ScotchPartners

60 Whitfield Street

Health Services Laboratories

Noise Emission Assessment
(Planning Condition 5 Report)

Revision 02

January 2019

Scotch Partners

Scotch Partners LLP
Building Services Engineering | Sustainability | Acoustics

Scriptor Court
157 Farringdon Road
London, EC1R 3AD

+44 (0) 203 544 5400
www.scotchpartners.com

Project Particulars

Client Name: Health Services Laboratories
Project Name: 60 Whitfield Street Laboratories

Disclaimer

Revision History

Revision		Date	Prepared By	Checked By
00	Initial planning issue	21/09/2017	Jacob Perry BMus AMIOA	Jason Clouston BEng MSc MIOA
01	Revised planning issue	27/09/2017	Jacob Perry BMus AMIOA	Jason Clouston BEng MSc MIOA
02	Condition 5 update	11/01/2019	Jacob Perry BMus MIOA	Jason Clouston BEng MSc MIOA

Contents

1 Introduction

1.1 Proposals are in place for the installation of new building services plant at 60 Whitfield Street, a laboratory/office building in Fitzrovia.

1.2 The proposal for the installation of new building services plant will generate noise external to the site. Final selections for plant have been made and so this report presents an assessment in response to Planning Condition 5.

1.3 In order to assess the noise impact associated with the proposed development, an external noise survey has been undertaken. The measurement data from the survey have been used to assess the level of noise emission from the proposed building services plant.

1.4 Chapter 2 of this report describes the external noise survey, and the noise emission assessment is presented in Chapter 3.

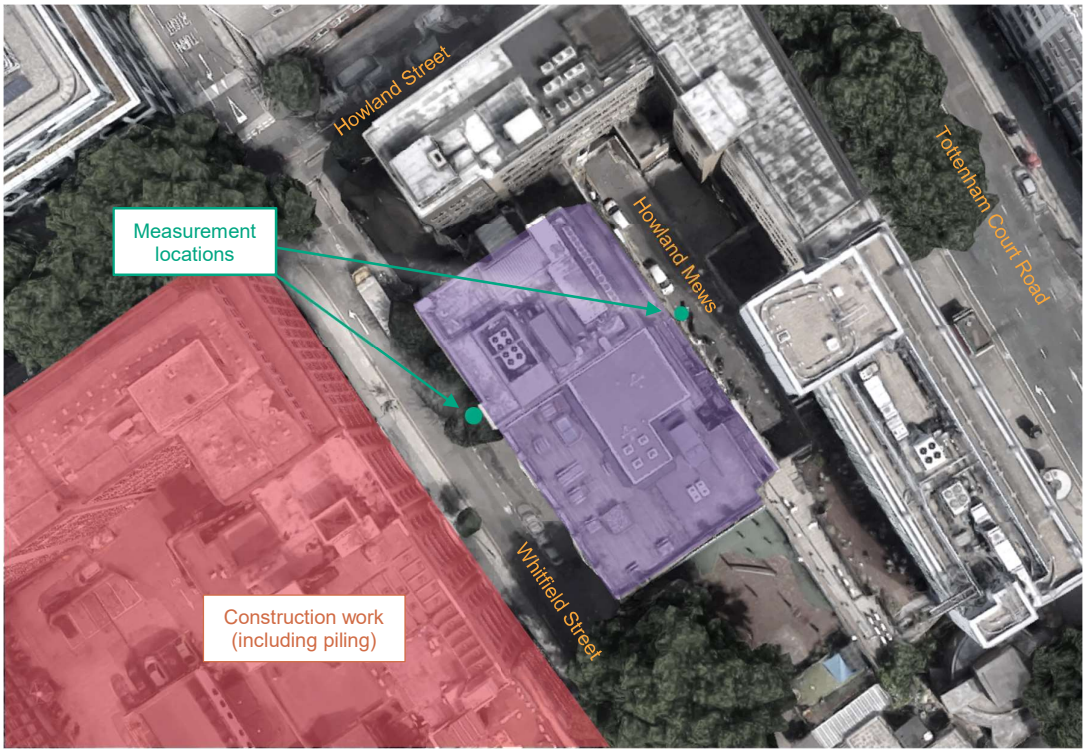
1.5 The full data from the external noise survey is available from Scotch Partners in electronic format on request.

