

ACOUSTIC REVIEW NOTE

Ref : 23106/002/lf

Date : 14 September 2023



PROJECT : Imperial London Hotel, 61 – 66 Russel Square, London

SUBJECT : Acoustic Review for Internal Services Noise

1.0 Introduction

- 1.1 Applied Acoustic Design (AAD) have been appointed to perform an MEP acoustic review for the above hotel fit out at 61 – 66 Russel Square, London. The aim is to carry out a desktop MEP noise assessment to determine whether the current design and equipment selection can achieve suitable internal noise levels.
- 1.2 The areas under the scope of acoustic review are located on the ground floor, first floor, tenth floor and in the basement, including restaurants, bar and staff areas, etc.
- 1.3 The noise assessment has been based on the MEP drawings and plant information in Appendix 1.

2.0 Noise Sensitive Areas and Internal Noise Criteria

2.1 Noise Sensitive Areas

- 2.1.1 The noise sensitive areas are identified as the breakfast area, executive lounge, sky bar, private dining, offices and staff welfare, etc. Areas less sensitive to noise but still requiring consideration include lobbies and kitchens.

2.2 Internal Noise Criteria

- 2.2.1 AAD has been advised the client do not have their own guidelines or requirements applicable to internal noise levels arising from building services operation. It is therefore proposed that the internal noise criteria due to building services should make reference to relevant industry standards such as those set out in CIBSE Guide A.
- 2.2.2 Appropriate internal noise criteria (building services) are shown in the following table (Table 1).

Table 1 Proposed Internal Noise Criteria

Internal Area	Maximum Services Noise Level
Breakfast Area, Executive Lounge, Private Dining, Sky Bar	NR 40 / 45 dB LAeq
Lobby, Reception, Foyer	NR 40 / 45 dB LAeq
Open Plan Office, Staff Welfare	NR 40 / 45 dB LAeq
Wellness/Gym, Changing Room, Toilet, Corridor, Circulation	NR 45 / 50 dB LAeq
Kitchen, Back of House, Storage, Linen	NR 50 / 55 dB LAeq

3.0 Internal Noise Sources

3.1 The equipment included in this study and the areas served by the proposed equipment are summarized in the following table (Table 2).

Table 2 Internal Noise Sources

Internal Noise Sources	Areas Served
Air Handling Unit (AHU)	Staff Welfare, Kitchens, Breakfast Bar, Reception, Service Yard, Sky Bar Entrance
Mechanically Ventilation with Heat Recovery Unit (MVHR)	Executive Lounge, Linen, Wellness/Gym, Corridor, Private Dining, Toilets, Cloak/Lobby/Storage, Sky Bar
Fan Coil Unit (FCU) (ceiling cassette/wall mounted)	Staff Welfare, Offices, Uniform, Change Room, Served, Kitchens, Dishwashing, Concierge, Staff, Chef, Sky Bar Access, Corridors, Night Service Prep, Wellness/Gym, Linen, Sky Bar, Lift Lobby, Corridor Lobby, Toilets, Cloak
FCU (concealed ducted)	Breakfast Area, Foyer, Foyer/Coffee, Lift Lobby, Reception, Executive Lounge, Sky Bar, Private Dining
Kitchen Extract Fan (KEF)	Kitchens

4.0 Review of the MEP Drawings and Equipment Information

4.1 Fan Coil Units (FCUs)

4.1.1 Based on the available FCU noise data, calculations have been carried out to estimate the noise levels caused by FCU operation at medium speed and, if necessary, any in-principle recommended attenuator insertion losses for ducted FCUs, as presented in Appendix 2.

4.1.2 It is understood it is likely to be impractical to fit Cassette and wall mounted FCUs with attenuators or other noise mitigation measures. Noise emission associated with the operation of such units is typically controlled by selecting suitable FCU models with adequately low sound power levels. Noise levels from the proposed cassette and wall mounted FCUs at medium speed have been assessed and found to be within the proposed internal noise criteria.

4.2 Air Handling Unit (AHU)

4.2.1 The MEP drawings indicate the AHU shall be provided with in-duct attenuators for the roomside supply and extract terminals, and the atmospheric fresh air intake and exhaust terminals.

4.2.2 In-principle recommended attenuator insertion losses for the AHU are given in Appendix 2. These values depend upon the AHU sound power levels and shall be subject to further review.

4.3 Crosstalk Attenuators

4.3.1 Provision of crosstalk attenuators for return air openings and common air ducts penetrating crosswalls between rooms is considered good practice. The proposed in-principle insertion losses applicable to the crosstalk attenuators are given in the sections below.

4.4 Duct Velocities

4.4.1 Some air ducts may give rise to air velocities that are considered on the high side and therefore could lead to airflow regenerated noise that exceeds the proposed internal noise criteria. It is recommended the cross-sectional areas or diameters of air ducts be adequately sized to reduce the air velocity and the associated airflow regenerated noise.

4.4.2 In principle recommended air velocities are given in Section 6 for reference.

4.5 Kitchen Extract Fan (KEF)

4.5.1 The kitchen extract fans should be provided with suitable attenuators in order to comply with the proposed noise criteria. Proposed in-principle insertion losses for such attenuators are given in Appendix 2.

4.6 MVHR

4.6.1 The MEP drawings indicate the MVHR shall be provided with in-duct attenuators for the roomside supply and extract terminals, and the atmospheric fresh air intake and exhaust terminals.

4.6.2 In-principle recommended attenuator insertion losses for the MVHR are given in Appendix 2. These values depend on the MVHR sound power levels and shall be subject to further review.

