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PROJECT TECHNICAL MEMORANDUM

JOB TITLE	:	Swan Street Gym, Manchester
PROJECT NO	:	31526
DATE	:	24 October 2025
FROM	:	Hann Tucker Associates
ISSUED TO	:	Design Team

RE: CONDITION 13b AND 14a DISCHARGE NOTE

The scheme has been granted Operative Consent (ref 37589/JO/2023 (S73 of 121380/FO/2018)). There are 2No conditions that relate to acoustics. There are Conditions 13a and 13b and 14a and 14b as follows:

> *"13a) the residential element of the development hereby approved shall be equipped with externally mounted ancillary plant, equipment and servicing in accordance with the following documentation:*
>
> - *Noise and vibration report prepared by Hann Tucker stamped as received by the City Council, as Local Planning Authority, on the 27 September 2018.*
> - *Hann Tucker Technical Note ref HT: 25176/PTM5 received by the City Council, as Local Planning Authority, on the 21 March 2024.*
> - *Air conditioning note received by the City Council, as Local Planning Authority, on the 21 March 2024.*
>
> *The approved details shall be implemented as part of the development and be maintained and retained thereafter.*
>
> *13b) Notwithstanding the noise and vibration report prepared by Hann Tucker stamped as received by the City Council, as Local Planning Authority, on the 27 September 2018, prior to the first use of each commercial units, details of any externally mounted ancillary plant, equipment and servicing shall be submitted for approval. The approved scheme shall be implemented prior to the first occupation of the residential element and each commercial unit* and thereafter retained and maintained in situ."

"14a) Notwithstanding the noise and vibration report prepared by Hann Tucker stamped as received by the City Council, as Local Planning Authority, on the 27 September 2018, (a) prior to the first use of each commercial unit and residents gym as indicated on drawings 2406-LHA-Z1-00-DR-A-PL-001 and 2406-LHA-Z1-M0-DR-A-PL-002 received by the City Council, as Local Planning Authority, on the 25 November 2024, a scheme of acoustic insulation shall be submitted for approval in writing by the City Council, as Local Planning Authority.

14b) The approved scheme shall then be implemented and a post completion survey (including appropriate mitigation measures and timescales for implementation if necessary) shall be submitted for approval in writing by the City Council, as Local Planning Authority, prior to the first use of each of the commercial units and residents gym. The measures implemented (including any additional measures agreed) shall be retained and maintained for as long as the development remains in use."

1.0 Condition 13b Assessment

1.1 Criteria

The nearest noise-sensitive receptors are understood to be:

- The apartment located directly above the Gym (approximately 1.5m).

External plant noise emissions shall be controlled to achieve a noise level not greater than 5 dB below representative background noise levels at any noise sensitive window when assessed to BS 4142.

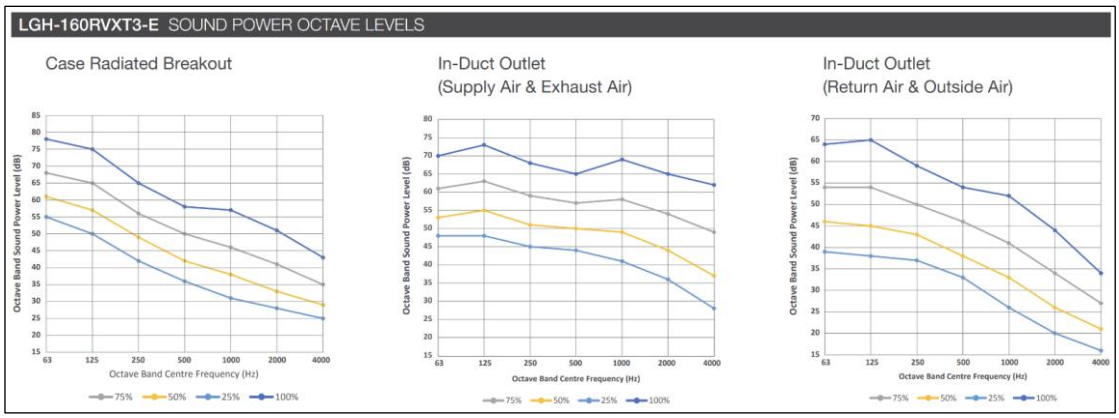
Period	BS 4142 Plant Noise Rating Limit
Daytime (07:00-23:00)	48 dB
Night-time (23:00-07:00)	37 dB

1.2 Assessment

1.2.1 Proposed Plant

There is 1No Mitsubishi LGH-160 unit located within the Gym area and ducted to atmosphere as shown below. The unit will be suspended from the soffit and will be exposed to the Gym itself.

