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MPF/PR0679/L04

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Cameron Radford
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Dear Cameron

HOUSE OF SOCIAL, FIRST STREET, MANCHESTER, PLANNING CONDITION 17

I write in relation to condition 17 of the planning approval for House of Social, First Street, and in particular in relation to noise breakout and noise transfer from the Food Hall on the ground floor.

INTRODUCTION

The planning approval for House of Social, First Street, Manchester includes a condition which requires that a noise study is conducted in relation to entertainment noise levels within the ground floor Food Hall on the ground floor of the building.

Fisher Acoustics Ltd has been commissioned by Renaker to determine the allowable activity noise levels within the Food Hall and to advise on compliance with the requirements of the planning approval for the development.

PLANNING CONDITION

Planning condition 17 of the planning approval for House of Social (planning application number 136170/FO/2023) states:

> *17) Notwithstanding the recommendation within the First Street Plot 10a Noise Impact Assessment First Street Developments Limited Ref PLOT10A-XX-XX-RP-Y-45001 P03 12 January 2023 by Cundall stamped as received on 17-02-23 before the operation of the ground floor Food Hall commences, details of it will be acoustically insulated and treated to limit the break out of noise shall be submitted for approval in writing by the City Council, as Local Planning Authority. This shall include a noise study of the premises and a scheme of acoustic treatment.*
>
> *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, respectively. The scheme proposed may need to include different measures such as acoustic lobbies at access and egress points of the premises, acoustic treatment of the building structure, sound limiters linked to sound amplification equipment and specified maximum internal noise levels. The approved noise insulation scheme shall be completed before any of the approved uses commence.*
>
> *Prior to occupation a post completion report to verify that all of the recommended mitigation measures have been installed and effectively mitigate any potential adverse noise impacts in adjacent residential accommodation arising directly from the proposed development shall be submitted and agreed in writing by the City Council as local planning authority. Prior to occupation any non compliance shall be suitably mitigated in accordance with an agreed scheme.*
>
> *The approved details shall be implemented and remain in place for as long as the unit is in use (and any subsequent permitted changes of use under Class E)*
>
> *Reason - To secure a reduction in noise in order to protect future residents from noise nuisance, pursuant to policies SP1 and DM1 of the Core Strategy and saved UDP Policy DC26.*

NOISE SENSITIVE RECEPTORS

The closest residential dwellings to the Food Hall at House of Social are the residential studios and clusters within House of Social itself. Other nearby residential receptors include the Vita Student residential building at First Street and Macintosh Mill.

There are other residential receptors that are at a greater distance from the Food Hall than the identified receptors and experience similar levels of pre-existing background noise. Thus, if satisfactory conditions are expected at the receptors identified in Figure 1, then satisfactory conditions can also be expected at other buildings that are at a greater distance from the Food Hall.

Plot 10A to the west of House of Social has planning approval for a 13-storey office building (planning reference 136043/FO/2023).

Figure 1 shows the location of the noise sensitive receptors in relation to House of Social.

