

MPF/PR0679/L03

9 October 2024

Dave Varty
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 Dave

HOUSE OF SOCIAL, MANCHESTER – PLANNING CONDITION 23

I write with confirmation of the results of the acoustic assessment of the proposed emergency and non-emergency plant at House of Social, First Street, 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 to be installed at House of Social, First Street, Manchester and to assess the expected noise levels in relation to the planning approval for the development.

PLANNING CONDITION

In relation to building services plant the planning approval for House of Social (planning application number 136170/FO/2023) states:

Condition 23:

- *“Prior to occupation of (a) The PBSA; and (b) The Food Hall (Sui Generis) a scheme for the acoustic insulation of any plant including externally mounted ancillary equipment, lift equipment, substation and any emergency plant associated with the development to ensure that it achieves a background noise level of 5dB below the existing background (LA90) at the nearest noise sensitive location shall be 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.*

The approved scheme shall be completed before the premises is occupied and a verification report submitted for approval by the City Council as local planning authority for each of (a) and (b) and any non compliance suitably mitigated in accordance with an agreed scheme prior to occupation.

The approved scheme shall remain operational thereafter. The approved details shall be implemented and remain in place for as long as the above uses are operational.

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

Condition 23 states that emergency plant associated with the development is required to achieve 'a background noise level of 5dB below the existing background (LA90) at the nearest noise sensitive location'.

However, it has been confirmed by the Environmental Protection Section of Manchester City Council that the above wording is incorrect. The Environmental Protection Section has confirmed that the typical requirement is that noise levels from emergency plant can be up to 10dB above the pre-existing background noise level during testing of the emergency equipment and that testing should only be undertaken on a weekday in the day time (between 9am and 5pm).

PRE-EXISTING NOISE LEVELS & ENVIRONMENTAL NOISE STUDIES

At the time of writing, the level of construction activity at and around the site is such that representative measurements to determine the typical levels of background noise at noise sensitive locations around the site cannot be carried out. However, reference can be made to the results of relatively recent noise surveys conducted in the area.

In particular, the following reports can be referred to:

1. Planning reference 125573/FO/2019: First Street South, Environmental Statement, Appendix 8.1, Noise & Vibration Assessment for Planning Purposes, dated 31 October 2019.
2. Planning reference 136170/FO/2023: First Street Plot 10b (House of Social) Environmental Statement, Appendix 10.3, Noise Impact Assessment, dated 23 January 2023

Table 1 identifies the typical background noise levels adjacent to the House of Social site identified by the above reports.

Period	Reference 1: Typical Background Noise Level (dB LA90)	Reference 2: Typical Background Noise Level (dB LA90)
Daytime (0700 to 2300)	57	55
Night time (2300 to 0700)	54	50

Table 1: Typical background noise levels adjacent to House of Social site

The typical background noise levels identified in Table 1 have been used to establish the allowable noise level due to building services plant in order to comply with the requirements of planning condition 23. Table 2 gives the applicable noise limits at noise sensitive locations close to the House of Social development for non-emergency building services plant.

Plant Noise Limit (dB LAeq)	
Daytime (07:00 hrs to 23:00 hrs)	Night time (23:00 hrs to 07:00 hrs)
51	47

Table 2: Environmental noise limits for non-emergency building services plant

As identified above, the Environmental Protection Section of Manchester City Council has advised that the noise level from emergency plant should be no greater than 10dB above the pre-existing background noise level during testing of the emergency equipment and that testing should only be undertaken on a weekday in the day time (between 9am and 5pm).

With reference to the environmental noise reports identified above, Table 3 identifies the maximum allowable noise level at any residential façade during testing of the external emergency plant at House of Social.

Period	Noise Level (dB LAeq)
Daytime (07:00 hrs to 23:00 hrs)	66

Table 3: Environmental noise limits for emergency building services plant

PROPOSED BUILDING SERVICES PLANT (NON-EMERGENCY)

Roof-mounted

The following non-emergency external plant items are to be installed on the roof at House of Social:

- 6 no. VRF condensers
- 4 no. Air Source Heat Pumps (ASHP)
- 2 no. corridor air extract fans

Figure 1 identifies the locations of the non-emergency plant at House of Social on the northern section of the roof.

