

MPF/PR0661/L05

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Dear Peter

TRINITY ISLANDS PLOT D2, MANCHESTER – EXTERNAL PLANT, PLANNING CONDITION 162

I write with confirmation of the measured external noise levels due to emergency and non-emergency plant at Plot D2, Trinity Islands, Manchester.

INTRODUCTION

Fisher Acoustics Ltd has been commissioned by Renaker Limited to measure the external noise levels due to operation of external plant installed at Trinity Islands Plot D2, Manchester and to compare the noise levels to the requirements of Conditions 162 of the planning permission for the development.

PLANNING CONDITION 162

In relation to building services plant at Plot D2, the planning permission for Trinity Islands (planning application number 132429/FO/2021) states:

Condition 162:

- *“Notwithstanding Chapter 11 - Noise and Vibration Matt Fisher Acoustics of the ES stamped as received by the City Council, as Local Planning Authority, on the 7 December 2021, (a) Prior to the first occupation of the residential element of phase D2 of the development hereby approved, details of any externally mounted ancillary plant, equipment and servicing shall be submitted for approval in writing by the City Council, as Local Planning Authority. For the avoidance of doubt, externally mounted plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5 dB (L_{aeq}) below the typical background (LA90) level at the nearest noise sensitive location.*

(b) Prior to the first occupation of the residential element of phase D2, a verification report will be required to validate that the work undertaken conforms to the recommendations and requirements approved as part of part (a) of this planning condition. The verification report shall include post completion testing to confirm the noise criteria has been met. In instances of non-conformity, these shall be detailed along with mitigation measures required to ensure compliance with the noise criteria. A verification report and measures shall be agreed until such a time as the development complies with part (a) of this planning condition.

Any mitigation measures shall be implemented in accordance with a timescale to be agreed with the City Council, as Local Planning Authority. Any measures shall thereafter retained and maintained in situ.

Reason - To minimise the impact of plant on the occupants of the development pursuant to policies SP1 and DM1 of the Manchester Core Strategy (2012) and saved policy DC26 of the Unitary Development Plan for the City of Manchester (1995).

PRE-EXISTING NOISE LEVELS & ENVIRONMENTAL NOISE STUDIES

The Noise and Vibration chapter of the Environmental Statement for Trinity Islands, compiled by Fisher Acoustics, identifies the results of daytime environmental noise surveys undertaken by Fisher Acoustics Limited at and around the site. 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 requirements of the planning condition.

Location	Rating Noise Level (dB LAeq)	
	Daytime (07:00 hrs to 23:00 hrs)	Night time (23:00 hrs to 07:00 hrs)
Trinity Islands, Tower C2	46	40
Trinity Islands, Tower D1	55	40
Trinity Islands, Tower D2	55	49
Travelodge Manchester Central Riverside (previously Hotel Campanile)	47	40

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 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)
Trinity Islands, Tower C2	66
Trinity Islands, Tower D1	71
Trinity Islands, Tower D2	76
Travelodge Manchester Central Riverside (previously Hotel Campanile)	72

Table 2: Environmental noise limits for emergency building services plant

BUILDING SERVICES PLANT (NON-EMERGENCY)

The following non-emergency plant items installed at Plot D2:

- 9 no. VRF units for penthouse air conditioning – roof mounted
- 1 no. refuse chute extract fan – roof mounted
- 1 no. lift motor room extract fan – rooftop lift motor room
- 1 no. refuse room extract fan –Ground Floor refuse room
- 1 no. fan for refuse lobby extract –Ground Floor refuse room
- 1 no. fan for refuse chute extract –Ground Floor refuse room
- 3 no. car park extract fans (also serve as emergency smoke extract fans) - Basement car park

It is understood that one of the car park extract fans is a standby fan.

Table 3 identifies the reported sound power levels of the installed non-emergency extract fans.

