ACAACOUSTICS

Acoustic assessment of proposed mechanical equipment at Industry House, 23-25 Hampshire Street, London

Report Reference: 180202-R001

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Client:	C4 Consulting Limited
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0. SUMMARY

- ACA Acoustics Limited have been commissioned to assess the acoustic impact of proposed new mechanical equipment to be installed at Industry House, 23-25 Hampshire Street, London, NW5 2TE.

- The assessment is required to provide evidence that noise emissions from the equipment will not be detrimental to the amenity of nearby noise sensitive properties and complies with the requirements of London Borough of Camden Council. London Borough of Camden Council's requirement, applicable at this site, is that the rating level of sound from the equipment shall ideally not exceed 10dB below the existing background LA90 outside nearby noise-sensitive properties.

- Noise-sensitive receivers have been identified as rear windows to houses on Brecon Mews and Brecknock Road, and to apartment blocks on Hampshire Street to the south of Industry House. A survey was carried out at two positions to the north and south of Industry House to establish existing background sound levels in the vicinity of both properties, and to determine sound levels of the existing mechanical equipment to be replaced.

- Representative background sound levels were measured at LAF90 51dB and LAF90 49dB during the proposed operating times of the new equipment. Based on results of the sound level survey and London Borough of Camden Council's requirement, the overall rating sound level limit for the equipment to outside the nearest noise-sensitive windows is set at ≤ 41dBA to windows on Brecon Mews, and ≤ 39dBA to windows of apartment blocks on Hampshire Street, and Brecknock Road.

- Calculations using manufacturer's sound level data for the new mechanical equipment, allowing for the benefit of noise mitigation treatments as set out in this report, confirm that the cumulative sound level for all the new plant operating will be not exceed the above criteria and should not be detrimental to the amenity of nearby residents.

1. INTRODUCTION

New mechanical equipment is to be installed at Industry House, 23-25 Hampshire Street, London.

The Planning Department of London Borough of Camden Council requires information in the form of an acoustic report regarding noise from the equipment. The report is required to demonstrate that noise emissions from the plant complies with London Borough of Camden Council's acoustic requirements applicable for mechanical services equipment affecting nearby noise-sensitive properties.

ACA Acoustics Limited has been commissioned by the client to carry out an assessment of noise from the new equipment and, where necessary, make recommendation to reduce sound levels from the equipment.

This report presents results of the sound level survey and assessment.

2. LONDON BOROUGH OF CAMDEN COUNCIL'S ACOUSTIC REQUIREMENTS

London Borough of Camden Council's policies relating to noise are set out in Appendix 2 of the Local Plan, which provides detailed noise thresholds to determine the potential acoustic impact of new developments.

In summary, London Borough of Camden requires an assessment to be carried out in accordance with British Standard 4142:2014 and the results compared against noise-related conditions set out in Table C of the Appendix, as shown in Table 1 below:

Existing Noise Sensitive Receptor	Assessment Location	Design Period	LOAEL (Green)	LOAEL to SOAEL (Amber)	SOAL (Red)
Dwellings	Garden used for main amenity (free field) and outside living or dining or bedroom window (façade)	Day	Rating level 10dB below background	Rating level between 9dB below and 5dB above background	Rating level greater than 5dB above background
Dwellings	Outside bedroom window (façade)	Night	Rating level 10dB below background and no events exceeding 57dB LAFmax	Rating level between 9dB below and 5dB above background or noise events between 57dB and 88dB LAFmax	Rating level greater than 5dB above background and/or events exceeding 88dB LAFmax

Table 1: London Borough of Camden Noise Limits

The scope of BS 4142:2014 advises that "*this British Standard describes methods for rating and assessing sound of an industrial and/or commercial nature … to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident*". BS 4142:2014 is commonly used to assess the potential for loss of amenity due to noise from mechanical services equipment and is considered appropriate for this application.

The assessment method of BS 4142:2014 corrects the specific sound level from the source under investigation to account for characteristics that could make the sound more intrusive to obtain a rating level. This rating level is compared against the prevailing background sound level outside the noise-sensitive property. Section 11 of BS 4142:2014 provides a commentary of the assessment result and advises that:

a) The greater the difference between the rating level and the background sound level, the greater the magnitude of the impact;
b) A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context;
c) A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context;
d) The lower the rating level is to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

Assessment result criteria shown within Appendix A of Camden's Local Plan are significantly more stringent than those set out in the British Standard and can therefore be taken to ensure a robust assessment. Compliance with the "Green" criteria or lower half of the "Amber" range will generally ensure no loss of amenity to nearby residents, albeit, the context of the development must also be considered on a project-by-project basis which can alter the initial assessment result. This is discussed in more detail in Section 4.

3. REVIEW OF SITE LOCATION & DEVELOPMENT PROPOSALS

The development site is at Industry House, 23-25 Hampshire Street, London.

A planning application is being prepared, to include the installation of 3no. air conditioning condensing units and 5no. heat recovery units, details of which can be found in section 5 of this report. A layout drawing (Ref. 4039-M-202) showing the proposed location of the units is provided below in Figure 1. The units are to be installed in 3 different locations, as highlighted in red.

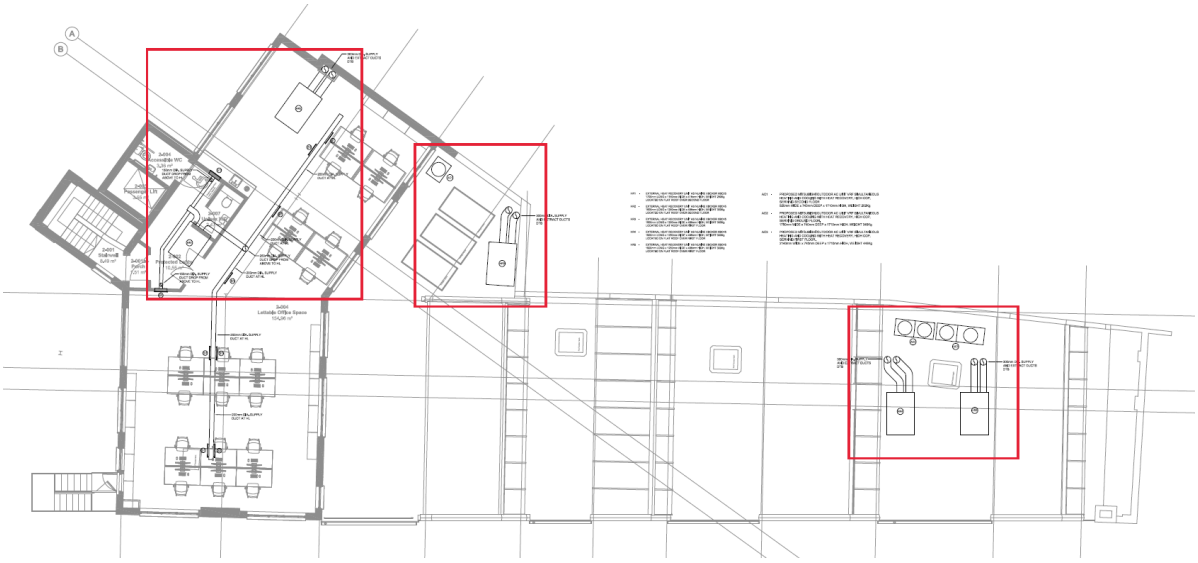

Figure 1: Equipment locations

A map of the local area showing potential closest noise-sensitive properties is provided below in Figure 2. Red crosses mark the survey positions, as discussed further in section 4.

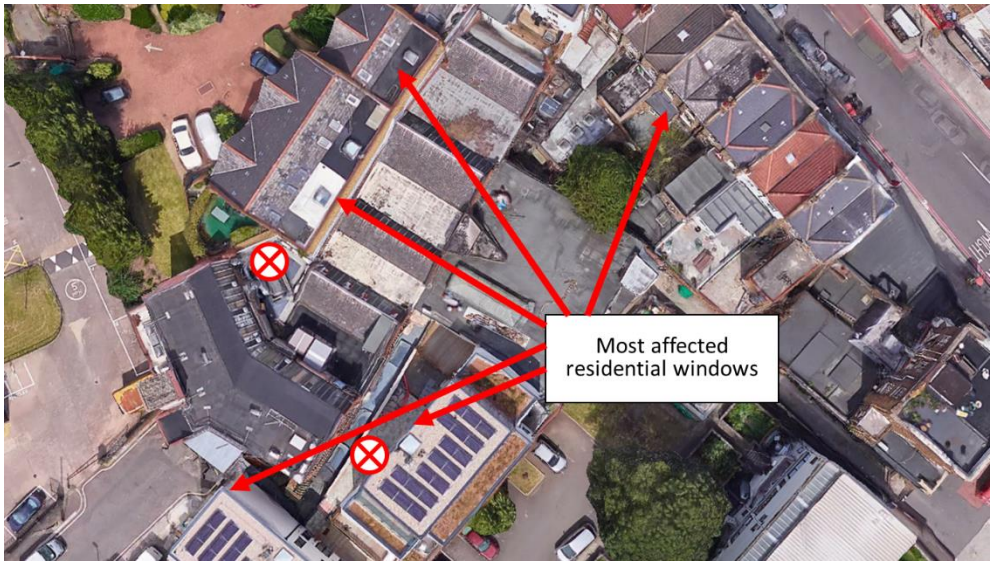

Figure 2: Aerial Photo showing residential windows and measurement positions

4. SOUND LEVEL SURVEY

To assess sound levels from the new mechanical equipment it is necessary to establish background sound levels in the vicinity. Details of the sound level survey carried out by ACA Acoustics Limited are provided below.

