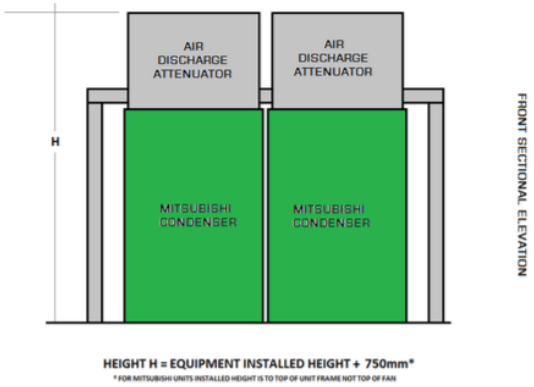
8.0 Appendix 2 - Manufacturer's Information (Attenuators)

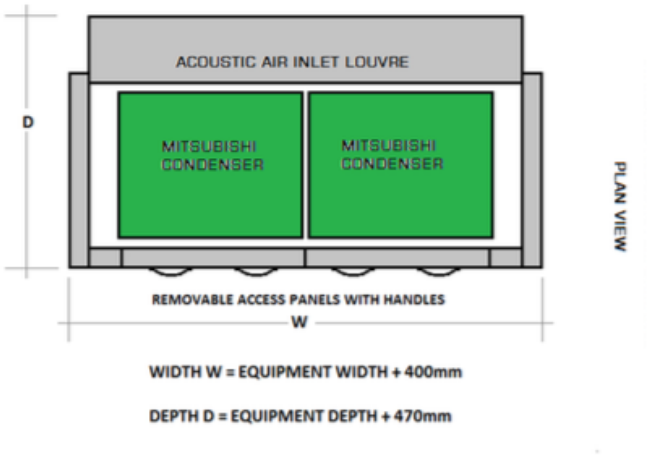
Ambient Acoustics - Package Attenuators – Typical Installation for Mitsubishi Chillers

(Acoustic Performance Data: Mitsubishi EP350+EP450, free-standing, 12dBA reduction)