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
PVE/ 1000Ø inverter driven, smoke rated axial fan, 3 no., high CO duty (6 air changes per hour) (sound power levels include benefit of the installed 1DENP attenuator), Car park extract								
In-duct outlet	67	80	69	65	61	58	61	59
Breakout	53	72	58	53	51	45	39	30
Systemair AXC 315-6/14°-2(B)-P, Refuse chute extract, 1 no. (EF RF/01)								
In-duct outlet	90	95	91	97	85	82	76	71
Breakout	84	89	85	91	79	76	70	65
Systemair AXC 560-9/12°-4(B)-P, Lift Motor room extract, 1 no. (EF RF/02)								
In-duct outlet	90	79	71	79	87	86	83	78
Systemair KVK Silent 355 EC, Refuse room extract, 1 no. (EF 00/02)								
In-duct outlet	75	82	84	80	69	68	62	56
Systemair AXC 315-6/14°-2(B)-P, Refuse lobbies extract, 1 no. (EF 00/03)								
In-duct outlet	90	95	91	97	85	82	76	71
Systemair AXC 315-6/14°-2(B)-P, Ground floor refuse chute extract, 1 no. (EF 01/03)								
In-duct outlet	90	95	91	97	85	82	76	71

Table 3: Sound power levels of non-emergency plant at Plot D2

Table 4 identifies the reported static insertion losses of the attenuators installed on the atmosphere side of the refuse room and refuse chute extract fans.

Building services plant item	Static Insertion loss, Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Refuse room extract, 1 no. (ATT/00/10 - EF/00/03 Refuse Store Extract)	3	4	8	18	23	17	15
Refuse chute extract, 1 no. (ATT/RF/02 - EF/RF/01 Refuse Exhaust)	2	3	7	18	25	19	17

Table 4: Static Insertion loss of refuse room and refuse chute attenuators

Table 5 identifies the reported sound pressure levels generated by the installed condenser plant.

Building services plant item	Sound Pressure Level (dB re 2×10^{-5} Pa) at 1 m							
	dB(A)	Octave Band Centre Frequency (Hz)						
		63	125	250	500	1k	2k	4k
Mitsubishi PUMY-SP140VKM, Penthouse VRF, 9 no.	56	62	58	56	53	52	46	41

Table 5: Sound pressure levels of all non-emergency plant at Plot D2

Figure 1 identifies the locations of the non-emergency plant installed at roof level.

