

Noise Impact Assessment Report to Support the Discharge of Condition 4 (b) of Application No.140139/FO/2024

Unit 3a, Albany Road Trading Estate, Albany Road, Chorlton-Cum-Hardy, Manchester, M21 0AZ

Report Reference 20864.PCD-RPT.02 Rev.A

Project Address	Unit 3a, Albany Road Trading Estate, Albany Road, Chorlton-Cum-Hardy, Manchester, M21 0AZ
Report Title	Noise Impact Assessment Report to Support the Discharge of Condition 4 (b) of Application No.140139/FO/2024
Prepared For	Screwfix Direct Limited
Report Reference Number	20864.PCD-RPT.02 Rev.A
Principal Author	Duncan Arkley MIOA, Principal Acoustic Consultant
Report Checked By	Daniel J. Green MIOA, Director & Principal Acoustic Consultant

Document Revision History		
Revision Reference	Issue Date	Purpose and/or Description of Revision
First Issue	20 th February 2026	Noise impact assessment report in support of the discharge of Condition 4(b) of Application No.140139/FO/2024
Rev.A	26 th February 2026	Noise impact assessment report in support of the discharge of Condition 4(b) of Application No.140139/FO/2024

Principal Author Contact Details	
Name	
Duncan Arkley MIOA	

CONTENTS

1	INTRODUCTION	1
2	SITE CONTEXT AND BACKGROUND INFORMATION.....	2
2.1	Site Description	2
2.2	Scenario	2
3	ENVIRONMENTAL NOISE SURVEY	3
3.1	Measurement Location and Procedure.....	3
3.2	Measurement Equipment.....	4
3.3	Weather Conditions	4
3.4	Survey Results	4
4	NOISE IMPACT ASSESSMENT	5
4.1	Noise Criterion.....	5
4.2	Post Installation Noise Measurements	5
4.3	Predicted Noise Levels at the Closest Noise Sensitive Receptor	6
5	CONCLUSION.....	7

LIST OF ATTACHMENTS

Appendix A	Acoustic Terminology
Appendix B	Environmental Noise Time History
Appendix C	Acoustic Calculations

1 INTRODUCTION

ES Acoustics Ltd have been commissioned by Screwfix Direct Limited to provide a commissioning noise impact assessment to support the discharge of Condition 4(b) of Application No. 140139/FO/2024, in relation to the installation of 3 no. external air source heat pump (ASHP) units at Unit 3a, Albany Road Trading Estate, Albany Road, Chorlton-Cum-Hardy, Manchester, M21 0AZ.

Planning Condition 4 states:

4) a) Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location. Prior to commencement of the use hereby approved the scheme shall be submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the site. The scheme shall be implemented in full before the use commences or as otherwise agreed in writing by the City Council as local planning authority.

b) Prior to the operation of the scheme a verification report shall be submitted to and approved in writing by the City Council as local planning authority to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic report. The report shall also undertake post completion testing to confirm that the noise criteria have been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria.

Reason - To safeguard the amenities of the occupiers of nearby residential accommodation, pursuant to policies SP1 and DM1 of the Core Strategy.

Part (a) of the above condition has previously been addressed through report 20864.PCD-RPT.01. This report addresses part (b) of the Condition.

The structure of this report is as follows:

- A review of site context and details of the installation, including the installation locations of the installed ASHPs, and the locations of the closest noise sensitive receptors relative to the ASHP installation locations;
- A summary of background sound levels representative of the closest noise sensitive receptor as determined in the report to address Condition 4(b);
- Details of the commissioning measurements taken on site to determine in-situ source noise levels from the plant installed;
- The noise impact assessment in accordance with BS 4142:2014+A1:2019 and the requirements of Condition 4(b) to establish compliance.

2 SITE CONTEXT AND BACKGROUND INFORMATION

2.1 Site Description

The site is located on the south side of an existing commercial estate in Greater Manchester, with the only nearby residential properties located to the west of the site. An indicative site plan is shown in Figure 1.

2.2 Scenario

3 no. ASHP units have been installed to the southwest corner of the building at ground level. Full details of the units are presented within the noise impact assessment within Section 4.

The closest noise sensitive receptor to the units is located on Albany Road to the west.