Two sound level survey measurement positions were selected, as marked in Figure 2 of section 3. One position was considered representative of sound levels to the rear of properties on Brecon Mews to the north of the site, and the other position representative of sound levels outside flat windows of the apartment block on Hampshire Street to the south of the site. A background sound level survey to the rear windows of properties on Brecknock Road was not possible, and so background sound levels measured on Hampshire Street have been used for this position for this assessment. Whilst on site, these measured levels were subjectively considered to be lower than those to the rear of Brecknock Road, and so are likely to result in a more robust assessment. The unattended survey was carried out over a nominally 24-hour period between 8th – 9th February 2018. During the survey the weather contained periods that were dry and calm.

The following equipment was used during the survey; the sound level meter was calibrated before and checked after the survey measurements with no change noted:

Equipment	Serial Number	Calibration Certificate
NTi Audio sound level meter type XL2 Class 1 complete with weatherproof and lockable outdoor environmental kit	A2A-06294-E0	160915
Rion sound level meter type NL-31 Class 1 complete with weatherproof and lockable outdoor environmental kit	00431030	1512668
Castle calibrator type 4226. Compliant to IEC 60942-1:2003 (Calibrated to a reference traceable to NIST)	1551589	044039/68679

Table 2: Equipment used

Results of the surveys are provided in graphical form in Figures 3 and 4 below.

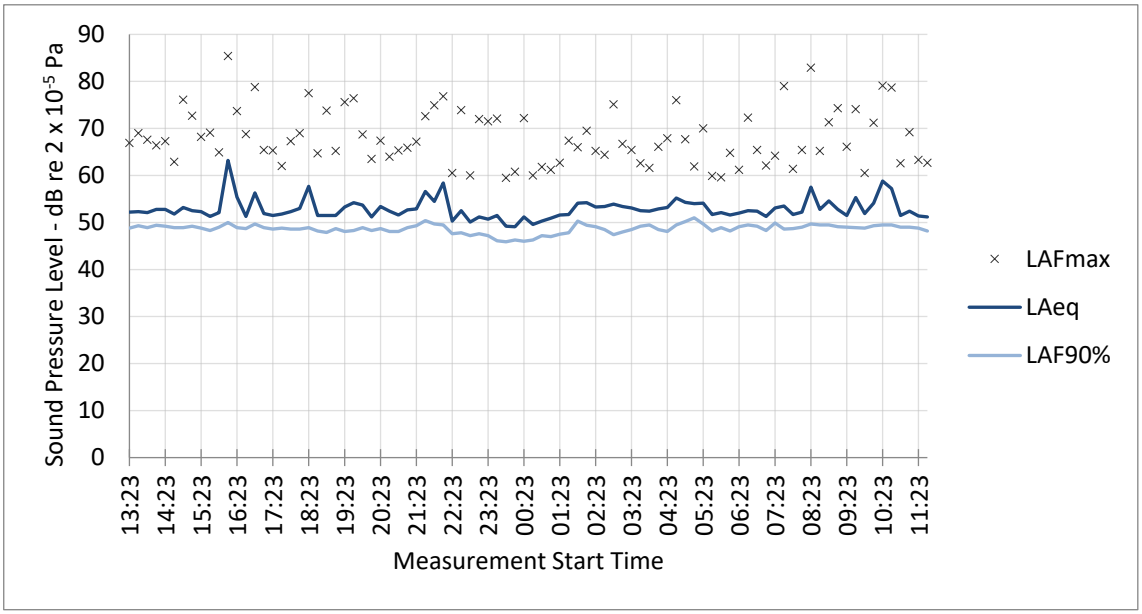

Figure 3: 24-hour sound level survey results at Hampshire Street

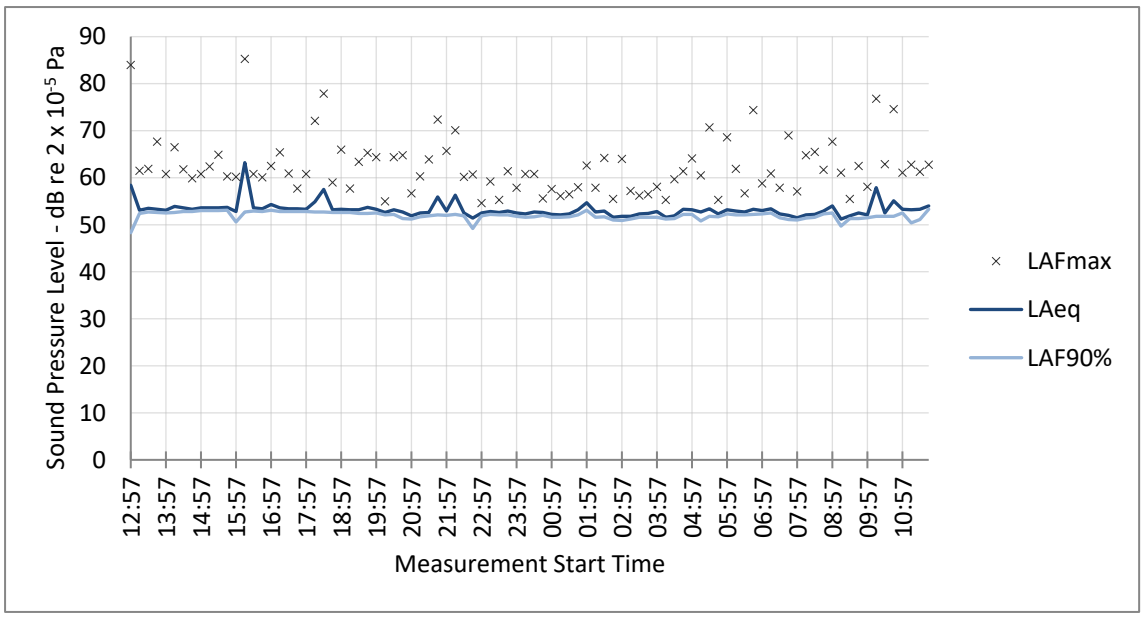

Figure 4: 24-hour sound level survey results at Brecknock Road

In accordance with BS 4142:214, the prevailing background sound level is not necessarily taken to be the lowest recorded values, but rather the level that best represents the typical background sound level during a defined period. The author has been advised that the units are likely to be operating during office hours, between 07:00 and 19:00 on weekdays.

A statistical analysis of the measured sound levels has been carried out, generally following suggested guidance contained in Section 8 of the Standard. Distribution of the measured LA90

sound levels over the proposed operating times of the equipment are shown in Figures 4 and 5 below.

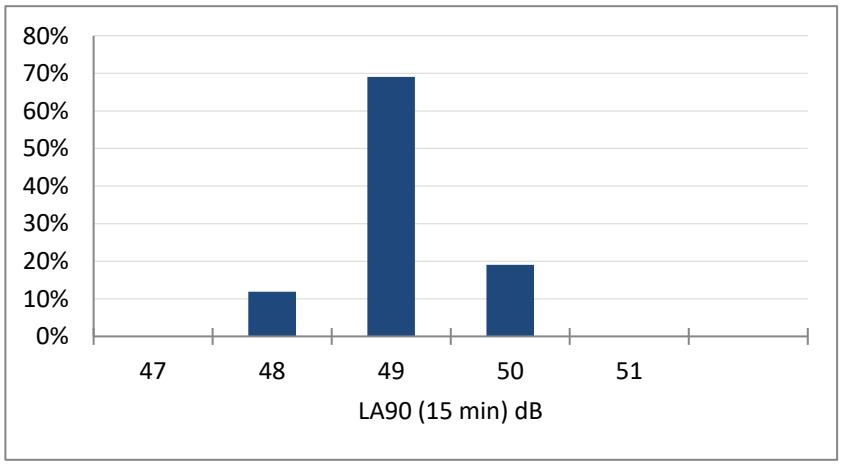

Figure 4: Statistical analysis of measured LA90 levels on Hampshire Street between 07:00 – 19:00

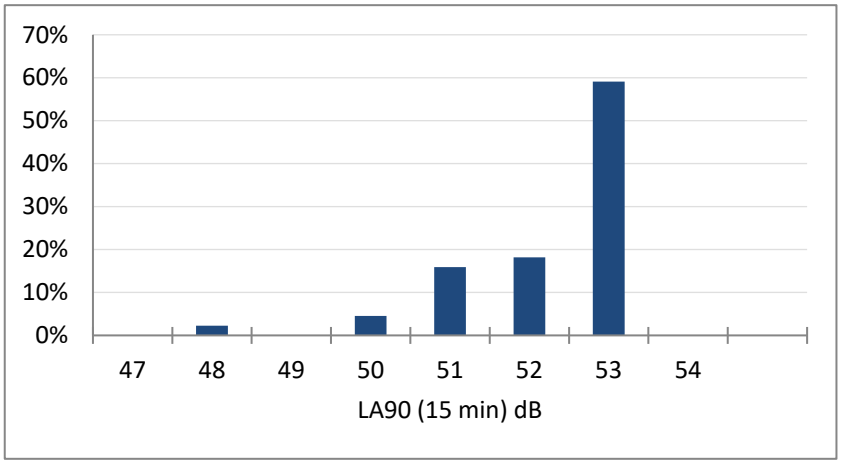

Figure 5: Statistical analysis of measured LA90 levels on Brecknock Road between 07:00 – 19:00

The values recorded by ACA Acoustics Limited are used as basis for acoustic design such that rating levels from the proposed new equipment are ≤30dBA outside the closest noise sensitive windows during the proposed operating times of the equipment; this is at least 10dBA below the representative night time background sound level. Confirmation of the background sound level used in the assessment is shown in Table 3 below.

Survey Date	Location	Existing Measured Background LA90, 15 min
8th – 9th February 2018	Hampshire Street	49dBA
8th – 9th February 2018	Brecknock Road	51dBA

Table 3: Summary background sound level survey results

5. ACOUSTIC ASSESSMENT

The development includes the installation of 3no. air conditioning condensing units and 5no. heat recovery units. Confirmation of the equipment model used in the assessment is provided in Table 4 below.