4.6.3 The MVHRs will be located within noise sensitive areas including the executive lounge and breakfast area, etc. Acoustic lagging shall be provided as necessary to reduce casing breakout noise. Details are further discussed in Section 6.

5.0 Internal Noise Assessment

5.1 Predicted Noise Levels

5.1.1 The predicted noise levels for some areas are found to exceed the proposed internal noise criteria (Table 2) and attenuators are required for some plant items. The recommended in-principle attenuator performances are given in Appendix 2.

6.0 Recommendations

6.1 Crosstalk Attenuators

6.1.1 Minimum 1500mm long crosstalk attenuators with maximum 33% free area (subject to pressure loss requirements) are recommended for common supply air ducts serving

adjoining rooms. Suitable crosstalk attenuators shall have the minimum insertion loss performance given in the following table (Table 3).

Table 3 Minimum insertion loss for crosstalk attenuators between rooms

Item	Minimum Insertion Loss, dB					
	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz
Crosstalk attenuator between meeting rooms and focus rooms	14	24	39	45	46	42

6.1.2 Note that it is also assumed that all penetrations will be appropriately filled, sealed and pattressed in line with the relevant partition performance.

6.2 Duct Velocities

6.2.1 Air ducts are recommended to be suitably sized to reduce air velocities and the associated airflow regenerated noise. In principle recommended maximum air velocities are given in the following table (Table 4).

Table 4 – Recommended Maximum Duct Velocities

System Type		Velocity (m/s)		
		NR 30-35	NR 35-40	NR 40-45
Low Pressure Systems				
Risers	Circular	9.0	10.0	11.0
	Flat Oval	8.0	9.0	10.0
	Rectangular	8.0	9.0	10.0
Main branch ducts	Circular	6.0	7.0	8.0
	Flat Oval	5.0	6.0	7.0
	Rectangular	5.0	6.0	7.0
General Low Velocity Systems				
	Sub-branch ducts	3.5	4.0	5.0
	Flexible connection	2.5	3.0	4.0
	Grilles	2.5	3.0	4.0
	Diffusers	2.0	2.5	3.5
	Return air stub ducts (above ceiling)	3.0	4.0	5.0
	Return air stub ducts (exposed)	2.0	2.5	3.5
	Sub-branch ducts (supply stub duct, exposed)	2.0	2.5	3.5

6.3 MVHR

- 6.3.1 The predicted noise levels from the MVHRs do not comply with the specified internal noise criteria due to duct-borne noise and also casing breakout noise.
- 6.3.2 Attenuators shall therefore be provided as per the recommended insertion losses presented in Appendix 2.
- 6.3.3 For MVHRs located above noise sensitive areas, the casing breakout noise shall be reduced by provision of acoustic lagging covering the MVHR casing and associated air ducts between the MVHR and attenuators, as summarized in the following table.

Table 5: Acoustic Treatments for Reducing Casing Breakout Noise from MVHRs

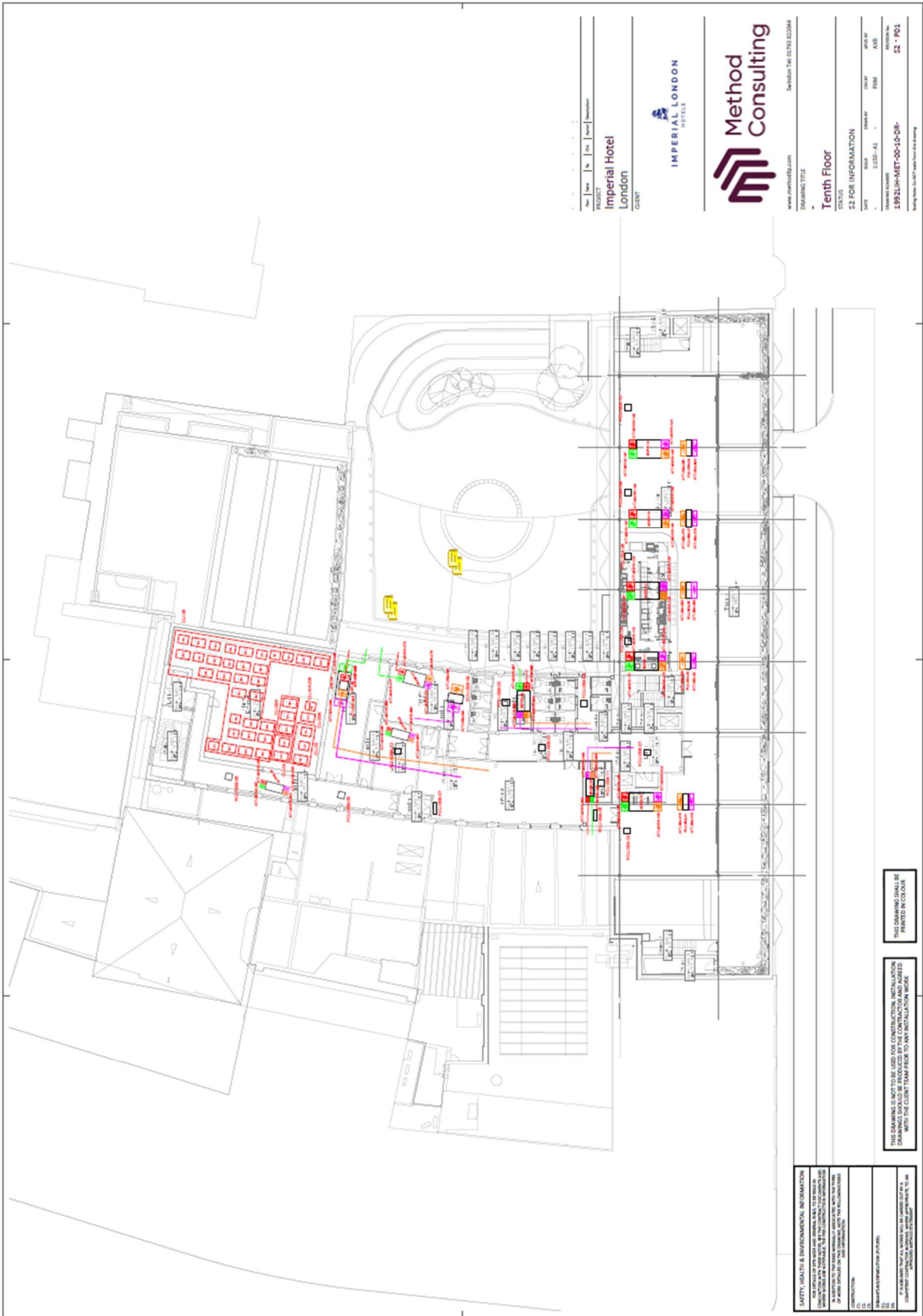
Plant	Area	Recommended Acoustic Treatment
MVHR-04	1 st Floor Wellness/Gym	Type A Acoustic Lagging
MVHR-05	L10 Corridor	
MVHR-08	L10 WC	
MVHR-17	1 st Floor Dining Support	
MVHR-01, MVHR-02	1 st Floor Executive Lounge	Type B Heavy Duty Acoustic Lagging
MVHR-06	L10 Staff Welfare	
MVHR-07	L10 Private Dining	
MVHR-10, MVHR-11, MVHR-12, MVHR-13, MVHR-14, MVHR-15	L 10 Sky Bar	