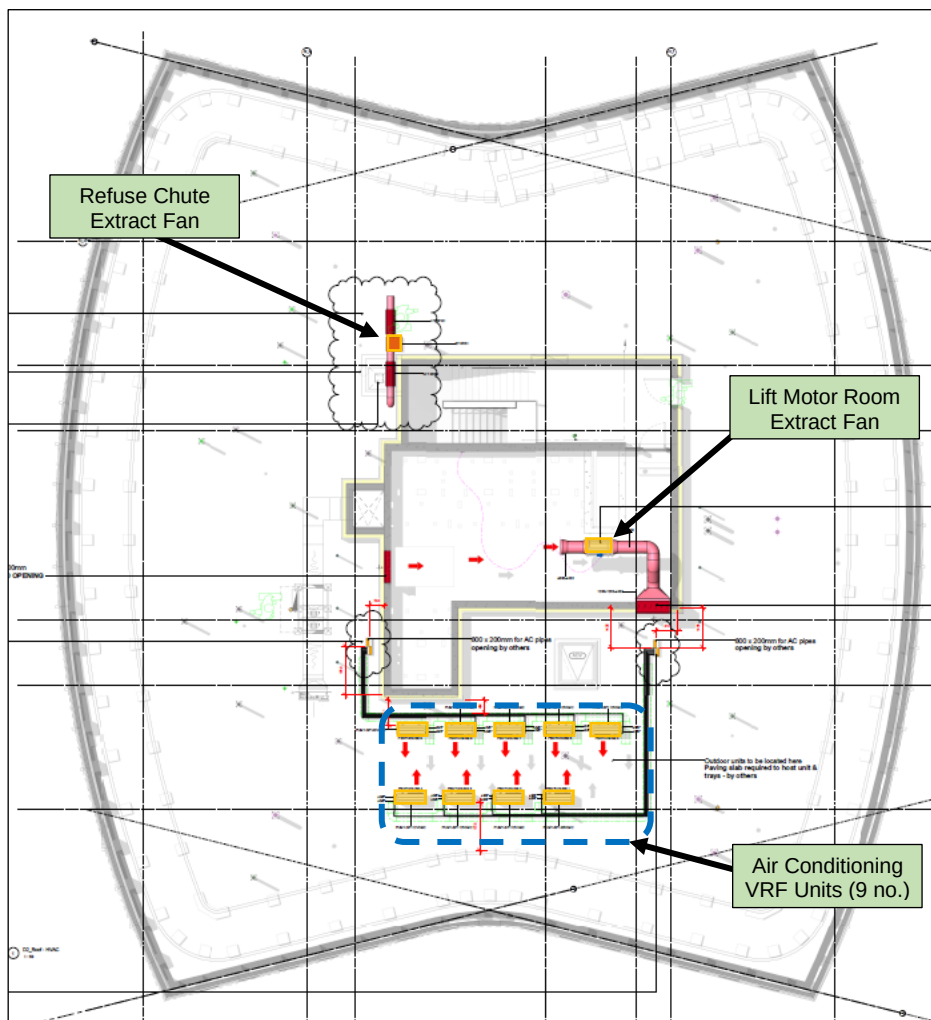


Figure 1: Roof level non-emergency plant locations, Plot D2

Figure 2 identifies the locations of the non-emergency plant installed on the ground floor.

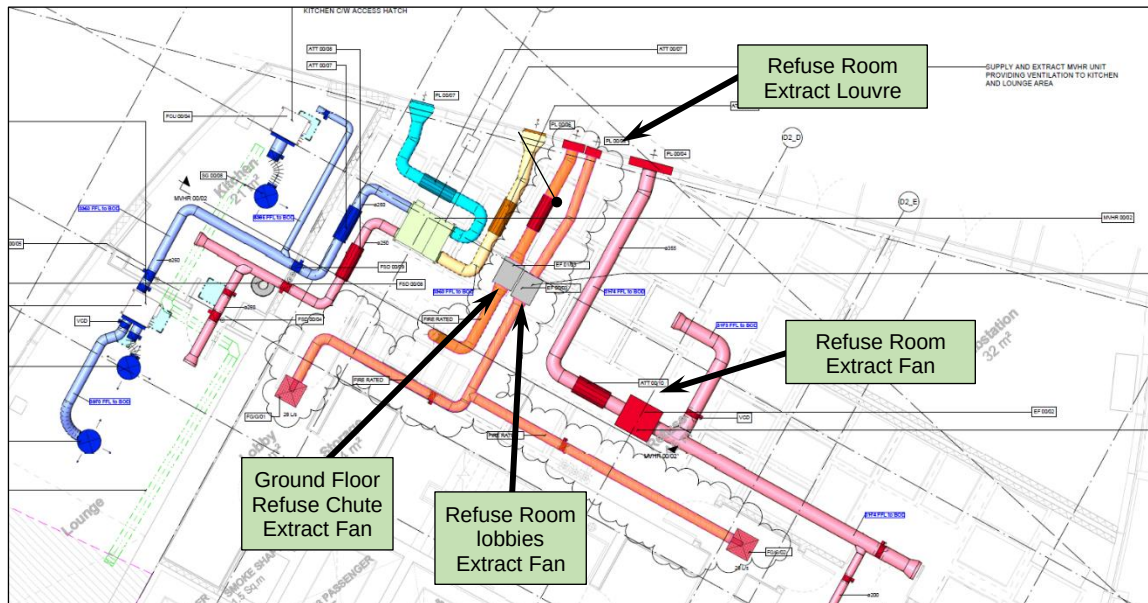


Figure 2: Ground Floor level non-emergency plant locations, Plot D2

The car park extract fans are located at Basement Level 1 and are ducted via louvres to atmosphere. Figure 3 identifies the location of the louvres to the car park extract fans.