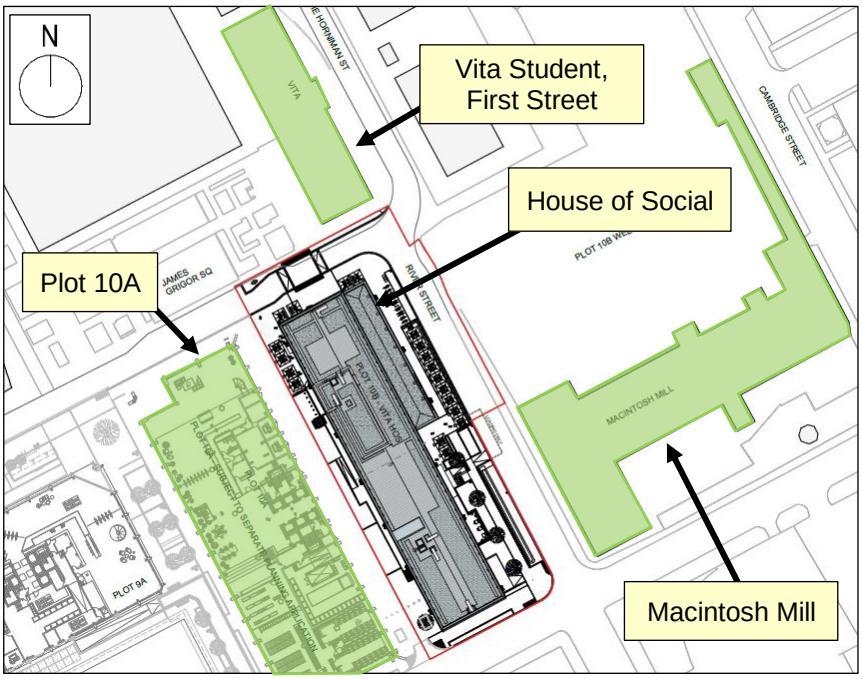

Figure 1: Site location plan

Figure 2 shows the proposed internal layout of the ground floor Food Hall.

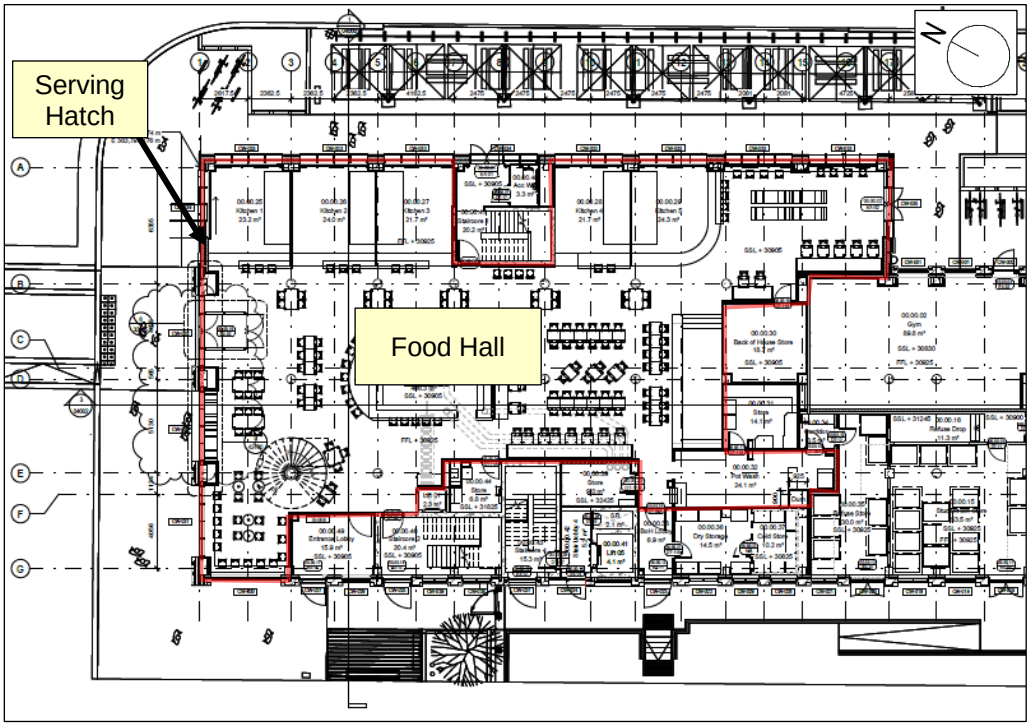

Figure 2: Proposed internal layout of Food Hall – Ground Floor

The Food Hall on the ground floor is acoustically open to the 'mezzanine' dining space on the 1st floor of the building. Figure 3 shows the proposed layout of the dining space.

