonus-multi/regupol-sonus-multi-45/

or Equivalent

NB it is very important to ensure that there are no gaps between the resilient layer and the concrete/screed below, in addition to this before any screed is poured it should be ensured that all edges are properly taped and sealed with the recommended details. Any gaps where screed may breach the resilient layer shall promote noise transmission and shall likely result in noise levels in the dwellings below that would exceed the maximum building regulations target upon the pre-completion testing of impact sound insulation.

4.4 Internal Walls

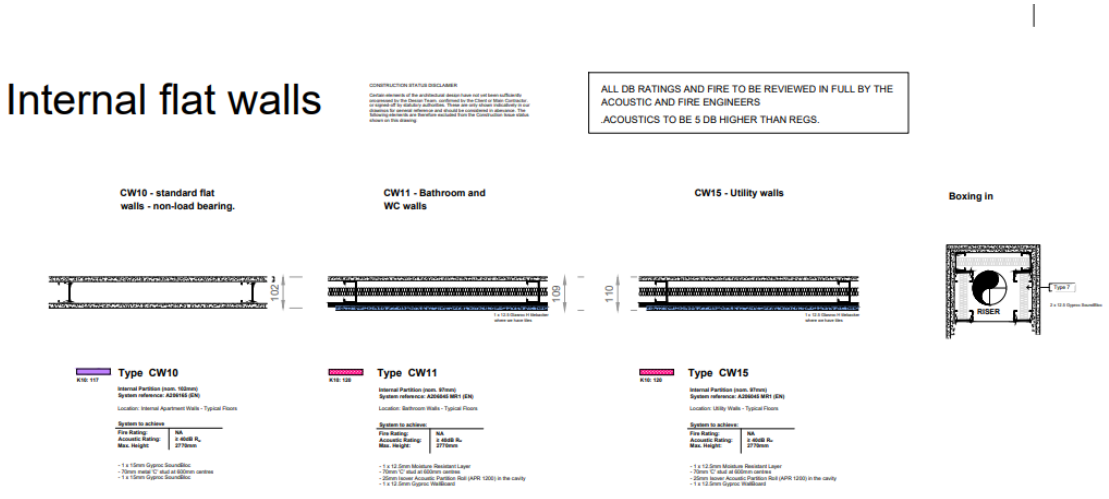


Figure 10 –internal wall construction

Azymuth has reviewed the Internal walls within dwellings and believe they should be meet a minimum acoustic rating of 45dB R_w subject to craftmanship.

4.5 Junction Details

In general, junctions created where two separating partitions simply meet, and one abuts the other are unsatisfactory for acoustic partitions. This is due to the possibility of flanking through the join and/or gaps developing along the junction. Thus, care will be required during the construction phase to ensure that detailing at junctions avoids such issues but instead ensures that plasterboard (or other drylining boards) are interleaved so as to avoid simple butt joints.

Azymuth has reviewed the junctions for the proposed site a list has been compiled to identify the some junctions that may need additional details or should be revisited at RIBA stage 5 of this site.

- T.22-ZB-ZZ-002 – SVP/RWP penetration details – Satisfactory
- T.25-ZB-ZZ-001 – Proposed lift details – Broadly satisfactory, however more detail may be needed.
- 1215-MCAU-T-35-001-T1 – Ceiling details need to include mineral wool as agreed.
- 1215-MCAU-T.22-XX-105-T1 - Wall Junction Details [1-of-XX] – generally satisfactory / additional details expected during RIBA Stage 5.

4.6 Internal Doors

Azymuth has reviewd the door schedule and believes the entrance to flats door to be:

- American Oak door- PAS 24 Doors. FD30S with Acoustic seals fire and smoke seals- 44mm thick doors, 30min resistant door set.

This will meet the minimum requirement for internal doors at R_W 32dB.

4.7 Electrical Sockets

To maintain the levels of insulation required, any electrical sockets in partitions must include either acoustic back boxes, putty pads or two or more layers of gypsum-based board (nominal mass per unit area 22kg/m_2) enclosing the socket box. In addition to this, sockets placed on opposite sides of a partition must also be staggered at least 150mm, so they are not placed directly opposing each other to reduce sound transmission.