Description	Equipment Model
AC1	Mitsubishi PURY-EP200YLM-A1
AC2	Mitsubishi PURY-EP500YLM-A1
AC3	Mitsubishi PURY-EP550YSLM-A1
HR1	Nuaire XBC25
HR2	Nuaire XBC45
HR3	Nuaire XBC45
HR4	Nuaire XBC45
HR5	Nuaire XBC45

Table 4: Proposed new mechanical equipment

Sound emissions from the mechanical equipment can be determined from manufacturer's published data. Note that alterations in equipment selections may be possible, so long as sound power levels for the new item does not exceed levels used in the calculation model as shown in Appendix A.

A computer model has been used to calculate the noise contribution from the proposed plant to outside nearest noise-sensitive windows. The model incorporates losses within the ductwork system based on the calculation method of CIBSE Guide B5 Noise and vibration control for HVAC along with environmental corrections set out in ISO 9613-2:1996.

The calculated specific sound level from the equipment to outside the closest noise sensitive windows is shown in Table 5. Summary print-outs from the calculation models are included in Appendix A.

Receptor Location	Calculated Equipment Sound Levels
Windows to properties on Brecon Mews	38dBA
Hampshire Street (Northern block)	37dBA
Hampshire Street (Southern block)	37dBA
Rear windows of properties on Brecknock Road	32dBA

Table 5: Calculated cumulative equipment sound levels at 1m outside noise-sensitive windows

Assessment of the calculated specific sound levels in accordance with BS 4142:2014 is provided in Table 6 below.

Description	Assessment location:				Relevant Clause	Commentary
	Brecon Mews	Hampshire Street (Northern block)	Hampshire Street (Southern block)	Brecknock Road		
Calculated specific sound level to closest noise-sensitive windows	LAeq 38dB	Laeq 37dB	Laeq 37dB	LAeq 32dB	7.1 7.3.6	Refer calculation sheets in Appendix A.
Background sound level	LA90 49dB	LA90 49dB	LA90 49dB	LA90 51dB	8.1.3 8.3	Representative night time background sound level.
Acoustic feature correction	0dB	0dB	0dB	0dB	9.2	The calculated specific sound level is at least 10dBA below the representative measured background sound level during operating hours. Sound emissions from the equipment are likely to be inaudible to outside nearby noise-sensitive properties and therefore, as discussed in Example 6 of BS 4142:2014 Appendix A, where it is not possible to clearly define the specific sound source above the prevailing background sound level then no penalty for acoustic features is required.
Rating level	LAr 38dB	LAr 37dB	LAr 37dB	LAr 32dB		
Excess of rating level over background sound level	**-11dBA**	**-12dBA**	**-12dBA**	**-13dBA**	**11**	**Assessment indicates negligible likelihood of adverse impact**

Table 6: BS 4142:2014 Assessment for all plant operating simultaneously

Table 6 shows that the overall rating level of the proposed new equipment will be at least 11dBA below the background LA90 sound level to outside the closest noise-sensitive properties.

BS 4142:2014 requires an assessment to consider the context of the development, rather than simply adhering to numerical figures. The specific sound level of the new plant has been calculated

to be at least 11dBA below the representative background sound level outside these closest noise-sensitive properties. At these levels noise from the new equipment should be inaudible to nearby occupants.

Prior to installation of the new equipment, existing kitchen extraction equipment was operating, causing an increase to the prevailing background sound level. With the installation of this new equipment, the kitchen extract equipment is being removed, and the sound level surveys were undertaken with the kitchen extract equipment powered off. As a result, the ambient sound level with the new equipment running will be lower than the previous ambient sound level prior to the installation of new equipment.

Considering the specific numerical value, allowing for a reduction of 15dBA through partially open windows, as described in BS 8233:2014, this equates to a maximum level inside closest residential properties from the new equipment of 13dBA; significantly below the guideline sound level to bedrooms of LAeq 30dB set out in BS 8233:2014 and at a level that would be significantly below internal ambient sound levels from sources within the property itself.

The author considers that the context of the assessment does not alter the initial estimate of the impact, and, following installation of mitigation treatments as detailed in section 6 below, that sound levels from the new mechanical equipment should not be detrimental to the amenity of any residential occupiers in the vicinity and no further noise mitigation measures will be required.

6. RECOMMENDATIONS FOR NOISE AND VIBRATION CONTROL TREATMENTS

Note that consideration of non-acoustic aspects including, but not limited to structural calculations, airflow and pressure drop and construction material are outside the scope of ACA Acoustics Limited and should be considered by others accordingly. Alternative methods of attenuation to those detailed below may be acceptable, for example relocation of noisy equipment to other, less sensitive, areas of the development. Full details of any alternative scheme, including working drawings and expected attenuation should be submitted and approved prior to manufacture.

6.1 High Performance Acoustic Enclosure

It is recommended that the VRF units be installed in a high-performance acoustic enclosure such as those supplied by Environ Technologies Limited, or equal and approved. Acoustic performance of a suitable enclosure is shown in Appendix B

6.2 Duct Mounted Attenuators

It is recommended that a duct-mounted attenuator is installed to the discharge of HRU1. Schedule of minimum dynamic insertion loss performance for the attenuator along with description of typical silencer to comply with the specified performance is provided in Appendix B. Note that the dimensions and free-area shown are nominal and the successful supplier should confirm their own selections to meet the minimum specified insertion loss performance.

The duct-mounted attenuator proposed will be readily available from most acoustic hardware suppliers, including Allaway Acoustics Limited (Contact Chris Williams – Tel: 01992 550825).

7. CONCLUSION

New mechanical equipment associated with offices at 25 Hampshire Street, London are to be installed.

ACA Acoustics have undertaken a background sound level survey in the vicinity and calculated maximum permissible source sound emissions from the new equipment.

Once the equipment schedule and layout drawings are finalised, the calculated cumulative rating levels with new equipment operating will be designed to be at least 10dBA below the prevailing background sound level to outside the closest noise-sensitive properties. At this level, the new equipment will fully comply with London Borough of Camden's requirements and will not be detrimental to the amenity of nearby residents.

APPENDIX A

Acoustic Calculations

Calculation Sheet

AC2 to Brecon Mews

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - AC2									
Sound Power Levels		**95.0**	**92.0**	**89.0**	**85.0**	**79.0**	**74.0**	**69.0**	**62.0**
Noise Control Treatments									
Treatment - Enclosure									
		-14.0	*-16.0*	*-23.0*	*-30.0*	*-37.0*	*-39.0*	*-38.0*	*-39.0*
ISO 9613 Calculation									
Horiz. Distance (m)	5.5								
Source Height (m)	1.5								
Receiver Height (m)	5.0								
Q Factor - Junction									
Direct Lp		**62.7**	**54.3**	**43.9**	**33.2**	**20.6**	**13.7**	**9.5**	**1.0**
ISO 9613 Barrier Attenuation									
		-12.5	*-11.3*	*-13.5*	*-16.5*	*-19.8*	*-20.0*	*-20.0*	*-20.0*
External Receiver									
External Receiver - Brecon Mews									
Sound Pressure, Lp:		**50.2**	**43.0**	**30.4**	**16.7**	**0.8**	**-6.3**	**-10.5**	**-19.0**

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Calculation Sheet

AC3 to Brecon Mews

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - AC3									
Sound Power Levels		**102.0**	**95.0**	**91.0**	**87.0**	**81.0**	**74.0**	**68.0**	**63.0**
Noise Control Treatments									
Treatment - Enclosure									
		-14.0	*-16.0*	*-23.0*	*-30.0*	*-37.0*	*-39.0*	*-38.0*	*-39.0*
ISO 9613 Calculation									
Horiz. Distance (m)	5.0								
Source Height (m)	1.5								
Receiver Height (m)	5.0								
Q Factor - Junction									
Direct Lp		**70.3**	**57.9**	**46.5**	**35.8**	**23.2**	**14.2**	**9.1**	**2.6**
ISO 9613 Barrier Attenuation									
		-12.4	*-11.2*	*-13.3*	*-16.3*	*-19.6*	*-20.0*	*-20.0*	*-20.0*
External Receiver									
External Receiver - Brecon Mews									
Sound Pressure, Lp:		**57.9**	**46.7**	**33.2**	**19.5**	**3.6**	**-5.8**	**-10.9**	**-17.4**

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Calculation Sheet

HR4 Casing to Brecon Mews

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR4 Casing									
Noise Levels		**68.0**	**59.0**	**56.0**	**41.0**	**39.0**	**38.0**	**34.0**	**23.0**
Noise Control Treatments									
Treatment - none									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
ISO 9613 Calculation									
Horiz. Distance (m)	9.0								
Source Height (m)	1.0								
Receiver Height (m)	5.0								
Q Factor - Junction									
Direct Lp		**46.1**	**33.6**	**29.7**	**14.7**	**13.8**	**13.0**	**8.8**	**-3.0**
ISO 9613 Barrier Attenuation									
		-8.3	*-5.2*	*-5.1*	*-6.4*	*-9.2*	*-11.8*	*-14.4*	*-17.1*
External Receiver									
External Receiver - Brecon Mews									
Sound Pressure, Lp:		**37.8**	**28.4**	**24.6**	**8.3**	**4.5**	**1.2**	**-5.6**	**-20.2**

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Calculation Sheet

HR5 Casing to Brecon Mews

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR5 Casing									
Noise Levels		**68.0**	**59.0**	**56.0**	**41.0**	**39.0**	**38.0**	**34.0**	**23.0**
Noise Control Treatments									
Treatment - none									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
ISO 9613 Calculation									
Horiz. Distance (m)	8.5								
Source Height (m)	1.0								
Receiver Height (m)	5.0								
Q Factor - Junction									
Direct Lp		**46.5**	**34.0**	**30.2**	**15.1**	**14.2**	**13.5**	**9.2**	**-2.6**
ISO 9613 Barrier Attenuation									
		-8.4	*-5.5*	*-5.6*	*-7.1*	*-10.1*	*-12.8*	*-15.4*	*-18.2*
External Receiver									
External Receiver - Brecon Mews									
Sound Pressure, Lp:		**38.1**	**28.5**	**24.6**	**8.1**	**4.1**	**0.7**	**-6.2**	**-20.8**

