

MPF/PR0634/L04

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James Daycock
Renaker Build Limited
NQ Building
47 Bengal Street
Ancoats
Manchester
M4 6BB

Flint Glass Works
64 Jersey Street
Manchester M4 6JW

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

Dear James

CROWN STREET PHASE 2, PLANNING CONDITIONS 20 (BUILDING C4) AND 58 (BUILDING C5)

We write with confirmation of the expected external noise levels due to the proposed amenity and commercial uses at Crown Street, Phase 2, Manchester.

INTRODUCTION

The planning approval for Crown Street, Phase 2, Manchester includes conditions which requires that a noise study is conducted in relation to activity noise egress from the proposed non-residential uses that are ancillary to the residential accommodation at the development.

Fisher Acoustics Ltd has been commissioned by Renaker Limited to determine the expected external noise levels generated by the proposed non-residential uses, which include a gym, and to advise on compliance with the requirements of the planning approval for the Development.

PLANNING CONDITION

Planning Condition 20 (Phase A - Building C4) and Planning Condition 58 (Phase B - Building C5) of the Planning Approval for Crown Street, Phase II (Planning Application number 126668/FO/2020) state:

- *Prior to commencement of any of the non-residential uses within Phase A (condition 20) / Phase B (condition 58) (including any gymnasium where this forms part of Phase A (condition 20) / Phase B (condition 58)), the premises 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.*

Where entertainment noise is proposed the LAeq (entertainment noise) shall be controlled to 10 dB 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.

Upon completion of Phase A (condition 20) / Phase B (condition 58) of the development a verification report to validate that the work undertaken throughout Phase A (condition 20) / Phase B (condition 58) 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 has 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.

The nearest noise sensitive locations to the non-residential uses, as referred to by the above conditions are the residential apartments within C4 and C5.

PROPOSED NON-RESIDENTIAL USES

The potentially noise generating non-residential uses at Crown Street, Phase 2 are as follows:

C4

- | | |
|-------------------------------------|---------------------|
| ▪ Commercial Unit | Level 0 and Level 1 |
| ▪ Gym | Level 1 |
| ▪ Yoga Studio | Level 1 |
| ▪ Residents Amenity/ Private Dining | Level 2 |

C5

- | | |
|------------------------------|---------------------|
| ▪ Commercial Unit | Level 0 and Level 1 |
| ▪ Gym | Level 1 |
| ▪ Studio | Level 1 |
| ▪ Residents Lounge | Level 2 |
| ▪ Private Dining Rooms 1 & 2 | Level 2 |

Figure 1 to Figure 6 show the locations of the non-residential uses in C4 and C5.