Azymuth understands that double skim plaster boards are being used for the site this will be satisfactory to maintain the levels of insulation between flats.

4.8 Notes on Workmanship

All quoted sound insulation values are subject to good workmanship and general practices throughout. Noise control measures can fail to perform as required if they are not installed as the manufacturer/designer has intended. Minor deviations from designs may appear unimportant but may have serious implications in relation to noise control. Good working practices are essential to achieve the target ratings.

5.0 Reverberation Control

This section details the additional absorption that would be required for corridors, hallways, stairwells and entrance halls that give access to any rooms for residential purposes in order to achieve suitable reverberation times (RTs) in the common areas of the apartment blocks.

For each space, a minimum area of a specific absorption class is required. Usually this is achieved via an acoustic ceiling treatment such as ceiling tiles (as above). Wall mounted absorbers can also be implemented to achieve the required areas.

5.1 Reverberation Control in Corridors

Method B (of Building Regs requirement E3) has been employed for the reverberation control in corridors. It has been assumed that all the corridors to apartments are carpeted.

For corridors that give direct access to flats and rooms for residential purposes an area equal to or greater than the floor area should be covered with a Class A absorber (Wall panels/ Baffles) these Areas have been calculated below:

Block A

- Ground Floor Space A requires 2.5m^2 of acoustic absorption distributed evenly
- Ground Floor Space B requires 2.9m^2 of acoustic absorption distributed evenly

- Floors 1-5 Space A requires 1.8m^2 of acoustic absorption distributed evenly
- Floors 1-5 Space B requires 1.2m^2 of acoustic absorption distributed evenly
- Floors 1-5 Space C requires 3.4m^2 of acoustic absorption distributed evenly

- Floors 6-9 Space B requires 1.2m^2 of acoustic absorption distributed evenly
- Floors 6-9 Space C requires 1.2m^2 of acoustic absorption distributed evenly

Block B

- Ground Floor = Not Applicable
- Floors 1-4 Space A requires 3m^2 of acoustic absorption distributed evenly
- Floors 5 Space B requires 2.4m^2 of acoustic absorption distributed evenly

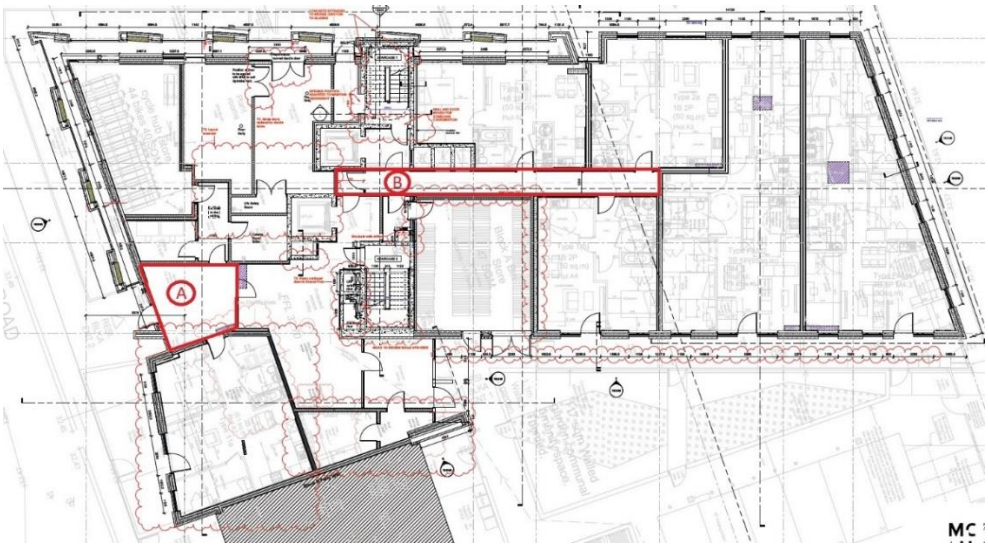


Figure 11 – Corridors marked up for where treatment is needed for ground floor Block A