Size -3400mmW x 1200mmFTB x 2157mmH



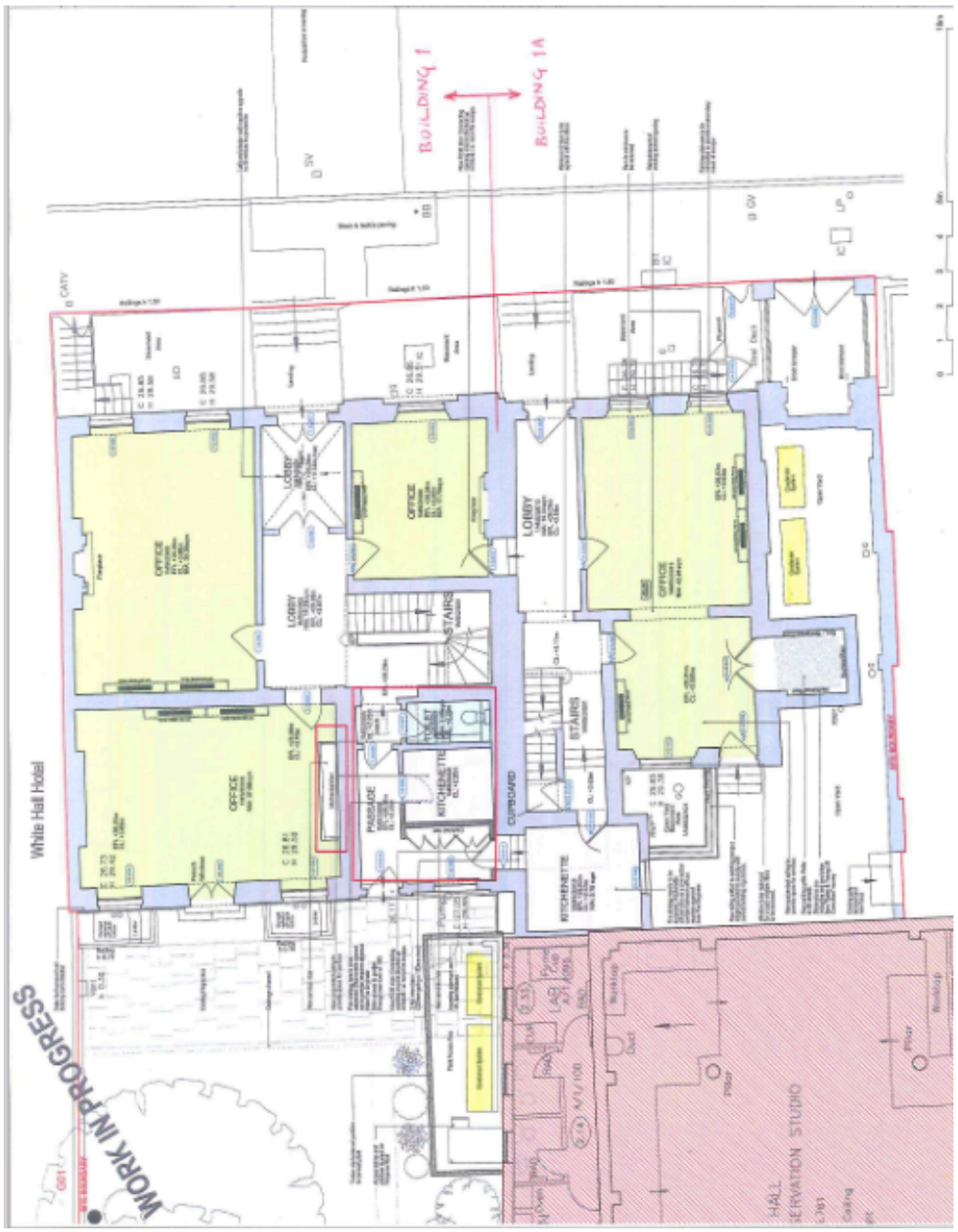
Attenuators - Elevation View



Attenuators – Plan View

Attenuators – Proposed Visual Screen I

9.0 Appendix 3 - Design Scheme Extract



10.0 Appendix 4 - Glossary of Acoustic Terms

Sound is measured in decibels (dB). To establish a reference framework it is useful to consider two noise levels which are at the extreme ends of the range to be considered. At the low end, 35 to 40 dB (A) is the normal noise level in a quiet living room, 35 dB (A) is the noise level given as a target for suburban bedrooms by the Wilson Report; a government report on noise published in 1963. At the high end is the noise level experienced at the pavement edge of a busy city centre street, a level of 75 to 80 dB (A).

The sensitivity of the human ear varies with pitch or frequency. The designation "A" used in this assessment simply means that the noise level was measured using a meter which is able electronically to respond very closely to the performance of the human ear.

Decibels are measured using a logarithmic scale, and therefore two numerically equal values cannot be added together arithmetically. Two equal noise levels occurring together form a new level which is 3 dB (A) higher than either alone. Thus two identical vehicles each producing 65 dB (A) outside someone's window will produce, not 130 dB (A), but 68 dB (A) if both engines are running together at the same distance from the microphone.

If one sound source is 10 dB (A) below an adjacent louder source, then the combined effect will be virtually no different to the louder one alone.

Experiments have shown that most people will indicate that a sound has become twice as loud, when on a measuring meter it has risen by about 10 dB (A). Also it is generally accepted that a difference in 3 dB (doubling in energy terms) is the smallest incremental step that can be distinguished by the average human ear.

Some additional acoustic terms are also referred to in this report. These are:

LA10: is the noise level just exceeded for 10% of the measurement period, and calculated by statistical analysis.