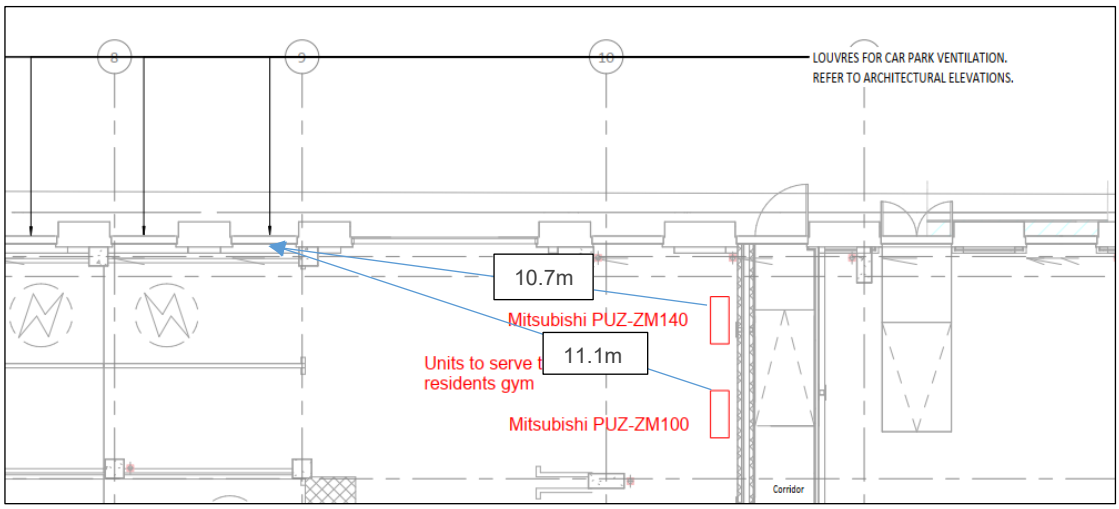
The unit will operate at 50% duty and the noise data for the unit is provided below (yellow line):



There will be also 2No condensing units provided as part of the scheme. This unit will be located within the underground carpark, away from the ventilation louvres. The noise data for these units is as follows:

- PUZ-ZM100VDAZ – 48 dBA at 1m
- PUZ-ZM140VDA – 51 dBA at 1m.

The location of the condensers are shown below along with the closest distance to the external louvres.



1.2.2 Calculated Atmospheric Noise Levels

The most affected noise sensitive receptor to the intake and exhaust of the MVHR unit is considered to be the apartment windows located directly above the Gym and a distance of 1.5m from the louvres.

It is also understood that the unit could operate 24/7 so the more onerous, night-time, criterion of 37 dB L_{ArTr} should be complied with.

Based on the proposed units and associated attenuator specifications the atmosphere noise levels have been calculated as follows:

Side/Location	Calculated Noise Level, L_{ArTr} (dB)
Exhaust	36
Intake	21
Combined	36

As such, calculations indicate that 37 dB L_{ArTr} should be readily achieved by the proposed ventilation plant.

Considering the location of the condensing units the direct noise level at the closest louvre would be around 32 dBA and assuming a reverberation time of 2.0 seconds in the carpark the reverberant contribution would be 55 dBA. As such, the reverberant component of the noise would dominate inside the carpark.

Based on an internal reverberant level of 55 dBA the noise level at a distance of 3m from the nearest louvre (ie the residential windows directly above the louvre) would be in the region of 33 dBA.

As such, calculations indicate that 37 dB L_{ArTr} should be readily achieved by the proposed condensers.