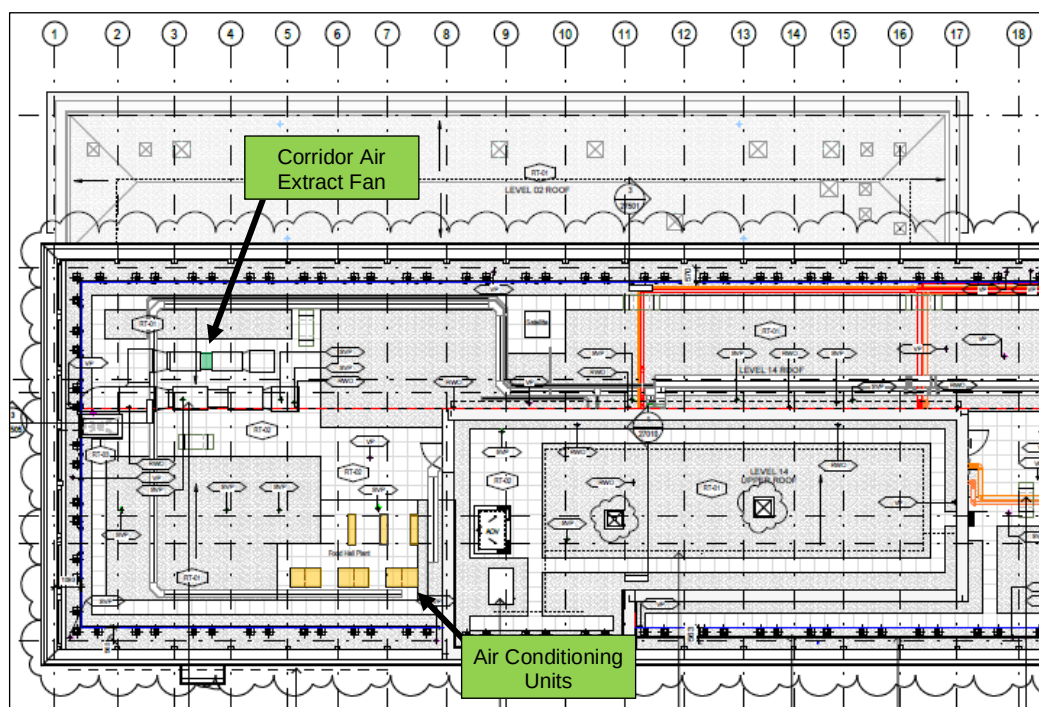


Figure 1: Rooftop non-emergency plant layout, House of Social (northern)

Figure 2 identifies the locations of the non-emergency plant at House of Social on the southern section of the roof.

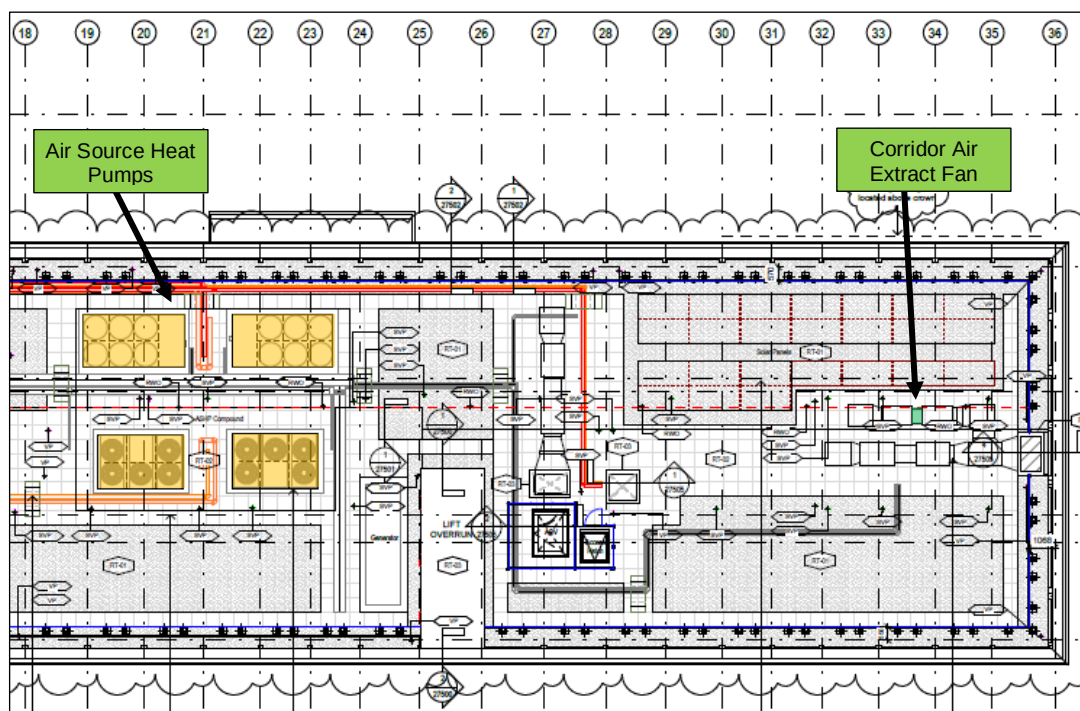


Figure 2: Rooftop non-emergency plant layout, House of Social (southern)

Table 4 identifies the reported sound pressure levels of the external roof-mounted condensers.