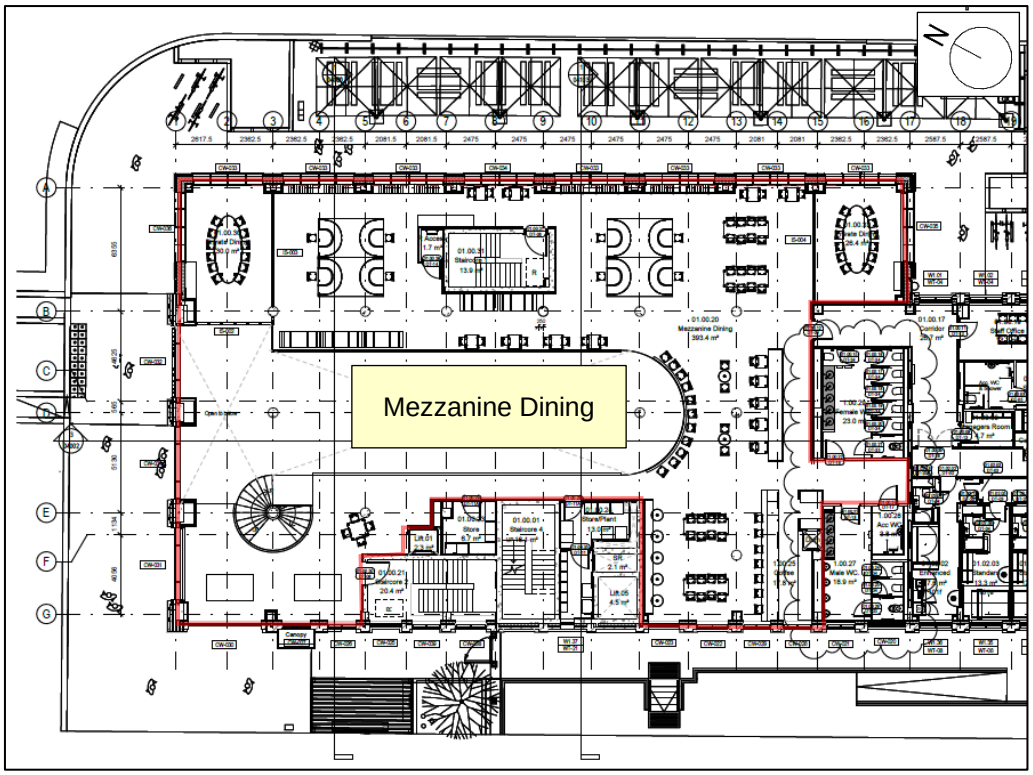

Figure 3: Proposed internal layout of Food Hall – First Floor

ENVIRONMENTAL NOISE CRITERIA

A sound system for background music replay is proposed within the Food Hall. Therefore, an assessment of potential music noise egress from the Food Hall and 1st floor dining space unit has been carried out in relation to planning condition 17.

As identified above, the criterion that must be designed to in relation to noise breakout to the external environment is as follows:

- Entertainment noise (LAeq,5 min) should be controlled to 5dB below the background noise level (LA90) without the entertainment noise present, in each octave band at the nearest noise sensitive location'.

The environmental noise report submitted as part of the planning application for the development and referenced by condition 17 identifies the specific external noise levels that must not be exceeded at the nearest residential properties to comply with the criteria identified in the condition, as follows:

Period	Sound Pressure Level (dB Leq) @ Octave Band Centre Frequency (Hz)						
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**
Daytime (07:00 to 23:00)	55	48	45	34	46	38	26
Night time (23:00 to 07:00)	45	38	38	34	33	25	16

Table 1: Maximum allowable external noise levels due to entertainment noise breakout

It is understood that the proposed latest operating time of any sound system within the Food Hall is 1am. Therefore, noise egress from House of Social must comply with the night time noise limits given in Table 1.

NOISE BREAKOUT

Within the curtain wall of the Food Hall there are patron access doors with lobbies and a 'grab-and-go' serving hatch openable to exterior. The principal determinant of the sound insulation performance of the external envelope will be the installed glazing, access doors and the open serving hatch.