- 6.3.4 The requirements of acoustic lagging are given in Appendix 3.

7.0 Summary

- 7.1 The internal noise levels arising from the proposed MEP design have been predicted. It is found that the proposed internal noise criteria are unlikely to be achieved without noise mitigation works.
- 7.2 Recommendations have been provided to reduce noise from the proposed MEP systems and also mitigate crosstalk between rooms.

REPORT ENDS



PROJECT	Imperial Hotel London
CLIENT	Imperial Hotel
DATE	15/07/23
STATUS	S2 FOR INFORMATION
DRWING TITLE	Tenth Floor
SCALE	1:100
DATE	15/07/23
BY	ASB
CHECKED BY	ASB
APPROVED BY	ASB
PROJECT NO.	199ALPH-MET-00-00-00
DRWING NO.	S2 - P01

www.methodconsulting.com
Tel: 020 758 82204

Method Consulting

IMPERIAL LONDON
HOTELS

SAFETY, HEALTH & ENVIRONMENTAL INFORMATION

THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROVISION OF ALL NECESSARY SAFETY, HEALTH & ENVIRONMENTAL INFORMATION TO THE CONTRACTOR AND ALL SUBCONTRACTORS AND ALL WORKERS ON THE SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROVISION OF ALL NECESSARY SAFETY, HEALTH & ENVIRONMENTAL INFORMATION TO THE CONTRACTOR AND ALL SUBCONTRACTORS AND ALL WORKERS ON THE SITE.

IF A HAZARDOUS MATERIAL IS IDENTIFIED ON THE SITE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROVISION OF ALL NECESSARY SAFETY, HEALTH & ENVIRONMENTAL INFORMATION TO THE CONTRACTOR AND ALL SUBCONTRACTORS AND ALL WORKERS ON THE SITE.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROVISION OF ALL NECESSARY SAFETY, HEALTH & ENVIRONMENTAL INFORMATION TO THE CONTRACTOR AND ALL SUBCONTRACTORS AND ALL WORKERS ON THE SITE.