L_A90. This is the sound level exceeded for 90% of a time interval T. L_A90 and it is termed background sound or noise level. It is effectively a measure of the minimum noise level which is experienced in the absence of specific noisy events such as brake squeal or engine backfire.

$L_{A\ eq(T)}$ is the equivalent continuous sound level over a time T, which can be described as the "energy - average" noise level.

L_A max is the highest noise level recorded by the measuring meter during a single event e.g. overlying aircraft. In this assessment the meter was set to "fast" response.

Ambient Sound - This is the all encompassing sound at a given location at a within a specified time frame and comprises the sound from all near and distant sources.

Noise - Noise was defined in the Wilson Report on 1964 as "unwanted sound'. Noise excluded vibration, except where indicated otherwise.

Appendix 4 – Lighting Strategy

Lighting Installation

The complete new lighting installation for 1 and 1A Montague Street has been designed to meet the requirements of CIBSE Lighting Guide LG7 for Offices and be compliant with the requirements of Building Regulations in terms of installed luminous efficacy (lm/W) and control together with Compliance with the Non-Domestic Building Services Compliance Guide.

The lamp choice requested by the client has been LED throughout. The luminaires therefore utilised in the lighting design throughout both buildings has utilised the latest technology LED lamp and driver technology.

IT has been proposed to use a DALI control system as owing to the nature of the various rooms in the building is it necessary to 'commission' and 'regulate' the lighting output in each office to be compliant with the Standards. All of the luminaires are therefore fully type tested and approved by an accredited DALI test laboratory and have the official DALI stamp.

The proposed installation will allow for all DALI compatible luminaires, sensors and controls including the power supplies etc to form a complete system. The contractor will allow attendance from the specialist luminaire supplier to attend site and commission and set up all the illumination levels to the whole site. The contractor will include for an on site demonstration to the engineer and suitable training for the client.

The luminaires require particular attention to setting out, location and positioning. The contractor will allow to cross reference the electrical tender drawings, the mechanical tender drawings and Architect's drawings and any interior design and specialist details when setting out the luminaires.

General lighting will be controlled via local demand switches in conjunction with presence and absence sensors all DALI compatible. Where demand switches are used in conjunction with absence sensors the lighting will not initiate until a demand switch is activated. These switches are located adjacent to the doors on entrance to an office or similar space. The switches also facilitate dimming of the luminaires. Once the lighting is 'demanded' it will remain active until the absence sensors do not detect any occupancy.

The sensors will be set of 20 to 30 minutes so that they do not cause nuisance switching off. Presence sensors are installed in all common access areas including toilers etc. When a person enters a space the presence sensors detect this and activate the lighting automatically. Similarly the sensors will be set of 20 to 30 minutes so that they do not cause nuisance switching off.

The above lighting installation will deliver a low energy lighting solution and the coupled with the control systems provide optimum energy use performance.

Lighting wiring will be wired using LSZH multicore cabling of minimum size 1.5mm^2. All wiring will be installed flush. The contractor will install the lighting wiring through the joisted floors in a neat and coordinated manner.

Termination points for wall lights will terminate in flush switch boxes. All final connections to all ceiling, wall, floor mounted luminaires and lighting fixtures will incorporate heat resistant sleeving.

Emergency Lighting Installation

Emergency lighting will be provided to cover designated locations and escape routes and will be achieved by means of switchable maintained units incorporated into the main lighting LED luminaires complete with 3 hour standby packs. The lighting has been designed to provide compliance with the British Standard for Emergency Lighting BS5266, current edition. Use of maintained LED luminaires provides an energy efficient solution with long lamp life and reliability.

Emergency lighting will be wired using cables and accessories as specified for the standard lighting installations.

Circuits feeding emergency luminaire circuits will be suitably labelled and live feeds for these luminaries will be wired via test key switches located adjacent the main distribution board, clearly identified as to what circuits, rooms, areas and luminaires they control.

The test key switches will be of the MK metalclad type and identified by means of red engraving with appropriate wording.