It should be noted that a cumulative assessment of the plant noise is not required as the receptors would be different owed to the location of the purposed plant items.

2.0 Condition 14a Assessment

2.1 Criteria

2.1.1 Airborne Sound Insulation

As a minimum requirement the elements separating the Gym and the residential apartments above will need to comply with the requirements of Approved Document E of the Building Regulations. These requirements are set out below:

The following sound insulation requirements shall apply to the residential internal building fabric.

Function	Element	Sound Insulation Criterion
		Airborne (Min Value)
Element that separates an apartment from any other part of the building	Party Wall	45 dB $D_{nT,w} + C_{tr}$
	Party Floor	45 dB $D_{nT,w} + C_{tr}$

Although the above are the minimum requirements, the goal should be to limit the amount of noise transfer between the space. This these considerations are set out in Section 2.1.2.

2.1.2 Noise Transfer

Manchester City Council does not have any specific guidance in relation to the operation of gyms. However, the 'ProPG: Gym Acoustics Guidance (GAG)' was published in March 2023 and presents a standardised methodology for assessing buildings and environments for the location of Gymnasiums, fitness and exercise spaces.

Section 2.3 of this guidance document presents internal sound level target criteria for gym activity in residential and other areas based on a 'G-Curve' framework. The guideline criteria for various receptor types are as follows:

Receptor Type	Airborne Sound (e.g, music) $L_{eq,T}$ (31.5Hz to 8KHz)	Heavy Impact Sound $L_{max,F}$ (31.5Hz to 8KHz)
Residential Areas	G15 – G25 (day) G10 – G20 (night)	G20 – G25 (day) G15 – G20 (night)

Notes:

1. *The Working Group generally found in their experience that levels below the upper values tended to avoid significantly adverse impacts (SOAEL) occurring and higher levels than these should generally be avoided, but this is highly dependent on context. The background and ambient noise levels at any given site can fluctuate (e.g., a building in an urban setting adjacent to busy infrastructure versus a building shielded from external adverse noise*

intrusions and/or quieter location). This variation will also cause a subjective variance in relation to the perceived noise impact, both during the design phase and the completed development and the SQA should be cognisant of which target criteria would be most appropriate to their Gym scheme.

2. *In rooms with low background noise levels (below ~20 dB $L_{A90,5minutes}$), the criteria should be carefully considered and fully justified. It has been noted that the subjective impression of low frequency noise could still cause issues of disturbance, despite meeting the above target ranges. Therefore, it is recommended that resulting heavy impact noise levels at frequencies 80Hz and below, do not exceed a level of 20dB above the existing background noise dB $L_{A90,5minutes}$ within commercial and retail adjacencies (without source/Gym related activities). Where good sound insulation and closed windows results in very low background sound levels this can result in the loss of masking sound making intruding low frequency sound from Gyms more prominent and so potentially more likely to cause disturbance.*
3. *For heavy impact noise at least 1/3 octave bands analysis is desirable over the audible range from 31.5Hz, although measuring down to 20Hz is desirable to cover the audible range and may assist in identifying outlying peaks of energy.*
4. *For music noise, particular care should be given to controlling noise in the low frequency region, in the range 31.5Hz to 200Hz and $L_{max,F}$, L1, L10 may also be used as parameters as a substitution for $L_{eq,T}$.*

Based on the ProPG: Gym Acoustics Guidance (GAG) guideline criteria, the following target criteria for the residential areas located directly above the proposed gymnasium have been derived between Hann Tucker and the Local Authority based on the results of on-site testing.

Receptor Type	Period	Criteria	
		Airborne Sound (e.g., music) $L_{eq,T}$ (31.5Hz to 8KHz)	**Heavy Impact Sound $L_{max,F}$ (31.5Hz to 8KHz)**
Residential Areas	Daytime (07:00 – 23:00)	G25	G27
	Night-time (07:00 – 23:00)	G20	G27

It should be noted that the heavier weights and slam balls would be extremely difficult to mitigate completely, and the above criteria would only be achievable up to an agreed weight or activity. Management of the space would always be an expectation to ensure correct and proper use of equipment.