Figure 3: Location of louvres to car park extract fans, Plot D2

BUILDING SERVICES PLANT (EMERGENCY)

The following emergency plant items have been installed at Plot D2:

- 3 no. car park extract fans (one of which is standby)
- 2 no. roof-mounted smoke extract fans (one of which is standby)

Table 6 identifies the reported sound power levels of the 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	
Car Park extract: PVE/ 1000Ø inverter driven, smoke rated axial fan, 3 no., 10 air changes per hour (sound power levels include benefit of the installed 1DENP attenuator)									
In-duct outlet	89	94	96	86	80	80	83	81	
Breakout	74	88	85	73	70	66	61	52	
Roof top smoke extract: 800 mm dia. inverter driven, smoke rated axial fan, 2 no. (sound power levels do not include benefit of the installed attenuator), Duty: 12.6 m³/s at 747 Pa									
In-duct outlet	122	114	127	126	121	114	108	101	
Breakout	101	91	104	109	94	85	88	81	

Table 6: Sound power levels of emergency smoke extract plant

* During test runs, the emergency fans will operate at 40% of normal duty, reducing noise by 22 dB(A)

Table 7 identifies the reported static insertion losses of the attenuators installed to the rooftop mounted smoke extract fans.

Building services plant item	Static Insertion loss, Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Smoke extract, 1 no.	6	8	14	22	20	13	12

Table 7: Static Insertion loss of smoke extract fan attenuators

Figure 4 identifies the locations of the roof mounted smoke extract fans.