2 External noise survey

2.1 Site description

2.1.1 External noise measurements were made atop 60/62 Whitfield Street in Fitzrovia, central London. Figure 2.1 shows the site and measurement locations.

Figure 2.1 Satellite image (courtesy of Google) with measurement locations highlighted



2.1.2 During the day, construction noise associated with the development on 65 Whitfield Street and 80 Charlotte Street was the dominant noise source along Whitfield Street, and was also audible in Howland Mews.

2.1.3 Deliveries to 60 Whitfield Street are made on a 24-hour basis via couriers to the rear of the site (Howland Mews). Therefore, motorbikes and cars are a regular noise source on Howland Mews both day and night.

2.1.4 In the absence of other sources, the ambient noise level was mostly controlled by traffic noise on the surrounding roads.

2.2 Measurement methodology

2.2.1 Simultaneous, unattended noise level measurements were conducted at two locations at roof level:

1. Extended from the rooftop, overlooking Whitfield Street. Measurements made at this location are believed to be representative of noise levels incident on façades facing Whitfield Street.

2. Extended from a balcony overlooking Howland Mews to the rear of the site, at fifth floor level. Measurements made at this location are believed to be representative of noise levels incident on façades facing Howland Mews.

2.2.2 The measurement locations are shown in Figure 2.1.

2.2.3 Statistical and spectral data were recorded continuously between 17/07/2017 (Monday) and 19/07/2017 (Wednesday) in 15-minute samples. Level-triggered audio recordings were made in the location facing Howland Mews, and have been used to determine the source of some maxima.

2.2.4 Both measurement positions are believed to have been far enough away from reflecting sources to provide a reasonable approximation of free-field values.

2.2.5 The following equipment was used for the noise survey:

Table 2.1 External noise measurement equipment

Equipment	Type	Serial no.	Location
Norsonic 131	Sound analyser	1312766	Whitfield Street
Norsonic 1207	Preamplifier	12160	
Norsonic 1227	Microphone	170606	
Norsonic 1218	Outdoor microphone enclosure	12182561	
Norsonic 139	Sound analyser	1392774	Howland Mews
Norsonic 1207	Preamplifier	20303	
Norsonic 1227	Microphone	170624	
Norsonic 1218	Outdoor microphone enclosure	12182559	
Brüel & Kjær 4231	Portable calibrator	2291098	Both

2.2.6 The calibration of the sound level meters and associated preamplifier/microphone were checked prior to and on completion of the measurement period in accordance with recommended practice. No significant drift in calibration occurred during the measurement period. The accuracy of the portable calibrator can be traced to National Physical Laboratory Standards.

2.2.7 The weather conditions were generally dry with wind not in excess of 5 ms^{-1}. Some heavy rainfall is believed to have occurred on the evening of 18/07/2017 at around 22:00, however this will not have affected measurements made outside of this time. It is not expected that weather conditions will have affected the findings of the noise emission assessment.

2.3 Measurement results

2.3.1 The measurement results are presented in Figure 2.2 and Figure 2.3 as level-history graphs.

2.3.2 The results can be seen to generally follow a diurnal pattern, decreasing to a minimum overnight. This is typical where traffic noise is a primary noise source.

2.3.3 Based on the measurements and level-triggered audio recordings, construction noise is thought to have begun at around 08:00, and ended around 18:00. This will have significantly affected the L_{Fmax} and $L_{eq,15min}$ data, but will have had less effect on $L_{90,15min}$ data as the noise was sporadic.

2.3.4 Measurements taken in the location facing Whitfield Street were mostly influenced by the construction noise, as evidenced by the substantial decrease in noise outside of construction times. Measurements facing Howland Mews were less affected by construction noise (due to screening), and were more affected by deliveries (which operate over a 24 hour period).

