fisher acoustics

Plot F2 Great Jackson Street, Manchester

Amenity Noise Impact Assessment

June 2026

Report Reference: F2-FAC-A180-RP-XX-002 P02

Flint Glass Works, 64 Jersey Street, Manchester, M4 6JW

0161 605 0905

info@fisheracoustics.co.uk

fisher acoustics

PROJECT TITLE	PLOT F2, GREAT JACKON STREET, MANCHESTER
REPORT TITLE	AMENITY NOISE IMPACT ASSESSMENT
CLIENT	RENAKER BUILD LTD 1ST FLOOR NQ BUILDING 47 BENGAL STREET MANCHESTER M4 6BB
REPORT REFERENCE	F2-FAC-A180-RP-XX-002 P02
DATE	11 JUNE 2026
AUTHOR	MATT FISHER, BENG (HONS) CENG MIOA

DOCUMENT HISTORY

FIRST ISSUE P01	5 JUNE 2026
P02	11 JUNE 2026

CONTENTS

1.0 SUMMARY 2

2.0 INTRODUCTION 4

3.0 DESCRIPTION OF SITE 5

4.0 LOCATION OF AMENITY AREAS 6

5.0 PLANNING CONDITION 9

6.0 NOISE SENSITIVE RECEPTORS 10

7.0 ENVIRONMENTAL NOISE SURVEYS AND EXTERNAL NOISE CRITERIA 11

8.0 INTERNAL NOISE TRANSFER 12

9.0 ACTIVITY NOISE BREAKOUT FROM AMENITY AREAS 14

10.0 MAXIMUM RECOMMENDED SOUND LEVEL FROM LOUDSPEAKERS 19

11.0 IMPACT SOUND TRANSFER FROM GYM 20

12.0 CONCLUSION 24

Table 1: Maximum allowable external music noise levels due to proposed amenity areas 11
Table 2: Maximum recommended noise levels in residential apartments due to music replay in amenity areas 12
Table 3: Maximum allowable noise levels in Level 1 amenity areas – re internal noise transfer 13
Table 4: Expected sound reduction index of ground and Level 1 amenity areas curtain wall 15
Table 5: Maximum allowable internal activity noise levels due solely to breakout, doors open 15
Table 6: Maximum allowable internal activity noise levels due solely to breakout, doors closed 16
Table 7: Maximum allowable internal activity noise levels, internal noise transfer & breakout, doors closed 17
Table 8: Maximum allowable internal activity noise levels, internal noise transfer & breakout, doors open 18
Table 9: Maximum allowable noise levels at individual loudspeakers – daytime 19
Table 10: Guidance Internal Sound Target Criteria for Gym Activity – Residential 20

Figure 1: Site location plan – Plot F2, Great Jackson Street 5
Figure 2: Ground floor plan showing location of Residents Lounge and Multi-use Suite 6
Figure 3: Level 1 plan - location of Club Lounge & Golf simulator, Multi-use Suite, Gym and Gym Studio 7
Figure 4: Second floor plan showing footprint of Amenity areas below 8
Figure 5: Noise sensitive receptors in the vicinity of the development 10
Figure 6: Plot F2 terrace boundary, external areas and potential loudspeaker locations 19
Figure 7: Ground floor, Gym floor plan 21

1.0 SUMMARY

Fisher Acoustics Ltd has been commissioned by Renaker Build Limited to conduct a noise impact assessment to respond to condition 23a of the planning approval for Plot F2, Great Jackson Street, Manchester (planning reference 143143/JO/2025).

Condition 23 states:

- *23) a) The residential amenity areas, including any gymnasium, within Phase 1 shall be acoustically insulated and treated to limit the break out of noise in accordance with a noise study of the premises and a scheme of acoustic treatment that has been submitted to and approved in writing by the City Council as local planning authority. The scheme shall be implemented in full before first occupation of the premises within Phase 1.*

  Where entertainment noise is proposed the LAeq (entertainment noise) shall be controlled to 5dB below the LA90 (without entertainment noise) in each octave band at the facade 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) 47dB and 41dB (Leq,5min), respectively.

  b) Prior to occupation of Phase 1 of the development a verification report to validate that the work undertaken throughout Phase 1 of the development conforms to the recommendations and requirements in the approved acoustic consultant's report shall be submitted to and approved in writing by the City Council as local planning authority. The verification report shall include post completion testing to confirm that acceptable criteria have been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria and timescales for the implementation of those measures.

  Reason - To safeguard the amenities of the occupiers of the building and occupiers of nearby properties, pursuant to policies SP1 and DM1 of the Core Strategy.'

Maximum recommended airborne noise levels within the residents amenity areas have been determined such that compliance with guidance published by Manchester City Council can be achieved.

Impact noise due to the dropping of free weights is to be controlled to acceptable levels by proprietary resilient gym flooring.

The maximum allowable external noise levels due to background music loudspeakers within the external seating and recreational areas have also been established. The permissible sound pressure levels from external loudspeakers are of necessity very low but are compatible with the replay of low-level background music within the proposed external seating areas. It is therefore considered that external loudspeakers can be accommodated within the scheme.

2.0 INTRODUCTION

Fisher Acoustics Ltd has been commissioned by Renaker Build Limited to conduct a noise impact assessment to respond to condition 23a of the planning approval for Plot F2, Great Jackson Street, Manchester (planning reference 143143/JO/2025).

Condition 23a requires that a noise study is conducted that demonstrates that appropriate noise levels are achieved at pre-existing noise sensitive receptors and within residential areas in Plot F2 due to activity noise from the amenity areas of the development.

This report responds to condition 23a and in particular advises on the maximum allowable internal noise levels within the amenity spaces to achieve compliance with the noise criteria stipulated in the planning condition.