2.1.3 Activity Noise Breakout

The nearest noise-sensitive receptors are understood to be:

- The apartment located directly above the Gym (approximately 1.5m).

Activity noise level breakout shall be controlled to achieve a noise level not greater than 5 dB below representative background noise levels at any noise sensitive window as follows:

Period	Activity Noise Egress Limit, L_{Aeq} (dB)
Daytime (07:00-23:00)	48 dB
Night-time (23:00-07:00)	37 dB

2.2 Assessment

2.2.1 Acoustic Gym Floor

Hann Tucker has previously carried out a series of weight drop measurements on various types of acoustic gym flooring.

Based on the results of the testing activity zones are proposed to be constructed from the following:

- 70mm Pliteq Genie Mat FIT Fusion Tile (610x610)
- 25mm Pliteq Genie Mat FF25NC Roll
- 25mm Pliteq Genie Mat FF25NC Roll
- 65mm Floating Retanol Xtreme Pro 1 screed over 500-gauge polythene VCL
- 40mm IKO Enertherm Void former insulation on existing RC slab.
- EXISTING RC SLAB (225mm)

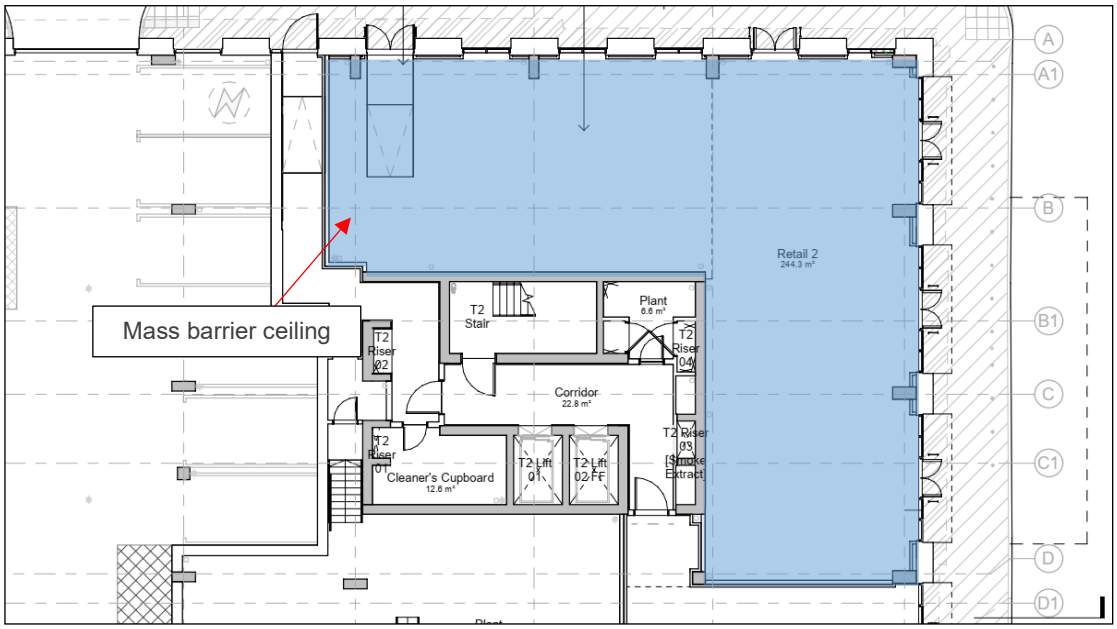
Circulation zones, teapoint areas and WCs floors are expected to be constructed from the following:

- 120mm Timber effect vinyl over
- Floating timber floor construction with isolation strips / layer
- 65mm Floating Retanol Xtreme Pro 1 screed over 500-gauge polythene VCL
- 40mm IKO Enertherm Void former insulation on existing RC slab

The proposed floor should be capable of achieving G27 for a 24kg weight drop and is in line with Hann Tucker's initial recommendations.