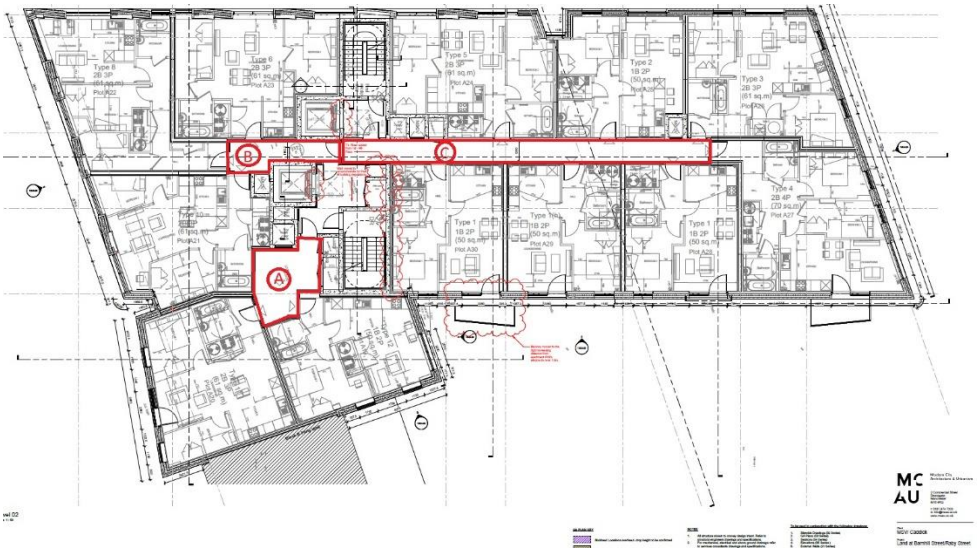


Figure 12 – Corridor marked up for where treatment is needed for floors 1-5 Block A

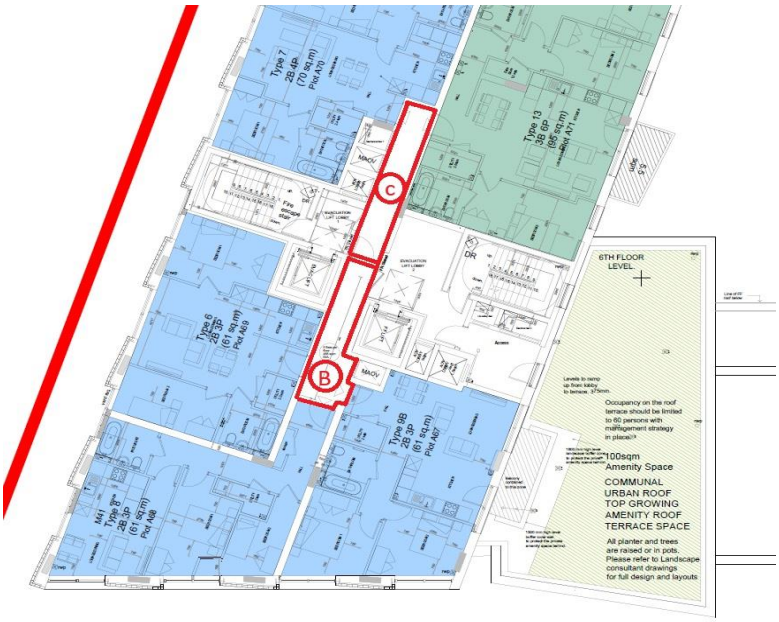


Figure 13 – Corridor marked up for where treatment is needed for floors 6-9 Block A