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
Samsung AM220AXVGGR/EU VRF Condenser Unit, 1 no., Cooling Mode	64	65	70	66	62	58	52	46
Samsung AM220AXVGGR/EU VRF Condenser unit, 1 no., Silent 3 Mode	49	52	49	50	47	43	38	33
Samsung AM200AXVGGR/EU VRF Condenser Unit, 1 no., Cooling Mode	61	66	61	60	60	55	50	47
Samsung AM200AXVGGR/EU VRF Condenser Unit, 1 no., Silent 3 Mode	49	53	49	50	47	43	38	33
Samsung AM280AXVGGR1EU VRF Condenser Unit, 1 no., Cooling	61	-	-	-	-	-	-	-
Samsung AM280AXVGGR1EU VRF Condenser Unit, 1 no., Heating	65	-	-	-	-	-	-	-
Samsung AM040BXMDGR/EU VRF Condenser Unit, 3 no., Cooling Mode	51	58	53	53	47	46	44	36
Samsung AM040BXMDGR/EU VRF Condenser unit, 3 no., Silent 3 Mode	55	49	41	41	37	35	33	28

Table 4: Sound pressure levels of roof-mounted condensers

Table 5 identifies the reported sound power levels of the remaining external roof mounted non-emergency plant. It should be noted that the reported sound power levels of the ASHP relate to the unit's operation at full power operation. However, the unit has a variable speed control and a lower noise operation at night time. Therefore the ASHPs are expected to typically generate lower noise levels than those reported below.

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
Samsung AM280AXVGGR1EU VRF Condenser Unit, 1 no.	83	-	75	80	83	83	77	70
ASHP Carrier Aquasnap with Greenspeed® Intelligence, Ref: 30RQP 310R, 2 no.	93	83	89	93	91	89	85	77
ASHP – Lochinvar Domestic hot water Amicus, Ref: LAHP-2154HTS, 2 no.	83	96	87	81	80	79	73	70
Corridor extract Elta Fan 4.89 m ³ /s at 286 Pa, 2DENP+LC063L2-P3/19+2DENP, 2 no.	81	91	83	76	68	67	76	76

Table 5: Sound power levels of roof-mounted plant

Internal plant items

In addition to the roof-mounted external plant, there are internal extract fans and heat-recovery ventilation units that are ducted to the external envelope of the building. These will be able to contribute to the external noise climate and have therefore been included in the assessment.

Figure 3 identifies the locations of the extract fans and heat-recovery ventilation units to be installed in the northern zone of the ground floor of House of Social.