As door lobbies are to be installed to the Food Hall, intermittent increases of external noise during the movement of patrons in and out of the Hall are not expected. However, the assessment has included a worst-case scenario of both internal and external doors of a lobby being open. In addition, between the hours of 7am and 7pm, a 'grab-and-go' hatch in the curtain wall is proposed to allow the serving of items. The assessment has included noise egress from the open hatch during the day.

The glazing specifications to the Food Hall, installed as part of the main construction contract for HoS, is as follows:

- 11.5 mm acoustic laminate – 16 mm thermal cavity - 6 mm float

The expected minimum weighted sound reduction index of the curtain wall fixed units and the patron access doors when closed are given in Table 2.

Building element	**Sound Reduction Index (dB) @ Octave Band Centre Frequency (Hz)**						
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**
Glazing - 11.5 mm laminate – 16 mm thermal cavity - 6 mm float	24	26	29	34	40	41	45
Doors	22	22	24	29	32	34	38

Table 2: Expected sound reduction index of Food Hall curtain wall elements

Calculations have been carried out to determine the allowable internal noise levels to achieve compliance with the external noise limits identified in Table 1 on the basis that the external doors to the Food Hall are closed or lobbied. The calculated noise levels during the day assumes that the 'grab-and-go' hatch is also open.

Table 3 identifies the calculated noise levels that could be generated in the Food Hall with doors closed and serving hatch open during daytime hours but closed during night-time hours without exceeding the daytime and night time external noise limits given in Table 1.

Location	Sound Pressure Level (dB Leq) @ Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Food Hall Daytime (0700 hrs to 2300 hrs)	87	81	78	77	79	71	59
Food Hall Night time (2300 hrs to 0700 hrs)	87	82	85	85	86	78	71

Table 3: Maximum allowable internal activity noise levels – daytime and night time, doors closed or lobbied, hatch open during the day

The overall daytime and night time noise levels given in Table 3 are 81 dB LAeq and 88 dB LAeq respectively. These noise limits represent reasonably high levels of music replay and could accommodate the proposed use of the Food Hall and Mezzanine Dining.

In the unlikely event that both the internal and external doors of a door lobby are propped open, the maximum allowable internal activity noise levels during the daytime and night time are given in Table 4 below.

Location	Sound Pressure Level (dB Leq) @ Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Food Hall Daytime (0700 hrs to 2300 hrs)	84	77	74	73	75	67	55
Food Hall Night time (2300 hrs to 0700 hrs)	76	69	69	65	64	56	47

Table 4: Maximum allowable internal activity noise levels – daytime and night time, all doors of lobbies open, hatch open during the day

The overall daytime and night time noise levels given in Table 4 are 77 dB LAeq and 68 dB LAeq respectively. These noise limits represent reasonably high levels of background music replay and could accommodate the proposed use of the Food Hall and Mezzanine Dining.

INTERNAL NOISE TRANSFER

There are residential apartments directly above the Mezzanine Dining area at Level 1 of Houd of Social. There is therefore the possibility of internal noise transfer between the Mezzanine Dining and the residential rooms above via the party floor.

Planning condition 17 identifies the maximum allowable noise levels at 63 Hz and 125 Hz in structurally adjoined residential properties due to entertainment noise transfer from the Food Hall. The condition does not stipulate allowable noise levels at frequency bands above 125 Hz. However, section 3.7.1.2 'Entertainment Venues' of 'Planning & Noise, Technical Guidance' issued by Manchester City Council in October 2022 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 17 and to avoid potential noise nuisance, the internal noise levels within a residential room due solely to music replay in the Food Hall should not exceed the values given in Table 5.