Figure 2.2 Level-history graph for measurements made facing Whitfield Street

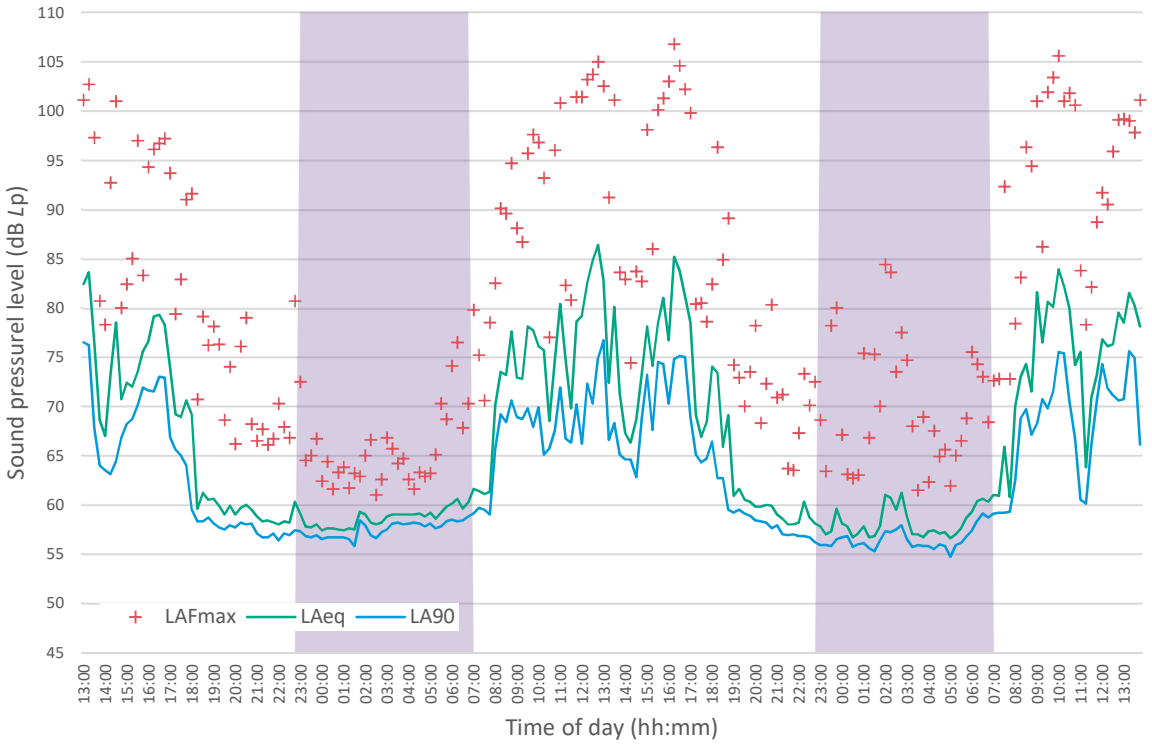
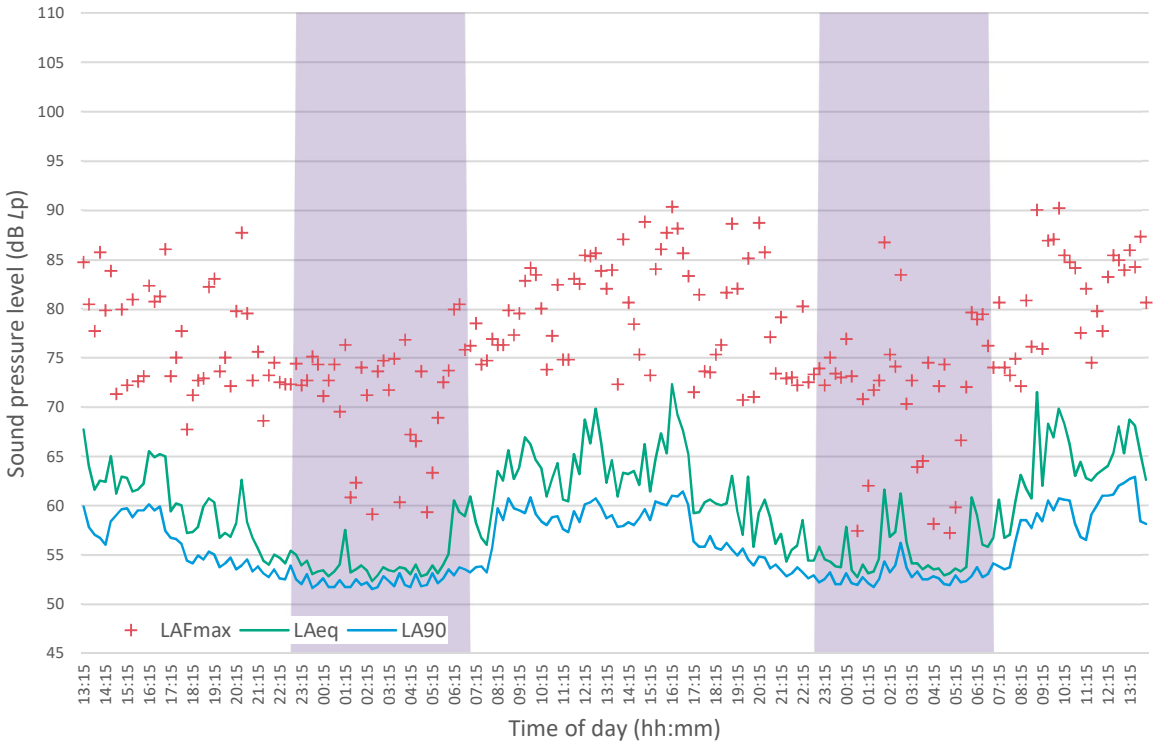