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Calculation Sheet

AC1 to Hampshire Street 1

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - AC1									
Sound Power Levels		**99.0**	**89.0**	**85.0**	**81.0**	**75.0**	**69.0**	**62.0**	**56.0**
Noise Control Treatments									
Treatment - Enclosure									
		-14.0	*-16.0*	*-23.0*	*-30.0*	*-37.0*	*-39.0*	*-38.0*	*-39.0*
ISO 9613 Calculation									
Horiz. Distance (m)	23.0								
Source Height (m)	1.5								
Receiver Height (m)	2.0								
Q Factor - Corner									
Direct Lp		**58.8**	**43.1**	**27.9**	**19.1**	**8.4**	**0.5**	**-6.0**	**-14.9**
ISO 9613 Barrier Attenuation									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
External Receiver									
External Receiver - Hampshire Street 1									
Sound Pressure, Lp:		**58.8**	**43.1**	**27.9**	**19.1**	**8.4**	**0.5**	**-6.0**	**-14.9**

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Calculation Sheet

HR3 Casing to Hampshire Street 1

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR3 Casing									
Noise Levels		**68.0**	**59.0**	**56.0**	**41.0**	**39.0**	**38.0**	**34.0**	**23.0**
Noise Control Treatments									
Treatment - none									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
ISO 9613 Calculation									
Horiz. Distance (m)	21.0								
Source Height (m)	1.0								
Receiver Height (m)	2.0								
Q Factor - Corner									
Direct Lp		**42.5**	**30.0**	**22.8**	**8.7**	**9.7**	**9.3**	**4.9**	**-7.9**
ISO 9613 Barrier Attenuation									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
External Receiver									
External Receiver - Hampshire Street 1									
Sound Pressure, Lp:		**42.5**	**30.0**	**22.8**	**8.7**	**9.7**	**9.3**	**4.9**	**-7.9**

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Calculation Sheet

HR1 Casing to Hampshire Street 2

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR1 Casing									
Noise Levels		**63.0**	**62.0**	**49.0**	**52.0**	**39.0**	**38.0**	**38.0**	**30.0**
Noise Control Treatments									
Treatment - none									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
ISO 9613 Calculation									
Horiz. Distance (m)	10.5								
Source Height (m)	11.0								
Receiver Height (m)	7.5								
Q Factor - Plane									
Direct Lp		**37.1**	**32.8**	**20.1**	**23.1**	**10.1**	**9.0**	**8.8**	**-0.2**
ISO 9613 Barrier Attenuation									
		-8.0	*-4.9*	*-5.5*	*-6.2*	*-7.3*	*-8.9*	*-11.0*	*-13.4*
External Receiver									
External Receiver - Hampshire Street 2									
Sound Pressure, Lp:		**29.1**	**27.9**	**14.5**	**16.9**	**2.8**	**0.1**	**-2.2**	**-13.6**

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Calculation Sheet

HR2 Casing to Hampshire Street 2

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR2 Casing									
Noise Levels		**68.0**	**59.0**	**56.0**	**41.0**	**39.0**	**38.0**	**34.0**	**23.0**
Noise Control Treatments									
Treatment - none									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
ISO 9613 Calculation									
Horiz. Distance (m)	19.0								
Source Height (m)	11.0								
Receiver Height (m)	7.5								
Q Factor - Plane									
Direct Lp		**37.3**	**24.8**	**22.2**	**7.2**	**5.2**	**4.1**	**-0.4**	**-13.0**
ISO 9613 Barrier Attenuation									
		-8.5	*-5.7*	*-7.1*	*-8.7*	*-10.7*	*-13.1*	*-15.8*	*-18.6*
External Receiver									
External Receiver - Hampshire Street 2									
Sound Pressure, Lp:		**28.8**	**19.1**	**15.1**	**-1.4**	**-5.5**	**-9.0**	**-16.2**	**-31.6**

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Calculation Sheet

AC2 to Brecknock Road

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - AC2									
Sound Power Levels		**95.0**	**92.0**	**89.0**	**85.0**	**79.0**	**74.0**	**69.0**	**62.0**
Directivity									
Width (m)	0.6								
Height (m)	0.6								
Angle (°)	90.0								
		-1.2	*-2.8*	*-5.5*	*-8.6*	*-12.0*	*-15.0*	*-15.0*	*-15.0*
Noise Control Treatments									
Treatment - Enclosure									
		-14.0	*-16.0*	*-23.0*	*-30.0*	*-37.0*	*-39.0*	*-38.0*	*-39.0*
ISO 9613 Calculation									
Horiz. Distance (m)	20.0								
Source Height (m)	1.5								
Receiver Height (m)	2.0								
Q Factor - Junction									
Direct Lp		**51.8**	**41.6**	**25.2**	**12.9**	**-1.3**	**-11.2**	**-15.7**	**-25.4**
ISO 9613 Barrier Attenuation									
		-12.8	*-11.5*	*-10.3*	*-15.1*	*-19.7*	*-20.0*	*-20.0*	*-20.0*
External Receiver									
External Receiver - Brecknock Road									
Sound Pressure, Lp:		**39.0**	**30.1**	**14.8**	**-2.1**	**-21.1**	**-31.2**	**-35.7**	**-45.4**

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Calculation Sheet

AC3 to Brecknock Road

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - AC3									
Sound Power Levels		**102.0**	**95.0**	**91.0**	**87.0**	**81.0**	**74.0**	**68.0**	**63.0**
Directivity									
Width (m)	0.6								
Height (m)	0.6								
Angle (°)	90.0								
		-1.2	*-2.8*	*-5.5*	*-8.6*	*-12.0*	*-15.0*	*-15.0*	*-15.0*
Noise Control Treatments									
Treatment - Enclosure									
		-14.0	*-16.0*	*-23.0*	*-30.0*	*-37.0*	*-39.0*	*-38.0*	*-39.0*
ISO 9613 Calculation									
Horiz. Distance (m)	20.0								
Source Height (m)	1.5								
Receiver Height (m)	2.0								
Q Factor - Junction									
Direct Lp		**58.8**	**44.6**	**27.2**	**14.9**	**0.7**	**-11.2**	**-16.7**	**-24.4**
ISO 9613 Barrier Attenuation									
		-12.8	*-11.5*	*-10.3*	*-15.1*	*-19.7*	*-20.0*	*-20.0*	*-20.0*
External Receiver									
External Receiver - Brecknock Road									
Sound Pressure, Lp:		**46.0**	**33.1**	**16.8**	**-0.1**	**-19.1**	**-31.2**	**-36.7**	**-44.4**

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Calculation Sheet

HR4 Casing to Brecknock Road

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR4 Casing									
Noise Levels		**68.0**	**59.0**	**56.0**	**41.0**	**39.0**	**38.0**	**34.0**	**23.0**
Noise Control Treatments									
Treatment - none									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
ISO 9613 Calculation									
Horiz. Distance (m)	9.0								
Source Height (m)	1.0								
Receiver Height (m)	5.0								
Q Factor - Junction									
Direct Lp		**46.1**	**33.6**	**29.7**	**14.7**	**13.8**	**13.0**	**8.8**	**-3.0**
ISO 9613 Barrier Attenuation									
		-8.3	*-5.2*	*-5.1*	*-6.4*	*-9.2*	*-11.8*	*-14.4*	*-17.1*
External Receiver									
External Receiver - Brecknock Road									
Sound Pressure, Lp:		**37.8**	**28.4**	**24.6**	**8.3**	**4.5**	**1.2**	**-5.6**	**-20.2**

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Calculation Sheet

HR5 Casing to Brecknock Road

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR5 Casing									
Noise Levels		**68.0**	**59.0**	**56.0**	**41.0**	**39.0**	**38.0**	**34.0**	**23.0**
Noise Control Treatments									
Treatment - none									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
ISO 9613 Calculation									
Horiz. Distance (m)	8.5								
Source Height (m)	1.0								
Receiver Height (m)	5.0								
Q Factor - Junction									
Direct Lp		**46.5**	**34.0**	**30.2**	**15.1**	**14.2**	**13.5**	**9.2**	**-2.6**
ISO 9613 Barrier Attenuation									
		-8.4	*-5.5*	*-5.6*	*-7.1*	*-10.1*	*-12.8*	*-15.4*	*-18.2*
External Receiver									
External Receiver - Brecknock Road									
Sound Pressure, Lp:		**38.1**	**28.5**	**24.6**	**8.1**	**4.1**	**0.7**	**-6.2**	**-20.8**

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Calculation Sheet

HR4 Intake to Brecon Mews

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR4 Intake									
Noise Levels		**77.0**	**69.0**	**69.0**	**58.0**	**58.0**	**56.0**	**48.0**	**39.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
End Reflection - Rect Flush									
		-11.3	*-6.5*	*-2.9*	*-0.9*	*-0.2*	*-0.1*	*0.0*	*0.0*
External Grille Directivity									
		-0.6	*-2.5*	*-5.4*	*-9.9*	*-15.0*	*-15.0*	*-15.0*	*-15.0*
ISO 9613 Calculation									
Horiz. Distance (m)	11.0								
Source Height (m)	1.0								
Receiver Height (m)	5.0								
Q Factor - Junction									
		-23.4	*-23.4*	*-23.4*	*-23.4*	*-23.4*	*-23.5*	*-23.8*	*-24.7*
ISO 9613 Barrier Attenuation									
		-8.3	*-8.7*	*-9.5*	*-10.7*	*-12.5*	*-14.7*	*-17.2*	*-20.0*
External Receiver									
External Receiver - Brecon Mews									
Sound Pressure, Lp:		**33.4**	**28.0**	**27.9**	**13.1**	**6.9**	**2.8**	**-8.0**	**-20.7**

