

MPF/PR0634/L03

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Dear James

CROWN STREET PHASE II, MANCHESTER – PLANNING CONDITIONS 21, 59 AND 120

I write with confirmation of the results of the acoustic assessment of the proposed emergency and on-emergency plant at Crown Street Phase II, Manchester.

INTRODUCTION

Fisher Acoustics Ltd has been commissioned by the Renaker Limited to determine the expected external noise levels generated by the proposed external building services plant and car park plant to be installed at Crown Street, Phase II, Manchester.

Crown Street Phase 2 involves the construction of two residential towers, referenced as C4 and C5 along with a public car park. Each residential tower is also provided with a dedicated basement car park.

PLANNING CONDITIONS

In relation to building services plant the planning conditions for Crown Street Phase II (planning application number 126668/FO/2020) state:

Condition 21 (C4 Plant):

- *“Prior to first occupation of Phase A, the building, together with any externally mounted ancillary equipment, shall be acoustically insulated in accordance with a scheme submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the equipment.*

Upon completion of Phase A of the development a verification report to validate that the work undertaken throughout Phase A 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 nearby residential accommodation, pursuant to policies SP1 and DM1 of the Core Strategy.

Condition 59 (C5 plant):

- *"Prior to first occupation of Phase B, the building, together with any externally mounted ancillary equipment, shall be acoustically insulated in accordance with a scheme submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the equipment."*

Upon completion of Phase B of the development a verification report to validate that the work undertaken throughout Phase B 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 nearby residential accommodation, pursuant to policies SP1 and DM1 of the Core Strategy.

Condition 120 (Public Car Park)

- *Prior to first use of the car park within Phase D, the building, together with any externally mounted ancillary equipment, shall be acoustically insulated in accordance with a scheme submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the equipment.*

Upon completion of Phase D of the development a verification report to validate that the work undertaken throughout Phase D 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 nearby residential accommodation, pursuant to policies SP1 and DM1 of the Core Strategy.

EXTERNAL NOISE CRITERIA

'Planning & Noise, Technical Guidance', dated June 2022 has been issued by the Environmental Protection, Environmental Health and The Neighbourhoods Service sections of Manchester City Council. The document provides guidance to applicants and consultants concerning the assessment and prediction of environmental noise associated with a particular development.

With regard to external noise due to building services plant at a proposed development, Section 3.7.1.5 of 'Planning & Noise, Technical Guidance' states:

- *'The development should be designed so as to achieve a rating level of 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location.'*

PRE-EXISTING NOISE LEVELS & ENVIRONMENTAL NOISE STUDIES

The Façade Sound Insulation Report for Crown Street, Phase II, reference Z3-FAC-A180-Rp-XX-001 - Crown Street, Phase 2 Façade Sound Insulation rev A, dated 15 September 2020, issued by Fisher Acoustics identifies the results of daytime and night time environmental noise surveys undertaken by REC Limited at and around the site.

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 daytime 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 allowable noise levels due to building services plant.

Table 1 below gives the applicable noise limits for non-emergency building services plant based upon the environmental noise survey data in order to comply with the guidance of Manchester City Council.

Location	Rating Noise Level (dB LAeq)	
	Daytime (07:00 hrs to 23:00 hrs)	Night time (23:00 hrs to 07:00 hrs)
C4 & C5 North/ North East Façade	44	39
C4 & C5 South/ South West Façade	65	60
C4 & C5 -residential facades overlooking Level 2 Podium	57	52

Table 1: Environmental noise limits for non-emergency building services plant

With regard to emergency plant, it is expected that such plant would only operate during emergencies and during periodical test runs (understood to be of five minutes duration every fortnight for the roof level fans and bi-annually for the car park smoke extract fans).

On this basis, it is not considered appropriate to require any proposed emergency plant to comply with the noise limits for continuously operating non-emergency plant. It is therefore suggested that the noise level from any emergency plant is no more than 10 dB(A) greater than the background noise level (measured as an LA90) at any residential receptor.

It is therefore recommended that the noise level at any residential façade during operation of any emergency plant does not exceed the daytime noise levels given in Table 2.