An assessment of impact noise transmission from the proposed residents' gym to the residential apartments above is also provided.

This report also determines the maximum allowable external noise levels due to background music loudspeakers within the external seating and recreational areas of Plot F2.

3.0 DESCRIPTION OF SITE

The overall Plot F development proposals are for the construction of two 51 storey residential towers (Plot F1 & Plot F2) comprising a total of 984 apartments (Use Class C3) and internal residential amenity uses, private car parking and cycle parking facilities within two basement levels, together with public realm, highway and associated works.

Plot F2 provides a total of 494 apartments.

The residential amenity spaces are located on the ground floor and Level 1 of the tower and are to include lounges, a multi-use suite and a gym.

Figure 1 shows the location of Plot F2 in the context of the overall Plot F development site.

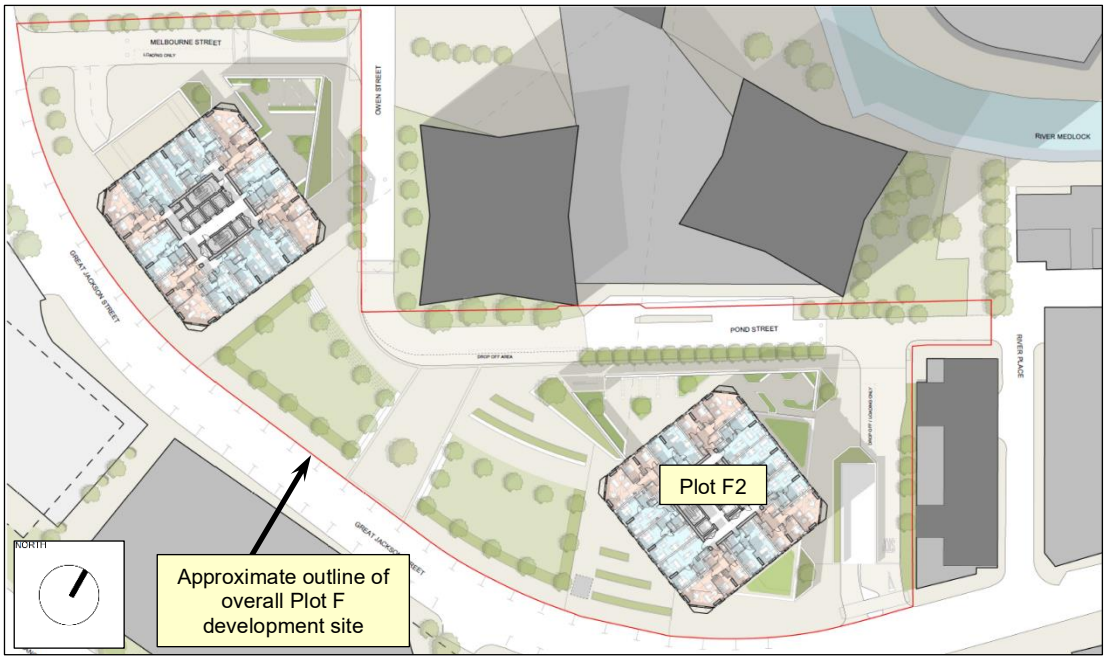


Figure 1: Site location plan – Plot F2, Great Jackson Street

4.0 LOCATION OF AMENITY AREAS

The residents amenity areas are to be located internally on the ground floor and Level 1 of Plot F2. The amenity areas on the ground floor are:

- Residents Lounge
- Multi-use Suite
- External terrace.

The amenity areas on Level 1 are:

- Gym
- Gym studio
- Club Lounge & Golf Simulator
- Multi-use Suite (including Private Dining)
- Co-working
- Content creation
- Podcast rooms.

With regard to potential noise disturbance of the residential occupiers, only the amenity areas with music replay have been considered and therefore the Co-working and Podcast rooms are not included in this assessment.

Figure **2** shows the location of the residents' amenity areas at ground floor.

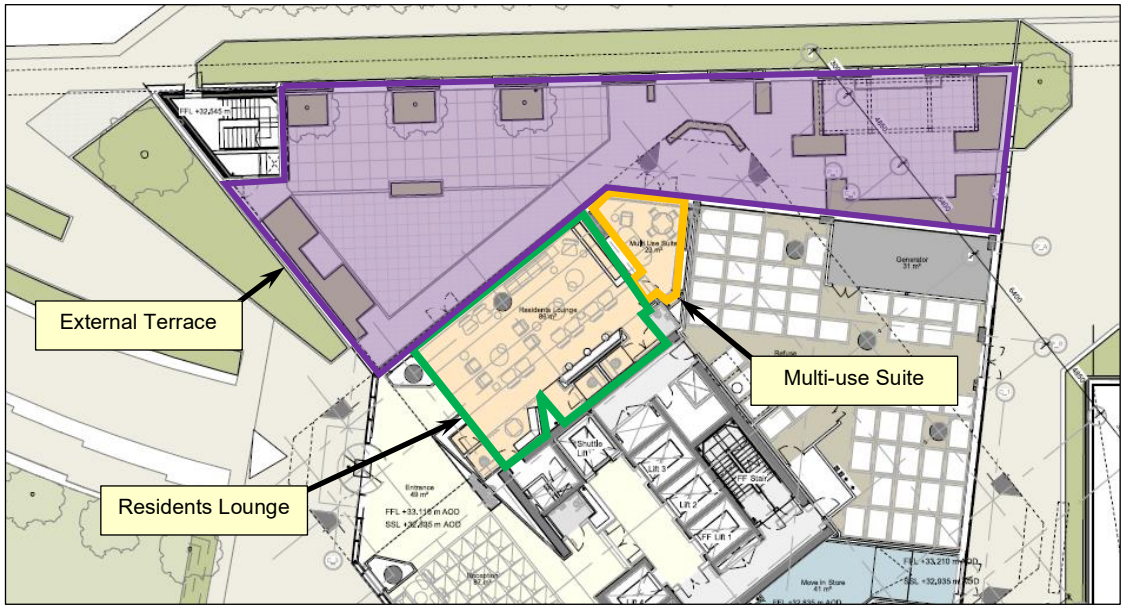


Figure 2: Ground floor plan showing location of Residents Lounge and Multi-use Suite

Figure 3 shows the position of the residents' amenity areas on Level 1.