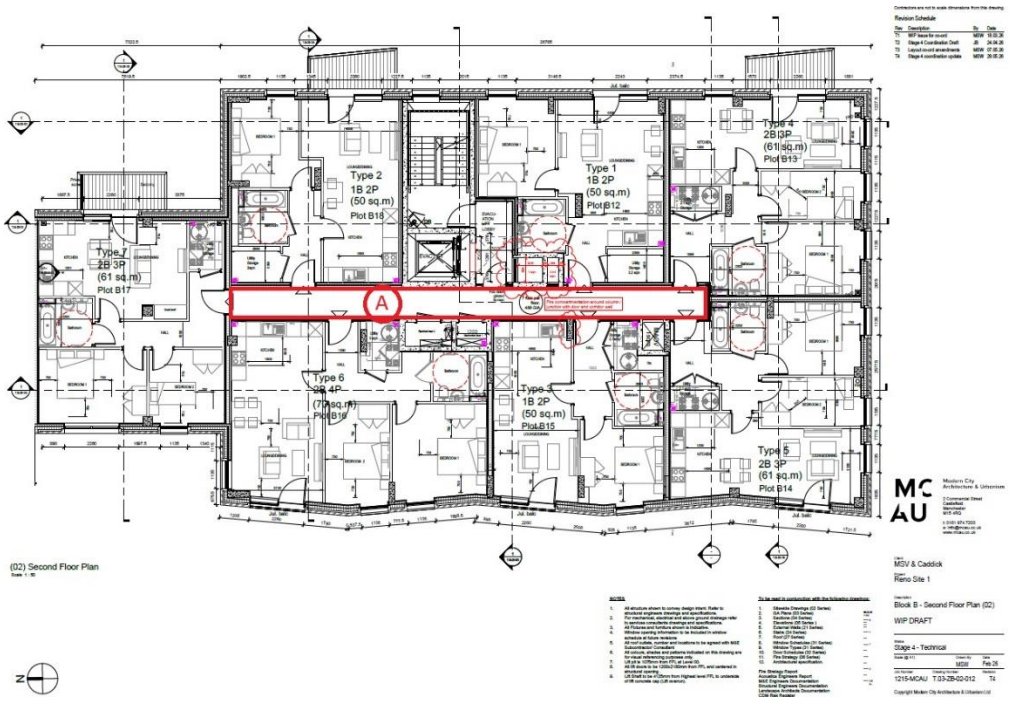


Figure 14 – Corridor marked up for where treatment is needed for floors 1-4 Block B

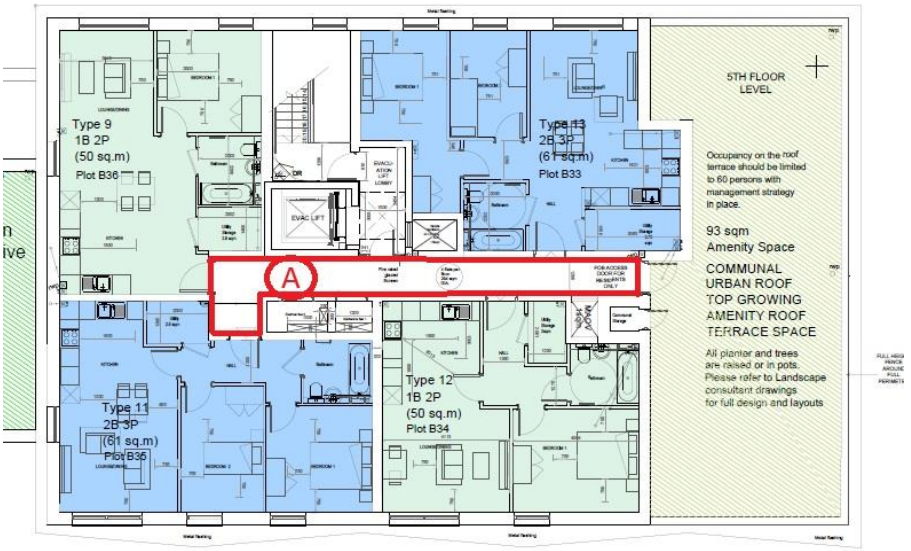


Figure 15 – Corridor marked up for where treatment is needed for floor 5 Block B

6.0 Summary

Azymuth has undertaken an acoustic design review for the proposed residential development to be located on MSV-Reno Site 1, Manchester.

Azymuth has reviewed:

- External buidling fabric including glazing, walls and roof (Section 4.0) and are compliant with current drawings provided.
- Proposed separating walls, floors, internal walls, junction details and internal doors (Section 5.0) Floor and internal wall more information is needed in these areas for Azymuth to suitably review.
- Requirements for reverberation control in common areas of the development (Section 6.0) compliant with ceiling treatment installed.