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Calculation Sheet

HR4 Discharge to Brecon Mews

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR4 Discharge									
Noise Levels		**82.0**	**75.0**	**79.0**	**65.0**	**66.0**	**66.0**	**60.0**	**58.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
End Reflection - Rect Flush									
		-10.0	*-5.4*	*-2.2*	*-0.7*	*-0.2*	*-0.1*	*0.0*	*0.0*
External Grille Directivity									
		-1.2	*-3.1*	*-6.4*	*-11.3*	*-15.0*	*-15.0*	*-15.0*	*-15.0*
ISO 9613 Calculation									
Horiz. Distance (m)	11.0								
Source Height (m)	1.0								
Receiver Height (m)	5.0								
Q Factor - Junction									
		-23.4	*-23.4*	*-23.4*	*-23.4*	*-23.4*	*-23.5*	*-23.8*	*-24.7*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	6.0								
Barrier Height (m)	4.0								
Screening at (m)	3.2								
		-8.3	*-8.7*	*-9.5*	*-10.7*	*-12.5*	*-14.7*	*-17.2*	*-20.0*
External Receiver									
External Receiver - Brecon Mews									
Sound Pressure, Lp:		**39.2**	**34.5**	**37.5**	**18.8**	**14.9**	**12.8**	**4.0**	**-1.7**

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Calculation Sheet

HR4 Supply to Brecon Mews

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR4 Supply									
Noise Levels		**81.0**	**74.0**	**79.0**	**65.0**	**66.0**	**65.0**	**60.0**	**56.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Breakout Lw Rev B									
		-8.2	*-13.2*	*-16.2*	*-21.2*	*-24.2*	*-27.2*	*-32.2*	*-34.2*
ISO 9613 Calculation									
Horiz. Distance (m)	8.0								
Source Height (m)	1.0								
Receiver Height (m)	5.0								
Q Factor - Junction									
		-21.0	*-21.0*	*-21.0*	*-21.0*	*-21.1*	*-21.1*	*-21.3*	*-22.1*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	4.0								
Barrier Height (m)	4.0								
Screening at (m)	3.0								
		-8.6	*-9.3*	*-10.5*	*-12.1*	*-14.3*	*-16.8*	*-19.5*	*-22.4*
External Receiver									
External Receiver - Brecon Mews									
Sound Pressure, Lp:		**43.1**	**30.4**	**31.2**	**10.6**	**6.4**	**-0.1**	**-13.1**	**-22.7**

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Calculation Sheet

HR4 Extract to Brecon Mews

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR4 Extract									
Noise Levels		**78.0**	**69.0**	**70.0**	**57.0**	**58.0**	**57.0**	**47.0**	**38.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Breakout Lw Rev B									
		-8.2	*-13.2*	*-16.2*	*-21.2*	*-24.2*	*-27.2*	*-32.2*	*-34.2*
ISO 9613 Calculation									
Horiz. Distance (m)	8.0								
Source Height (m)	1.0								
Receiver Height (m)	5.0								
Q Factor - Junction									
		-21.0	*-21.0*	*-21.0*	*-21.0*	*-21.1*	*-21.1*	*-21.3*	*-22.1*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	3.5								
Barrier Height (m)	4.0								
Screening at (m)	2.8								
		-9.0	*-10.0*	*-11.5*	*-13.4*	*-15.8*	*-18.5*	*-21.3*	*-23.0*
External Receiver									
External Receiver - Brecon Mews									
Sound Pressure, Lp:		**39.7**	**24.7**	**21.3**	**1.3**	**-3.1**	**-9.8**	**-27.8**	**-41.3**

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Calculation Sheet

HR5 Intake to Brecon Mews

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR5 Intake									
Noise Levels		**77.0**	**69.0**	**69.0**	**58.0**	**58.0**	**56.0**	**48.0**	**39.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
End Reflection - Rect Flush									
		-11.3	*-6.5*	*-2.9*	*-0.9*	*-0.2*	*-0.1*	*0.0*	*0.0*
External Grille Directivity									
		-0.6	*-2.5*	*-5.4*	*-9.9*	*-15.0*	*-15.0*	*-15.0*	*-15.0*
ISO 9613 Calculation									
Horiz. Distance (m)	10.5								
Source Height (m)	1.0								
Receiver Height (m)	5.0								
Q Factor - Junction									
		-23.0	*-23.0*	*-23.0*	*-23.0*	*-23.1*	*-23.1*	*-23.4*	*-24.3*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	5.5								
Barrier Height (m)	4.0								
Screening at (m)	3.1								
		-8.4	*-8.9*	*-9.9*	*-11.3*	*-13.2*	*-15.5*	*-18.1*	*-20.9*
External Receiver									
External Receiver - Brecon Mews									
Sound Pressure, Lp:		**33.7**	**28.1**	**27.9**	**12.9**	**6.5**	**2.3**	**-8.5**	**-21.2**

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Calculation Sheet

HR5 Discharge to Brecon Mews

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR5 Discharge									
Noise Levels		**82.0**	**75.0**	**79.0**	**65.0**	**66.0**	**66.0**	**60.0**	**58.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
End Reflection - Rect Flush									
		-10.0	*-5.4*	*-2.2*	*-0.7*	*-0.2*	*-0.1*	*0.0*	*0.0*
External Grille Directivity									
		-1.2	*-3.1*	*-6.4*	*-11.3*	*-15.0*	*-15.0*	*-15.0*	*-15.0*
ISO 9613 Calculation									
Horiz. Distance (m)	10.5								
Source Height (m)	1.0								
Receiver Height (m)	5.0								
Q Factor - Junction									
		-23.0	*-23.0*	*-23.0*	*-23.0*	*-23.1*	*-23.1*	*-23.4*	*-24.3*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	5.5								
Barrier Height (m)	4.0								
Screening at (m)	3.1								
		-8.4	*-8.9*	*-9.9*	*-11.3*	*-13.2*	*-15.5*	*-18.1*	*-20.9*
External Receiver									
External Receiver - Brecon Mews									
Sound Pressure, Lp:		**39.4**	**34.6**	**37.5**	**18.7**	**14.6**	**12.3**	**3.5**	**-2.3**

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Calculation Sheet

HR5 Supply to Brecon Mews

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR5 Supply									
Noise Levels		**81.0**	**74.0**	**79.0**	**65.0**	**66.0**	**65.0**	**60.0**	**56.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Breakout Lw Rev B									
		-8.2	*-13.2*	*-16.2*	*-21.2*	*-24.2*	*-27.2*	*-32.2*	*-34.2*
ISO 9613 Calculation									
Horiz. Distance (m)	7.0								
Source Height (m)	1.0								
Receiver Height (m)	5.0								
Q Factor - Junction									
		-20.1	*-20.1*	*-20.1*	*-20.1*	*-20.2*	*-20.2*	*-20.4*	*-21.1*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	3.0								
Barrier Height (m)	4.0								
Screening at (m)	2.7								
		-9.1	*-10.2*	*-11.7*	*-13.7*	*-16.2*	*-18.8*	*-21.7*	*-23.0*
External Receiver									
External Receiver - Brecon Mews									
Sound Pressure, Lp:		**43.5**	**30.5**	**30.9**	**9.9**	**5.4**	**-1.3**	**-14.3**	**-22.3**

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Calculation Sheet

HR5 Extract to Brecon Mews

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR5 Extract									
Noise Levels		**78.0**	**69.0**	**70.0**	**57.0**	**58.0**	**57.0**	**47.0**	**38.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Breakout Lw Rev B									
		-8.2	*-13.2*	*-16.2*	*-21.2*	*-24.2*	*-27.2*	*-32.2*	*-34.2*
ISO 9613 Calculation									
Horiz. Distance (m)	7.0								
Source Height (m)	1.0								
Receiver Height (m)	5.0								
Q Factor - Junction									
		-20.1	*-20.1*	*-20.1*	*-20.1*	*-20.2*	*-20.2*	*-20.4*	*-21.1*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	3.0								
Barrier Height (m)	4.0								
Screening at (m)	2.7								
		-9.1	*-10.2*	*-11.7*	*-13.7*	*-16.2*	*-18.8*	*-21.7*	*-23.0*
External Receiver									
External Receiver - Brecon Mews									
Sound Pressure, Lp:		**40.5**	**25.5**	**21.9**	**1.9**	**-2.6**	**-9.3**	**-27.3**	**-40.3**

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Calculation Sheet

HR3 Intake to Hampshire Street 1

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR3 Intake									
Noise Levels		**77.0**	**69.0**	**69.0**	**58.0**	**58.0**	**56.0**	**48.0**	**39.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
End Reflection - Rect Flush									
		-11.3	*-6.5*	*-2.9*	*-0.9*	*-0.2*	*-0.1*	*0.0*	*0.0*
External Grille Directivity									
		0.2	*1.4*	*2.1*	*2.8*	*3.5*	*4.3*	*5.1*	*5.1*
ISO 9613 Calculation									
Horiz. Distance (m)	20.0								
Source Height (m)	1.0								
Receiver Height (m)	2.0								
Q Factor - Corner									
		-25.0	*-25.0*	*-25.1*	*-25.1*	*-25.1*	*-25.2*	*-25.7*	*-27.4*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	0.5								
Barrier Height (m)	2.0								
Screening at (m)	1.0								
		-10.1	*-11.6*	*-13.7*	*-16.1*	*-18.7*	*-21.6*	*-23.0*	*-23.0*
External Receiver									
External Receiver - Hampshire Street 1									
Sound Pressure, Lp:		**30.7**	**27.3**	**29.6**	**18.8**	**17.4**	**13.5**	**4.4**	**-6.2**