Location	Daytime Noise Level (dB LAeq)
C4 & C5 North/ North East Façade	59
C4 & C5 South/ South West Façade	80
C4 & C5 Over-looking Podium	72

Table 2: Environmental noise limits for emergency building services plant

PROPOSED BUILDING SERVICES PLANT (NON-EMERGENCY)

The following non-emergency plant items are to be installed at C4 & C5 and the public car park of Crown Street, Phase II:

C4

- 5 no. VRF units for penthouse air conditioning – roof mounted
- 1 no. fan for Refuse Lobby extract – roof mounted
- 1 no. Mitsubishi VRF unit – car park entrance
- 1 no. fan for refuse store extract – internally at Ground Floor level
- 3 no. car park extract fans (also serve as emergency smoke extract fans)

C5

- 5 no. VRF units for penthouse air conditioning– roof mounted
- 1 no. fan for Refuse Lobby extract – roof mounted
- 4 no. VRF units – car park entrance
- 1 no. fan for refuse extract – internally at Ground Floor level
- 3 no. car park extract fans (also serve as emergency smoke extract fans)

Public Car Park

- 2 no. car park extract fans (also serve as emergency smoke extract fans)

All of the proposed car park extraction plant at Crown Street, Phase II is located within dedicated spaces which are louvred to external air.

It is understood that only two of the car park extract fans at C4 and C5 would run at any one time. The third smoke extract fan is a standby fan.

Table 3 identifies the reported sound power levels of the non-emergency extract plant at C4 & C5 and serving the public car park.

Building services plant item	Sound Power Level (dB re 1 x 10 ⁻¹² Watts)							
	dB(A)	Octave Band Centre Frequency (Hz)						
		63	125	250	500	1k	2k	4k
C4								
C4 Car Park: PVE 800mm dia. inverter driven, smoke rated axial fan, 3 no., high CO duty (6 air changes per hour) (sound power levels include benefit of the installed attenuator)	70	77	74	70	65	60	65	61
Systemair KV DUO 400 EC fan, Refuse Lobby extract (in-duct), 1 no.	76	74	80	69	63	65	71	70
Systemair KV DUO 400 EC, Refuse Lobby extract (Breakout), 1 no.	62	58	70	59	54	50	55	55
Systemair MUB 042 500 EC MULTIBOX fan, Refuse room extract, 1 no.	81	79	83	80	78	76	72	69
C5								
C5 Car Park: PVE 800mm dia. inverter driven, smoke rated axial fan, 3 no., high CO duty (6 air changes per hour) (sound power levels include benefit of the installed attenuator)	70	77	74	70	65	60	65	61
Systemair KV DUO 250 EC fan, Refuse Lobby extract (in-duct), 1 no.	65	73	71	71	61	55	55	49
Systemair KV DUO 250 EC fan, Refuse Lobby extract (Breakout), 1 no.	47	45	54	53	44	38	34	26
Systemair KV DUO 500 EC, Refuse room extract fan (in-duct), 1 no.	81	87	90	85	75	74	69	63
Public Car Park								
Public Car Park: PVE 1250mm dia. inverter driven, smoke rated axial fan with attenuator, 2 no., high CO duty (6 air changes per hour)	76	85	84	75	68	66	69	68

Table 3: Sound power levels of non-emergency plant at C4

Table 4 identifies the reported sound pressure levels of the condenser plant to be installed at C4 and C5.

Building services plant item	Sound Pressure Level (dB re 2 x 10 ⁻⁵ Pa) at 1 m							
	dB(A)	Octave Band Centre Frequency (Hz)						
		63	125	250	500	1k	2k	4k
C4								
Mitsubishi PUMY-SP140VKMR2, Penthouse VRF, 5 no.	56	62	58	56	53	52	47	40
Mitsubishi PURY-EP1000-YSNW-A1 VRF Units, 1 no.	68	69	67	69	66	60	60	56
C5								
Mitsubishi PUMY-SP140VKMR2, Penthouse VRF, 5 no.	56	62	58	56	53	52	47	40
Mitsubishi PURY-EP550YSNW -A2 VRF Units, 4 no.	64	79	66	65	63	56	52	51

Table 4: Sound pressure levels of all non-emergency plant at C4 and C5

Table 5 identifies the reported static insertion losses of the attenuators to be installed to the refuse room extract fans of C4 and C5.