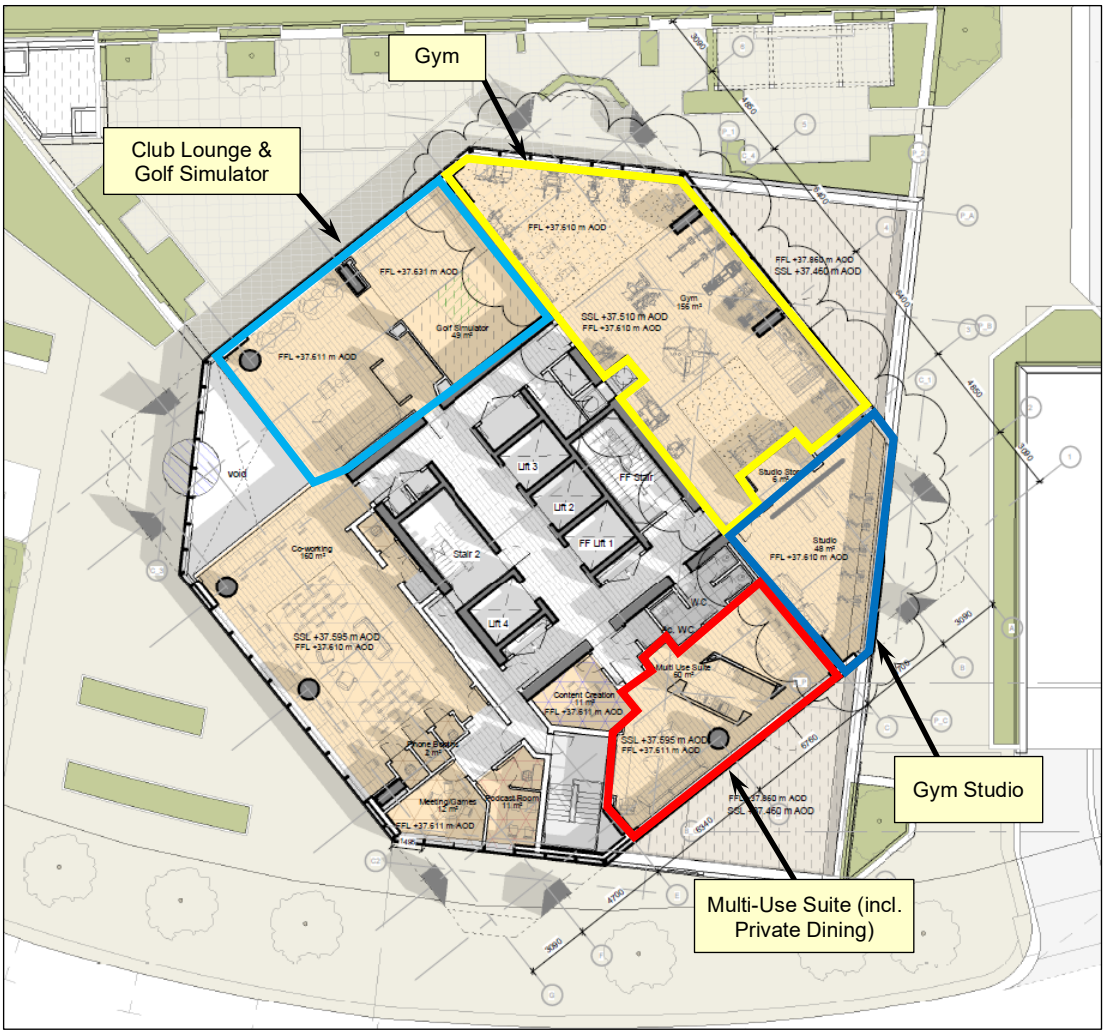


Figure 3: Level 1 plan - location of Club Lounge & Golf Simulator, Multi-use Suite, Gym and Gym Studio

Figure 4 overlays the footprint of each Level 1 amenity area onto the Level 2 floor plan.