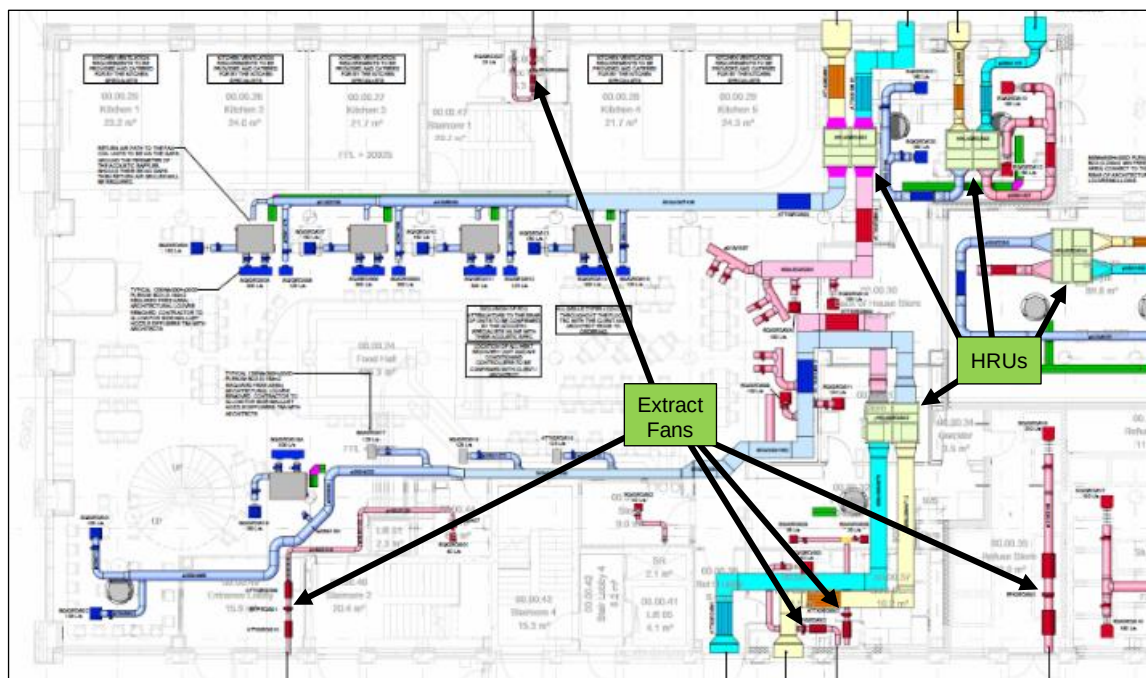


Figure 3: Ground floor plant layout, House of Social (north of gridline 18)

Figure 4 identifies the locations of the extract fans and heat-recovery ventilation units to be installed in the southern zone of the ground floor of House of Social.

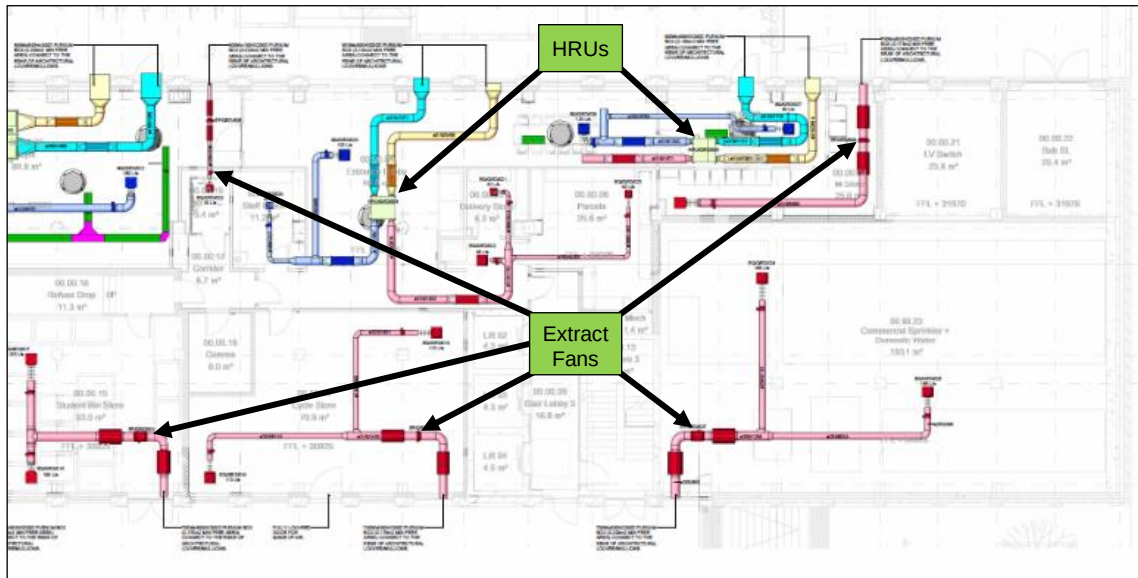


Figure 4: Ground Floor plant layout, House of Social (south of gridline 18)

Figure 5 identifies the locations of the extract fans and heat-recovery ventilation units to be installed on the first floor of House of Social.