2.2.2 Mass Barrier Ceilings

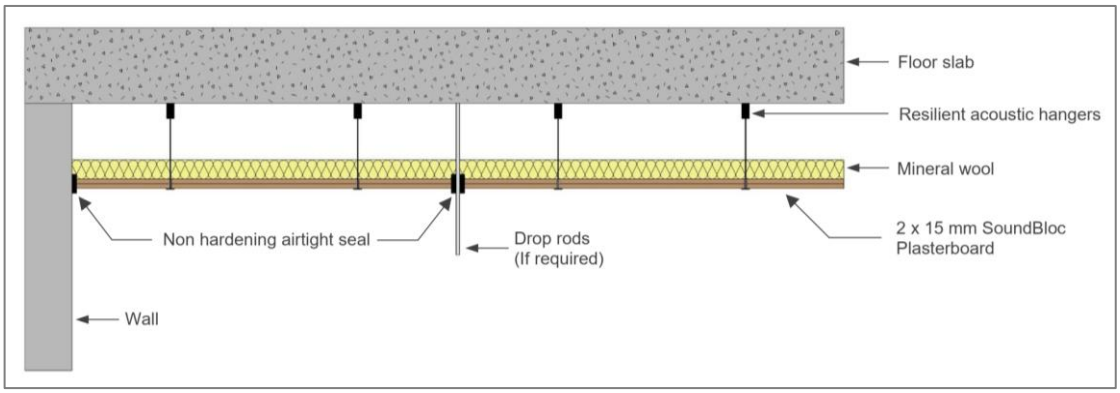
A mass barrier ceiling should be provided in the following locations:



Location of Mass Barrier Ceiling (Blue) and Blockwork Wall Lining (Green)

The mass barrier ceiling should comprise of 2x15mm SoundBloc on rubber/neoprene acoustic hangers with at least 50mm mineral wool in the cavity with a total depth of 100mm.

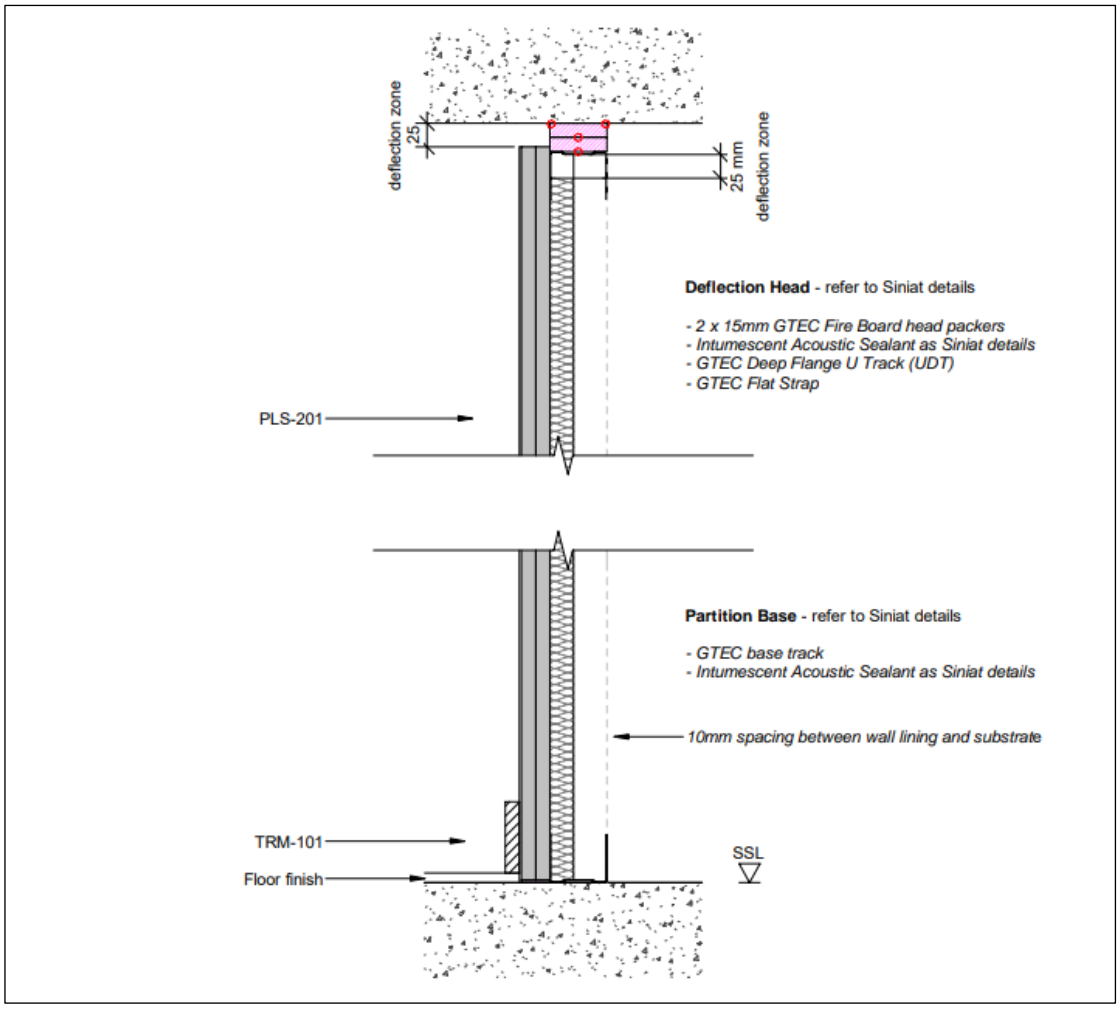
The below sketch illustrates a typical mass barrier ceiling and all services should be located below this mass barrier with the exception of SVPs which can be contained within the ceiling cavity with vertical elements wrapped in 25mm mineral wool and enclosed with 2x15mm SoundBloc.



