

MPF/PR0538/L16

2 August 2021

Matt Anderson
John Sisk & Son Ltd
2nd Floor Maclaren House
Talbot Road
Old Trafford
Manchester
M32 0FP

Flint Glass Works
64 Jersey Street
Manchester M4 6JW

0161 605 0905 📞
info@fisheracoustics.co.uk 📧
www.fisheracoustics.co.uk 🌐

Dear Matt

CIRCLE SQUARE, AFFINITY LIVING, BUILDINGS 5 & 6, MANCHESTER

We write to confirm the results of the internal noise measurements conducted within the apartments of Buildings 5 & 6, Circle Square, Manchester. The measurements have been conducted to determine the internal noise levels due to external and internal noise sources and to compare the measurements to the acoustic requirements for the project.

INTRUSIVE NOISE CRITERIA - PLANNING CONDITION 25, PARTS 1 & 2

Parts 1 & 2 of planning condition 25 of the planning approval for Buildings 5 & 6, Circle Square, reference 111026/FO/2016/C1 (as amended by 116450/FO/2017), state:

- Part 1: *No installation of any external facade materials shall commence unless and until final details of the proposed windows and noise associated with plant to be installed have been submitted and agreed in writing by the City Council as Local Planning Authority. The scheme of acoustic insulation and ventilation shall meet the standards as set out in the following documents:*
 - *Noise Impact Assessment prepared by Fisher Acoustics Appendix 15.3 (Proposed Phase 1C (Plot 9);*

and

 - *o Updated Ventilation Strategy prepared by Crookes Walker Consulting R003 Revision 2;*
- Part 2: The approved noise insulation scheme shall be completed before any of the dwelling units are occupied. Prior to occupation a post completion report to verify that all of the recommended mitigation measures have been installed in the residential accommodation shall be submitted and agreed in writing by the City Council as local planning authority and any non-compliance suitably mitigated in accordance with an agreed scheme prior to occupation.

Reason - To secure a reduction in noise from Oxford Road and Charles Street ; in order to protect future residents from noise nuisance, pursuant to policies SP1, H1 and DM1 of the Core Strategy.

Part 1 of condition 25 was discharged on 3 April 2020 (application number CDN/20/0140). The discharge notice states:

- 'Condition 25 (Noise) -On the basis of the following, the condition is partially discharged as follows:

Provided that the windows are installed in accordance with the following:

(a) F1632-Blocks 5&6 Glass Matrix Rev 4, issued by FK, F1632 TDS-002-GT6-PROJECT DATA AND CALCS 8.8A-24-12.8A 50Rw, F1632-TDS-003-GT7-PROJECT DATA & CALCS 10-16-8.8A 45Rw, F1632-TDS-004-GT8-PROJECT DATA & CALCS 8.8A-15-8 41Rw, F1632-TDS-005-GT9-PROJECT DATA & CALCS 8.8-15-8 36 Rw, F1632-TDS-006-GT10-PROJECT DATA & CALCS 13.5-15-12 39 Rw and F1632-TDS-007-GT11-PROJECT DATA & CALCS 10-16-6 Acoustic 39 Rw;

(b) Kawneer AA720 opening lights, Kawneer AA110 curtain wall frame, purge panels, fixed panels and external wall construction.

(c) Recommended noise levels and acoustic insulation measures set out in the Noise Impact Assessment prepared by Fisher Acoustics Appendix 15.1 (Proposed Phase 1B (Plot 7 and 8); and

(d) Noise levels and acoustic insulation measures set out Updated Ventilation Strategy prepared by Crookes Walker Consulting R003 Revision 2;

the proposed windows meet the specifications in the initial acoustic report and can now be installed'.

With reference to part c) of the discharge notice, the recommended noise levels within apartments are reproduced in Table 1.