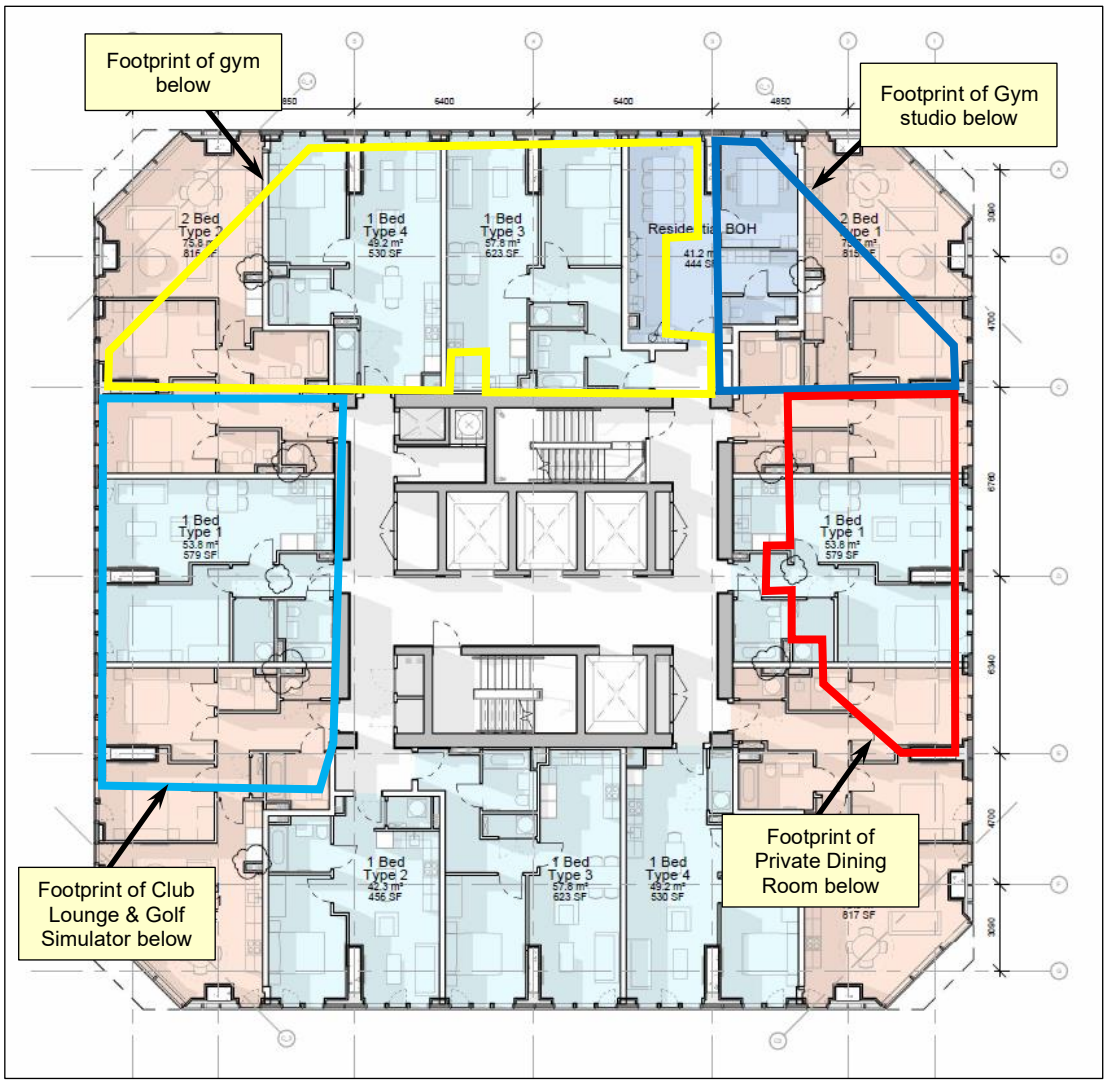


Figure 4: Second floor plan showing footprint of Amenity areas below

5.0 PLANNING CONDITION

Planning condition 23 of the Planning Permission for Plot F2, reference: 143143/JO/2025, dated 18 February 2026, states:

- '*23) a) The residential amenity areas, including any gymnasium, within Phase 1 shall be acoustically insulated and treated to limit the break out of noise in accordance with a noise study of the premises and a scheme of acoustic treatment that has been submitted to and approved in writing by the City Council as local planning authority. The scheme shall be implemented in full before first occupation of the premises within Phase 1.*

  Where entertainment noise is proposed the LAeq (entertainment noise) shall be controlled to 5dB below the LA90 (without entertainment noise) in each octave band at the facade of the nearest noise sensitive location, and internal noise levels at structurally adjoined residential properties in the 63HZ and 125Hz octave frequency bands shall be controlled so as not to exceed (in habitable rooms) 47dB and 41dB (Leq,5min), respectively.

  b) Prior to occupation of Phase 1 of the development a verification report to validate that the work undertaken throughout Phase 1 of the development conforms to the recommendations and requirements in the approved acoustic consultant's report shall be submitted to and approved in writing by the City Council as local planning authority. The verification report shall include post completion testing to confirm that acceptable criteria have been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria and timescales for the implementation of those measures.

  Reason - To safeguard the amenities of the occupiers of the building and occupiers of nearby properties, pursuant to policies SP1 and DM1 of the Core Strategy.'

6.0 NOISE SENSITIVE RECEPTORS

Figure 5 identifies the nearest noise sensitive receptors to Plot F2. The buildings that are not identified as 'noise sensitive receptors' in Figure 5 are at a greater distance from the proposed development than the identified receptors and are subject to similar levels of pre-existing ambient noise. Thus, if satisfactory conditions are expected at the assessed receptors, then satisfactory conditions can also be expected at any other buildings.

It should be noted that Plot F2 itself is a noise-sensitive receptor due to the residential dwellings at and above Level 2 of the building.