THIS DRAWING SHALL BE PRINTED IN FULL

THIS DRAWING SHALL BE PRINTED IN FULL

THIS DRAWING SHALL BE PRINTED IN FULL

Imperial London Hotel MEP acoustic review

Unit Designation	Area/Purpose	Location	Manufacturer	Type	Duty required (l/s)	External Static (Pa) (Guess/estimate)	Heat Exchanger	Condenser	Cooling Capacity (external design condition 32 degC)	Heating Capacity (external design condition -4 degC)	Weights (kg)	Notes
CEF-01	Basement Car Park Fume and Smoke Exhaust	Basement Car Park	Elta	Smoke rated exhaust	approx 22,000	400? Await riser opening	No	No	-	-	TBC	
CIF-01...N	Car Park Fume and Smoke Impulse Fans (numerous)	Basement Car Park	Elta	Smoke Rated Impulse	TBC	-	No	No	-	-	TBC	
SEF-01	Basement Servery Support Smoke Extract	Basement	Elta	Smoke Rated exhaust	200	200			-	-	-	Secondary power supply fire rated ductwork operate on local smoke detectors FAI to FAP.
SMAF-01	Basement Servery Support Smoke Extract make up air fan	Basement	Elta	Smoke rated make-up air	200	2150-200	No	No	-	-	-	Secondary power supply fire rated ductwork operate on local smoke detectors FAI to FAP.
TBC	Level 10 Sky Bar Support											
MVHR-18	North Wing Linen rooms and caretaker office	Level 10	Flakt Woods	Supply & Exhaust	135	120	Yes	No	-	Air off 21	TBC	Supply 15 l/s supply to office, extract 15 l/s from linen. Transfer grille between the 2 (in door?) duct via mechanical riser. Serves levels 1-9
MVHR-19	Basement Servery Stores	Basement	Flakt Woods	Supply & Exhaust	50	100	Yes	No	-	Air off 21	TBC	Supply central corridor, exhaust store rooms (not cool rooms) transfer ducts or grilles
AHU-XX (space only)	Ground Floor Franchise Ventilation	GF Superplant		Supply & Extract	2500	400	Thermal Wheel	Yes	10kW	15kW	TBC	Space only
AHU-ZZ (space only)	Ground Floor Franchise Kitchen Make-up Air	GF Superplant		Supply Only	2500	400	No	Yes	-	Air off 18	TBC	Space only
KEF-ZZ (space only)	Ground Floor Franchise Kitchen Exhaust	GF Superplant		Kitchen Exhaust Fan	3000	400	No	No	-	-	TBC	Space only
MVHR-ZZ	Ground Floor Franchise WCs	GR Superplant									TBC	Space only
AHU-01	Basement Staff Welfare	Former Ballroom Level 1 Plant Room	Airedale	Supply & Extract	1200	300	TBC	Yes	Air Off 24	Air off 21	TBC	
AHU-02	Basement Kitchen Make-up Air	Fomer Ballroom Level 1	Airedale	Supply Only	950	300	No	Yes	-	Air Off 18	TBC	
KEF-01	Basement Kitchen Exhaust	Fomer Ballroom Level 1 or Service Yard	VES	Kitchen Exhaust Fan	1115	400	No	No	-	-	TBC	
AHU-03	Ground Floor Breakfast Bar	Fomer Ballroom Level 1	Airedale	Supply & Extract	1500	300	Counterflow	Yes	Air Off 24	Air off 21	TBC	
AHU-04	Ground Floor Breakfast Bar Kitchen Make-up air	Service Yard	Airedale	Supply Only	3030	300	No	Yes	-	Air Off 18	TBC	
KEF-02	Ground Floor Breakfast Bar Kitchen Exhaust	Service Yard	VES	Kitchen Exhaust Fan	3570	400	No	No	-	-	TBC	
MVHR-16	Ground Floor Rooms	Ceiling space / Ground floor Plant rooms	Flakt Woods	Supply & Exhaust	250	100	Counterflow	Electric Heat	-	Air off 21	TBC	Unit added 12 May

AHU-05	Ground Floor Reception	Ground Floor Rear Plant Room	Airedale	Supply & Exhaust	1,000	300	Counterflow	Yes	Air off 24	Air off 21	TBC	Top connections on room side? Volume reduced from 1250l/s to 1000l/s 12 May
MVHR-17	First Floor In Room Dining Support	In ceiling/L1 Superplant	Flakt Woods	Supply & Exhaust	200	100	Counterflow	Electric Heat	-	Air off 21	TBC	Unit Added 12 May
AHU-06	First Floor Kitchen Make-up air	Service Yard	Airedale	Supply Only	1540	300	No	Yes	-	Air off 18	TBC	Flow rate reduced from 1540l/s to 1200l/s 12 May
KEF-03	First Floor Kitchen Exhaust	Ceiling or Service Yard	VES	Kitchen Exhaust Fan	1755	400	No	No	-	-	TBC	Flow rate reduced from 1755l/s to 1415l/s 12 May
MVHR-01	First Floor Executive Lounge	Ceiling	Flakt Woods	Supply & Extract	250	100	Counterflow	Electric Heat	-	Air off 21	TBC	
MVHR-02	First Floor Executive Lounge	Ceiling	Flakt Woods	Supply & Extract	250	100	Counterflow	Electric Heat	-	Air off 21	TBC	
MVHR-03	First Floor Linen	Ceiling	Flakt Woods	Supply & Extract	150	100	Counterflow	No	-	-	TBC	
MVHR-04	First Floor Wellness/Gym	Ceiling	Flakt Woods	Supply & Extract	250	100	Counterflow	Electric Heat	-	Air off 18	TBC	
AHU-07	Bedrooms plus Skybar Entrance	Superplant First Floor	Airedale	Supply & Extract	6200	600	Counterflow	Yes	Air off 24	Air off 21	TBC	Internal Unit Final volume to be tweaked after schematic completed.
AHU-08	Level 10 Kitchen Make-up air	Level 10 Plant Room	Airedale	Supply Only	1910	300	No	Yes	-	Air off 18	TBC	
KEF-04	Level 10 Kitchen Exhaust	Level 10 Plant Room	VES	Kitchen Exhaust Fan	2250	400	No	No	-	-	TBC	
MVHR-05	Level 10 Corridor	Level 10 Plant Room or ceiling	Flakt Woods	Supply & Exhaust	50	100	Counterflow	Electric Heat	-	Air off 18	TBC	
MVHR-06	Level 10 Staff Welfare	Level 10 Plant Room or ceiling	Flakt Woods	Supply & Exhaust	100	100	Counterflow	Electric Heat	-	Air off 21	TBC	
MVHR-07	Level 10 Private Dining	Level 10 Plant Room or ceiling	Flakt Woods	Supply & Exhaust	200	100	Counterflow	Electric Heat	-	Air off 21	TBC	
MVHR-08	Level 10 WCs	Ceiling	Flakt Woods	Supply & Exhaust	240	100	Counterflow	Electric Heat	-	Air off 18	TBC	
MVHR-09	Level 10 Cloak/Lobby/Storage	Ceiling	Flakt Woods	Supply & Exhaust	100	100	Counterflow	Electric Heat	-	Air off 21	TBC	
MVHR-10	Level 10 Sky Bar	Ceiling	Flakt Woods	Supply & Exhaust	435	80	Counterflow	No	-	Air off 21	TBC	
MVHR-11	Level 10 Sky Bar	Ceiling	Flakt Woods	Supply & Exhaust	435	80	Counterflow	No	-	Air off 21	TBC	
MVHR-12	Level 10 Sky Bar	Ceiling	Flakt Woods	Supply & Exhaust	435	80	Counterflow	No	-	Air off 21	TBC	
MVHR-13	Level 10 Sky Bar	Ceiling	Flakt Woods	Supply & Exhaust	435	80	Counterflow	No	-	Air off 21	TBC	
MVHR-14	Level 10 Sky Bar	Ceiling	Flakt Woods	Supply & Exhaust	435	80	Counterflow	No	-	Air off 21	TBC	
MVHR-15	Level 10 Sky Bar	Ceiling	Flakt Woods	Supply & Exhaust	435	80	Counterflow	No	-	Air off 21	TBC	