Room Type	Time of day	
	07:00 to 23:00	23:00 to 07:00
Living room	35 dB LAeq, 16 hours	-
Dining area	40 dB LAeq, 16 hours	-
Bedroom	35 dB LAeq, 16 hours	30 dB LAeq, 16 hours Individual noise events should not normally exceed 45 dB (L _{Amax}) more than 15 fifteen times a night

Table 1: Intrusive noise criteria

MEASUREMENT METHODOLOGY

The measurement methodology, as agreed with Manchester City Council to demonstrate compliance with the internal noise level requirements of condition 25 and to satisfy the requirements of part 2 of condition 25, is as follows:

- 1) 10% of apartments are to be tested in the daytime only
- 2) Night-time measurements will be interpolated from the daytime noise levels, based on daytime and night-time pre-construction survey data (gathered in 2015).
- 3) Install sound level meters in a living room and bedroom of one apartment between the hours of approx. 4.30pm and 7pm (i.e. at a time when construction noise at Circle Square has ceased but road traffic levels can be assumed to be at a typical maximum).
- 4) Measure the noise level in the rooms for approximately 5 minutes. If the average (LAeq) noise level in the room has not settled after 5 minutes, continue the measurement until a consistent (LAeq) noise level has been established (up to approx. 10 minutes if required).
- 5) Measure the reverberation time in the rooms to allow the measured noise levels to be corrected to allow for the reduction in internal noise level that will occur upon furnishing of the rooms.
- 6) Analyse the data to determine the daytime noise level in the rooms. With reference to the results of the 2015 noise surveys, estimate the night-time internal noise levels within bedrooms based on the change in external noise levels between the daytime and night time.
- 7) Repeat the above measurements and analysis for the living room and a bedroom within a further forty two apartments.
- 8) The location of the apartments under test will be selected by Fisher Acoustics on the basis of apartments that are most exposed to the surrounding road traffic noise sources and with reference to any change in the glazing specification to apartments.

The internal noise measurements were conducted by Fisher Acoustics Ltd between 1625 hours and 1920 hours on Tuesday 20 July 2021, 1535 hours and 1945 hours on Wednesday 21 July 2021 and 1530 hours and 1835 hours on 22 July 2021. Minimal construction activity noise was prevalent within the building during the measurements.

Road traffic volumes were found to be consistent on Oxford Road and Charles Street and traffic was travelling at speed on the Mancunian Way beyond 7pm and thus the measurements were extended beyond the originally proposed finish time. Rail traffic on the nearby Manchester Piccadilly to Oxford Road railway line was consistent throughout the measurement surveys.

The measurements were undertaken with windows and opening external doors closed. All of the tested rooms were unfurnished such that the reverberation times of the rooms were greater than would be the case in the rooms when furnished. Therefore, the measured noise levels have been corrected to allow for the expected reduction in reverberation time following the furnishing of the rooms. The measured reverberation times have been corrected to 0.5 seconds for bedrooms and 0.6 seconds for living rooms.

The MVHR in each apartment was operational for the duration of the measurements, providing continuous whole house background ventilation in accordance with the requirements of Approved Document F.

The measurements were conducted in general accordance with 'ANC Guidelines -Noise Measurements in Buildings, Part 2: Noise from External Sources (e.g. traffic noise) within Buildings'.

MEASURED NOISE LEVELS DUE TO EXTERNAL NOISE SOURCES

Apartment Number	Corrected Average Daytime Noise Level, dB (LAeq, 5mins)		Principle external noise sources during measurement
	Kitchen/ Living Room (Limit = 35 dB LAeq, 16hrs)	Bedroom (Limit = 35 dB LAeq, 16hrs)	
1.08	30	25	Road traffic, including buses
1.09	27	25	"
1.10	30	26	"
1.11	32	24	Road traffic, including buses, 3 trains
1.14	28	21	Road traffic
1.17	26	23	Road traffic, passenger train
1.19	30	23	Road traffic
2.05	27	21	Road traffic, including buses and HGV
2.07	31	24	Road traffic, including buses
2.08	33	25	"
2.10	31	26	"
2.16	28	23	Road traffic, including bus
2.20	26	20	Road traffic, including buses
3.08	31	25	"
3.09	31	26	Road traffic, including buses, 2 trains
3.11	30	25	Road traffic, including buses
3.12	29	25	Road traffic, 2 passenger trains, freight train
3.21	26	21	Road traffic
4.06 Studio	24		Road traffic
4.10	32	25	Road traffic, including buses
4.13	30	23	Road traffic
4.17	31	25	Road traffic, 1 passenger train
4.20	30	23	Road traffic, internal construction noise
5.08	29	25	Road traffic, including buses
5.09	30	24	Road traffic, including buses, train
5.11	34	23	Road traffic, including buses, train
5.14	29	21	Road traffic
6.07	28	22	Road traffic, including buses
6.10	32	22	Road traffic, including buses, 2 trains
6.12	31	22	Road traffic, including buses, 1 train
6.16	30	23	Road traffic, 1 train
7.08	35	26	Road traffic, including buses (MVHR dominant)
7.11	30	23	Road traffic, including buses
7.14	33	24	Road traffic including high revving car, 2 trains
7.17	32	26	Road traffic, passenger Trans Pennine Express train
16.17	31	29	Living Room: 3 passenger trains Bedroom: 1 freight train
16.20	33	25	Road traffic (Mancunian Way)
19.16	33	26	Living Room: 2 passenger trains Bedroom: 2 passenger trains & 1 freight train
19.19	33	26	Road traffic (Mancunian Way)
26.17	31	22	Living Room: 2 passenger trains Bedroom: 1 passenger train
26.20	32	23	Road traffic (Mancunian Way)
34.16	31	26	Living Room: 1 passenger trains Bedroom: 2 passenger trains, high-revving car
34.19	31	28	Road traffic (Mancunian Way)