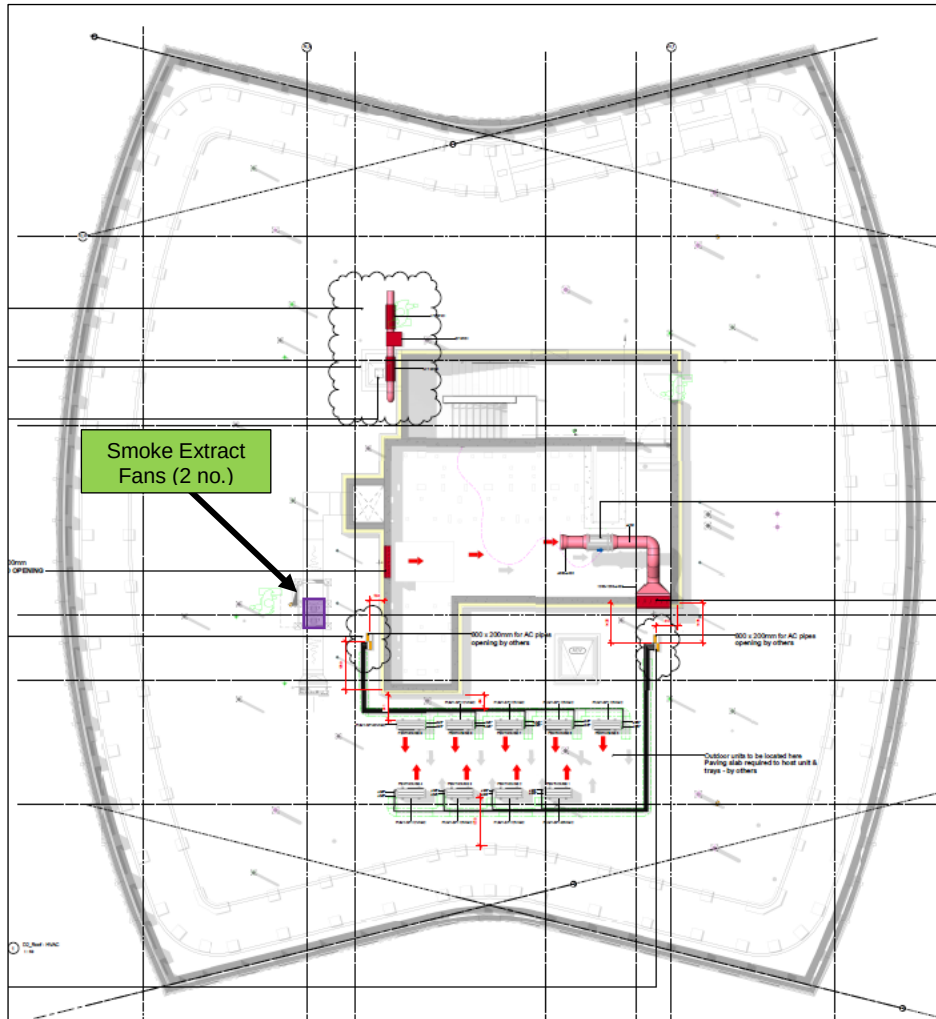


Figure 4: Roof-mounted emergency plant locations, Plot D2

EXTERNAL NOISE MEASUREMENTS

Measurements of each plant item were made in normal operation and emergency mode (where applicable).

Figure 5 identifies the rooftop measurement locations for emergency and non-emergency plant at D2.

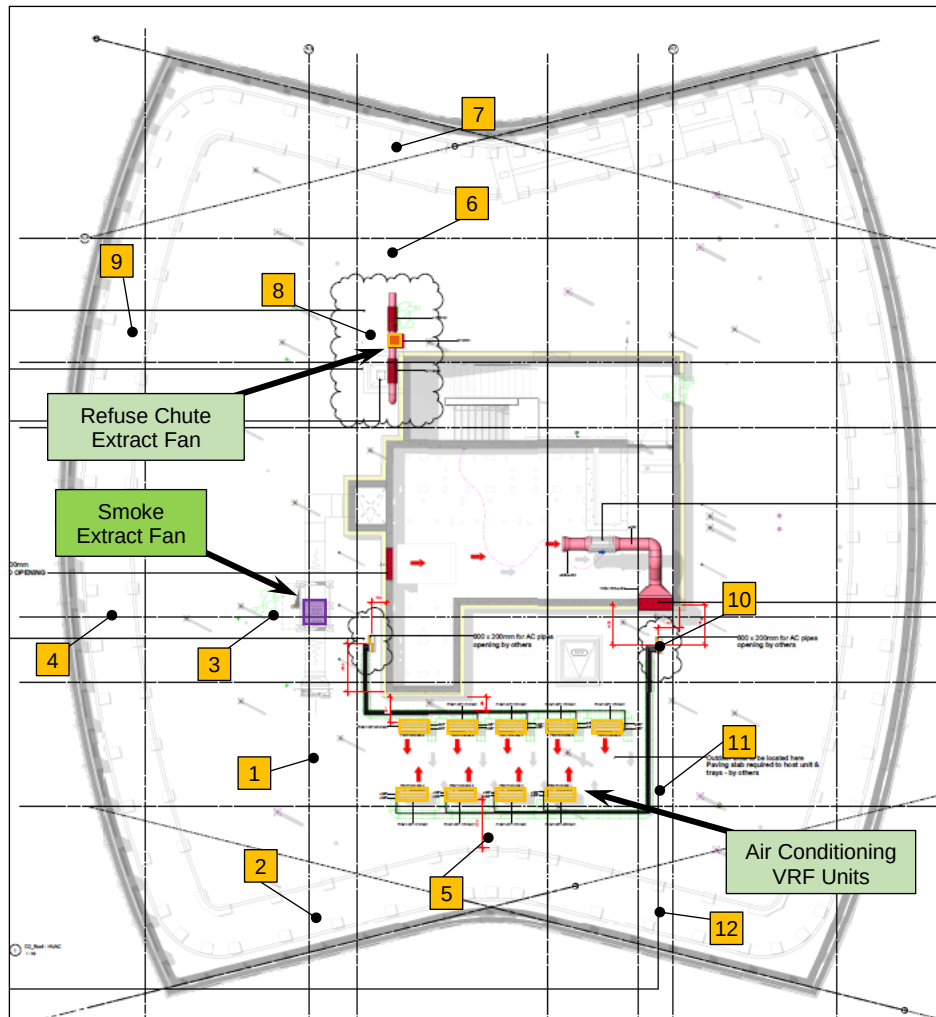


Figure 5: Roof level measurement locations, Plot D2

The roof-top plant noise measurement locations were as follows:

- Location 1: At 1m on-axis from the smoke extract fan exhaust
- Location 2: At 5m on-axis from the smoke extract fan exhaust
- Location 3: At 1m from the side of the smoke extract fan casing
- Location 4: At 5m from the side of the smoke extract fan casing
- Location 5: At 1m from the condenser units
- Location 6: At 1m from the refuse chute extract fan exhaust
- Location 7: At 5m from the refuse chute extract fan exhaust
- Location 8: At 1m from the side of refuse chute extract fan casing
- Location 9: At 5m from the side of refuse chute extract fan casing
- Location 10: At 1m from the lift motor room extract fan exhaust louvre
- Location 11: At 5m from the lift motor room extract fan exhaust louvre
- Location 12: At 9m from the lift motor room extract fan exhaust louvre

Figure 6 identifies the locations of the ground floor measurement position for the refuse room extract plant.

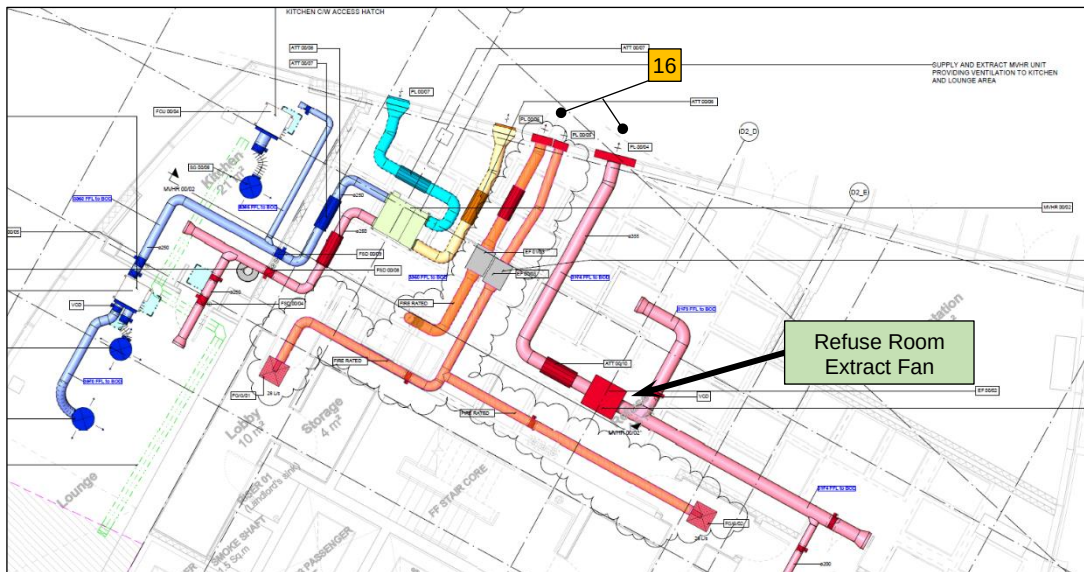


Figure 6: Ground floor measurement locations, Plot D2 Trinity Islands

The ground floor non-emergency plant noise measurement locations were as follows:

- Location 16: At 1m from the bin room and extract chute louvres

Figure 7 identifies the locations of the car park smoke extract measurement positions at ground floor level.