Imperial London Hotel MEP acoustic review

Imperial Hotel

AC Equipment Schedule



VRV & Single Split Heating and Cooling Equipment											
Indoor Unit Reference Number	Area Served	Description	Unit Capacity (medium speed)			Supply Air Rate (l/s)	External Static Pressure (Pa)	Sound Pressure Level (dB(A))	Dimensions mm (mm x mm x mm)	Manufacturer & Model	Notes
			Cooling (kW _{cool})	Cooling (kW _{cool})	Heating (kW)						
VARIABLE REFRIGERANT VOLUME SYSTEMS											
CU-01	Former Ballroom Basement	Condensing Unit		32	21					REYQ12U	Refrigerant TBC. Outdoor Winter Design Condition: -4°C, Outdoor Summer Design Condition: 32°C _{Coil} / RH50%, Indoor Winter Design Condition: 21°C (setpoint 22.5°C), Indoor Summer Design Condition 24°C _{Coil} / RH50% (setpoint 22.5°C). Bedroom given condensing unit capacities are at 100% total peak heating demand and 80% total peak cooling demand. Any capacities given for risers typically 100%. Typically 4-5 risers per bedroom system.
FCU-01-01	Staff Welfare	Ceiling Cassette	2.20	4.00	2.2					FXFQ25B	
FCU-01-02	Staff Welfare	Ceiling Cassette	2.20	4.00	2.2					FXFQ25B	
FCU-01-03	Staff Welfare	Ceiling Cassette	2.20	4.00	2.2					FXFQ25B	
FCU-01-04	Staff Welfare	Ceiling Cassette	2.20	4.00	2.2					FXFQ25B	
FCU-01-05	Office	Ceiling Cassette	1.40	1.80	1.7					FXFQ25B	
FCU-01-06	Uniform	Ceiling Cassette	1.20	1.50	1.4					FXFQ25B	
FCU-01-07	Change Room	Ceiling Cassette	3.20	4.70	3.8					FXFQ25B	
FCU-01-08	Change Rom	Ceiling Cassette	3.20	4.70	3.8					FXFQ25B	
FCU-01-09	Servery	Wall Mounted	2.50	3.50	2.0					FXAQ40A	
CU-02	Former Ballroom Ground Floor	Condensing Unit		90	28					REYQ38U	
FCU-02-01	Breakfast Area	Concealed Ducted	14.80	21.90	7.0		TBC 150Pa?			FXMQ250MA	
FCU-02-02	Breakfast Area	Concealed Ducted	14.80	21.90	7.0		TBC 150Pa?			FXMQ250MA	
FCU-02-03	Breakfast Area	Concealed Ducted	14.80	21.90	7.0		TBC 150Pa?			FXMQ250MA	
FCU-02-04	Breakfast Area	Concealed Ducted	14.80	21.90	7.0		TBC 150Pa?			FXMQ250MA	

1992LIHMET-00-XX-SH-M-5780-P01 AC Schedule

Page 1 of 21

28/07/2023

Imperial Hotel

AC Equipment Schedule



CU-03	Ground Floor	Condensing Unit		112	63					REYQ38U
FCU-03-01	Foyer	Concealed Ducted	9.10	13.00	7.0		TBC 150Pa?			FXSQ140
FCU-03-02	Foyer	Concealed Ducted	9.10	13.00	7.0		TBC 150Pa?			FXSQ140
FCU-03-03	Foyer/Coffee	Concealed Ducted	9.10	13.00	7.0		TBC 150Pa?			FXSQ140
FCU-03-04	Kitchen	Wall Mounted	4.00	5.00	5.2					FXAQ63A
FCU-03-05	Kitchen	Wall Mounted	4.00	5.00	5.2					FXAQ63A
FCU-03-06	Dishwashing	Wall Mounted	4.00	5.00	4.0					FXAQ63A
FCU-03-07	Large Office	Ceiling Cassette	3.00	4.30	2.6					FXFQ25B
FCU-03-08	Concierge	Ceiling Cassette	0.80	1.10	0.9					FXZQ15A
FCU-03-09	Small Office	Ceiling Cassette	0.80	1.10	0.9					FXZQ15A
FCU-03-10	Staff	Ceiling Cassette	1.00	1.50	0.9					FXZQ15A
FCU-03-11	Chef	Ceiling Cassette	0.80	1.10	0.9					FXZQ15A
FCU-03-12	Lift Lobby	Concealed Ducted	1.90	2.70	1.3					FXSQ32A
FCU-03-13	Sky Bar Access	Wall Mounted	4.40	6.70	3.8					FXAQ63A
FCU-03-14	Sky Bar Access	Wall Mounted	4.40	6.70	3.8					FXAQ63A
FCU-03-15	Reception	Concealed Ducted	9.10	13.00	7.0					FXSQ140
FCU-03-16	Foyer	Concealed Ducted	9.10	13.00	7.0					FXSQ140
CU-04	First Floor	Condensing Unit		66.7	41					REYQ28U
FCU-04-01	Executive Lounge	Concealed Ducted	10.40	15.10	5.4		TBC 150Pa?			FXMQ200MA
FCU-04-02	Executive Lounge	Concealed Ducted	10.40	15.10	5.4		TBC 150Pa?			FXMQ200MA
FCU-04-03	Corridor	Ceiling Cassette	2.30	2.90	1.7					FXZQ40A
FCU-04-04	Back Corridor	Ceiling Cassette	1.10	1.30	1.0					FXZQ20A
FCU-04-05	Night Service Prep	Ceiling Cassette	2.50	3.70	1.2					FXZQ40A
FCU-04-06	Wellness/Gym	Ceiling Cassette	5.70	7.30	9.0		TBC 150Pa?			FXFQ80B
FCU-04-07	Wellness/Gym	Ceiling Cassette	5.70	7.30	9.0		TBC 150Pa?			FXFQ80B
FCU-04-08	Kitchen	Wall Mounted	4.00	5.00	3.0					FXAQ63A
FCU-04-09	Kitchen	Wall Mounted	4.00	5.00	3.0					FXAQ63A
FCU-04-10	Linen	Wall Mounted	2.90	4.00	2.5					FXAQ60A