Table 3: Measured, RT-corrected average (LAeq,5mins) daytime noise levels in apartment rooms

Table 3 above shows the measured, RT-corrected average ($L_{Aeq, 5min}$) daytime noise levels in living rooms and bedrooms.

It can be seen that compliance with the daytime internal noise criterion has been achieved in all of the tested living rooms and bedrooms

In order to determine the expected night time noise levels within the bedrooms under test given the measured levels of internal noise during the day, reference has been made to the results of previous noise surveys carried out at the site by Fisher Acoustics.

In particular, measurements of external noise carried out during the daytime of Thursday 10 December 2015 and the night time of Friday 11 December 2015 between 11pm and 01.20am showed that there was no difference between the daytime noise level and the night time noise level between 11pm and 1am on Oxford Road and Charles Street. (In reality, the 8-hour average night time noise levels may be slightly lower as noise levels would tend to reduce after approximately 4am).

Therefore no 'daytime-to-night time' correction has been applied to the measured noise daytime levels in bedrooms to determine the potential night time noise levels in bedrooms.

Table 4 shows the expected night time average noise levels in bedrooms.

Apartment Number	Estimated Average Night Time Noise Level, dB ($L_{Aeq,8hrs}$) (Limit = 30 dB $L_{Aeq,8hrs}$)
1.08 Bedroom 1	25
1.09 Bedroom	25
1.10 Bedroom 1	26
1.11 Bedroom 2	24
1.14 Bedroom 1	21
1.17 Bedroom 2	23
1.19 Bedroom 3	23
2.05 Bedroom 2	21
2.07 Bedroom 2	24
2.08 Bedroom 2	25
2.10 Bedroom 1	26
2.16 Bedroom 2	23
2.20 Bedroom	20
3.08 Bedroom 1	25
3.09 Bedroom	26
3.11 Bedroom 2	25
3.12 Bedroom 2	25
3.21 Bedroom	21
4.06 Studio	24
4.10 Bedroom 1	25
4.13 Bedroom 2	23
4.17 Bedroom 2	25
4.20 Bedroom	23
5.08 Bedroom 1	25
5.09 Bedroom	24
5.11 Bedroom 2	23
5.14 Bedroom 2	21

Apartment Number	Estimated Average Night Time Noise Level, dB (L_{Aeq,8hrs}) (Limit = 30 dB L_{Aeq,8hrs})
6.07 Bedroom 2	22
6.10 Bedroom 2	22
6.12 Bedroom 1	22
6.16 Bedroom 1	23
7.08 Bedroom 1	26
7.11 Bedroom 2	23
7.14 Bedroom 2	24
7.17 Bedroom 2	26
16.17 Bedroom 2	29
16.20 Bedroom	25
19.16 Bedroom 2	26
19.19 Bedroom 3	26
26.17 Bedroom 2	22
26.20 Bedroom	23
34.16 Bedroom 2	26
34.19 Bedroom 3	28

Table 4: Measured, RT-corrected average (L_{Aeq,5mins}) noise levels in bedrooms

It can be seen that compliance with the night-time 'L_{Aeq}' internal noise criterion is expected to be achieved in all of the assessed bedrooms. It can be seen that there is a minimum difference of 4dB between the potential night time internal noise levels and the night time internal noise criterion.