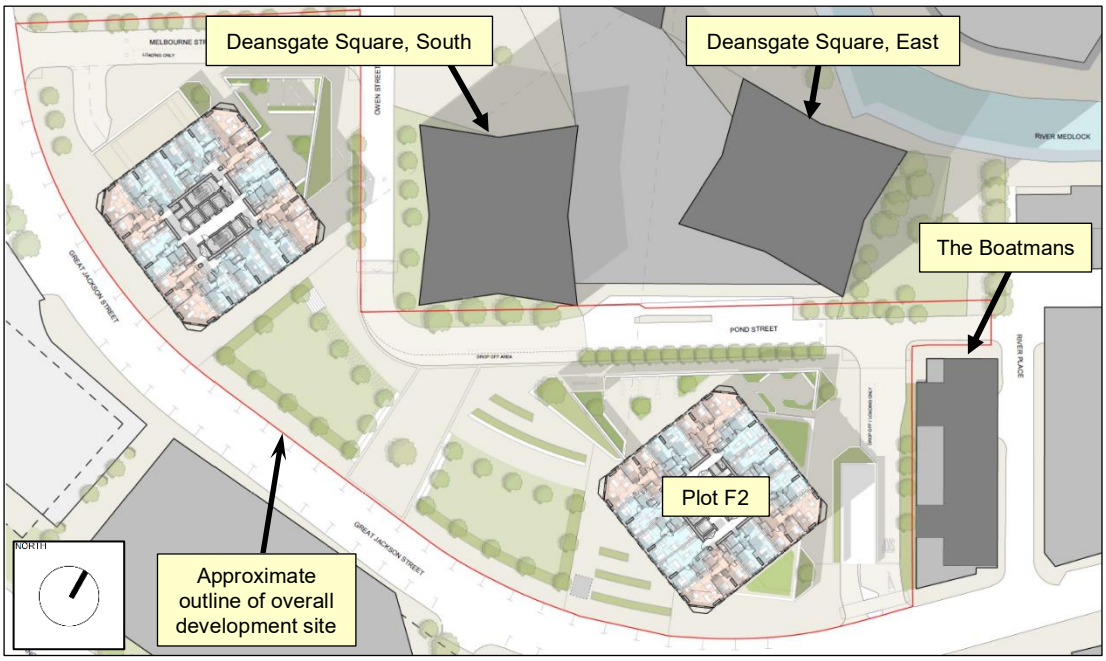


Figure 5: Noise sensitive receptors in the vicinity of the development

7.0 ENVIRONMENTAL NOISE SURVEYS AND EXTERNAL NOISE CRITERIA

The Environmental Impact Assessments that were conducted as part of the planning submission for the development of Plot F and the adjacent Crown Street Phase 3 development included noise surveys at and around the various noise sensitive receptors in the vicinity of Plot F. The results of the noise surveys allow the establishment of the maximum allowable external noise levels at the closest noise sensitive receptors due to activity noise breakout from the amenity areas.

Table 1 identifies the maximum allowable cumulative daytime and night time free-field external noise levels at the closest residential façades due to activity noise breakout from the amenity areas to comply with the noise criterion of condition 23.

Period	Sound Pressure Level (dB Leq) @ Octave Band Centre Frequency (Hz)						
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**
Proposed Residential Towers, F1 & F2 (0700 to 2300)	58	52	50	48	49	43	34
Proposed Residential Towers, F1 & F2 (2300 to 0700)	47	40	40	40	45	36	22
Residences, Deansgate Square (0700 to 2300)	49	46	48	48	52	44	31
Residences, Deansgate Square (2300 to 0700)	49	46	48	48	46	39	29
Residences, The Boatmans (0700 to 2300)	51	42	41	39	40	33	21
Residences, The Boatmans (2300 to 0700)	49	38	37	37	40	34	21

Table 1: Maximum allowable external music noise levels due to proposed amenity areas

8.0 INTERNAL NOISE TRANSFER

With regard to internal noise transfer from the Plot F2 amenity areas to the residential areas, condition 23a identifies noise limits at 63 Hz and 125 Hz but does not provide noise limits at frequency bands above 125 Hz. Section 3.7.1.2 'Entertainment Venues' of 'Planning & Noise, Technical Guidance', issued October 2022 by the Environmental Protection, Environmental Health and The Neighbourhoods Service sections of Manchester City Council states that in relation to entertainment noise 'the [NR15] curve may be too stringent at mid and higher frequencies'. It is therefore suggested that at frequency bands above 125 Hz, the allowable noise level in apartments due to entertainment (music) noise from adjoining amenity spaces lies between NR15 and NR20.

With reference to the above, in order to comply with the requirements of condition 23a and to achieve acceptable noise levels generally, it is recommended that the internal noise levels within an apartment due solely to music replay in the amenity areas do not exceed the values given in Table 2.

Location	Sound Pressure Level (dB Leq) @ Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Apartments above amenity areas	47	41	26	20	17	15	12

Table 2: Maximum recommended noise levels in residential apartments due to music replay in amenity areas

The structural floor between the amenity areas and the apartments directly above is a 250 mm thick flat concrete slab. In addition, solid ceilings are to be installed in all Level 1 amenity area except the main gym. Given the party floor slab and the proposed ceilings, Table 3 identifies the calculated maximum allowable music noise levels in the Level 1 amenity areas without exceeding the noise limits given in Table 2 for the residential apartments.

Room	Sound Pressure Level (dB Leq) @ Octave Band Centre Frequency (Hz)						
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**
Gym	80	75	72	75	75	77	77
Gym Studio	83	83	82	82	80	80	82
Private Dining	82	80	78	82	80	80	80
Content Creation	82	80	78	82	80	80	80
Club Lounge & Golf Simulator	82	80	78	82	80	80	80

Table 3: Maximum allowable noise levels in Level 1 amenity areas – re internal noise transfer

The allowable music noise levels identified in Table 3 would allow background music replay in the gym and relatively high levels of background music replay in the other amenity areas, such that compliance can be achieved with the guidance published by Manchester City Council.

9.0 ACTIVITY NOISE BREAKOUT FROM AMENITY AREAS

NOISE EGRESS CALCULATIONS

Noise egress calculations have been carried out to determine the expected noise level at the closest residential properties due to activity noise breakout from the proposed amenity areas.