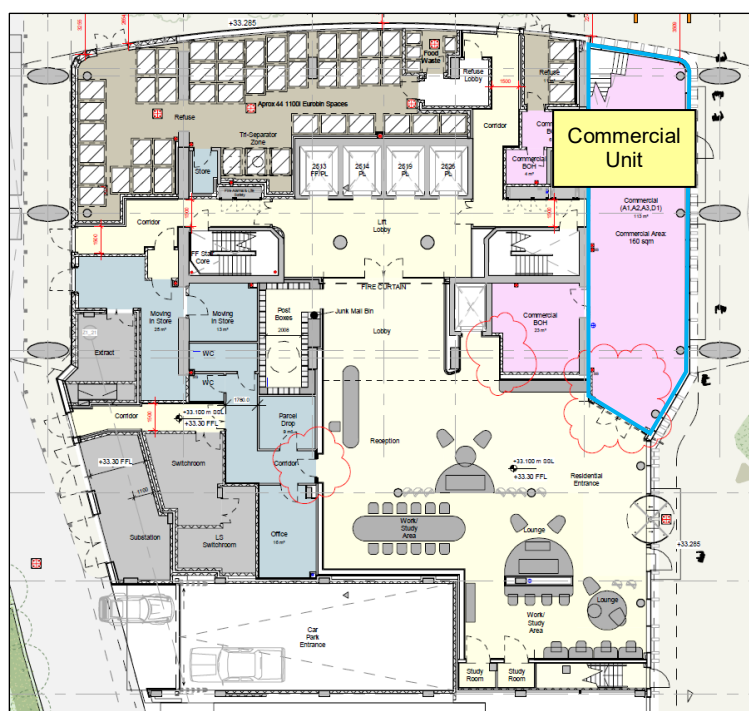


Figure 1: C4, Level 0

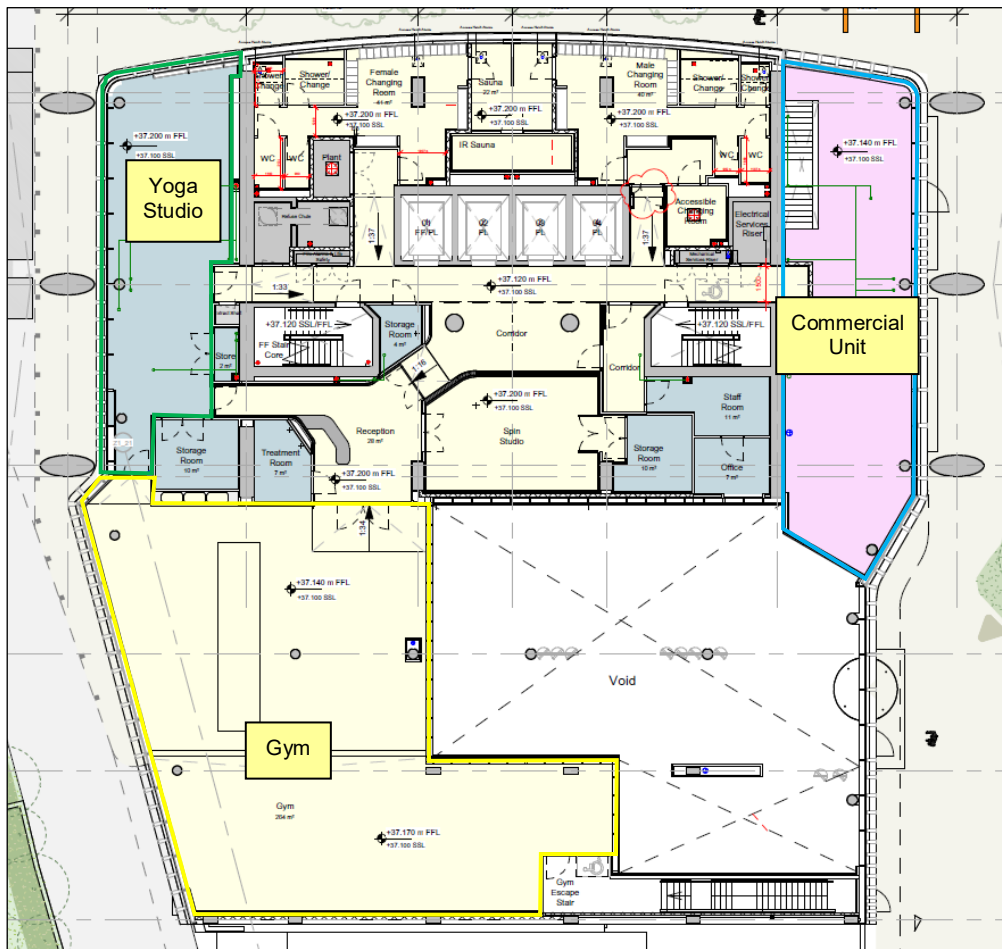


Figure 2: C4, Level 1

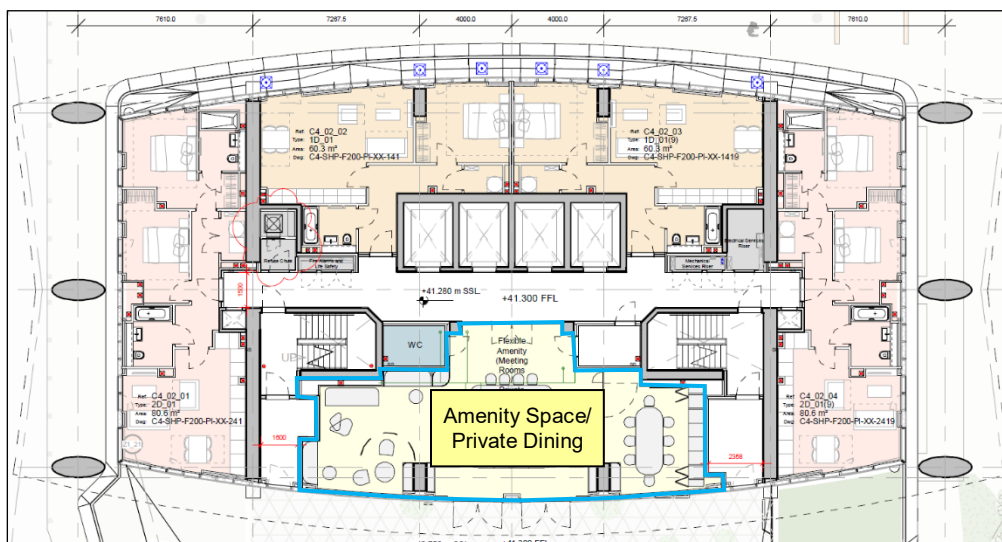


Figure 3: C4, Level 2

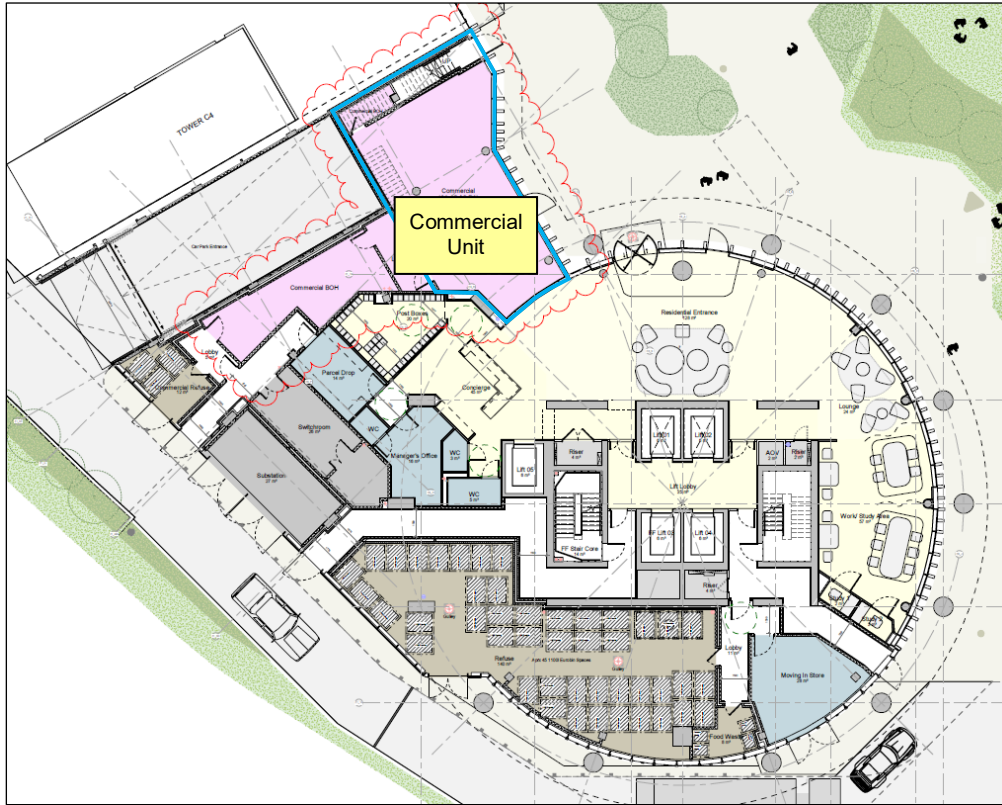


Figure 4: C5, Level 0

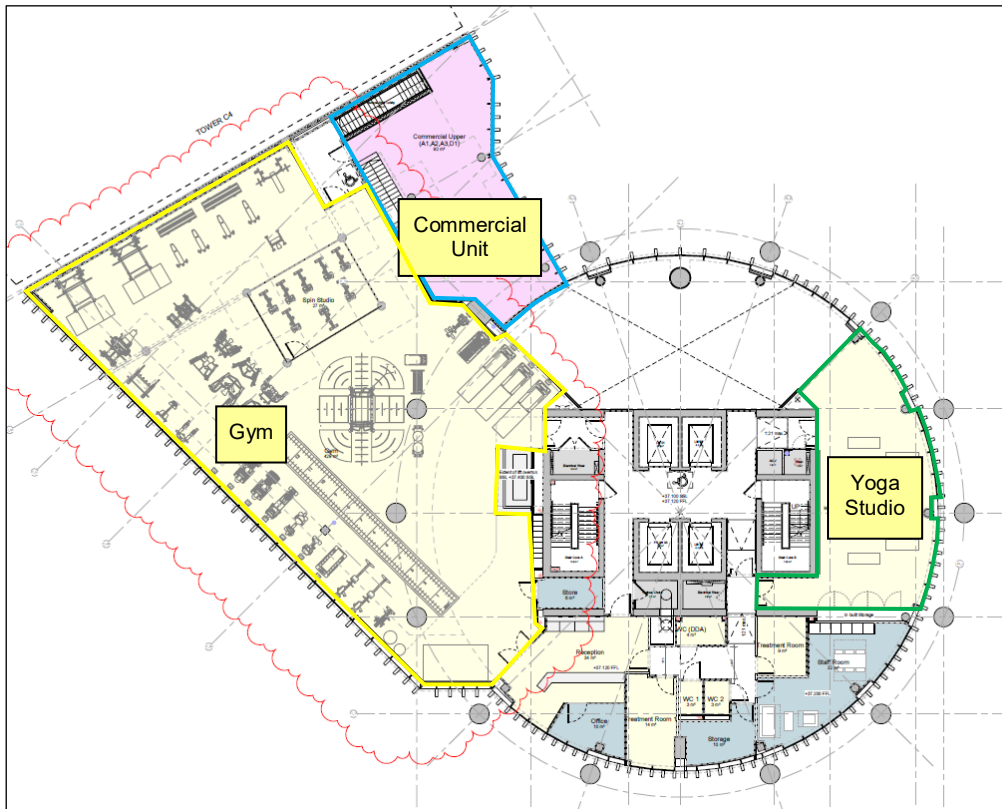


Figure 5: C5, Level 1

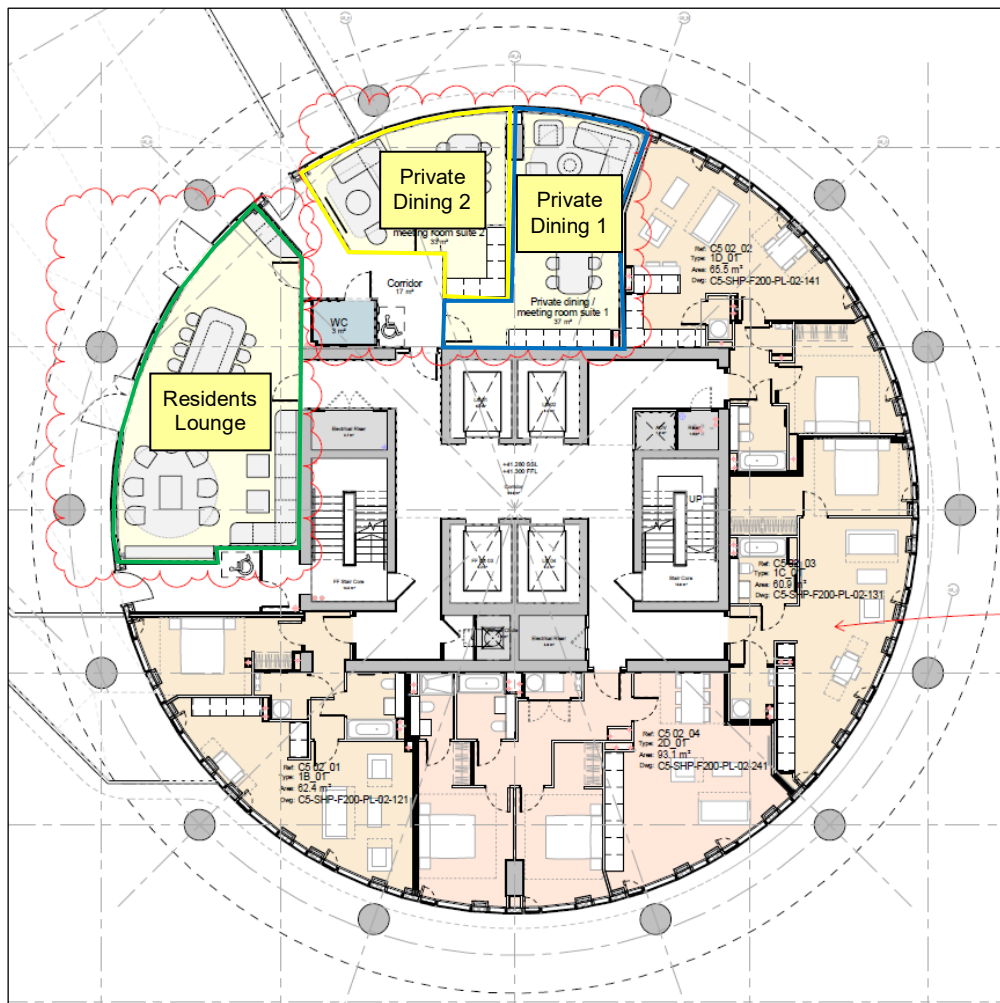


Figure 6: C5, Level 2

INTERNAL NOISE TRANSFER

Within C4 there are residential apartments directly above the Commercial Unit, Yoga Studio and the Flexible Amenity/ Private Dining Rooms. Within C5 there are residential apartments directly above the gym, Yoga Studio, Residents lounge and Private Dining Rooms. There is therefore the possibility of internal noise transfer between the non-residential spaces and the apartments above via the party floor structural slab.

In C4 and C5, the party floor between all non-residential spaces and the apartments directly above is a 250 mm thick flat concrete slab.