Building services plant item	Static Insertion loss, Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
C4							
Allaway Acoustics 900mm long - Refuse Room Extract, 1 no.	3	7	13	26	37	30	26
C5							
Allaway Acoustics 900mm long - Refuse Room Extract, 1 no.	3	7	13	26	37	30	26

Table 5: Static Insertion loss of refuse room attenuators

Figure 1 identifies the locations of the car park extract plant at Crown Street, Phase II, all at ground floor level.

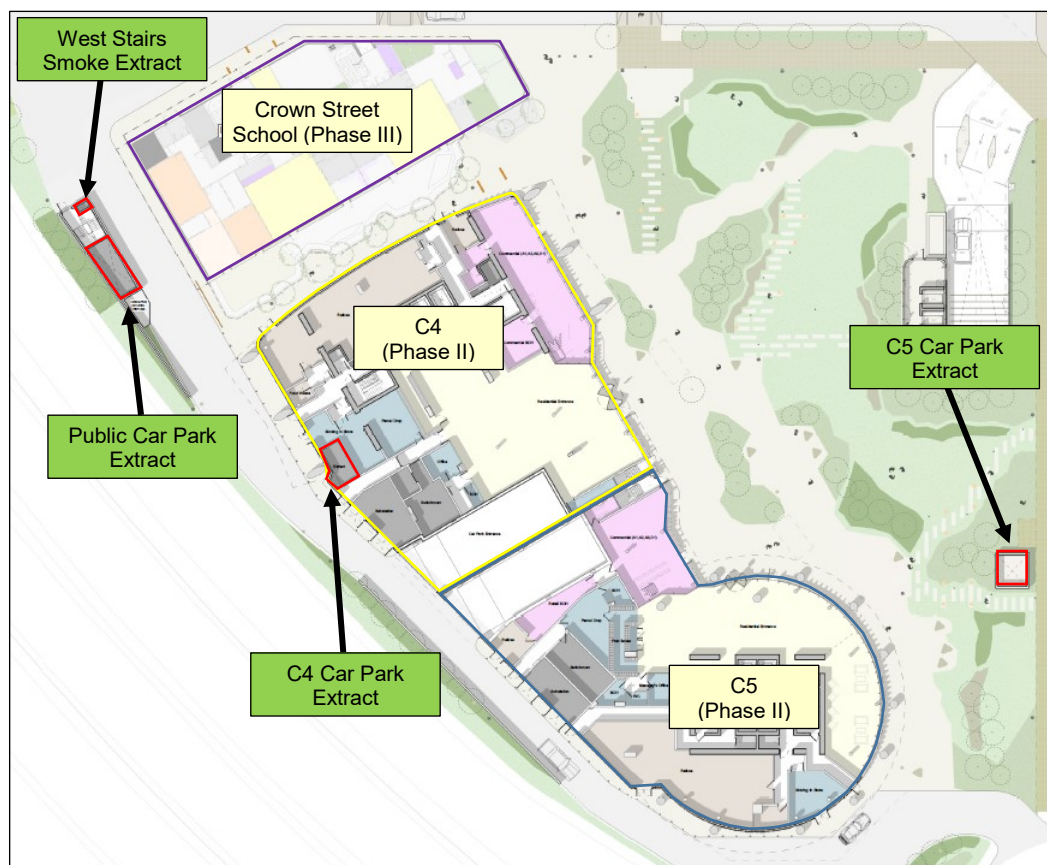


Figure 1: Smoke extract plant locations, Crown Street Phase II & III

Figure 2 identifies the locations of the non-emergency plant at C4 to be installed at roof level.