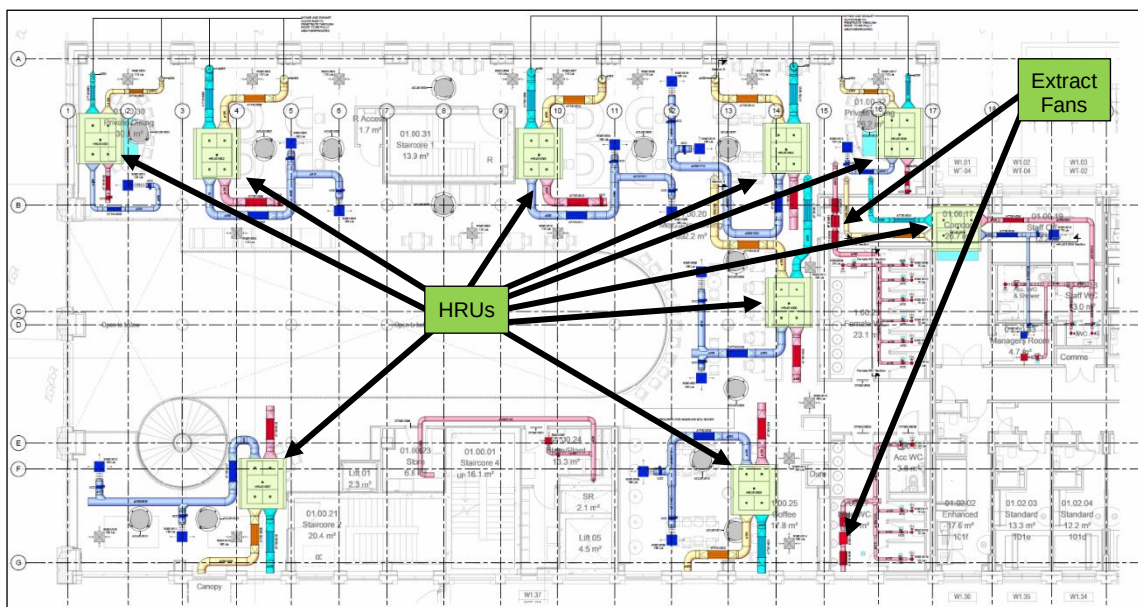


Figure 5: Level 01 plant layout, House of Social

Table 6 identifies the reported sound power levels of the extract fans and heat-recovery ventilation units to be installed on the ground and first floor of the building.

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
Klimor EVO-T Compact 1200, Ref: 2122RPF CPRVFFCAD/2122LPFCPRVF FCADCS (HRU), , No. 2								
Fresh Air Supply: 0.6 m ³ /s 225 Pa	75	-	69	69	72	70	67	64
Exhaust: 0.6 m ³ /s 225 Pa	81	-	71	71	76	76	74	69
Klimor EVO-T Compact 4100, Ref: 1117RPF CPRVFFCAD/1117LPFCPRVF FCADCS (HRU), No. 13								
Fresh Air Supply: 0.33 m ³ /s 175 Pa	70	-	68	67	63	61	67	55
Exhaust: 0.33 m ³ /s 175 Pa	72	-	68	67	66	66	67	60
Systemair K 125 EC Sileo, (Extract Fan: Acc WC (Adjacent Staff Office), Acc WC (Adjacent Staircore 1)), No. 2	61	69	69	63	59	53	48	39
Systemair K 150 EC Sileo, (Extract Fan: Store (Adjacent Staircore 2)), No. 1	58	70	65	59	55	50	49	46
Systemair K 200 EC Sileo, (Extract Fan: Dry Storage), No. 1	64	72	77	60	60	52	53	44
Systemair K 315M EC, (Extract Fan: Refuse Store (30 sq.m), Cycle Store, M Store), No. 3	71	77	79	73	65	65	64	59
Systemair Prio 355 EC, (Extract Fan: Student Bin Store, Commercial Sprinkler Room), , No. 2	75	88	85	77	72	68	62	54
Systemair KV DUO 150 EC, (Extract Fan: Female WC, Male WC), No. 2	77	86	75	77	78	68	66	64
Systemair KV DUO 315 EC, (Extract Fan: Roof), No. 1	72	77	84	77	66	61	59	51

Table 6: Sound power levels of ground and first floor mounted plant

PROPOSED BUILDING SERVICES PLANT (EMERGENCY)

The following emergency plant items are to be installed externally on the roof of House of Social:

- 6 no. Elta 630mm diameter inverter driven roof mounted smoke-rated axial fan

Only three of the smoke extract fans will run at any time as the remaining units are standby units.

Table 7 identifies the reported emergency sound power levels of the smoke extract fans. The quoted sound power levels include the performance of the atmosphere-side attenuators to be installed to each fan.

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
Elta Fan, Model no.: 2DENP+RS-LCS071P2-A3/21+2DENP, 100% duty: 7.43 m ³ /s at 543Pa, 4 no., exhaust	90	95	100	91	79	78	84	83
Elta Fan, Model no.: 2DENP+RS-LCS063L2-A3/23+2DENP, 100% duty: 4.86 m ³ /s at 330Pa, 2 no., exhaust	93	88	80	72	71	80	80	88

Table 7: In-duct sound power levels of roof mounted emergency smoke extract plant, 100% duty

During testing of the smoke extract systems, the smoke extract fans will be operated at 33% of the emergency duty. Table 8 identifies the reported emergency sound power levels of the roof mounted smoke extract plant at 33 % (test) duty.

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
Elta Fan, Model no.: 2DENP+RS-LCS071P2-A3/21+2DENP, 33% (test) duty, 4 no.	73	65	56	52	49	52	50	65
Elta Fan, Model no.: 2DENP+RS-LCS063L2-A3/23+2DENP33% (test) duty, 2 no.	65	60	50	43	41	50	51	60

Table 8: In-duct sound power levels of roof mounted emergency smoke extract plant, 33% (test) duty

Figure 6 identifies the location of the roof mounted smoke extract fans at House of Social on the northern section of the roof.