Private Dining Room 1 in C5 is separated from the horizontally adjacent apartment by a wide cavity twin frame wall that achieves a minimum weighted sound reduction index of 65 dB Rw.

In order to avoid potential noise nuisance to residents, it is recommended that the internal noise levels within an apartment due solely to music replay in the non-residential spaces within C4 and C5 do not exceed the values given in Table 1.

Location	Sound Pressure Level (dB) @ Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
C4 & C5 Apartments	40	30	23	20	17	15	12

Table 1: Maximum recommended noise levels in apartments due to music replay in non-residential spaces

It will be noted that the maximum recommended noise levels in apartments at 63 Hz and 125 Hz are lower than those stipulated by Condition 20 (C4) and Condition 58 (C5). Therefore compliance with the recommended values in Table 6 will provide a substantial margin of comfort that the requirements of the planning condition will be achieved.

Given the party floor slab and associated structures in C4, Table 2 identifies the calculated maximum allowable music noise levels in the C4 non-residential spaces without exceeding the noise limits given in Table 1.

Location	Sound Pressure Level (dB) @ Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Gym	75	73	77	73	69	66	65
Yoga Studio	75	78	79	79	76	75	73
Flexible Amenity/ Private Dining	75	78	79	79	76	75	73
Commercial Unit	76	70	67	71	77	77	80

Table 2: Maximum allowable noise level in C4 non-residential spaces – re internal noise transfer

Given the party floor slab, party wall and associated structures in C5, Table 3 identifies the calculated maximum allowable music noise levels in the C5 non-residential spaces without exceeding the noise limits given in Table 1.

Location	Sound Pressure Level (dB) @ Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Gym	77	69	72	75	78	78	78
Yoga Studio	78	78	82	80	80	80	80
Lounge (Level 01)	78	78	82	80	80	80	80
Private Dining/ Meeting Room Suite 2	78	78	82	80	80	80	80
Private Dining/ Meeting Room Suite 1	73	75	73	75	78	80	80
Commercial Unit (Day time 7:00 to 23:00)	74	69	72	74	74	73	60
Commercial Unit (Night-time 23:00 to 07:00)	70	65	68	71	70	69	56

Table 3: Maximum allowable noise level in C5 non-residential spaces – re internal noise transfer

The noise levels detailed in Tables 2 and 3 would allow a typical retail outlet, bar or restaurant with background music replay to be accommodated in the commercial unit. Similarly the expected activity noise levels within the non-residential spaces are no greater than the values in Tables 2 and 3.

Given compliance with the noise limits given in Tables 2 and 3, it is expected that the proposed commercial unit within the Development will be able to operate within the proposed Planning Class without causing disturbance to existing and future residential receptors.