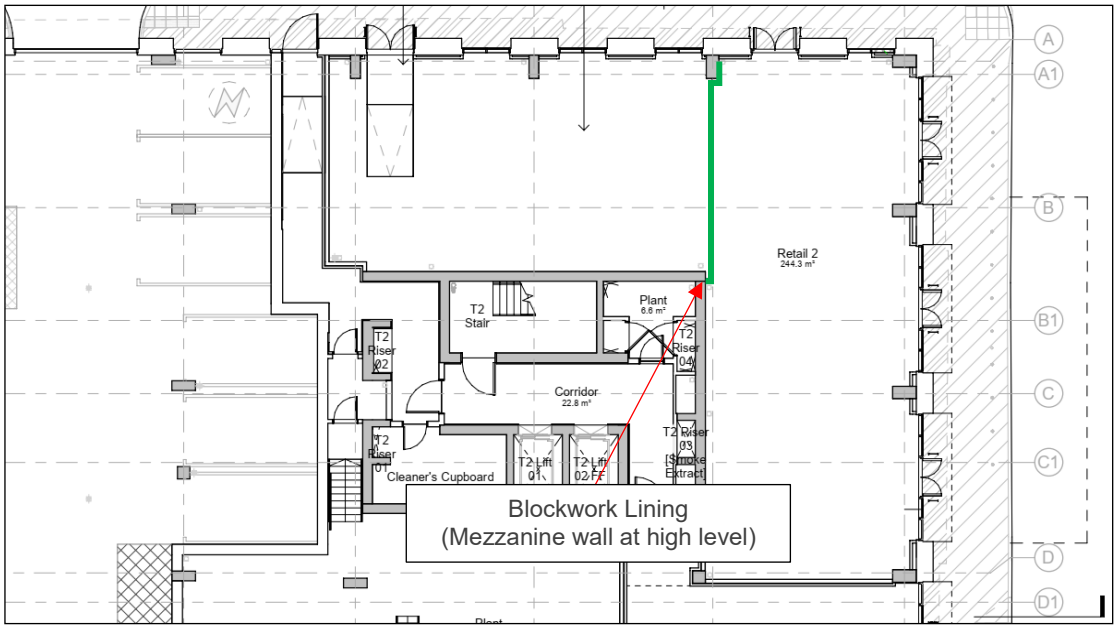
Sketch Detail of Mass Barrier Ceiling

2.2.3 Wall Linings

There is a blockwork wall separating the double height Gym space and the adjacent bedroom. The base-build information indicates that this wall is formed of MBL-121 (140mm blockwork) with a IWS-121 lining. The details for the IWS-121 lining are shown below.