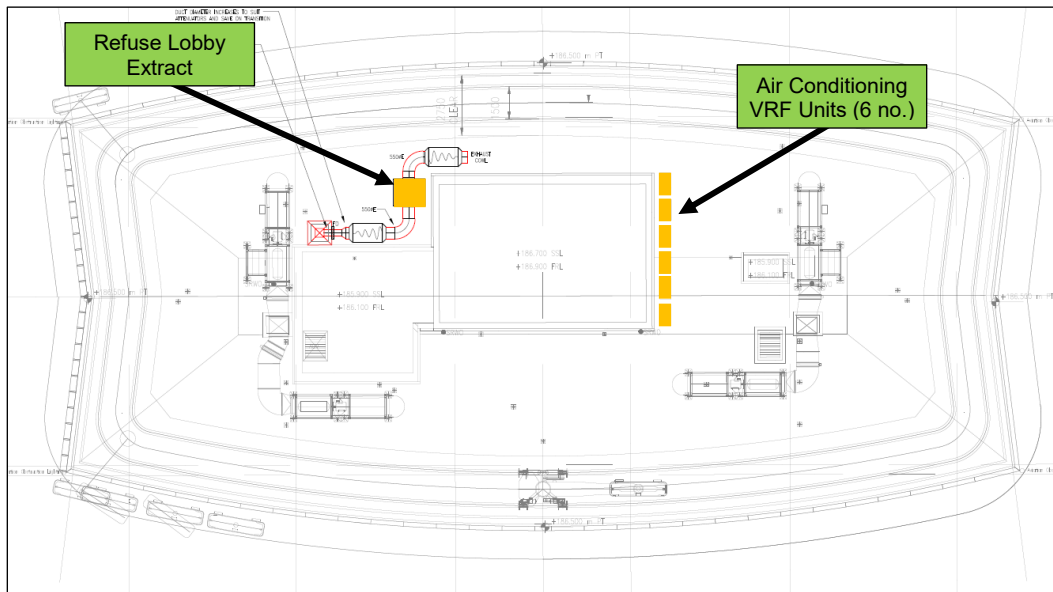


Figure 2: Roof level non-emergency plant locations, C4

Figure 3 identifies the locations of the non-emergency plant at C4 to be installed on the ground floor.

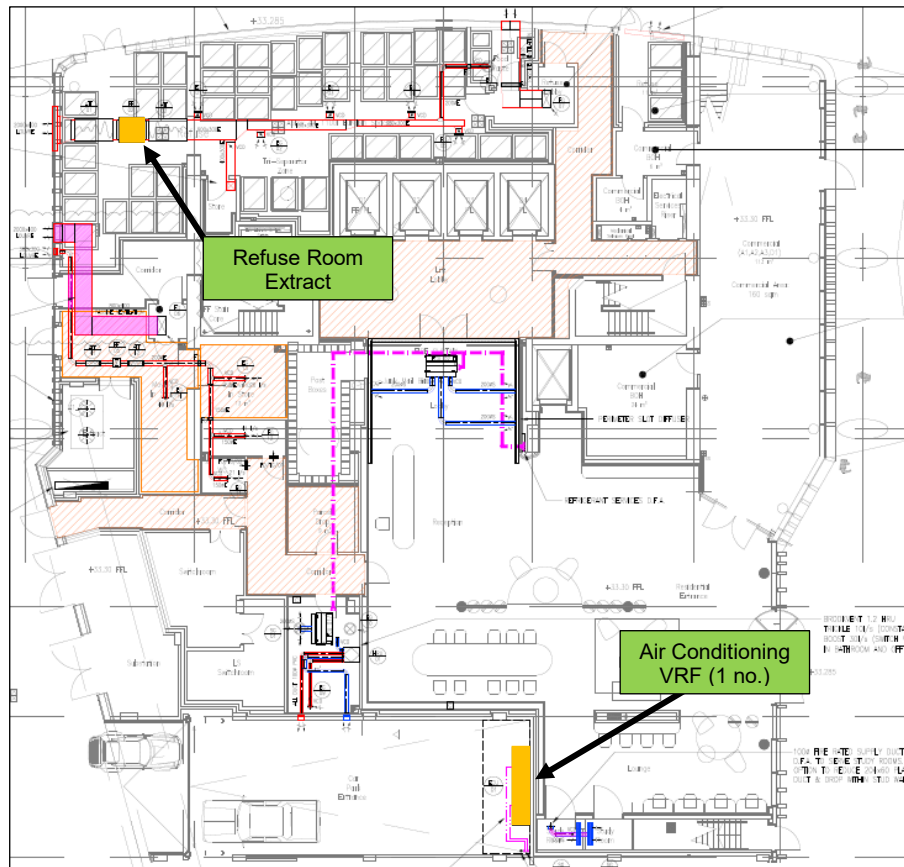


Figure 3: Ground Floor level non-emergency plant locations, C4

Figure 4 identifies the locations of the non-emergency plant at C5 to be installed at roof level.