ENVIRONMENTAL NOISE CRITERIA - NOISE EGRESS FROM NON-RESIDENTIAL USES

It is noted that planning conditions 20 and 58 require that entertainment noise (measured as an 'LAeq' ('average')) shall be controlled to 10 dB below the pre-existing 'LA90' (background noise) in each octave band at the facade of the nearest noise sensitive location. However, in relation to 'entertainment noise, Section 3.7.1.2 of 'Planning & Noise, Technical Guidance' published by Manchester City Council in June 2022 states:

- *A planning application for a new entertainment venue that is structurally detached from other building uses should demonstrate that music noise from the proposal will not be 'audible' in nearby residential properties, assuming that the residential properties in question have their windows open. The criterion here is: 'Entertainment noise (LAeq,5min) should be controlled to 5dB below the typical background noise level (LA90) in each octave band at the nearest noise sensitive location'.*

It is therefore proposed that the non-residential areas adhere to the most recent (2022) guidance published by Manchester City Council.

The closest residential receptors to the non-residential units are the apartments within Crown Street Phase 2 itself.

The Noise and Vibration chapter of the Environmental Statement for Crown Street Phase 2 (Phase C) (planning application number 133516/MO/2022), compiled by Fisher Acoustics, identifies the results of environmental noise surveys undertaken by Fisher Acoustics Limited at and around the site. The chapter also presents the results of 3D acoustic modelling studies and in particular the predicted noise levels at residential buildings within the Crown Street masterplan.

The results of the noise surveys have been to establish the applicable external noise limits at residential facades to comply with the guidance of Manchester City Council.

Table 4 identifies the maximum allowable free-field external noise levels at the residential facades due to activity noise breakout from the non-residential uses.

Period	Sound Pressure Level (dB Leq) @ Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
N/ NE Façades - 07:00 - 23:00	45	36	38	38	42	36	25
N/ NE Façades - 23:00 - 07:00	45	36	33	33	37	31	20
S/ SW Façades - 07:00 - 23:00	60	57	59	59	63	57	46
S/ SW Façades - 23:00 - 07:00	55	52	54	54	58	52	41
C4 SE façade / C5 NW façade - 07:00 - 23:00	52	50	50	51	56	48	35
C4 SE façade / C5 NW façade - 23:00 - 07:00	47	45	45	46	51	43	30

Table 4: Maximum allowable free-field external noise levels at residential facades due to activity noise from Crown Street, Phase 2 non-residential uses

NOISE EGRESS CALCULATIONS

Noise egress calculations have been carried out to determine the expected noise level at the closest residential properties due to noise from the non-residential uses. Calculations of noise egress from a building requires the following information:

1. Dimensions of radiating surfaces (e.g. curtain wall)
2. Distance of radiating surfaces to sensitive receptor
3. Sound reduction index of radiating surfaces
4. Orientation of radiating surface to sensitive receptor

The principal noise radiating surface of the non-residential uses is the predominantly glazed curtain wall. The non-residential spaces are provided with mechanical supply and extract ventilation and thus do not rely on opening elements for ventilation.

The glazing specifications to the non-residential uses, installed as part of the main Contract for Crown Street, Phase 2, are as follows:

C4

- Commercial Unit: 13.5 mm laminate / 16 mm cavity / 17.5 mm laminate
- Gym: 13.5 mm laminate / 16 mm cavity / 17.5 mm laminate
- Yoga Studio: 13.5 mm laminate / 16 mm cavity / 17.5 mm laminate
- Flexible Amenity/ Private Dining: 12.8 mm laminate / 16 mm cavity / 5 mm float / 16 mm cavity / 16.8 mm laminate

C5

- Commercial Unit: 13.5 mm laminate / 16 mm cavity / 17.5 mm laminate
- Gym: 13.5 mm laminate / 16 mm cavity / 17.5 mm laminate
- Yoga Studio: 13.5 mm laminate / 16 mm cavity / 17.5 mm laminate
- Lounge: 12.8 mm laminate / 18 mm cavity / 16.8 mm laminate
- Private Dining 1 & 2: 12.8 mm laminate / 18 mm cavity / 16.8 mm laminate

The expected sound reduction index of the glazed curtain wall and associated framing is identified in Table 5.