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Calculation Sheet

HR3 Discharge to Hampshire Street 1

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR3 Discharge									
Noise Levels		**82.0**	**75.0**	**79.0**	**65.0**	**66.0**	**66.0**	**60.0**	**58.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
End Reflection - Rect Flush									
		-11.3	*-6.5*	*-2.9*	*-1.0*	*-0.3*	*-0.1*	*0.0*	*0.0*
External Grille Directivity									
		0.2	*1.4*	*2.1*	*2.8*	*3.5*	*4.3*	*5.1*	*5.1*
ISO 9613 Calculation									
Horiz. Distance (m)	20.0								
Source Height (m)	1.0								
Receiver Height (m)	2.0								
Q Factor - Corner									
		-25.0	*-25.0*	*-25.1*	*-25.1*	*-25.1*	*-25.2*	*-25.7*	*-27.4*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	0.5								
Barrier Height (m)	2.0								
Screening at (m)	1.0								
		-10.1	*-11.6*	*-13.7*	*-16.1*	*-18.7*	*-21.6*	*-23.0*	*-23.0*
External Receiver									
External Receiver - Hampshire Street 1									
Sound Pressure, Lp:		**35.7**	**33.2**	**39.5**	**25.7**	**25.4**	**23.5**	**16.3**	**12.7**

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Calculation Sheet

HR3 Supply to Hampshire Street 1

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR3 Supply									
Noise Levels		**81.0**	**74.0**	**79.0**	**65.0**	**66.0**	**65.0**	**60.0**	**56.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Breakout Lw Rev B									
		-8.2	*-13.2*	*-16.2*	*-21.2*	*-24.2*	*-27.2*	*-32.2*	*-34.2*
ISO 9613 Calculation									
		-26.1	*-26.1*	*-26.1*	*-26.1*	*-26.1*	*-26.3*	*-26.8*	*-28.7*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	3.5								
Barrier Height (m)	1.0								
Screening at (m)	1.2								
		-7.7	*-7.7*	*-7.7*	*-7.6*	*-7.4*	*-7.0*	*-6.1*	*-3.3*
External Receiver									
External Receiver - Hampshire Street 1									
Sound Pressure, Lp:		**39.0**	**27.0**	**29.0**	**10.1**	**8.2**	**4.5**	**-5.1**	**-10.2**

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Calculation Sheet

HR3 Extract to Hampshire Street 1

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR3 Extract									
Noise Levels		**78.0**	**69.0**	**70.0**	**57.0**	**58.0**	**57.0**	**47.0**	**38.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Breakout Lw Rev B									
		-8.2	*-13.2*	*-16.2*	*-21.2*	*-24.2*	*-27.2*	*-32.2*	*-34.2*
ISO 9613 Calculation									
		-26.1	*-26.1*	*-26.1*	*-26.1*	*-26.1*	*-26.3*	*-26.8*	*-28.7*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	3.5								
Barrier Height (m)	1.0								
Screening at (m)	1.2								
		-7.7	*-7.7*	*-7.7*	*-7.6*	*-7.4*	*-7.0*	*-6.1*	*-3.3*
External Receiver									
External Receiver - Hampshire Street 1									
Sound Pressure, Lp:		**36.0**	**22.0**	**20.0**	**2.1**	**0.2**	**-3.5**	**-18.1**	**-28.2**

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Calculation Sheet

HR1 Intake to Hampshire Street 2

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR1 Intake									
Noise Levels		**71.0**	**65.0**	**63.0**	**65.0**	**60.0**	**56.0**	**48.0**	**47.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
End Reflection - Rect Flush									
		-11.3	*-6.4*	*-2.8*	*-1.0*	*-0.3*	*-0.1*	*0.0*	*0.0*
External Grille Directivity									
		0.2	*1.6*	*2.4*	*3.1*	*3.9*	*4.8*	*5.5*	*5.6*
ISO 9613 Calculation									
Horiz. Distance (m)	10.0								
Source Height (m)	11.0								
Receiver Height (m)	7.5								
Q Factor - Plane									
		-25.5	*-25.5*	*-25.5*	*-25.5*	*-25.5*	*-25.6*	*-25.8*	*-26.7*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	3.5								
Barrier Height (m)	10.0								
Screening at (m)	9.8								
		-7.8	*-7.9*	*-8.0*	*-8.1*	*-8.5*	*-9.1*	*-10.1*	*-11.6*
External Receiver									
External Receiver - Hampshire Street 2									
Sound Pressure, Lp:		**26.6**	**26.8**	**29.1**	**33.5**	**29.7**	**26.0**	**17.6**	**14.3**

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Calculation Sheet

HR1 Discharge to Hampshire Street 2

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR1 Discharge									
Noise Levels		**77.0**	**78.0**	**72.0**	**75.0**	**66.0**	**66.0**	**64.0**	**65.0**
Silencer									
		-9.0	*-13.0*	*-24.0*	*-27.0*	*-25.0*	*-20.0*	*-13.0*	*-10.0*
End Reflection - Rect Flush									
		-11.3	*-6.4*	*-1.0*	*0.1*	*1.6*	*0.1*	*0.0*	*0.0*
External Grille Directivity									
		0.2	*1.6*	*2.4*	*3.1*	*3.9*	*4.8*	*5.5*	*5.6*
ISO 9613 Calculation									
Horiz. Distance (m)	10.0								
Source Height (m)	11.0								
Receiver Height (m)	7.5								
Q Factor - Plane									
		-25.5	*-25.5*	*-25.5*	*-25.5*	*-25.5*	*-25.6*	*-25.8*	*-26.7*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	3.5								
Barrier Height (m)	10.0								
Screening at (m)	9.8								
		-7.8	*-7.9*	*-8.0*	*-8.1*	*-8.5*	*-9.1*	*-10.1*	*-11.6*
External Receiver									
External Receiver - Hampshire Street 2									
Sound Pressure, Lp:		**23.6**	**26.8**	**15.9**	**17.5**	**12.6**	**16.2**	**20.6**	**22.3**

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Calculation Sheet

HR1 Supply to Hampshire Street 2

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR1 Supply									
Noise Levels		**76.0**	**77.0**	**72.0**	**76.0**	**66.0**	**66.0**	**62.0**	**64.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Breakout Lw Rev B									
		-6.0	*-11.0*	*-14.0*	*-19.0*	*-22.0*	*-25.0*	*-30.0*	*-32.0*
ISO 9613 Calculation									
Horiz. Distance (m)	11.0								
Source Height (m)	11.0								
Receiver Height (m)	7.5								
Q Factor - Plane									
		-26.2	*-26.3*	*-26.3*	*-26.3*	*-26.3*	*-26.4*	*-26.6*	*-27.6*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	5.0								
Barrier Height (m)	10.0								
Screening at (m)	9.4								
		-8.1	*-8.3*	*-8.8*	*-9.6*	*-10.9*	*-12.7*	*-15.0*	*-17.5*
External Receiver									
External Receiver - Hampshire Street 2									
Sound Pressure, Lp:		**35.7**	**31.4**	**22.9**	**21.1**	**6.8**	**1.9**	**-9.6**	**-13.2**

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Calculation Sheet

HR1 Extract to Hampshire Street 2

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR1 Extract									
Noise Levels		**70.0**	**64.0**	**62.0**	**65.0**	**59.0**	**56.0**	**48.0**	**48.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Breakout Lw Rev B									
		-10.0	*-15.0*	*-18.0*	*-23.0*	*-26.0*	*-29.0*	*-34.0*	*-36.0*
ISO 9613 Calculation									
		-26.2	*-26.3*	*-26.3*	*-26.3*	*-26.3*	*-26.4*	*-26.6*	*-27.6*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	5.0								
Barrier Height (m)	10.0								
Screening at (m)	9.4								
		-8.1	*-8.3*	*-8.8*	*-9.6*	*-10.9*	*-12.7*	*-15.0*	*-17.5*
External Receiver									
External Receiver - Hampshire Street 2									
Sound Pressure, Lp:		**25.7**	**14.4**	**9.0**	**6.1**	**-4.2**	**-12.1**	**-27.6**	**-33.1**

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Calculation Sheet

HR2 Intake to Hampshire Street 2

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR2 Intake									
Noise Levels		**77.0**	**69.0**	**69.0**	**58.0**	**58.0**	**56.0**	**48.0**	**39.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
End Reflection - Rect Flush									
		-11.3	*-6.5*	*-2.9*	*-0.9*	*-0.2*	*-0.1*	*0.0*	*0.0*
External Grille Directivity									
		0.2	*1.6*	*2.4*	*3.1*	*3.9*	*4.8*	*5.5*	*5.6*
ISO 9613 Calculation									
Horiz. Distance (m)	18.0								
Source Height (m)	11.0								
Receiver Height (m)	7.5								
Q Factor - Plane									
		-30.3	*-30.3*	*-30.3*	*-30.3*	*-30.3*	*-30.4*	*-30.9*	*-32.4*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	11.0								
Barrier Height (m)	10.0								
Screening at (m)	8.9								
		-8.4	*-9.0*	*-10.0*	*-11.5*	*-13.4*	*-15.8*	*-18.4*	*-21.3*
External Receiver									
External Receiver - Hampshire Street 2									
Sound Pressure, Lp:		**27.2**	**24.8**	**28.2**	**18.5**	**17.9**	**14.5**	**4.2**	**-9.1**