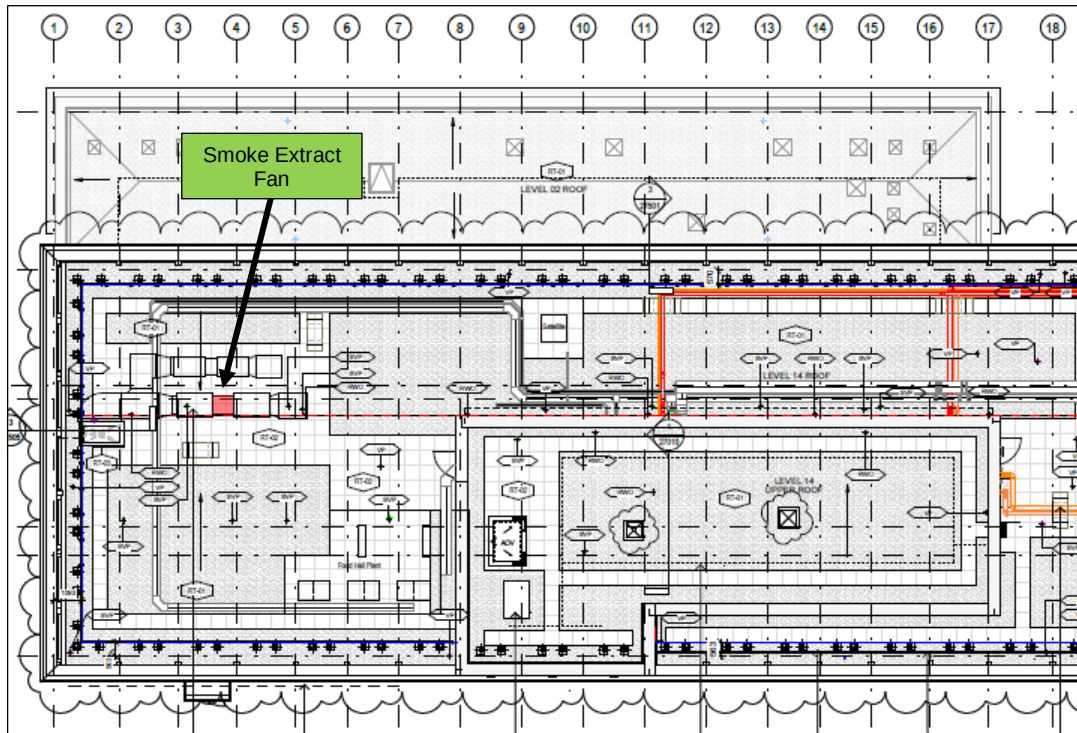


Figure 6: Rooftop external emergency plant layout, House of Social (North of grid line 18)

Figure 7 identifies the location of the roof mounted smoke extract fans at House of Social on the southern section of the roof.