Glazing specification	Sound Reduction Index (dB) @ Octave Band Centre Frequency (Hz)						
	63 Hz	125 Hz	250 Hz	500 Hz	1kHz	2kHz	4kHz
13.5 mm laminate / 16mm cavity/ 17.5mm laminate	25	25	37	41	41	49	53
12.8 mm laminate / 16 mm cavity / 5 mm float / 16 mm cavity / 16.8 mm laminate	27	29	36	37	40	48	62
12.8 mm laminate / 18 mm cavity / 16.8 mm laminate	25	25	37	41	41	49	53

Table 5: Sound reduction index of vision panels to ancillary areas, including frame

The following spaces have patron access doors within the façade:

C4

- Commercial Unit, Level 0
- Flexible Amenity, Level 2

C5

- Commercial Unit, Level 0
- Residents Lounge, Level 2

The calculations of noise egress take into account the expected sound insulation performance of the access doors when closed and also include a worst case assessment of intermittently open doors. If the external doors to a space are opened for the access or egress of patrons, then the sound insulation of the envelope to the unit will be reduced.

Table 6 identifies the calculated noise levels that could be generated within the various non-residential spaces of C4 with patron doors open without exceeding the daytime and night time external noise limits given in Table 4.

Location	Sound Pressure Level (dB Leq) @ Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
C4							
Yoga Studio, Level 1 – 07:00 to 23:00	90	92	>100	>100	>100	>100	>100
Yoga Studio, Level 1 – 23:00 to 07:00	85	87	>100	>100	>100	>100	>100
Gym, Level 1 – 07:00 to 23:00	99	100	>100	>100	>100	>100	>100
Gym, Level 1 – 23:00 to 07:00	94	95	>100	>100	>100	>100	>100
Commercial Unit, Level 0 & 1 - 07:00 to 23:00	72	68	73	78	83	77	65
Commercial Unit, Level 0 & 1 - 23:00 to 07:00	72	68	68	73	78	72	60
Flexible Amenity, Level 1 - 07:00 to 23:00	67	70	74	80	84	77	63
Flexible Amenity, Level 1 - 23:00 to 07:00	62	65	69	75	79	72	58

Table 6: Maximum allowable internal activity noise levels relating to noise egress – daytime and night time, C4 - doors open

It will be noted that in some instances, internal noise levels of greater than 100 dB are allowable. This is a consequence of the high levels of external road traffic noise at certain elevations of the building.

It will also be noted that the allowable internal noise levels detailed in Table 6 are typically greater than those in Table 2. The applicable internal noise limits in each space are the lower of the values in Tables 2 and 6.

The noise levels detailed in Table 6 would allow all of the proposed uses to operate as intended, including the provision of background music.

Table 7 identifies the calculated noise levels that could be generated within the various non-residential spaces of C5 with patron doors open without exceeding the daytime and night time external noise limits given in Table 4.

Location	Sound Pressure Level (dB Leq) @ Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
C5							
Yoga Studio, Level 1 – 07:00 to 23:00	75	71	87	96	>100	>100	95
Yoga Studio, Level 1 – 23:00 to 07:00	75	71	82	91	96	97	90
Gym, Level 1 – 07:00 to 23:00	100	>100	>100	>100	>100	>100	>100
Gym, Level 1 – 23:00 to 07:00	95	97	>100	>100	>100	>100	>100
Private Dining 1, Level 2 – 07:00 to 23:00	86	82	98	>100	>100	>100	>100
Private Dining 1, Level 2 – 23:00 to 07:00	86	82	93	>100	>100	>100	>100
Private Dining 2, Level 2 – 07:00 to 23:00	81	77	93	>100	>100	>100	>100
Private Dining 2, Level 2 – 23:00 to 07:00	81	77	88	98	>100	>100	>100
Commercial Unit, Level 0 & 1 - 07:00 to 23:00	75	66	68	68	73	67	55
Commercial Unit, Level 0 & 1 - 23:00 to 07:00	75	66	63	63	68	62	50
Residents Lounge, Level 2 - 07:00 to 23:00	72	75	79	85	89	82	68
Residents Lounge, Level 2 - 23:00 to 07:00	67	70	74	80	84	77	63

Table 7: Maximum allowable internal activity noise levels relating to noise egress – daytime and night time, C5 - doors open

It will be noted that in some instances, internal noise levels of greater than 100 dB are allowable. This is a consequence of the high levels of external road traffic noise at certain elevations of the building.