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Calculation Sheet

HR2 Discharge to Hampshire Street 2

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR2 Discharge									
Noise Levels		**82.0**	**75.0**	**79.0**	**65.0**	**66.0**	**66.0**	**60.0**	**58.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
End Reflection - Rect Flush									
		-11.3	*-6.5*	*-2.9*	*-1.0*	*-0.3*	*-0.1*	*0.0*	*0.0*
External Grille Directivity									
		0.2	*1.6*	*2.4*	*3.1*	*3.9*	*4.8*	*5.5*	*5.6*
ISO 9613 Calculation									
Horiz. Distance (m)	18.0								
Source Height (m)	11.0								
Receiver Height (m)	7.5								
Q Factor - Plane									
		-30.3	*-30.3*	*-30.3*	*-30.3*	*-30.3*	*-30.4*	*-30.9*	*-32.4*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	11.0								
Barrier Height (m)	10.0								
Screening at (m)	8.9								
		-8.4	*-9.0*	*-10.0*	*-11.5*	*-13.4*	*-15.8*	*-18.4*	*-21.3*
External Receiver									
External Receiver - Hampshire Street 2									
Sound Pressure, Lp:		**32.2**	**30.8**	**38.2**	**25.4**	**25.9**	**24.5**	**16.2**	**9.9**

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Calculation Sheet

HR2 Supply to Hampshire Street 2

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR2 Supply									
Noise Levels		**81.0**	**74.0**	**79.0**	**65.0**	**66.0**	**65.0**	**60.0**	**56.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Breakout Lw Rev B									
		-10.0	*-15.0*	*-18.0*	*-23.0*	*-26.0*	*-29.0*	*-34.0*	*-36.0*
ISO 9613 Calculation									
		-31.2	*-31.2*	*-31.2*	*-31.2*	*-31.2*	*-31.3*	*-31.8*	*-33.5*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	13.0								
Barrier Height (m)	10.0								
Screening at (m)	8.7								
		-8.6	*-9.2*	*-10.3*	*-11.9*	*-14.0*	*-16.4*	*-19.1*	*-22.0*
External Receiver									
External Receiver - Hampshire Street 2									
Sound Pressure, Lp:		**31.3**	**18.6**	**19.5**	**-1.1**	**-5.2**	**-11.8**	**-24.9**	**-35.5**

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Calculation Sheet

HR2 Extract to Hampshire Street 2

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR2 Extract									
Noise Levels		**78.0**	**69.0**	**70.0**	**57.0**	**58.0**	**57.0**	**47.0**	**38.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Breakout Lw Rev B									
		-10.0	*-15.0*	*-18.0*	*-23.0*	*-26.0*	*-29.0*	*-34.0*	*-36.0*
ISO 9613 Calculation									
		-31.2	*-31.2*	*-31.2*	*-31.2*	*-31.2*	*-31.3*	*-31.8*	*-33.5*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	13.0								
Barrier Height (m)	10.0								
Screening at (m)	8.7								
		-8.6	*-9.2*	*-10.3*	*-11.9*	*-14.0*	*-16.4*	*-19.1*	*-22.0*
External Receiver									
External Receiver - Hampshire Street 2									
Sound Pressure, Lp:		**28.3**	**13.6**	**10.5**	**-9.1**	**-13.2**	**-19.8**	**-37.9**	**-53.5**

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Calculation Sheet

HR4 Intake to Brecknock Road

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR4 Intake									
Noise Levels		**77.0**	**69.0**	**69.0**	**58.0**	**58.0**	**56.0**	**48.0**	**39.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
End Reflection - Rect Flush									
		-11.3	*-6.5*	*-2.9*	*-0.9*	*-0.2*	*-0.1*	*0.0*	*0.0*
External Grille Directivity									
		0.0	*0.8*	*0.9*	*1.0*	*1.2*	*1.4*	*1.6*	*1.6*
ISO 9613 Calculation									
Horiz. Distance (m)	20.0								
Source Height (m)	1.0								
Receiver Height (m)	1.5								
Q Factor - Junction									
		-28.0	*-28.0*	*-28.0*	*-28.1*	*-28.1*	*-28.2*	*-28.7*	*-30.4*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	5.5								
Barrier Height (m)	4.0								
Screening at (m)	1.1								
		-11.2	*-13.0*	*-15.3*	*-17.9*	*-20.7*	*-23.0*	*-23.0*	*-23.0*
External Receiver									
External Receiver - Brecknock Road									
Sound Pressure, Lp:		**26.5**	**22.2**	**23.7**	**12.1**	**10.1**	**6.1**	**-2.1**	**-12.8**

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Calculation Sheet

HR4 Discharge to Brecknock Road

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR4 Discharge									
Noise Levels		**82.0**	**75.0**	**79.0**	**65.0**	**66.0**	**66.0**	**60.0**	**58.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
End Reflection - Rect Flush									
		-10.0	*-5.4*	*-2.2*	*-0.7*	*-0.2*	*-0.1*	*0.0*	*0.0*
External Grille Directivity									
		0.3	*0.8*	*0.9*	*1.0*	*1.2*	*1.5*	*1.6*	*1.6*
ISO 9613 Calculation									
Horiz. Distance (m)	20.0								
Source Height (m)	1.0								
Receiver Height (m)	1.5								
Q Factor - Junction									
		-28.0	*-28.0*	*-28.0*	*-28.1*	*-28.1*	*-28.2*	*-28.7*	*-30.4*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	5.5								
Barrier Height (m)	4.0								
Screening at (m)	1.1								
		-11.2	*-13.0*	*-15.3*	*-17.9*	*-20.7*	*-23.0*	*-23.0*	*-23.0*
External Receiver									
External Receiver - Brecknock Road									
Sound Pressure, Lp:		**33.1**	**29.4**	**34.3**	**19.3**	**18.2**	**16.2**	**9.9**	**6.2**

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Calculation Sheet

HR4 Supply to Brecknock Road

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR4 Supply									
Noise Levels		**81.0**	**74.0**	**79.0**	**65.0**	**66.0**	**65.0**	**60.0**	**56.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Breakout Lw Rev B									
		-8.2	*-13.2*	*-16.2*	*-21.2*	*-24.2*	*-27.2*	*-32.2*	*-34.2*
ISO 9613 Calculation									
		-27.1	*-27.1*	*-27.1*	*-27.1*	*-27.2*	*-27.3*	*-27.7*	*-29.2*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	3.0								
Barrier Height (m)	4.0								
Screening at (m)	1.1								
		-12.2	*-14.3*	*-16.8*	*-19.5*	*-22.4*	*-23.0*	*-23.0*	*-23.0*
External Receiver									
External Receiver - Brecknock Road									
Sound Pressure, Lp:		**33.5**	**19.3**	**18.8**	**-2.9**	**-7.8**	**-12.5**	**-22.9**	**-30.5**

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Calculation Sheet

HR4 Extract to Brecknock Road

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR4 Extract									
Noise Levels		**78.0**	**69.0**	**70.0**	**57.0**	**58.0**	**57.0**	**47.0**	**38.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Breakout Lw Rev B									
		-8.2	*-13.2*	*-16.2*	*-21.2*	*-24.2*	*-27.2*	*-32.2*	*-34.2*
ISO 9613 Calculation									
		-27.1	*-27.1*	*-27.1*	*-27.1*	*-27.2*	*-27.3*	*-27.7*	*-29.2*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	3.0								
Barrier Height (m)	4.0								
Screening at (m)	1.1								
		-12.2	*-14.3*	*-16.8*	*-19.5*	*-22.4*	*-23.0*	*-23.0*	*-23.0*
External Receiver									
External Receiver - Brecknock Road									
Sound Pressure, Lp:		**30.5**	**14.3**	**9.8**	**-10.9**	**-15.8**	**-20.5**	**-35.9**	**-48.4**

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Calculation Sheet

HR5 Intake to Brecknock Road

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR5 Intake									
Noise Levels		**77.0**	**69.0**	**69.0**	**58.0**	**58.0**	**56.0**	**48.0**	**39.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
End Reflection - Rect Flush									
		-11.3	*-6.5*	*-2.9*	*-0.9*	*-0.2*	*-0.1*	*0.0*	*0.0*
External Grille Directivity									
		0.0	*0.8*	*0.9*	*1.0*	*1.2*	*1.4*	*1.6*	*1.6*
ISO 9613 Calculation									
Horiz. Distance (m)	20.0								
Source Height (m)	1.0								
Receiver Height (m)	1.5								
Q Factor - Junction									
		-28.0	*-28.0*	*-28.0*	*-28.1*	*-28.1*	*-28.2*	*-28.7*	*-30.4*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	5.5								
Barrier Height (m)	4.0								
Screening at (m)	1.1								
		-11.2	*-13.0*	*-15.3*	*-17.9*	*-20.7*	*-23.0*	*-23.0*	*-23.0*
External Receiver									
External Receiver - Brecknock Road									
Sound Pressure, Lp:		**26.5**	**22.2**	**23.7**	**12.1**	**10.1**	**6.1**	**-2.1**	**-12.8**

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Calculation Sheet

HR5 Discharge to Brecknock Road

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR5 Discharge									
Noise Levels		**82.0**	**75.0**	**79.0**	**65.0**	**66.0**	**66.0**	**60.0**	**58.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
End Reflection - Rect Flush									
		-10.0	*-5.4*	*-2.2*	*-0.7*	*-0.2*	*-0.1*	*0.0*	*0.0*
External Grille Directivity									
		0.3	*0.8*	*0.9*	*1.0*	*1.2*	*1.5*	*1.6*	*1.6*
ISO 9613 Calculation									
Horiz. Distance (m)	20.0								
Source Height (m)	1.0								
Receiver Height (m)	1.5								
Q Factor - Junction									
		-28.0	*-28.0*	*-28.0*	*-28.1*	*-28.1*	*-28.2*	*-28.7*	*-30.4*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	5.5								
Barrier Height (m)	4.0								
Screening at (m)	1.1								
		-11.2	*-13.0*	*-15.3*	*-17.9*	*-20.7*	*-23.0*	*-23.0*	*-23.0*
External Receiver									
External Receiver - Brecknock Road									
Sound Pressure, Lp:		**33.1**	**29.4**	**34.3**	**19.3**	**18.2**	**16.2**	**9.9**	**6.2**