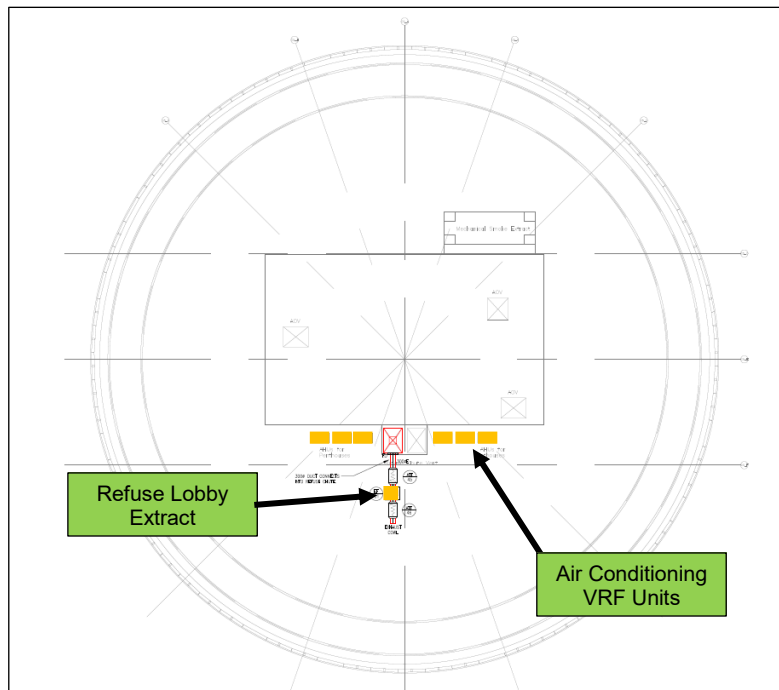


Figure 4: Roof level non-emergency plant locations, C5

Figure 5 identifies the locations of the non-emergency plant at C5 to be installed on the ground floor

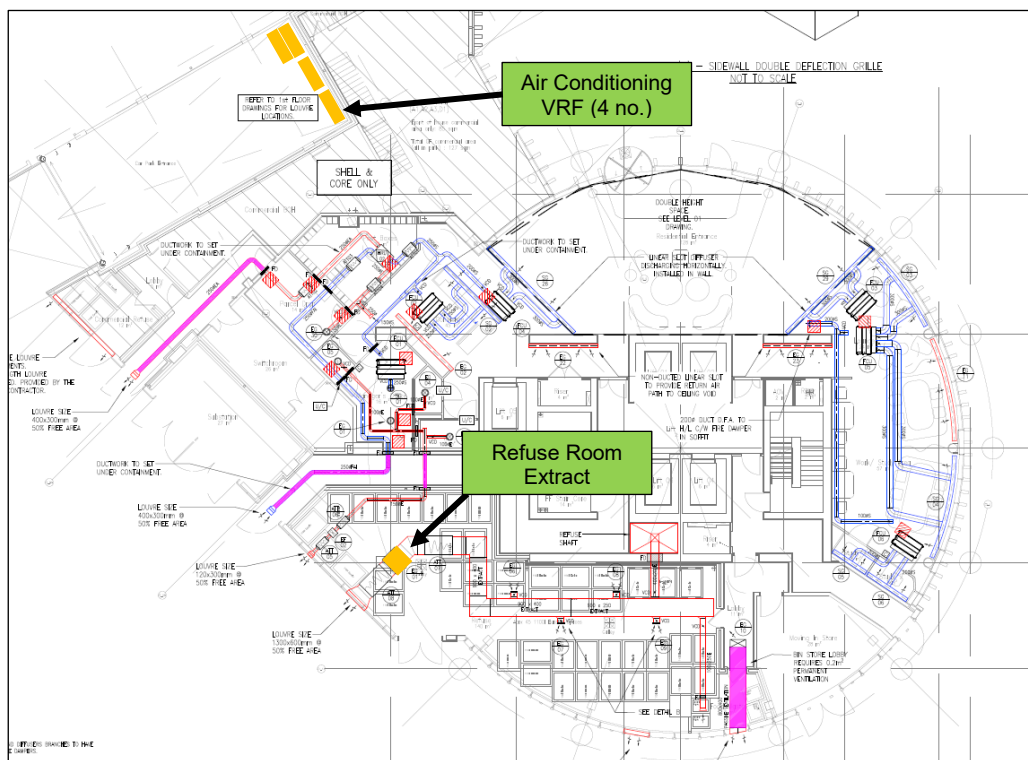


Figure 5: Ground Floor level non-emergency plant locations, C5

PROPOSED BUILDING SERVICES PLANT (EMERGENCY)