The application site boundary, ASHP installation location, and the closest noise sensitive receptor are shown in the figure below:



Figure 1 Indicative image showing plant installation location and noise sensitive receptor location (Ref: Google Earth)

A detailed noise impact assessment including noise propagation calculations to the closest noise sensitive receptors is presented in Section 4.

3 ENVIRONMENTAL NOISE SURVEY

3.1 Measurement Location and Procedure

A noise survey was undertaken on site as shown in Figure 2. The monitoring position was chosen in order to provide a secure location with background noise levels representative of those at the residential receiver.



Figure 2 Indicative image showing monitoring location (Ref: Google earth)

An initial appraisal of the site during the site visit determined that the noise profile of the area was dominated by road traffic on Albany Road, occasional tramline movements from the east, and existing plant noise serving neighbouring commercial units.

The measurement procedure complied with ISO 1996-2:2017 Acoustics '*Description, measurement and assessment of environmental noise - Part 2: Determination of environmental noise levels*', with automated monitoring undertaken between 12:45 on 14/08/2024 and 11:55 on 15/08/2024.

The key acoustic descriptors measured for this assessment are as follows:

- $L_{Aeq,T}$ (the continuous equivalent A-weighted noise level over a given time period, T);
- $L_{A90,T}$ (the noise level exceeded for 90% of the measurement period T , referred to as the 'background' noise level);

3.2 Measurement Equipment

The table below presents the equipment used for the baseline noise survey. The equipment calibration was verified before and after use and no abnormalities were observed.

Equipment	Make and Model	Serial Number
Type 1 Sound Level Meter with Integrated Microphone	Convergence Instruments NSRTW MK3	AtvcBf0S+f2fKjAb0BRtD
Calibrator	Svantek SV36 Class 1 Sound Calibrator	122255

Table 1 Noise survey equipment

Copies of calibration certificates are available upon request.

3.3 Weather Conditions

Measurements of temperature and wind speed were undertaken over a 15-minute period on both the installation and collection visits as reported in the table below. From a review of the noise data captured, any adverse weather conditions present during the survey had no significant effect on the survey results.

A summary of the weather data is reported in the table below:

Description	Installation Date 14/08/2024	Collection Date 15/08/2024
Temperature (° Celsius)	20*	19*
Wind speed (m/s)	2.7**	4.5**
Wind direction	West	South
Presence of damp roads/wet ground	None	Damp roads present

Table 2 Weather conditions

*measured during the site visit using a handheld anemometer

**maximum speed measured over 15-minute period during the site visit using a handheld anemometer

3.4 Survey Results

A time history of the environmental noise survey is shown in Appendix B.

A summary of the measurement results is presented in the table below for daytime and night-time. For reference, the representative background sound level is defined by the most frequently occurring $L_{A90:5min}$ throughout the survey. Due to the presence of additional reflections at the monitoring location, 3dB has been subtracted from the presented results in Table 6. The values plotted in Appendix B are the raw data as captured.

Period	Residual Sound Level $L_{Aeq, T}$ (dB)	Representative Background Sound Level L_{A90} (dB)
Daytime 07:00-23:00	57	48
Night-time 23:00-07:00	48	39
Opening Hours 07:00-20:00	57	48

Table 3 Measured noise levels

4 NOISE IMPACT ASSESSMENT

4.1 Noise Criterion

Condition 4(a) requires “a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location”. Based on the results of the environmental noise survey, this would result in a criterion as summarised in the table below:

Period	Representative Background Sound Level L_{A90} (dB)	Condition 4(a) Criterion $L_{Aeq, Tr}$ (dB)
Opening Hours 07:00-20:00	48	43

Table 4 Noise emissions criterion for Condition 4(a) compliance

It should be noted that as the background sound level is formed of the baseline noise level in the area, it is not physically possible to measure noise levels for direct comparison with the condition requirements, which are lower than the baseline in the area.

As the criterion level of 43dB(A), in addition to the baseline level of 48dB(A), would result in a level of 49dB(A), a measured level commensurate to this value when measured at the closest noise sensitive receiver would be indicative of full compliance with the noise emissions criterion.

4.2 Post Installation Noise Measurements

The external building services plant is comprised of the following units:

- 2 no. Daikin RZA200D
- 1 no. Daikin RZAG50A

Condition 4(b) requires that “The report shall also undertake post completion testing to confirm that the noise criteria have been met.”