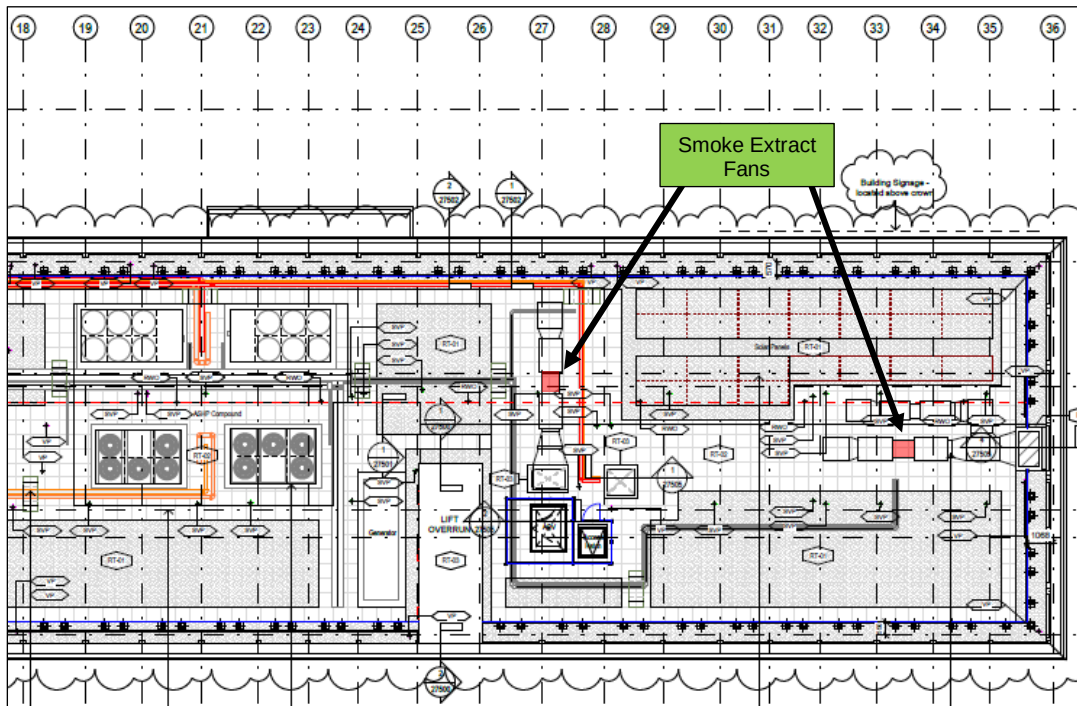


Figure 7: Rooftop external emergency plant layout, House of Social (South of grid line 18)

PLANTROOM NOISE EGRESS CALCULATIONS

Noise egress calculations have been carried out to determine the expected noise level at the closest residential properties due to noise egress from the roof top plantroom at House of Social. Calculations of noise egress from a building requires the following information:

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

Figure 8 identifies the location of the roof top plantroom at House of Social.

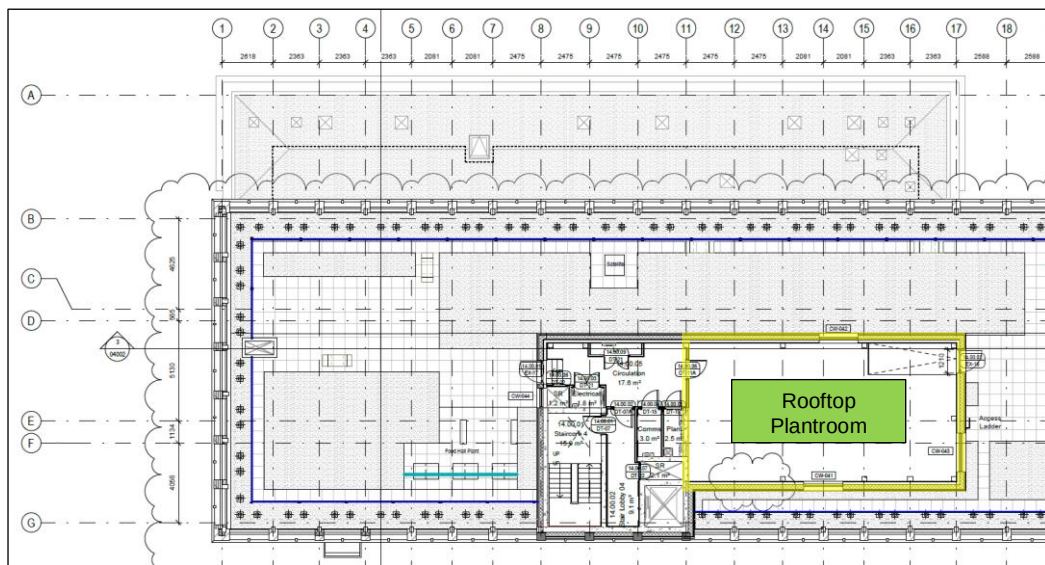


Figure 8: Roof-top plantroom location, House of Social

Non-emergency plant is also located within the ground floor Commercial Sprinkler and Domestic Water plantroom.

Figure 9 identifies the location of the ground floor commercial sprinkler and domestic water plantroom at House of Social.