It will also be noted that the allowable internal noise levels detailed in Table 7 are typically greater than those in Table 3. The applicable internal noise limits in each space are the lower of the values in Tables 3 and 7.

The noise levels detailed in Table 7 would allow all of the proposed uses to operate as intended, including the provision of background music.

Table 8 identifies the calculated noise levels that could be generated within the various non-residential spaces of C4 with patron doors closed without exceeding the daytime and night time external noise limits given in Table 4.

Location	Sound Pressure Level (dB Leq) @ Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
C4							
Yoga Studio, Level 1 – 07:00 to 23:00	90	92	>100	>100	>100	>100	>100
Yoga Studio, Level 1 – 23:00 to 07:00	85	87	>100	>100	>100	>100	>100
Gym, Level 1 – 07:00 to 23:00	99	100	>100	>100	>100	>100	>100
Gym, Level 1 – 23:00 to 07:00	94	95	>100	>100	>100	>100	>100
Commercial Unit, Level 0 & 1 - 07:00 to 23:00	80	76	90	98	>100	99	89
Commercial Unit, Level 0 & 1 - 23:00 to 07:00	80	76	85	93	98	94	84
Flexible Amenity, Level 1 - 07:00 to 23:00	85	90	96	>100	>100	100	88
Flexible Amenity, Level 1 - 23:00 to 07:00	80	85	91	98	>100	95	83

Table 8: Maximum allowable internal activity noise levels relating to noise egress – daytime and night time, C4 - doors closed

It will also be noted that the allowable internal noise levels detailed in Table 8 are greater than those in Table 2. The applicable internal noise limits in each space are the lower of the values in Tables 2 and 8.

The noise levels detailed in Table 8 would allow all of the proposed uses to operate as intended, including the provision of foreground music.

Table 9 identifies the calculated noise levels that could be generated within the various non-residential spaces of C5 with patron doors closed, without exceeding the daytime and night time external noise limits given in Table 4.

Location	Sound Pressure Level (dB Leq) @ Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
C5							
Yoga Studio, Level 1 – 07:00 to 23:00	75	71	87	96	>100	>100	95
Yoga Studio, Level 1 – 23:00 to 07:00	75	71	82	91	96	97	90
Gym, Level 1 – 07:00 to 23:00	100	>100	>100	>100	>100	>100	>100
Gym, Level 1 – 23:00 to 07:00	95	97	>100	>100	>100	>100	>100
Private Dining 1, Level 2 – 07:00 to 23:00	86	82	98	>100	>100	>100	>100
Private Dining 1, Level 2 – 23:00 to 07:00	86	82	93	>100	>100	>100	>100
Private Dining 2, Level 2 – 07:00 to 23:00	81	77	93	>100	>100	>100	>100
Private Dining 2, Level 2 – 23:00 to 07:00	81	77	88	98	>100	>100	>100
Commercial Unit, Level 0 & 1 - 07:00 to 23:00	83	75	86	89	93	89	80
Commercial Unit, Level 0 & 1 - 23:00 to 07:00	83	74	81	84	88	84	75
Residents Lounge, Level 2 - 07:00 to 23:00	88	92	100	>100	>100	>100	93
Residents Lounge, Level 2 - 23:00 to 07:00	83	87	95	>100	>100	100	88

Table 9: Maximum allowable internal activity noise levels relating to noise egress – daytime and night time, C5 - doors closed

It will also be noted that the allowable internal noise levels detailed in Table 9 are typically greater than those in Table 3. The applicable internal noise limits in each space are the lower of the values in Tables 3 and 9.

The noise levels detailed in Table 9 would allow all of the proposed uses to operate as intended, including the provision of foreground music.

CONCLUSION

With reference to the assessments detailed above, full compliance with the requirements of Conditions 20 and 58 are expected, such that the proposed non-residential uses within the Development will be able to operate as intended whilst maintaining residential amenity at existing and future residential receptors.

If there are any aspects that you would like to discuss, please do not hesitate to contact the undersigned.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Matt Fisher', is written over a faint, light blue rectangular background.

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