Table 5 shows the measured RT-corrected maximum (L_{Amax}) daytime noise levels in bedrooms.

Apartment Number	Measured Maximum Daytime Noise Level, dB (L_{Amax}) (Limit = 45 dB L_{Amax})	Principle external noise sources during measurement
1.08 Bedroom 1	37	Road traffic, including buses
1.09 Bedroom	37	"
1.10 Bedroom 1	39	"
1.11 Bedroom 2	35	Road traffic, including buses, 3 trains
1.14 Bedroom 1	33	Road traffic
1.17 Bedroom 2	31	Road traffic, passenger train
1.19 Bedroom 3	36	Road traffic
2.05 Bedroom 2	33	Road traffic, including buses and HGV
2.07 Bedroom 2	33	Road traffic, including buses
2.08 Bedroom 2	35	"
2.10 Bedroom 1	35	"
2.16 Bedroom 2	33	Road traffic, including bus
2.20 Bedroom	28	Road traffic, including buses
3.08 Bedroom 1	35	"
3.09 Bedroom	36	Road traffic, including buses, 2 trains
3.11 Bedroom 2	39	Road traffic, including buses
3.12 Bedroom 2	38	Road traffic, 2 passenger trains, freight train
3.21 Bedroom	39	Road traffic

Apartment Number	Measured Maximum Daytime Noise Level, dB (L _{Amax}) (Limit = 45 dB L _{Amax})	Principle external noise sources during measurement
4.06 Studio	29	Road traffic
4.10 Bedroom 1	36	Road traffic, including buses
4.13 Bedroom 2	34	Road traffic
4.17 Bedroom 2	38	Road traffic, 1 passenger train
4.20 Bedroom	37	Road traffic, internal construction noise
5.08 Bedroom 1	35	Road traffic, including buses
5.09 Bedroom	34	Road traffic, including buses, train
5.11 Bedroom 2	32	Road traffic, including buses, train
5.14 Bedroom 2	32	Road traffic
6.07 Bedroom 2	32	Road traffic, including buses
6.10 Bedroom 2	32	Road traffic, including buses, 2 trains
6.12 Bedroom 1	29	Road traffic, including buses, 1 train
6.16 Bedroom 1	35	Road traffic, 1 train
7.08 Bedroom 1	33	Road traffic, including buses (MVHR dominant)
7.11 Bedroom 2	35	Road traffic, including buses
7.14 Bedroom 2	43	Road traffic including high revving car, 2 trains
7.17 Bedroom 2	42	Road traffic, passenger Trans Pennine Express train
16.17 Bedroom 2	39	1 freight train
16.20 Bedroom	31	Road traffic (Mancunian Way)
19.16 Bedroom 2	39	2 passenger trains & 1 freight train
19.19 Bedroom 3	32	Road traffic (Mancunian Way)
26.17 Bedroom 2	30	1 passenger train
26.20 Bedroom	32	Road traffic (Mancunian Way)
34.16 Bedroom 2	37	2 passenger trains, high-revving car
34.19 Bedroom 3	35	Road traffic (Mancunian Way)

Table 5: Measured, RT-corrected maximum (L_{Amax,5mins}) noise levels in bedrooms

During the daytime measurements within bedrooms, there were no excesses over the night time internal noise criterion of 45dB L_{Amax} given maximum noise events generated by freight trains, passenger trains, buses and high-revving performance cars. Compliance with the night time maximum internal noise criterion is therefore expected in all of the assessed bedrooms due to 'normal' external night time noise events.

CONCLUSION

With reference to the measurement results and subsequent analysis, compliance with the daytime and night time average internal noise criteria is expected in all of the tested apartment rooms.

During the daytime measurements within bedrooms, there were no excesses over the night time internal noise criterion of 45dB LA_{max} due to maximum external noise events generated by freight trains, passenger trains, buses and high-revving performance cars. Compliance with the night time maximum internal noise criterion is therefore expected in all of the assessed bedrooms due to 'normal' external night time noise events.

It is therefore considered that the requirements of planning condition 25 relating to internal noise levels within apartments have been achieved.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Matt Fisher', is positioned above the printed name.

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