The amenity areas are to be fully mechanical ventilated and cooled spaces such that the opening of windows and doors is not required to ventilate the spaces. Therefore, the determinant of the sound insulation performance of the external envelope will be the glazed curtain wall.

However, there are patron access doors within the curtain wall of the Residents Lounge and Multi-Use Suite at ground floor level and therefore the principal determinant of the sound insulation performance of the external envelope will be the installed glazing and the access doors.

As no door lobbies are installed to the ground floor resident lounge and multi-use suite, there could be increases of external noise during the intermittent movement of residents in and out of the amenity spaces or if the doors remain open. Therefore, the assessment has included a worst-case scenario of open doors.

The glazing specification to the amenity spaces curtain wall, installed as part of the main construction contract for Plot F2, is as follows:

- Double glazing of 16.8 mm laminated glass / 16 mm cavity / 13.5 mm laminated glass
- External doors

The expected minimum weighted sound reduction index of the curtain wall fixed units and the patron access doors when closed are given in Table 4.

Building element	Sound Reduction Index (dB) @ Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Curtain wall, glazed with 16.8 mm laminate/ 16 mm cavity/ 13.5 mm laminate	18	27	39	37	40	51	64
External Doors	18	20	25	28	30	30	34

Table 4: Expected sound reduction index of ground and Level 1 amenity areas curtain wall

Calculations have been carried out to determine the maximum allowable internal noise levels within the amenity spaces with entrance doors open (where applicable) such that the external noise limits identified in Table 1 are not exceeded. Table 5 identifies the calculated noise levels.

Location	Period	Sound Pressure Level (dB Leq) @ Octave Band Centre Frequency (Hz)						
		63	125	250	500	1k	2k	4k
Residents Lounge (Ground Floor)	(0700 hrs to 2300 hrs)	75	72	75	74	74	67	57
	(2300 hrs to 0700 hrs)	70	70	70	64	67	64	54
Multi-use Suite (Ground Floor)	(0700 hrs to 2300 hrs)	75	72	75	74	74	67	57
	(2300 hrs to 0700 hrs)	70	70	70	64	66	66	59
Gym (Level 1)	(0700 hrs to 2300 hrs)	75	72	87	83	88	89	83
	(2300 hrs to 0700 hrs)	68	72	87	83	88	89	83
Gym studio (Level 1)	(0700 hrs to 2300 hrs)	75	72	88	83	89	90	84
	(2300 hrs to 0700 hrs)	70	72	88	83	89	90	84
Private Dining (Level 1)	(0700 hrs to 2300 hrs)	75	83	89	86	89	89	78
	(2300 hrs to 0700 hrs)	70	80	88	85	88	89	78
Club Lounge & Golf Simulator (Level 1)	(0700 hrs to 2300 hrs)	75	80	88	86	88	89	78
	(2300 hrs to 0700 hrs)	70	79	88	86	88	89	78

Table 5: Maximum allowable internal activity noise levels due solely to breakout, doors open

Calculations have also been carried out to determine the allowable internal noise levels to achieve compliance with the recommended maximum external noise levels assuming that the external doors to the ground floor residents lounge and Multi-use Suite are closed.

Table 6 identifies the calculated noise levels that could be generated in the amenity spaces with doors closed without exceeding the daytime and night time external noise limits given in Table 1.

Location	**Period**	**Sound Pressure Level (dB Leq) @ Octave Band Centre Frequency (Hz)**						
		63	**125**	**250**	**500**	**1k**	**2k**	**4k**
Residents Lounge (Ground Floor)	(0700 hrs to 2300 hrs)	82	80	86	84	87	87	79
	(2300 hrs to 0700 hrs)	75	79	86	84	86	87	78
Multi-use Suite (Ground Floor)	(0700 hrs to 2300 hrs)	82	80	86	83	88	87	78
	(2300 hrs to 0700 hrs)	75	78	84	84	86	87	77
Gym (Level 1)	(0700 hrs to 2300 hrs)	78	80	87	83	88	89	83
	(2300 hrs to 0700 hrs)	70	75	86	83	88	89	83
Gym studio (Level 1)	(0700 hrs to 2300 hrs)	82	80	88	83	89	90	84
	(2300 hrs to 0700 hrs)	75	75	87	83	89	90	84
Private Dining (Level 1)	(0700 hrs to 2300 hrs)	82	83	89	86	89	89	78
	(2300 hrs to 0700 hrs)	75	80	88	85	88	89	78
Club Lounge & Golf Simulator (Level 1)	(0700 hrs to 2300 hrs)	82	83	88	86	88	89	78
	(2300 hrs to 0700 hrs)	75	79	88	86	88	89	78

Table 6: Maximum allowable internal activity noise levels due solely to breakout, doors closed

OVERALL MAXIMUM ALLOWABLE INTERNAL NOISE LEVELS

Given the calculated allowable noise levels due to internal and external noise transfer, Table 7 identifies the overall maximum allowable internal activity noise levels, including music replay, within the amenity areas.