The following emergency plant items are to be installed at Crown Street Phase II:

C4

- 3 no. car park extract fans
- 4 no. roof-mounted smoke extract fans

C5

- 3 no. car park smoke extract fans
- 2 no. roof-mounted smoke extract fans

Public Car Park

- 2 no. car park smoke extract fans
- 2 no. escape stair smoke extract fans

It is understood that only two of the smoke extract fans in C4 and C5 car parks will run at any instant. The third smoke extract fan unit remains on standby. Similarly, only two of the roof mounted smoke extract fans at C4 and one of the roof mounted smoke extract fan C5 would run at any one time. The remaining fans are standby.

Table 6 identifies the reported emergency sound power levels of the car park smoke extract plant.

Building services plant item	Sound Power Level (dB re 1 x 10 ⁻¹² Watts)							
	dB(A)	Octave Band Centre Frequency (Hz)						
		63	125	250	500	1k	2k	4k
C4 Car Park: PVE 800mm dia. inverter driven, smoke rated axial fan, 3 no., 10 air changes per hour (sound power levels include benefit of the installed attenuator)	86	93	88	92	90	89	87	83
C5 Car Park: PVE 800mm dia. inverter driven, smoke rated axial fan, 3 no., 10 air changes per hour (sound power levels include benefit of the installed attenuator)	86	93	88	92	90	89	87	83
Public Car Park: PVE 1250mm dia. inverter driven, smoke rated axial fan, 2 no., 10 air changes per hour (sound power levels include benefit of the installed attenuator)	89	99	97	88	80	81	82	81
West Stairway: 710 mm dia., smoke rated axial fan, 2 no.	110	109	106	106	104	104	103	99
C4: 800 mm dia. inverter driven, smoke rated axial fan, 4 no. (sound power levels include benefit of the installed attenuator)	99*	100	95	95	90	91	95	91
C5: 800mm dia. inverter driven, smoke rated axial fan, 2 no. (sound power levels include benefit of the installed attenuator)	87*	94	92	89	84	81	78	76

Table 6: Sound power levels of emergency smoke extract plant

* During test runs the emergency fans can be run at 1/3 normal duty, reducing noise by 29dB

Figure 6 identifies the locations of the roof mounted smoke extract fans at C4.