All miniature circuit breakers and associated switchgear will be suitable labelled to avoid inadvertent isolation of emergency lighting circuits.

Emergency lighting units will be of 3 hours duration upon mains failure.

External Lighting Strategy

New external lighting will be provided comprising wall mounted bulkhead to the external elevation of the property as indicated on the drawings; to provide general lighting to the external areas.

The external lighting systems will designed to meet the ILP Guidance Note for the Reduction of Obtrusive Light 2011. Luminaires will be selected to meet the BREEAM requirement ENE03 where BREEAM compliance is required.

All luminaires shall have a luminous efficacy greater than the current lumens per circuit watt required to comply with Part L2B of approved document Part L of the Building Regulations 2016 and associated Non-Domestic Building Services Compliance Guide.

The new external lighting installations will be controlled via a photocell wired in series with a digital time switch and a manual key operated override switch. The key switch will be labelled “external lighting override”. The settings of the time switch shall be agreed with the Client and will be fully adjustable.

Photocells control will be located on a north-facing wall of the building at a mounting height of no less than 3000mm above floor level and shielded from artificial light of surrounding luminaires. The photocell will be adjustable between 25-2000lux. The time switch and associated override switch will be located in an agreed location adjacent the distribution board. Final position of the photocells to be agreed.

Appendix 5 – VRF Outdoor Unit Schedule

FRANKHAM

Project Name : 1/1a Montague Street

Project Number : 226532
Date : 05/05/2017
Revision : P02

EQUIPMENT SCHEDULE — **VARIABLE REFRIGERENT FLOW SYSTEM - OUTDOOR UNITS**

Ref	Location	Model	Manufacturer	No. of Indoor Units	No. of Manifold Units	System Cooling Capacity	Total Cooling Capacity	System Heating Capacity	Total Heating Capacity	Nominal EER	Nominal COP	Air Flow	Unit Dimensions			Electrical Details				Weight	Noise Level	Weight	Notes
													Height	Length	Depth	Power Input	Running Current	Phase	Supply				
						(kW)	(kW)	(kW)	(kW)			(m3/s)	(mm)	(mm)	(mm)	(kW)	(A)	(Ø)	(V,HZ)	(kg)	(dBA)	(kg)	
ODU.01	Building 1 - Ground Flr	PURY-EP450YLM-A1	Mitsubishi	16	1	50.00	TBC	43.38	TBC	3.37	3.53	320	1710	1750	740	14.50	24.5	3	415 / 50	336	62.5	R410A	1 - 6
ODU.02	Building 1 - Ground Flr	PURY-EP350YLM-A1	Mitsubishi	13	1	40.00	TBC	35.61	TBC	3.18	3.48	230	1710	1220	740	12.56	19.9	3	415 / 50	244	62.5	R410A	1 - 6
ODU.01A	Building 1A - Ground Flr	PURY-EP250YLM-A1	Mitsubishi	10	1	28.00	TBC	26.96	TBC	3.86	3.72	185	1710	920	740	8.40	13	3	415 / 50	202	60	R410A	1 - 6
ODU.02A	Building 1A - Ground Flr	PURY-EP250YLM-A1	Mitsubishi	8	1	28.00	TBC	26.95	TBC	3.86	3.72	185	1710	920	740	8.40	13	3	415 / 50	202	60	R410A	1 - 6

Notes:

1 - Use of Acoutic Screening / Attenuation to be confirmed based on Acoustian's final report
2 - Refer to separate schedule for VRF manifold details
3 - Refer to separate schedule for VRF indoor unit details
4 - Selection based on UK design conditions, low speed settings, and refridgerant type R410A
5 - All units to have anti vibration mounting and installed on big foot system
6 - Overall System Efficiencies to be inline with Building Regulations or Better
7 - VRF Systems to be manufactured by Mitsubishi and supplied by Kooltech. Quote reference Q0901-404442/9. Contact Scott Dorrall 07747 845 161.