1992LIHMET-00-XX-SH-M-5780-P01 AC Schedule

Page 2 of 21

28/07/2023

Imperial London Hotel MEP acoustic review

Imperial Hotel

AC Equipment Schedule



CU-05A	Level 10	Condensing Unit		141					REYQ54U
FCU-05A-01	Sky Bar	Concealed Ducted	18.50	22.50			TBC 150Pa?		FXMQ250A
FCU-05A-02	Sky Bar	Ceiling Cassette	4.60	5.70	8.0				FXFQ33B
FCU-05A-03	Sky Bar	Concealed Ducted	18.50	22.50			TBC 150Pa?		FXMQ250A
FCU-05A-04	Sky Bar	Ceiling Cassette	4.60	5.70	8.0				FXFQ33B
FCU-05A-05	Sky Bar	Concealed Ducted	18.50	22.50			TBC 150Pa?		FXMQ250A
FCU-05A-06	Sky Bar	Ceiling Cassette	4.60	5.70	8.0				FXFQ33B
FCU-05A-07	Sky Bar	Concealed Ducted	18.50	22.50			TBC 150Pa?		FXMQ250A
FCU-05A-08	Sky Bar	Ceiling Cassette	4.60	5.70	8.0				FXFQ33B
FCU-05A-09	Sky Bar	Concealed Ducted	18.50	22.50			TBC 150Pa?		FXMQ250A
FCU-05A-10	Sky Bar	Ceiling Cassette	4.60	5.70	8.0				FXFQ33B
CU-05B	Level 10	Condensing Unit		34.2	52.6				REYQ14U
FCU-05B-01	Lift Lobby	Ceiling Cassette	1.00	1.40	1.9		TBC 150Pa?		FXZQ15A
FCU-05B-02	Corridor Lobby	Ceiling Cassette	1.00	1.40	1.9		TBC 150Pa?		FXZQ15A
FCU-05B-03	Male WC	Ceiling Cassette	2.00	2.20	4.0				FXZQ32A
FCU-05B-04	Female WC	Ceiling Cassette	2.00	2.20	4.0				FXZQ32A
FCU-05B-05	Back Corridor	Ceiling Cassette	1.70	1.90	3.2				FXZQ25A
FCU-05B-06	Back Corridor	Ceiling Cassette	1.70	1.90	3.2				FXZQ25A
FCU-05B-07	Kitchen	Wall Mounted	4.00	5.00	8.0				FXAQ33A
FCU-05B-08	Kitchen	Wall Mounted	4.00	5.00	8.0				FXAQ33A
FCU-05B-09	Private Dining	Concealed Ducted	6.20	9.00	12.5		TBC 150Pa?		FXSQ100A
FCU-05B-10	Staff Welfare	Ceiling Cassette	2.00	3.20	4.0				FXZQ32A
FCU-05B-11	Cloak	Ceiling Cassette	0.80	1.00	1.9				FXZQ15A
CU-06A1	Bedrooms	Condensing Unit		43.5	30.5				REYQ22U
FCU-06A1-424	Riser 2/3 Room 924	Concealed Ducted	2.3	3.0	1.7		TBC 30-50Pa?		FXSQ40A
FCU-06A1-833	Riser 2/3 Room 833	Concealed Ducted	4.1	5.3	2.9		TBC 30-50Pa?		FXSQ33A
FCU-06A1-733	Riser 2/3 Room 733	Concealed Ducted	4.1	5.3	2.9		TBC 30-50Pa?		FXSQ33A
FCU-06A1-633	Riser 2/3 Room 633	Concealed Ducted	4.1	5.3	2.9		TBC 30-50Pa?		FXSQ33A
FCU-06A1-533	Riser 2/3 Room 533	Concealed Ducted	4.1	5.3	2.9		TBC 30-50Pa?		FXSQ33A
FCU-06A1-434	Riser 2/3 Room 434	Concealed Ducted	2.1	2.6	1.5		TBC 30-50Pa?		FXSQ32A
FCU-06A1-334	Riser 2/3 Room 334	Concealed Ducted	2.1	2.6	1.5		TBC 30-50Pa?		FXSQ32A
FCU-06A1-234	Riser 2/3 Room 234	Concealed Ducted	2.1	2.6	1.5		TBC 30-50Pa?		FXSQ32A