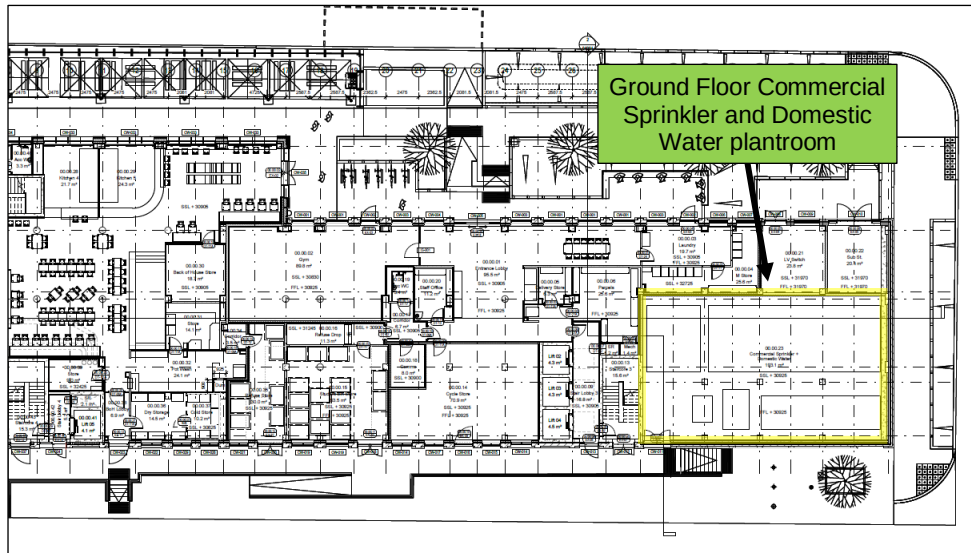


Figure 9: Ground Floor Commercial Sprinkler and Domestic Water plantroom location, House of Social

Plantroom non-emergency plant

The following non-emergency items are to be installed within the rooftop plantroom at House of Social:

- 5 no. water pumps

Table 9 identifies the reported sound pressure levels of the pumps.

Building services plant item	Sound Pressure Level (dB re 2×10^{-5} Pa) at 1 m
ASHP DHW TPE 100 - 250, 11kw / 4000 rpm, 2 no.	73
ASHP LTHW TPE 65 - 250, 4kw / 4000 rpm, 2 No.	69
DHW Return, UPS 25 – 80, 1 No.	< 43

Table 9: Sound pressure levels from pumps in rooftop plantroom

The following plant items are to be installed within the ground floor plantroom at House of Social:

- 4 no. pumps

Only three of the pumps will only run at any time as the third pump is a standby unit.

Table 10 identifies the reported sound pressure level from the pumps

Building services plant item	Sound Pressure Level (dB re 2×10^{-5} Pa) at 1 m
HYDRO MPC-E 3 CRIE 20-6, 11kW Pumps, 3 no.	73
4280FE Motor Mounted Pump (15kW), 1 no.	67

Table 10: Sound pressure levels from pumps in ground floor plantroom

Plantroom emergency plant

The following emergency plant items are to be installed within the rooftop plantroom at House of Social:

- 2 no. Elta 630mm diameter inverter driven roof mounted smoke-rated axial fan

Table 11 identifies the reported emergency sound power levels of the smoke fans. The quoted sound power levels include the performance of the atmosphere-side attenuator to be installed to the fan.

Building services plant item	Sound Power Level (dB re 1×10^{-12} Watts)							
	dB(A)	Octave Band Centre Frequency (Hz)						
		63	125	250	500	1k	2k	4k
Elta Fan, Model no.: 2DENP+RS-LCS063L2-A3/23+2DENP, 100% duty: 4.86 m ³ /s at 330Pa (exhaust)	93	88	80	72	71	80	80	88

Table 11: In-duct sound power levels of plantroom emergency smoke extract plant, 100% duty

During test runs the emergency fans will be operated at 33% normal duty. Table 12 identifies the reported sound power levels of the smoke extract fan at 33% (test) duty.

Building services plant item	Sound Power Level (dB re 1×10^{-12} Watts)							
	dB(A)	Octave Band Centre Frequency (Hz)						
		63	125	250	500	1k	2k	4k
Elta Fan, Model no.: 2DENP+RS-LCS063L2-A3/23+2DENP 33% (test) duty (exhaust)	65	60	50	43	41	50	51	60

Table 12: In-duct sound power levels of plantroom emergency smoke extract plant, 33% (test) duty

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

Location	Free-field Sound Pressure Level (dBA)					
	Non-Emergency				Emergency	
	Day Time	Night Time	Limit		Test	Limit
			Day Time	Night Time		
House of Social, West Elevation, Level 13	43	40	51	47	51	66
House of Social, West Elevation (South), Level 1	34	31	51	47	-	66
House of Social, East Elevation, Level 13	50	47	51	47	58	66
Macintosh Mill	30	27	51	47	38	66
Plot 10A, East Elevation	51	47	51	47	59	66
Vita Student, First Street	27	24	51	47	35	66
Downing Building (Phase B)	43	40	51	47	51	66

Table 13: Calculated House of Social emergency and non-emergency noise levels at the nearest noise sensitive locations

With reference to Table 13, it can be seen that the calculated noise levels at all of the nearest residential facades due to the emergency and non-emergency plant comply with the applicable noise limits.

CONCLUSION

Based on the reported sound level data for the proposed plant at House of Social, the calculated noise levels due to both non-emergency and emergency plant comply with the applicable noise limits at noise-sensitive receptors.

Compliance with the requirements of Planning Condition 23 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



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