Location	Period	Sound Pressure Level (dB Leq) @ Octave Band Centre Frequency (Hz)						
		63	125	250	500	1k	2k	4k
Residents Lounge (Ground Floor)	(0700 hrs to 2300 hrs)	82	80	86	84	87	87	79
	(2300 hrs to 0700 hrs)	75	79	86	84	86	87	78
Multi-use Suite (Ground Floor)	(0700 hrs to 2300 hrs)	82	80	86	83	88	87	78
	(2300 hrs to 0700 hrs)	75	78	84	84	86	87	77
Gym (Level 1)	(0700 hrs to 2300 hrs)	78	75	72	75	75	77	77
	(2300 hrs to 0700 hrs)	70	75	72	75	75	77	77
Gym studio (Level 1)	(0700 hrs to 2300 hrs)	82	80	82	82	80	80	82
	(2300 hrs to 0700 hrs)	75	75	82	82	80	80	82
Content Creation	(0700 hrs to 2300 hrs)	82	80	78	82	80	80	78
	(2300 hrs to 0700 hrs)	75	80	78	82	80	80	78
Private Dining (Level 1)	(0700 hrs to 2300 hrs)	82	80	78	82	80	80	78
	(2300 hrs to 0700 hrs)	75	79	78	82	80	80	78
Club Lounge & Golf Simulator (Level 1)	(0700 hrs to 2300 hrs)	82	80	78	82	80	80	80
	(2300 hrs to 0700 hrs)	75	79	78	82	80	80	78

Table 7: Maximum allowable internal activity noise levels, internal noise transfer & breakout, doors closed

Table 8 identifies the overall maximum allowable internal activity noise levels, including music replay, within the amenity areas, on the basis that the entrance doors to the ground floor residents lounge and multi-use suite are open and do not have internal lobbies.

Location	Period	Sound Pressure Level (dB Leq) @ Octave Band Centre Frequency (Hz)						
		63	125	250	500	1k	2k	4k
Residents Lounge (Ground Floor)	(0700 hrs to 2300 hrs)	75	72	75	74	74	67	57
	(2300 hrs to 0700 hrs)	70	70	70	64	67	64	54
Multi-use Suite (Ground Floor)	(0700 hrs to 2300 hrs)	75	72	75	74	74	67	57
	(2300 hrs to 0700 hrs)	70	70	70	64	66	66	59
Gym (Level 1)	(0700 hrs to 2300 hrs)	75	72	72	75	75	77	77
	(2300 hrs to 0700 hrs)	68	72	72	75	75	77	77
Gym studio (Level 1)	(0700 hrs to 2300 hrs)	75	72	82	82	80	80	82
	(2300 hrs to 0700 hrs)	70	72	82	82	80	80	82
Content Creation	(0700 hrs to 2300 hrs)	75	80	78	82	80	80	78
	(2300 hrs to 0700 hrs)	70	80	78	82	80	80	78
Private Dining (Level 1)	(0700 hrs to 2300 hrs)	75	80	78	82	80	80	78
	(2300 hrs to 0700 hrs)	70	79	78	82	80	80	78
Club Lounge & Golf Simulator (Level 1)	(0700 hrs to 2300 hrs)	75	72	75	74	74	67	57
	(2300 hrs to 0700 hrs)	70	70	70	64	67	64	54

Table 8: Maximum allowable internal activity noise levels, internal noise transfer & breakout, doors open

Given the proposed uses of the amenity spaces, compliance with the noise limits given in Table 7 and Table 8 is fully expected.

10.0 MAXIMUM RECOMMENDED SOUND LEVEL - EXTERNAL LOUDSPEAKERS

The proposed layout for external loudspeakers at the ground floor terrace of Plot F2 has been provided by Pure AV. Figure 6 identities the proposed location of external loudspeakers at the Plot F2 ground floor terrace.



Figure 6: Plot F2 terrace boundary, external areas and potential loudspeaker locations

Calculations have been carried out to determine the maximum allowable sound pressure levels at 1 metre from each loudspeaker such that the maximum allowable daytime external noise level at the nearest residential properties, as detailed in Table 1, are not exceeded. The calculations assume that at each location identified in Figure 6 there is one loudspeaker and that all loudspeakers at each location operate simultaneously.

Table 9 identifies the calculated maximum allowable day time sound pressure levels at 1 metre from each external loudspeaker to comply with the noise limits in Table 1.

Loudspeaker Location (see Figure 6)	Sound Pressure Level (dB Leq), 1 metre @ Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
1 - 9	62	53	53	51	53	47	38

Table 9: Maximum allowable noise levels at individual loudspeakers – daytime

The permissible sound pressure levels are of necessity very low but are compatible with the replay of low-level background music in an external seating area. It is therefore considered that external loudspeakers can be accommodated within the scheme.

11.0 IMPACT SOUND TRANSFER FROM GYM

There is the potential for disturbance of residents due to the dropping of weights on the floor of the proposed gym. There is no statutory performance requirement in relation to the transfer of noise from gyms to residential areas. However, guidance has been jointly published by the Institute of Acoustics, the Association of Noise Consultants and the Chartered Institute of Environmental Health. In particular, 'ProPG: Gym Acoustics Guidance', published in March 2023, provides suggested maximum noise levels in residential dwellings due to both airborne and impact noise transfer from gyms.

Table 10 identifies the criteria for residential areas, with reference to the 'G curves' presented within ProPG: Gym Acoustics Guidance. G curves provide a way to reference sound spectra data in a single figure.

Receptor Type	**Guide Criteria**	
	Airborne Sound (e.g. music) Leq, T (31.5Hz to 8kHz)	**Heavy Impact Sound Lmax,F (31.5Hz to 8kHz)**
Residential Areas	G15-G25 (day) G10-G20 (night)	G20-G25 (day) G15-G20 (night)

Table 10: Guidance Internal Sound Target Criteria for Gym Activity – Residential

It should be noted that the values in Table 2 to comply with the recommendations of Manchester City Council relating to internal music noise transfer more onerous than the upper noise limits of 'ProPG: Gym Acoustics Guidance' for daytime airborne noise transfer to residential areas and similar to the upper noise limits of 'ProPG: Gym Acoustics Guidance' for night time airborne noise transfer to residential areas. Therefore, the Manchester City Council noise limits have been designed to in relation to airborne noise transfer.