Figure 2.3 Level-history graph for measurements facing Howland Mews



3 Noise emission assessment

3.1 Criteria

3.1.1 Full planning permission was granted on 1st February 2018 (Application Ref: 2017/6286/P), subject to several conditions, including one which relates to the control of external plant noise emission.

3.1.2 Condition 5 of the planning permission states the following:

The specific sound level from the proposed plant shall be 5dB(A) or more below the background sound level at the nearest residential receptor at any time and 5dB(A) or more below the background sound level at the nearest non-residential receptor between 08:00 and 18:00. Prior to the plant being commissioned and once the design has been finalised, a report shall be submitted to the LPA in writing detailing the proposed mitigation measures and how the plant and equipment will be installed and constructed to ensure compliance with the above requirements.

Reason: To ensure that the amenity of occupiers of the development site / surrounding premises is not adversely affected by noise from mechanical installations/ equipment, in accordance with Policy A4 of the Camden Local Plan 2017.

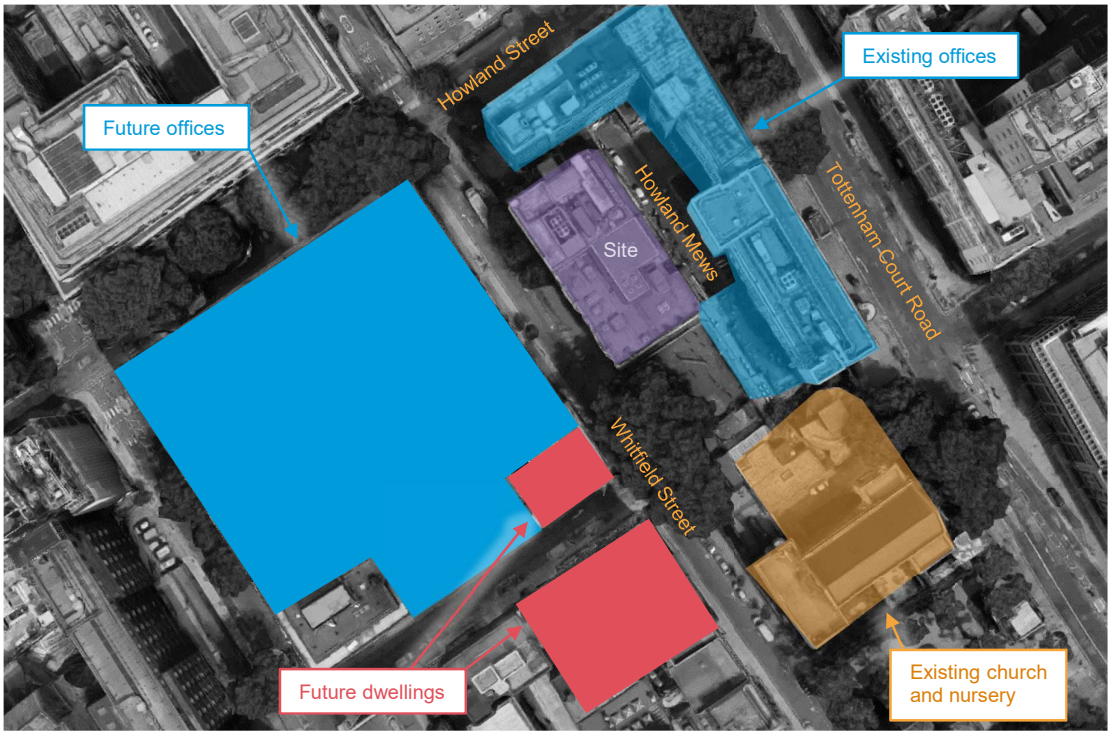
3.2 Identification of noise-sensitive receptors