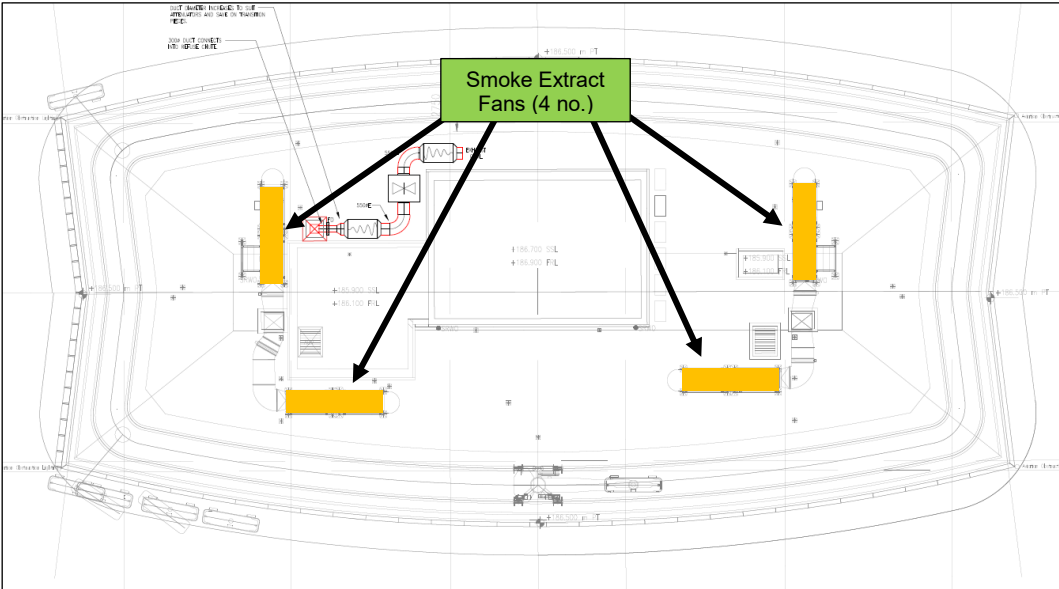


Figure 6: Roof-mounted emergency plant locations, C4

Figure 7 identifies the locations of the roof mounted smoke extract fans at C5.

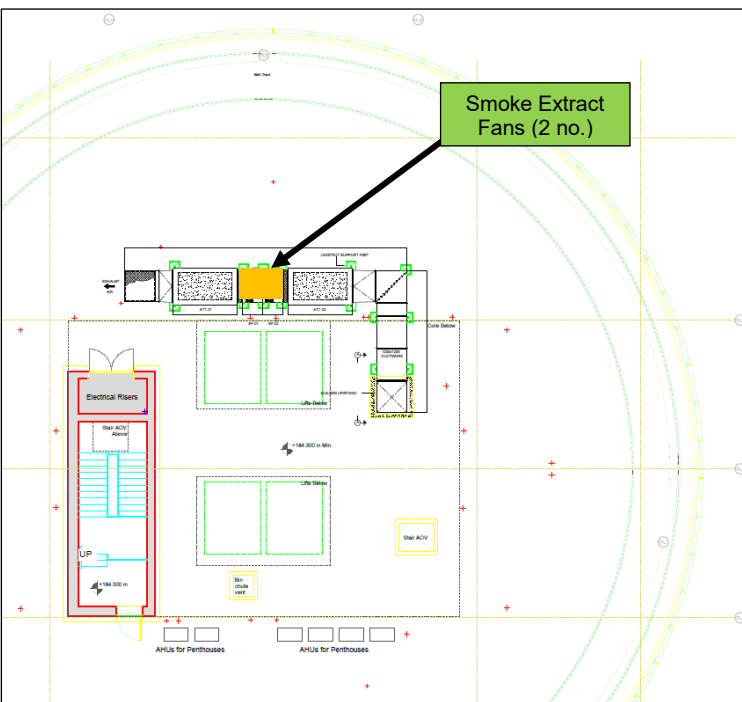


Figure 7: Roof-mounted emergency plant locations, C5

CALCULATED EXTERNAL NOISE LEVELS DUE TO BUILDING SERVICES PLANT

Based on the reported sound power level for the plant items detailed above, the expected noise levels at the nearest noise sensitive façades have been calculated.

Table 7 identifies the calculated noise levels. The calculated noise levels assume that all non-emergency plant is running simultaneously and all emergency plant is running simultaneously.

Location	Free-field Sound Pressure Level (dB LAeq)					
	Non-Emergency				Emergency	Noise Limit
	Day Time	Night Time	Noise Limit			
			Day Time	Night Time		
C4 North East Elevation, Level 50	26	26	44	39	50	59
C4 South West Elevation, Level 2	39	39	65	60	56	80
C4 South West Elevation, Level 50	26	26	65	60	49	80
C4 West Corner, Level 2	36	36	65	60	59	80
C5 North East Elevation, Level 2	36	36	44	39	50	59
C5 North East Elevation, Level 50	25	25	44	39	49	59
C5 South Elevation, Level 2	48	48	65	60	51	80

Table 7: Calculated emergency and non-emergency noise plant levels at the nearest noise sensitive locations

With reference to Table 7, it can be seen that compliance with the established noise limits in relation to simultaneously operating building services plant at Crown Street Phase is fully expected.

CONCLUSION

Based on the reported sound power data for the proposed plant at Crown Street Phase II, it can be seen that the calculated worst case noise levels at the nearest residential façades due to both non-emergency and emergency plant do not exceed the applicable noise limits at noise-sensitive receptors.

Compliance with Manchester City Council's published guidance relating to noise from building services plant is therefore expected.

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', with a stylized flourish at the end.

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