APPENDIX 2 – Recommended Attenuator Performance

Item	Minimum Insertion Loss, dB					
	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz
ATT-AHU-01S	10	18	29	35	33	22
ATT-AHU-01R	14	24	39	45	46	42
ATT-AHU-01F	14	24	39	45	46	42
ATT-AHU-01E	14	24	39	45	46	42
ATT-AHU-02S	10	18	29	35	33	22
ATT-AHU-02R	10	18	29	35	33	22
ATT-AHU-02F	10	18	29	35	33	22
ATT-AHU-02E	14	24	39	45	46	42
ATT-AHU-03S	17	30	48	50	50	50
ATT-AHU-03R	10	18	29	35	33	22
ATT-AHU-03F	14	24	39	45	46	42
ATT-AHU-03E	17	30	48	50	50	50
ATT-AHU-04S	14	24	39	45	46	42
ATT-AHU-04F	14	24	39	45	46	42
ATT-AHU-05S	10	18	29	35	33	22
ATT-AHU-05R	17	30	48	50	50	50
ATT-AHU-05F	14	24	39	45	46	42
ATT-AHU-05E	14	24	39	45	46	42
ATT-AHU-06S	17	30	48	50	50	50
ATT-AHU-06F	14	24	39	45	46	42
ATT-AHU-07S	14	24	39	45	46	42
ATT-AHU-07R	17	30	48	50	50	50
ATT-AHU-07F	14	24	39	45	46	42
ATT-AHU-07E	17	30	48	50	50	50
ATT-AHU-08S	14	24	39	45	46	42
ATT-AHU-08F	10	18	29	35	33	22
ATT-MVHR-01S	10	18	29	35	33	22
ATT-MVHR-01R	6	12	18	21	20	13

Item	Minimum Insertion Loss, dB					
	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz
ATT-MVHR-01F	2	7	10	11	9	8
ATT-MVHR-01E	2	7	10	11	9	8
ATT-MVHR-02S	10	18	29	35	33	22
ATT-MVHR-02R	6	12	18	21	20	13
ATT-MVHR-02F	2	7	10	11	9	8
ATT-MVHR-02E	2	7	10	11	9	8
ATT-MVHR-03S	2	7	10	11	9	8
ATT-MVHR-03R	2	7	10	11	9	8
ATT-MVHR-03F	2	7	10	11	9	8
ATT-MVHR-03E	2	7	10	11	9	8
ATT-MVHR-04S	6	12	18	21	20	13
ATT-MVHR-04R	2	7	10	11	9	8
ATT-MVHR-04F	2	7	10	11	9	8
ATT-MVHR-04E	2	7	10	11	9	8
ATT-MVHR-05S	6	12	18	21	20	13
ATT-MVHR-05R	2	7	10	11	9	8
ATT-MVHR-05F	2	7	10	11	9	8
ATT-MVHR-05E	2	7	10	11	9	8
ATT-MVHR-06S	10	18	29	35	33	22
ATT-MVHR-06R	6	12	18	21	20	13
ATT-MVHR-06F	2	7	10	11	9	8
ATT-MVHR-06E	2	7	10	11	9	8
ATT-MVHR-07S	10	18	29	35	33	22
ATT-MVHR-07R	6	12	18	21	20	13
ATT-MVHR-07F	2	7	10	11	9	8
ATT-MVHR-07E	2	7	10	11	9	8
ATT-MVHR-08S	6	12	18	21	20	13
ATT-MVHR-08R	2	7	10	11	9	8
ATT-MVHR-08F	2	7	10	11	9	8
ATT-MVHR-08E	2	7	10	11	9	8

Item	Minimum Insertion Loss, dB					
	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz
ATT-MVHR-09S	2	7	10	11	9	8
ATT-MVHR-09R	2	7	10	11	9	8
ATT-MVHR-09F	2	7	10	11	9	8
ATT-MVHR-09E	2	7	10	11	9	8
ATT-MVHR-10S	10	18	29	35	33	22
ATT-MVHR-10R	6	12	18	21	20	13
ATT-MVHR-10F	2	7	10	11	9	8
ATT-MVHR-10E	2	7	10	11	9	8
ATT-MVHR-11S	10	18	29	35	33	22
ATT-MVHR-11R	6	12	18	21	20	13
ATT-MVHR-11F	2	7	10	11	9	8
ATT-MVHR-11E	2	7	10	11	9	8
ATT-MVHR-12S	10	18	29	35	33	22
ATT-MVHR-12R	6	12	18	21	20	13
ATT-MVHR-12F	2	7	10	11	9	8
ATT-MVHR-12E	2	7	10	11	9	8
ATT-MVHR-13S	10	18	29	35	33	22
ATT-MVHR-13R	6	12	18	21	20	13
ATT-MVHR-13F	2	7	10	11	9	8
ATT-MVHR-13E	2	7	10	11	9	8
ATT-MVHR-14S	10	18	29	35	33	22
ATT-MVHR-14R	6	12	18	21	20	13
ATT-MVHR-14F	2	7	10	11	9	8
ATT-MVHR-14E	2	7	10	11	9	8
ATT-MVHR-15S	10	18	29	35	33	22
ATT-MVHR-15R	6	12	18	21	20	13
ATT-MVHR-15F	2	7	10	11	9	8
ATT-MVHR-15E	2	7	10	11	9	8
ATT-MVHR-16S	6	12	18	21	20	13
ATT-MVHR-16R	2	7	10	11	9	8