3.2.1 The nearest *existing* residential receptors to the site are believed to be 100 Whitfield Street and those around Torrington Place. They are relatively far away from the proposed site and well screened to it, as such it is not expected that noise emission from this site will have an impact on these dwellings. It is, however, understood that the development of 80 Charlotte Street and 65 Whitfield Street will include some *new* residential receptors, and it is considered important to consider the noise impact on *future* residents as well.

3.2.2 The surrounding non-residential receptors around the site include; offices, a church, and a nursery.

3.2.3 The locations of the noise-sensitive receptors used in this assessment are highlighted on the satellite image in Figure 3.1.

Figure 3.1 Satellite image (courtesy of Google) with assessed noise-sensitive receptors highlighted



3.3 Assessment methodology

3.3.1 BS 4142:2014 *Method for rating and assessing industrial and commercial sound* provides guidance on the assessment of the impact of a noise source. The standard presents a methodology for comparing the noise level of the new source (the *specific sound level*) with that of the existing *background noise level* in the area in the absence of the new source (*the background sound level*).

3.4 Plant proposals

3.4.1 The plant proposals involve the replacement of the existing rooftop plant with new air handling units, extract fans, and DX & VRV heat pump units. Final equipment selections have been made, and the following are the manufacturer's noise level data for these selections:

Table 3.1 Rooftop plant proposals

Equipment	Noise level
14 No. VRV units	1 No. Daikin REYQ8T: 58 dB L_{pA} at 1 metre, per unit 3 No. Daikin REYQ12T: 61 dB L_{pA} at 1 metre, per unit 4 No. Daikin REYQ14T: 61 dB L_{pA} at 1 metre, per unit 4 No. Daikin REYQ16T: 64 dB L_{pA} at 1 metre, per unit 2 No. Daikin REYQ18T: 65 dB L_{pA} at 1 metre, per unit
5 No. Air Handling Units (AHUs)	All are airHANDLERS units In-duct supply range of 57 - 71 dB L_{wA} In-duct exhaust range of 63 - 74 dB L_{wA} Attenuator / silencers to be fitted to atmosphere side ducts Casing breakout range of 40 - 50 dB L_{pA} at 1 metre
1 No. DX unit	Daikin RZAG100MV1: 51 dB L_{pA} at 1 metre
3 No. Toilet extract fans	All are Nuaire AVT-X Twinfan units In-duct exhaust range of 73 - 75 dB L_{wA} Attenuator / silencers to be fitted to atmosphere side ducts Casing breakout range of 53 - 54 dB L_{wA}
5 No. Laboratory extract fans	All are Central Fans CMVeco units In-duct exhaust range of 79 - 89 dB L_{wA} Attenuator / silencers to be fitted to atmosphere side ducts Casing breakout range of 50 - 65 dB L_{pA} at 1 metre

3.4.2 The specification of the attenuator / silencers to be fitted onto the atmosphere side ducts are as follows:

Table 3.2 Attenuator / silencer specification (sound insertion loss in decibels)

Frequency (Hz)	63	125	250	500	1000	2000	4000
AHUs	11	14	23	31	42	33	29
Toilet Extract Fans	3	7	12	18	26	21	18
Small Laboratory Extract Fan	3	5	10	15	20	15	13
Larger Laboratory Extract Fan	4	6	9	11	14	10	7

3.4.3 The plant will have the potential to operate in some capacity for 24-hours a day, but will be limited in duty in the evenings and overnight to reduce the risk of disturbance to neighbouring properties. As the building will have reduced occupancy during these times this is not expected to affect the proposed usage of the space.