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

Table 5: Maximum recommended noise levels in residential rooms due to music in Food Hall

The separating floor build-up between the Level 1 Mezzanine Dining and the residential rooms above is to be as follows:

- 225 mm thick concrete slab underdrawn with of two layers of 15 mm dense plasterboard (minimum density 830 kg/m^3) fixed to resilient ceiling hangers to create a minimum cavity of 150 mm, 75 mm mineral wool of minimum density 22 kg/m3 within the ceiling void.

The separating floor is capable of achieving a weighted sound level difference between the Mezzanine Dining and the residential rooms above of approximately 65 dB DnT,w

Given the expected sound insulation performance of the proposed separating floor build-up, Table 6 identifies the maximum allowable noise levels in the Food Hall and the Mezzanine Dining area to comply with the noise limits identified in Table 5.

Room	**Sound Pressure Level (dB Leq) @ Octave Band Centre Frequency (Hz)**						
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**
Mezzanine Dining, Level 1	90	90	80	86	87	88	89
Food Hall, Ground floor	92	92	85	90	90	90	90

Table 6: Maximum recommended sound levels in rooms – due to internal noise transfer only

It will be noted that the allowable noise levels at 500 Hz and above are greater than the allowable noise levels below 500 Hz. In contrast, for a typical music source, noise levels at 500 Hz and above are generally lower than those below 500 Hz. As a consequence, the overall noise level in the room is expected to be determined by the noise levels at lower frequencies.

The expected overall noise level generated by music replay that complies with the noise limits at low frequency for the Food Hall is 85 dB LAeq. This noise limit represents reasonably high levels of music replay and could accommodate the proposed use of the Food Hall and Mezzanine Dining.

OVERALL MAXIMUM ALLOWABLE INTERNAL NOISE LEVELS WITHIN FOOD HALL

Given the above calculated allowable noise levels due to external noise breakout and internal noise transfer, Table 7 and 8 identifies the overall maximum allowable internal activity noise levels, including music replay, within the Food Hall.

Location	Sound Pressure Level (dB Leq) @ Octave Band Centre Frequency (Hz)						
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**
Food Hall Daytime (0700 hrs to 2300 hrs)	87	81	78	77	79	71	59
Food Hall Night time (2300 hrs to 0700 hrs)	87	82	85	85	86	78	71

Table 7: Maximum allowable internal activity noise levels – daytime and night time, doors closed or lobbied, hatch open during the day

The overall daytime and night time noise levels given in Table 3 are 81 dB LAeq and 88 dB LAeq respectively. These noise limits represent reasonably high levels of music replay and could accommodate the proposed use of the Food Hall and Mezzanine Dining.

Location	Sound Pressure Level (dB Leq) @ Octave Band Centre Frequency (Hz)						
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**
Food Hall Daytime (0700 hrs to 2300 hrs)	84	77	74	73	75	67	55
Food Hall Night time (2300 hrs to 0700 hrs)	76	69	69	65	64	56	47

Table 8: Maximum allowable internal activity noise levels – daytime and night time, all doors of lobbies open, hatch open during the day

The overall daytime and night time noise levels given in Table 4 are 77 dB LAeq and 68 dB LAeq respectively. These noise limits represent reasonably high levels of background music replay and could accommodate the proposed use of the Food Hall and Mezzanine Dining.

Given the proposed operation of the Food Hall as a food outlet with background music replay, compliance with the noise limits given in Tables 7 and 8 is fully expected.

CONCLUSION

The maximum allowable internal noise levels within the Food Hall have been calculated such that the applicable external noise limits at the closest residential receptors and the maximum allowable noise levels within the structurally adjoined residential areas above the Food Hall are not exceeded.

The calculated allowable noise levels are greater than those expected within the Food Hall, given the proposed operation of the unit as a food outlet with music replay.

Compliance with the requirements of condition 17 of the planning approval is therefore fully expected.

If there is any aspect of the above that you would like to discuss then please do not hesitate to contact the undersigned.

Yours sincerely

MATT FISHER BEng (Hons) CEng MIOA
For and on behalf of Fisher Acoustics Limited