Item	Minimum Insertion Loss, dB					
	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz
ATT-MVHR-16F	2	7	10	11	9	8
ATT-MVHR-16E	2	7	10	11	9	8
ATT-MVHR-17S	6	12	18	21	20	13
ATT-MVHR-17R	2	7	10	11	9	8
ATT-MVHR-17F	2	7	10	11	9	8
ATT-MVHR-17E	2	7	10	11	9	8
ATT-MVHR-18S	6	12	18	21	20	13
ATT-MVHR-18R	2	7	10	11	9	8
ATT-MVHR-18F	2	7	10	11	9	8
ATT-MVHR-18E	2	7	10	11	9	8
ATT-MVHR-19S	2	7	10	11	9	8
ATT-MVHR-19R	2	7	10	11	9	8
ATT-MVHR-19F	2	7	10	11	9	8
ATT-MVHR-19E	2	7	10	11	9	8
ATT-KEF-01R	6	12	18	21	20	13
ATT-KEF-01E	2	7	10	11	9	8
ATT-KEF-02R	17	30	48	50	50	50
ATT-KEF-02E	20	34	50	50	50	50
ATT-KEF-03R	17	30	48	50	50	50
ATT-KEF-03E	14	24	39	45	46	42
ATT-KEF-04R	14	24	39	45	46	42
ATT-KEF-04E	10	18	29	35	33	22
ATT-02-01S, ATT-02-01R FCU-02-01	9	11	10	9	8	3
ATT-02-02S, ATT-02-02R FCU-02-02	9	11	10	9	8	3
ATT-02-03S, ATT-02-03R FCU-02-03	9	11	10	9	8	3
ATT-02-04S, ATT-02-04R FCU-02-04	9	11	10	9	8	3
ATT-03-01S, ATT-03-01R FCU-03-01	9	11	10	9	8	3
ATT-03-02S, ATT-03-02R FCU-03-02	9	11	10	9	8	3
ATT-03-03S, ATT-03-03R FCU-03-03	9	11	10	9	8	3
ATT-03-12S, ATT-03-12R FCU-03-12	5	6	5	4	3	2

Item	Minimum Insertion Loss, dB					
	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz
ATT-03-15S, ATT-03-15R FCU-03-15	9	11	10	9	8	3
ATT-03-16S, ATT-03-16R FCU-03-16	9	11	10	9	8	3
ATT-04-01S, ATT-04-01R FCU-04-01	9	11	10	9	8	3
ATT-04-02S, ATT-04-02R FCU-04-02	9	11	10	9	8	3
ATT-05A-01S, ATT-05A-01R FCU-05A-01	9	11	10	9	8	3
ATT-05A-03S, ATT-05A-03R FCU-05A-03	9	11	10	9	8	3
ATT-05A-05S, ATT-05A-05R FCU-05A-01	9	11	10	9	8	3
ATT-05A-07S, ATT-05A-07R FCU-05A-01	9	11	10	9	8	3
ATT-05A-09S, ATT-05A-09R FCU-05A-01	9	11	10	9	8	3
ATT-05B-09S, ATT-05B-09R FCU-05B-09	9	11	10	9	8	3

APPENDIX 3 – Acoustic Lagging Requirements

- 1.0 Where acoustic lagging for fitment is called for on the drawings or in other parts of the specification, this shall consist of a resilient layer wrapped around the noise source, together with an outer high mass skin.
- 2.0 Type A: Standard Acoustic Lagging
 - 2.1 Resilient Layer; 50mm (minimum) thickness of mineral wool or fibreglass having a density of approximately 100kg/m³, or 50mm (minimum) thick Lamella mat at a density of 45kg/m³.
 - 2.2 Outer Mass Skin; Either a high density sound deadening mat (10kg/m²) or a 2mm thick synthetic lead sheet.
 - 2.3 The materials shall be installed in one of the following ways:
 - 2.3.1 Wrap the duct with the resilient layer and outer mass skin, then retain both with straps.
 - 2.3.2 Using metal pins and large fixing washers. Pins will have a perforated metal base plate, and be non self adhesive but fixed to the duct surface with a suitable glue or other fixant, spaced at a maximum of 300mm centres. The mineral wool and outer mass layer will be laid over the pins, which will then protrude, to be cut back to minimum length and sealed with the washers.
 - 2.4 As an alternative, any of several proprietary acoustic duct lagging products may be used. These must first be passed to the acoustic consultant for approval.
- 3.0 Type B: Heavy Duty Acoustic Lagging – Sheet material
 - 3.1 Resilient Layer; 75mm (minimum thickness of mineral wool or fibreglass having a density of approximate 100kg/m³, or 75mm (minimum) thick Lamella mat at a density of 45kg/m³.
 - 3.2 Outer Mass Skin; 2mm sheet steel, 19mm plasterboard plank, or other sheet material of surface density no less than 15kg/m².
 - 3.3 The sheet material shall be fixed to an independently supported timber or steel framework which does not come into direct contact with the ductwork. All joints shall be taped and sealed with caulking or a suitable dense mastic.
- 4.0 With either type of lagging, the outer mass skin shall not at any point come into direct contact with the ductwork, especially at flanged joints and hangers. Similarly, it shall not come into contact with the building structure. In addition, it must be ensured that the whole acoustic lagging system is tightly fitted. All joints in non-Lamella substrates must be staggered and lapped by no less than 50mm - direct butt joints are not permitted.
- 5.0 All materials shall be non-combustible and to the approval of the fire officer.