To increase the sound insulation of the separating element, a lining should be provided to the Gym side of the wall. The lining should consist of 2x12.5mm SoundBloc (or equivalent) acoustically isolated from the blockwork using a suitable product (e.g. Pliteq Genie Clip or the Getzner Wall Lining Bracket). For clarity, the location of the blockwork lining is shown below:



Location of Mass Barrier Ceiling (Blue) and Blockwork Wall Lining (Green)

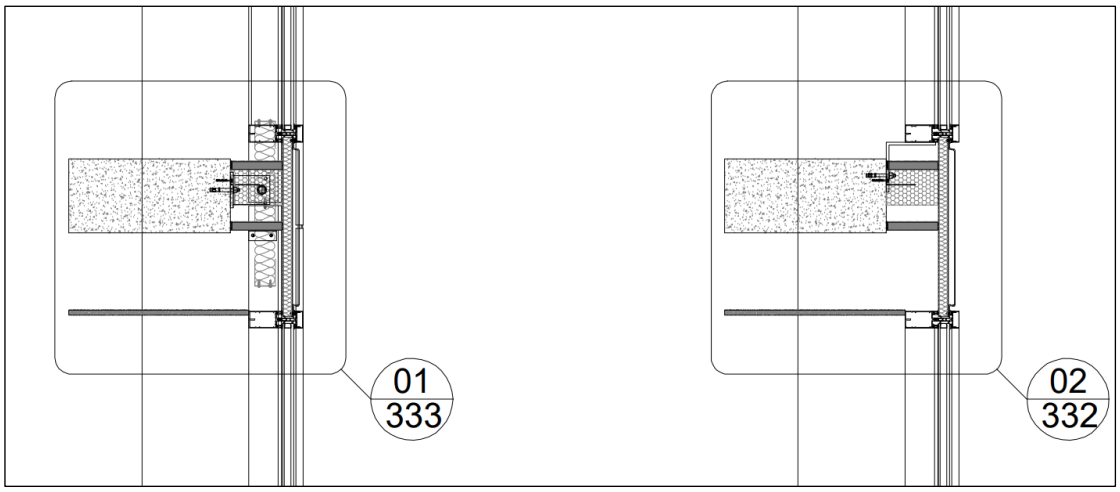
Linings to other core walls and columns within the Gym space should not be required provided that these walls will not be used for impactful activities (e.g. subject to impacts from medicine balls). In the event that any core wall area shall be used for such activities, a lining should be in installed. This lining should meet the specification described above but also capable of withstanding the expected impacts.

The external wall linings have been provided as part of the base-build shell of the unit.

2.2.4 Slab Edge Detail/Curtain Walling

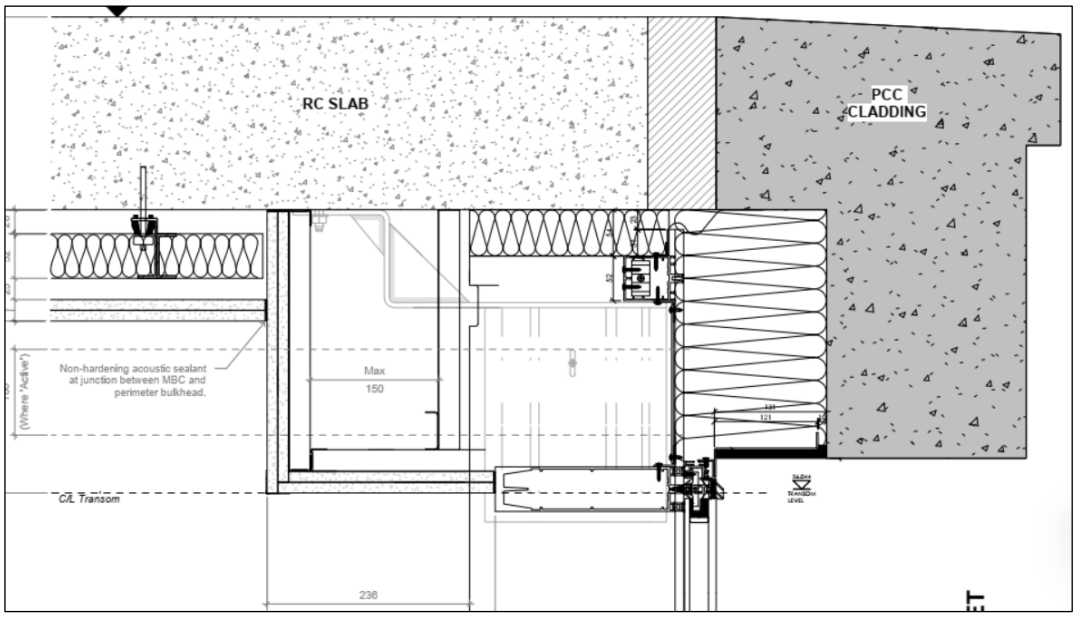
The sound insulation between the Gym and the apartment above will be impacted by the flanking performance of the base-build façade. The NEG Architectural Systems drawings show that the system is a stick system with a face-fixed bracket at the slab edge. The mullions are split at the slab and an insulated 300mm above and below the split.