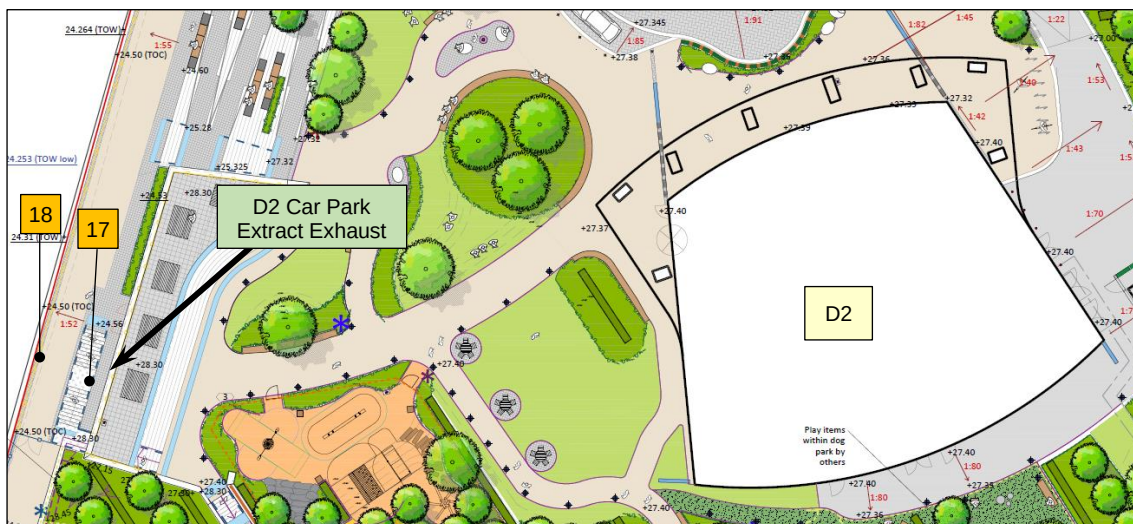


Figure 7: Car park extract measurement locations, Plot D2 Trinity Islands (Ground Floor)

The car park smoke extract non-emergency and emergency plant noise measurement locations were as follows:

- Location 17: At 1m from the car park extract louvres at a microphone height of 1.5m above ground level
- Location 18: At 5.5m from the car park extract louvres at a microphone height of 1.5m above ground level

During the site visit, both the total noise level during operation of the plant and the ambient noise level in the absence of noise from the plant was measured. The specific noise level due to operation of the plant has then been derived.

From the measurement results, the noise level at the closest residential receptors due to the operation of non-emergency and emergency plant has been determined. From an acoustic perspective, the closest dwellings to the rooftop plant are the apartments of Plot D2 at Level 54. The closest dwellings to the ground level plant are the apartments of Plot D2 at Level 4. The closest noise sensitive receptor to the car park extract louvres is the Travelodge Manchester Central Riverside (previously Hotel Campanile) on Regent Road.

Table 8 identifies the derived noise levels at the closest residential receptors due to the emergency and non-emergency plant serving Plot D2.

Location	Free-field Sound Pressure Level (dB LAeq)					
	Non-Emergency plant operational noise level		Noise Limit		Emergency plant operational noise level	Noise Limit for Emergency plant
	Day Time	Night Time	Day Time	Night Time		
D2 East Elevation, Level 4	38	38	55	49	41	76
D2 West Elevation, Level 4	29	29	55	49	39	76
D2 South Elevation, Level 54	43	43	55	49	46	76
D2 West Elevation, Level 54	43	43	55	49	50	76
Travelodge Hotel (was Hotel Campanile)	26	26	47	40	36	72

Table 8: Specific noise levels due to Plot D2 Trinity Islands plant operation

It can be seen that the measured non-emergency plant noise levels identified in Table 8 comply with the applicable noise limits.

It can also be seen that the measured emergency plant noise levels identified in Table 8 comply with the noise limits.

It is therefore considered that compliance with the requirements of planning condition 162 has been achieved in relation to the assessed building services plant.

CONCLUSION

The derived noise levels at the closest noise sensitive receptors due to the operation of all non-emergency and emergency building services plant at Plot D2 Trinity Islands comply with the applicable noise limits in relation to condition 162 of the planning permission for the development.

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

Yours sincerely