7.0 Design Checklist

Section Headings	Subheadings	Status / Progress	Findings / Compliance
External Building Envelope	NIA Recommendations (primarily glazing and apartment ventilation systems)	Incorporated specifications from previously issued NIA provided in Section 3.1	NorDan data sheet info Compliant
	External Walls	Reviewed external wall constructions in Section 3.2	Compliant
	Roof	Reviewed roof constructions in Section 3.3	Compliant
Separating Elements	Separating Walls	Reviewed in Section 4.1	Compliant
	Separating Floors	Reviewed in Section 4.3	inclusion of 50mm Isowool recommended 4.5mm Regupol recommended to achieve Impact Sound requirements
	Internal Elements	Reviewed in Section 4.4	Compliant
	Junction Details	Reviewed all provided junction details to date in Section 4.5	Compliant with changes suggested in this report. Some additional details still needed.
Reverberation Control	Corridors	Reviewed areas requiring additional absorption in Section 5.1	Compliant with acoustic treatment in corridors.

Table 8 – Acoustic design checklist

Appendix A – Glossary of Acoustic Terms

Decibel (dB)
This is the unit used to measure sound. The human ear has an approximately logarithmic response to acoustic pressure over a very large dynamic range (typically 20 micro Pascal to 100 Pascal).

dB (A)
This is a measure of the overall noise level of sound across the audible spectrum with a frequency weighting (i.e. A-weighting) to compensate for the sensitivity of the human ear to sound of different frequencies. The A-weighting curve is implemented in sound level meters using an electronic filter that approximately corresponds to the frequency response of the ear.

Octave Band Noise Level
The human ear is sensitive to sound over a range of frequencies between approximately 20Hz to 20kHz. The ear is also generally more sensitive to medium and high frequencies than to low frequencies. In order to define the frequency content of a noise, the spectrum can be divided into frequency bands. The most commonly used frequency bands are octave bands, in which the mid-frequency of each band is twice that of the band below it.

L_{Aeq}
This is the equivalent steady sound level in dB (A) containing the same acoustic energy as the actual fluctuating sound level over a given time period.

Reverberation Time (RT or sometimes T_{30} or T_{60})
This is the time taken for the reverberant sound energy in an enclosure to decay one millionth of its equilibrium value, i.e. by 60dB, after the source has been switched off, is known as the reverberation time. The reverberation time is frequency dependent and it is customary to measure its value in octave or one-third octave bands. Reverberation occurs when sound waves are repeatedly reflected from each surface of the room.

Sound Reduction Index (SRI)
Difference measured between the amount of energy flowing towards the wall in the source room and the total amount of energy entering the receiving room (usual range 100 - 3150 Hz for one third octave band values). The SRI varies with frequency and is measured in a laboratory in either octave or one-third octave bands.

SRI = L1 - L2 + 10 log (S/A), where:

L1 = Noise level in the source room
L2 = Noise levels in the receiving room
S = Surface area of test specimen
A = Equivalent acoustic absorption area in the receiving room

Weighted Sound Reduction Index (R_w)
This is a weighted single figure descriptor of the sound insulation performance of a partition measured under laboratory conditions. The procedure used to quantify the R_w is to compare the sound reduction index (SRI) in each of the one-third octave bands from 100Hz to 3150Hz against a set of standard reference curves.

Appendix B – Documents Reviewed by Azymuth

Azymuth have reviewed the following documents while issuing acoustic design advice for the development:

1215-MCAU-T.22-XX-102-T1 - Generic Partition Details Twin Stud
1215-MCAU-T.22-XX-103-T1 - Generic Partition Details Single Stud
1215-MCAU-T.22-XX-105-T1-Wall Junction Details [1-of-XX]
1215-MCAU-T.22-ZA-104-T1 - Partition Details - Party Walls
1215-MCAU-T.22-ZA-XX-030-T1-Typical Pattressing Locations and details Sheet 01
1215-MCAU-T.22-ZA-XX-031-T1-Typical Pattressing Locations and details Sheet 02
1215-MCAU-T.22-ZA-XX-106-T1-Internal Wall Types - Blocks A-E
1215-MCAU-T.34-ZA-XX-020-T1-Typical Balcony Type and Detail
1215-MCAU-T.34-ZA-XX-021-T1-Typical Juliet Balcony Details
1215-MCAU-T.35-ZA-00-001-T1-Block A - Ground Floor Ceiling Plan (00)
1215-MCAU-T.35-ZA-01-002-T1-Block A - First Floor Ceiling Plan (01)
1215-MCAU-T.35-ZA-05-006-T1-Block A - Fifth Floor Ceiling Plan (05)
1215-MCAU-T.35-ZA-06-007-T1-Block A - Sixth Floor Ceiling Plan (06)
1215-MCAU-T.35-ZB-00-001-T1 - Block B - Ground Floor Ceiling Plan (00)
1215-MCAU-T.35-ZB-04-005-T1 - Block B - Fourth Floor Ceiling Plan (04)
1215-MCAU-T.35-ZCD-00-001-T1 - Block C & D - Ground Floor Ceiling Plan (00)
1215-MCAU-T.35-ZCD-02-003-T1 - Block C & D - Typical Lower Ceiling Plan (02)
1215-MCAU-T.35-ZCD-04-005-T1 - Block C & D - Fourth Floor Ceiling Plan (04)
1215-MCAU-T.35-ZCD-05-006-T1 - Block C & D - Attic Ceiling Plan (05)
1215-MCAU-T.35-ZE-00-001-T1 Block E- Ground Floor Ceiling Plan (00)
1215-MCAU-T.35-ZE-02-003-T1 Block E-Typical Lower Ceiling Plan (02)
1215-MCAU-T.35-ZE-03-004-T1 Block E - Third Floor Ceiling Plan (03)
1215-MCAU-T.35-ZE-04-005-T1 Block E-Typical Attic Ceiling Plan (04)
1215-MCAU-T.31-910-T1 Block Entrance Elevations_DRAFT
1215-MCAU-T.31-SC-901-T1 Window Schedule 1-of-2_DRAFT
1215-MCAU-T.31-SC-902-T1 Window Schedule 2-of-2_DRAFT
1215-MCAU-T.31-SC-903-T1 Block A Window Schedule 1-of-1_DRAFT
1215-MCAU-T.31-SC-904-T1 Block A Window Schedule 2-of-2_DRAFT
1215-MCAU-T.31-SC-905-T1 Window & Door Schedule - Block F_DRAFT
1215-MCAU-T.32-SC-901-T1 External Door Schedule 1-of-2_DRAFT
1215-MCAU-T.32-SC-902-T1 External Door Schedule 2-of-2_DRAFT
1215-MCAU-03-00-P25 GF floor plan
1215-MCAU-03-01-P25 1F floor plan
1215-MCAU-03-02-P25 2f floor plan
1215-MCAU-03-03-P25
1215-MCAU-03-04-P25
1215-MCAU-03-05-P25
1215-MCAU-03-06-P25
1215-MCAU-03-07-P25
1215-MCAU-03-08-P25
1215-MCAU-03-09-P25
1215-MCAU-03-10-P25
1215-MCAU-C-05-07-P14
1215-MCAU-CD-05-06-P14
1215-MCAU-DE-05-11-P13
1215-MCAU-E-05-10-P15

1215-MCAU-E-05-12-P6
1215-MCAU-EF-05-13-P2
1215-MCAU-F-05-01-P17
1215-MCAU-T.04-ZB-103-T2 Block B - Section D-D - North Elevation
1215-MCAU-T.05-ZA-205-T1-Block A - Proposed Elevation Combined
1215-MCAU-T.05-ZB-200-T1 Block B - West Elevation
1215-MCAU-T.05-ZB-201-T1 Block B - South Elevation
1215-MCAU-T.05-ZB-202-T1 Block B - East Elevation
1215-MCAU-T.31-ZA-SC-901-T1-Block A - Window and Door Schedule
1215-MCAU-T.31-ZB-SC-901-T1 Block B - Window and External Door Schedule Count_DRAFT
[1] 22-12-BLKABCDE-DETAILS 3