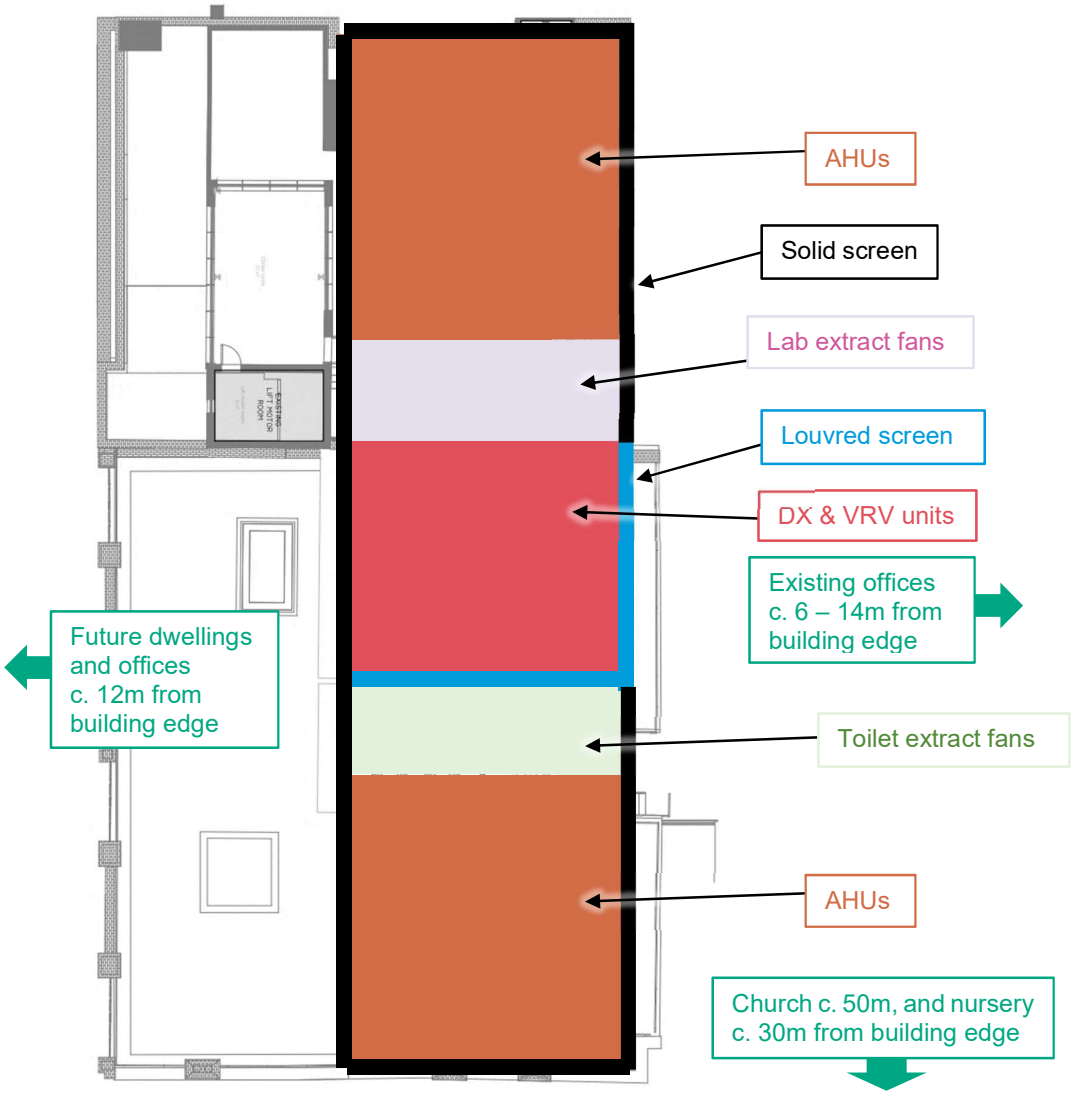
3.4.4 An acoustically rated louvred screen will surround the rooftop plant area where the VRV units are installed, with a height that meets or exceeds the contained plant. A solid screen will be provided to surround the other areas of rooftop plant. This will further mitigate noise emission from new plant items. The following specification and product is proposed for the acoustic louvred screen:

Table 3.3 Louvre specification (sound transmission loss in decibels)

Frequency (Hz)	63	125	250	500	1000	2000	4000
300mm deep acoustic louvred screen provided by Levolux	4	8	11	13	17	18	14

3.4.5 Figure 3.2 shows the locations of the proposed new plant items:

Figure 3.2 Proposed rooftop plant locations



3.5 Background sound levels

3.5.1 As the proposed equipment will be limited to operate over a different duty at night, separate day and night *background sound levels* have been established.

Table 3.4 Established lowest background sound levels at noise-sensitive receivers

		Lowest *background sound level*	
Noise-sensitive receivers	**Survey data used**	08:00 – 18:00	18:00 – 08:00
Existing church and nursery. Future offices and dwellings	Facing Whitfield Street	60 dB $L_{A90,15min}$	55 dB $L_{A90,15min}$
Existing offices	Facing Howland Mews	56 dB $L_{A90,15min}$	52 dB $L_{A90,15min}$

3.6 Predicted *specific sound levels*

3.6.1 The *specific sound level* at each noise sensitive receiver using the following procedure:

- The noise levels of each plant item are considered using Table 3.1.
- The sound insertion loss of the louvred screen presented in Table 3.3 is subtracted from each VRV unit.
- Attenuation due to screening has been calculated for those items of plant obscured from neighbouring properties by the solid screen. This typically provides a worst-case of c. 5 dB screening across the frequency range, although some receivers (e.g. nursery, church and lower level offices / residential) will benefit from higher levels of screening attenuation.
- The attenuation due to *geometrical divergence* is calculated for each plant item to each receiver using the well-established formula, in-line with ISO 9613-2.
- Attenuation due to *atmospheric absorption* and *ground effect* have not been considered as it is not believed that these mechanisms would provide meaningful attenuation over such short distances.
- A + 3 dB correction has been applied to noise via all paths to account for the influence of sound that is reflected from the solid screen.
- The noise contribution from each plant item is then summed for each receiver to give the *specific sound level*.

3.6.2 It would be unlikely for all building services plant associated with this development to operate at full duty simultaneously, however as this is a possibility this has been considered. The results are presented in Table 3.5.

Table 3.5 Predicted specific sound levels

Receiver	*Specific sound level* All plant at full duty
Existing offices	50 dB L_{Aeq}
Existing church	39 dB L_{Aeq}
Exisitng nursery	39 dB L_{Aeq}
Future offices	47 dB L_{Aeq}
Futures dwellings	47 dB L_{Aeq}

3.7 Assessment against background sound levels

3.7.1 Table 3.6 shows the assessed *specific sound levels* for each receiver, and a comparison of these values to the established *background sound levels* for each receiver relevant to the requirements of Condition 5.

Table 3.6 Comparison of the BS 4142 specific sound level to lowest background noise levels

Receiver	Relationship to *background sound level*	
	08:00 – 18:00	18:00 – 08:00
Existing offices	6 dB below	-
Existing church	21 dB below	-
Exisitng nursery	21 dB below	-
Future offices	13 dB below	-
Futures dwellings	13 dB below	8 dB below

3.7.2 Table 3.6 shows that even with all plant operating at full duty simultaneously, the specific sound level is between 6 dB and 21 dB below neighbouring properties during the time periods stipulated within Condition 5.

3.8 Conclusions

3.8.1 Final plant selections have been made and manufacturers' noise level data is known for the equipment proposed to be installed on the rooftop of 60 Whitfield Street.

3.8.2 Noise emission calculations demonstrate that the requirements to control plant noise to neighbouring properties, as stipulated within Condition 5 of the planning permission, are expected to be met. This is as a result of careful plant selections, and provision of suitable attenuation measures within the proposals.

ScotchPartners

Scotch Partners LLP
Building Services Engineering | Sustainability | Acoustics

Scriptor Court
157 Farringdon Road
London, EC1R 3AD

+44 (0) 203 544 5400
www.scotchpartners.com