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Calculation Sheet

HR5 Supply to Brecknock Road

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR5 Supply									
Noise Levels		**81.0**	**74.0**	**79.0**	**65.0**	**66.0**	**65.0**	**60.0**	**56.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Breakout Lw Rev B									
		-8.2	*-13.2*	*-16.2*	*-21.2*	*-24.2*	*-27.2*	*-32.2*	*-34.2*
ISO 9613 Calculation									
Horiz. Distance (m)	18.0								
Source Height (m)	1.0								
Receiver Height (m)	1.5								
Q Factor - Junction									
		-27.1	*-27.1*	*-27.1*	*-27.1*	*-27.2*	*-27.3*	*-27.7*	*-29.2*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	3.0								
Barrier Height (m)	4.0								
Screening at (m)	1.1								
		-12.2	*-14.3*	*-16.8*	*-19.5*	*-22.4*	*-23.0*	*-23.0*	*-23.0*
External Receiver									
External Receiver - Brecknock Road									
Sound Pressure, Lp:		**33.5**	**19.3**	**18.8**	**-2.9**	**-7.8**	**-12.5**	**-22.9**	**-30.5**

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Calculation Sheet

HR5 Extract to Brecknock Road

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - HR5 Extract									
Noise Levels		**78.0**	**69.0**	**70.0**	**57.0**	**58.0**	**57.0**	**47.0**	**38.0**
Silencer									
		0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Breakout Lw Rev B									
		-8.2	*-13.2*	*-16.2*	*-21.2*	*-24.2*	*-27.2*	*-32.2*	*-34.2*
ISO 9613 Calculation									
Horiz. Distance (m)	18.0								
Source Height (m)	1.0								
Receiver Height (m)	1.5								
Q Factor - Junction									
		-27.1	*-27.1*	*-27.1*	*-27.1*	*-27.2*	*-27.3*	*-27.7*	*-29.2*
ISO 9613 Barrier Attenuation									
Barrier - Single Barrier									
Distance to Barrier (m)	3.0								
Barrier Height (m)	4.0								
Screening at (m)	1.1								
		-12.2	*-14.3*	*-16.8*	*-19.5*	*-22.4*	*-23.0*	*-23.0*	*-23.0*
External Receiver									
External Receiver - Brecknock Road									
Sound Pressure, Lp:		**30.5**	**14.3**	**9.8**	**-10.9**	**-15.8**	**-20.5**	**-35.9**	**-48.4**

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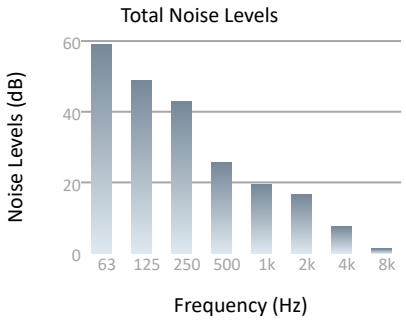
Project Name	23-25 Hampshire Street, London, NW5 2TE
Project Reference	180202
Reference	Brecon Mews
Description	Rear skylight near AC2/AC3
Noise Limit	41
dBA	38.35



Noise Sources

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
AC2	1	50.18	42.99	30.43	16.67	0.78	-6.35	-10.5	-19.05
AC3	1	57.9	46.74	33.21	19.46	3.57	-5.77	-10.91	-17.43
HR4 Intake	1	33.42	27.97	27.89	13.1	6.85	2.76	-7.99	-20.72
HR4 Discharge	1	39.18	34.46	37.47	18.85	14.89	12.76	3.99	-1.75
HR4 Supply	1	43.1	30.39	31.24	10.58	6.43	-0.12	-13.06	-22.67
HR4 Extract	1	39.7	24.73	21.26	1.3	-3.1	-9.8	-27.81	-41.28
HR4 Casing	1	37.84	28.38	24.57	8.3	4.51	1.23	-5.56	-20.15
HR5 Intake	1	33.65	28.11	27.9	12.94	6.54	2.32	-8.49	-21.23
HR5 Discharge	1	39.42	34.6	37.48	18.69	14.57	12.32	3.48	-2.26
HR5 Supply	1	43.49	30.46	30.91	9.88	5.44	-1.29	-14.32	-22.31
HR5 Extract	1	40.49	25.46	21.91	1.88	-2.56	-9.29	-27.29	-40.28
HR5 Casing	1	38.1	28.52	24.55	8.08	4.11	0.68	-6.19	-20.8

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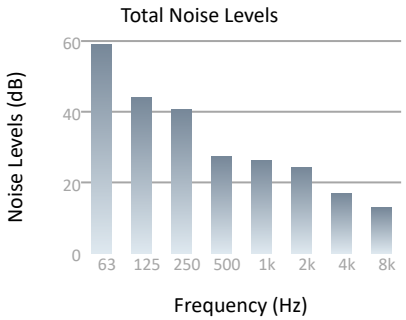
Project Name	23-25 Hampshire Street, London, NW5 2TE
Project Reference	180202
Reference	Hampshire Street 1
Description	Northern apartment block
Noise Limit	39
dBA	37.16



Noise Sources

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
AC1	1	58.76	43.11	27.94	19.07	8.38	0.54	-5.99	-14.93
HR3 Casing	1	42.54	30.03	22.77	8.71	9.72	9.34	4.86	-7.91
HR3 Intake	1	30.71	27.27	29.56	18.78	17.45	13.48	4.38	-6.24
HR3 Supply	1	38.96	26.97	29	10.07	8.22	4.48	-5.12	-10.25
HR3 Extract	1	35.96	21.97	20	2.08	0.22	-3.52	-18.1	-28.22
HR3 Discharge	1	35.71	33.24	39.55	25.69	25.41	23.45	16.35	12.73

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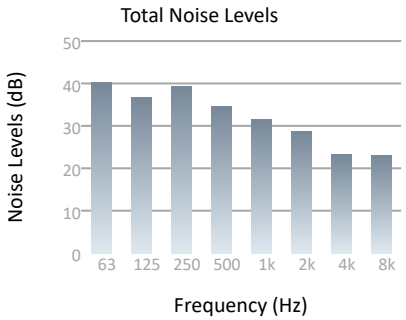
Project Name	23-25 Hampshire Street, London, NW5 2TE
Project Reference	180202
Reference	Hampshire Street 2
Description	Southern apartment block
Noise Limit	39
dBA	37.43



Noise Sources

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
HR1 Casing	1	29.13	27.93	14.55	16.87	2.77	0.11	-2.22	-13.61
HR1 Intake	1	26.62	26.77	29.11	33.51	29.67	26.04	17.6	14.27
HR1 Supply	1	35.68	31.42	22.93	21.09	6.78	1.91	-9.61	-13.15
HR1 Discharge	1	23.65	26.77	15.9	17.54	12.57	16.22	20.59	22.27
HR1 Extract	1	25.7	14.44	8.95	6.11	-4.2	-12.07	-27.58	-33.13
HR2 Casing	1	28.77	19.15	15.1	-1.44	-5.5	-9.04	-16.17	-31.63
HR2 Intake	1	27.21	24.8	28.25	18.51	17.95	14.48	4.22	-9.08
HR2 Supply	1	31.29	18.62	19.53	-1.08	-5.19	-11.77	-24.94	-35.5
HR2 Discharge	1	32.2	30.77	38.23	25.41	25.9	24.45	16.19	9.89
HR2 Extract	1	28.29	13.62	10.53	-9.07	-13.19	-19.76	-37.91	-53.46

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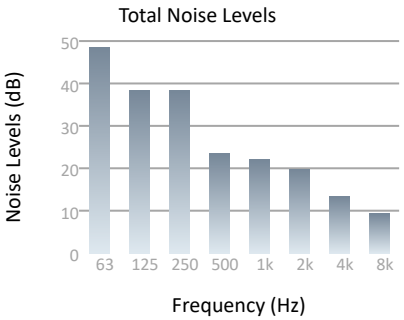
Project Name	23-25 Hampshire Street, London, NW5 2TE
Project Reference	180202
Reference	Brecknock Road
Description	Rear Windows of properties on Brecknock Road
Noise Limit	39
dBA	32.26



Noise Sources

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
AC2	1	38.95	30.07	14.84	-2.11	-21.08	-31.22	-35.68	-45.36
AC3	1	45.95	33.07	16.84	-0.11	-19.08	-31.22	-36.68	-44.36
HR5 Intake	1	26.54	22.24	23.69	12.11	10.08	6.12	-2.09	-12.75
HR5 Supply	1	33.46	19.34	18.83	-2.91	-7.81	-12.52	-22.94	-30.45
HR5 Extract	1	30.46	14.34	9.83	-10.91	-15.81	-20.52	-35.91	-48.42
HR5 Discharge	1	33.11	29.4	34.33	19.28	18.17	16.18	9.89	6.22
HR5 Casing	1	38.1	28.52	24.55	8.08	4.11	0.68	-6.19	-20.8
HR4 Casing	1	37.84	28.38	24.57	8.3	4.51	1.23	-5.56	-20.15
HR4 Intake	1	26.54	22.24	23.69	12.11	10.08	6.12	-2.09	-12.75
HR4 Discharge	1	33.11	29.4	34.33	19.28	18.17	16.18	9.89	6.22
HR4 Supply	1	33.46	19.34	18.83	-2.91	-7.81	-12.52	-22.94	-30.45
HR4 Extract	1	30.46	14.34	9.83	-10.91	-15.81	-20.52	-35.91	-48.42

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APPENDIX B

Noise Control Treatments

Schedule of Noise Control Treatments

Reference	Location	Description	Insertion Losses (dB)							
			63	125	250	500	1k	2k	4k	8k
Enclosure		Environlite Acoustic Enclosure	14	16	23	30	37	39	38	39
ATT1	HR1 Discharge	XBC45-HS-MS16 1600L x 525W x 365H	9	13	24	27	25	20	13	10

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