The ProPG guidance relates to all gyms, including commercial gyms. It could therefore be argued that the guidance is necessarily more onerous than needs to be the case for a gym that is solely for the use of the residents of the building, as the users of a residents-only gym can be instructed in the safe use of weights such that the dropping of weights on the floor does not occur frequently. In addition, the ProPG publication post-dates the planning submission for the Plot F development.

On this basis, it is not proposed to strictly design for the impact noise targets of the ProPG. However, reasonable and practicable measures are proposed to mitigate occasional weight drops by users, as described below.

Figure 7 shows the proposed equipment layout within the gym. The proposed free weights area is highlighted.

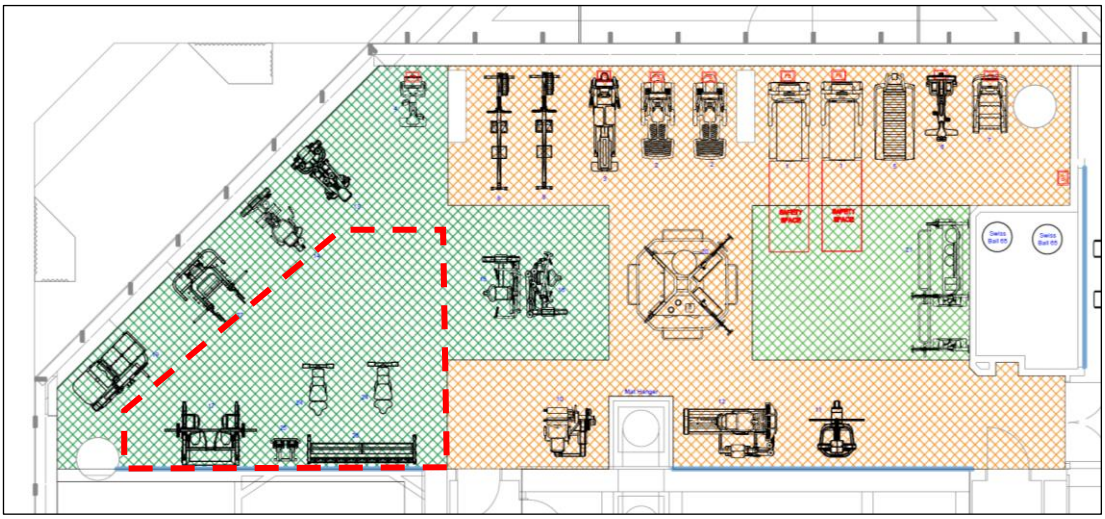


Figure 7: Ground floor, Gym floor plan

Reasonable mitigation of impact noise due to the dropping of free weights can be achieved by the installation of a proprietary resilient floor coverings in the weights area of the gym.

The proposed resilient floor covering in the free weights area identified in Figure 7 is identified below.

- 40 mm thick Sportec Style Tile on 25 mm Sylomer SR42 on 25 mm Sylomer SR28

The flooring build-up in the free weights area of the gym is expected to achieve maximum impact sound levels (Lmax) in the residential apartments above the gym that are approximately 3 dB greater than the recommended maximum night time 'G20' impact sound levels in residential areas identified in the ProPG guidance due to the typical dropping of free weights (e.g. 20 kg dumbbells dropped from a height of 500 mm). This exceedance may only occur in one or two one-third octave frequency bands and is not therefore considered to be significant.

The identified level of performance relative to the recommendations of the ProPG document is considered acceptable as the building management will be able to influence the conduct of gym users such that weight drops occur infrequently.

'Functional' gym area

In the Functional area of the gym, it is recommended that any floor covering achieves a minimum impact sound reduction of 16 dB dLw.

The functional area of the gym is to be provided with treadmills. With regard to the potential for 'Synchronised Repetitive Excitation' (SRE) of a gym floor and structure due to the use of treadmills, Section 3.5.3 of the ProPG guidance states:

> 3.5.3 SRE Testing Method
>
> Synchronised Repetitive Excitation would typically occur in Gyms where people are running/ stepping together. Estimates of the response factor and complementary heel-drop tests as described in SCI P354 can assist to determine if the structural floor is dynamically sensitive to footfall excitation.
>
> Walk-by or running (with flat-footed style) to a metronome set typically to 160 steps per minute (to represent 11km/hr) are ways that have been used by members of the Working Group to explore this, but it is the experience of the Working Group that this is not commonly done and is usually dealt with by a combination of the isolation within treadmills and also the floor treatment. It should be for the SQA to use their experience to advise in this regard, as it is the Working Group's view that this remains very hard to standardise.

As stated above, the ProPG relies on the 'Suitable Qualified Acoustician' to advise on control of SRE as there is no standardised testing method for treadmills.

To our knowledge, the generation of SRE has not been reported in any similar residential gym to that proposed within concrete framed buildings due to treadmills that have not been mounted on isolation pads.

Acoustic treatment of treadmills and resistance machines

If required, treadmills and weights machines can be provided with individual isolation pads to control impact noise to the adjacent areas and residential areas above. Such mounts can be installed retrospectively. Suitable products include:

1) TVS Impact Absorbers
2) Pliteq GenieMat TMIP (treadmill isolators)
3) Pliteq GenieMat WSI (weight stack isolators)

12.0 CONCLUSION

The expected internal noise levels within the amenity areas are such that compliance with the requirements of condition 23a in relation to internal noise transfer and external noise breakout are fully expected.

Potential impact noise from the gym due to the dropping of weights is to be controlled by the provision of high performance proprietary resilient gym floor coverings specifically designed to reduce low frequency impact noise, such that acceptable levels of noise are expected in the residential areas above the gym. Therefore, compliance with planning condition 23a is expected due to the operation of the proposed gym.