The slab edge details taken from the base build information are shown below.



Base-build Slab Edge Details (Single Height Space)

The above should achieve a performance of around D_{nfw} 50 dB.



Base-build Slab Edge Details (Single Height Space)

The above should achieve a performance of around D_{nfw} 55 dB.

2.2.5 Mass Barrier – Wall Lining Interface

The interface between the mass barrier ceiling and the blockwork wall lining will need to be developed so that both systems interface and conceal the structure behind. The interface should be a soft joint so as not to rigidly connect the two systems.

2.3 Music/Activity Noise Limits

Based on the specification of the mass barrier ceiling and the enhanced slab edge and the additional linings to the blockwork walls, the composite sound reduction between the Gym and the worst-case bedroom of the mezzanine level apartment has been calculated based on the procedures set out in ISO 12354-1:2017. The calculated performance is set out below:

Composite Sound Reduction Index, R, at each Octave Band Centre Frequency						
63	**125**	**250**	**500**	**1000**	**2000**	**4000**
37	51	54	52	53	64	66

Based on the above, calculations have been carried out to establish the maximum internal noise level that could occur in the Gym and comply with G20 at night and G25 during the day. These limits are set out below and should be used to limit any sound systems in the space.

Product	**Maximum Noise Level, $L_{Aeq,1min}$, at each Octave Band Centre Frequency**						
	63	**125**	**250**	**500**	**1000**	**2000**	**4000**
Daytime Limits	84	88	82	74	72	80	79
Night-time Limits	81	83	78	69	67	75	74

The above limits would allow background music to be played at a moderate volume during the day and a low volume at night.

It should be noted that the above are calculated values. While all due care has been taken to establish the levels, on-site testing once the development has been completed would be required to confirm the final limiting levels.

Based on the above limits the levels of noise egress have been calculated though the existing façade. It is understood that the exiting façade is formed of aluminium framed glazed units with the following build-up:

OUTER: 8.8mm ANNEALED ACOUSTIC LAMINATE
(GF UNITS OUTER: 9.5MM ANNEALED ACOUSTIC LAMINATE(P4A))
CAVITY: 90% ARGON/ 10% AIR FILLED CAVITY WITH 20mm BLACK WARM EDGE SPACER
INNER: 6mm TOUGHENED +FG1.2, HEAT SOAK TESTED

The above would likely have the following minimum acoustic performance.

Zone	Minimum Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)						
	63	125	250	500	1000	2000	4000
Retail 2	22	23	27	33	37	40	40

Based on the above and the daytime and night-time limiting noise levels set out above the levels of noise breakout through the façade has been calculated as follows:

Time Period	Calculated Levels of Noise Breakout, L_{Aeq} (dB)
Day	41
Night	36

Based on the above, providing that the internal noise levels are limited to these set out above, the levels of breakout noise are likely to comply with the requirements of the Local Authority.

Yours sincerely

Jake Howarth

For HANN TUCKER ASSOCIATES