To determine source noise levels for the plant units installed, measurements have been undertaken on site with the units operating at their full capacity in heating mode, at a distance of 1m from the front of the units as shown in Table 5.

Measurement Description	Sound pressure level dB at octave band centre frequency Hz								dB(A)
	63	125	250	500	1k	2k	4k	8k	
Measured SPL 1m in front of all units, $L_{eq;1min}$	73	73	75	69	65	60	55	50	71
Measured SPL 1m in front of all units, $L_{eq;1min}$	74	74	75	69	65	61	55	51	71
Measured SPL 1m in front of all units, $L_{eq;1min}$	72	74	75	69	65	60	55	50	71

Measured SPL 1m in front of right hand (smaller) unit, $L_{eq;1min}$	76	70	73	66	63	58	52	49	69
Measured SPL 1m in front of left hand unit, $L_{eq;1min}$	70	72	74	69	66	60	55	50	71
Measured SPL 1m in front of left hand unit, $L_{eq;1min}$	72	72	71	67	65	60	55	51	70
Average Level - All units operating simultaneously – average measured $L_{eq;1min}$	73	72	73	68	64	59	54	50	70

Table 5 Sound pressure level measured at 1m from installed plant (heating mode)

In addition to measurements taken in front of the units measurements have been taken as close to the residential receiver as practically possible whilst remaining on publicly accessible land. As this was immediately adjacent to a busy road, it was not possible to obtain a clean measurement without vehicular noise present. As a result, the L_{90} (value captured over 90% of the measurement) is referenced, to remove the influence of individual vehicle movements.

The average measured $L_{A90;1min}$ value as captured close to the receiver with the units operating in full capacity was **48dB(A)**, indicating no variation from the measured representative background sound level measured prior to the plant installation. As an initial indicator, this implies that the noise from the plant is sufficiently low as to achieve compliance with the LPA requirements, i.e. as the background noise level did not increase, the proposed units are not contributing to the level, or causing an increase in the prevailing background level, as discussed in Section 4.1.

From observations taken at the receiver, plant noise emissions were all but inaudible during the measurements, which further aligns with the confirmation of compliance with the requirements.

4.3 Predicted Noise Levels at the Closest Noise Sensitive Receptor

In addition to the measured noise levels at the closest receiver, the Specific Sound Level of the plant has been assessed to the noise sensitive receptor, considering various factors such as attenuation over distance, surface reflections, barrier/screening effects, and directivity, and considering the measured source noise levels captured at 1m from the units as installed.

To establish the Rating Level as required by BS 4142:2014+A1:2019 and Condition 4(b), appropriate acoustic feature corrections should be applied to the Specific Sound Level. It must be noted that the acoustic feature corrections are applied based on the level at receptor location, not at source, as they are reflective of the sound perceived by the receptor.

While the ASHPs would cycle on and off individually depending on the internal load within certain areas of the building, the sound perceived at the closest receptor would likely be continuous as at least one of the units would likely always be operating, or at least would operate over extended periods. This was confirmed through site observations, whereby the units operated continuously throughout the site visit, with no variation in operating speed or noise output. Therefore, no correction has been applied for intermittency.

With regards to tonality, no particular tonal characteristics were observed on site and there is no evidence of tonality in the measurements taken.

Operational noise emissions from ASHP units would not be considered impulsive and therefore no correction is applied. No impulsive characteristics were audible on site, indeed, noise levels from the units were continuous and consistent throughout the site visit.

Table 6 compares the Rating Sound Level calculated at the closest receptor. Full calculations are presented in Appendix C.

Period	Condition 4(b) Criterion dB L _{Ar, Tr}	Calculated Rating Level at Receptor dB L _{Ar, Tr}	+/- compared against criterion dB
Opening Hours 07:00- 20:00	43	43	0

Table 6 Summary of the Rating Level at receptor as proposed

As demonstrated by the calculations and summary above, the proposal would ensure full compliance with Condition 4(b).

No further mitigation measures would be required.

5 CONCLUSION

ES Acoustics Ltd have been commissioned by Screwfix Direct Limited to provide a commissioning noise impact assessment report to support the discharge of Condition 4(b) of Application No. 140139/FO/2024, in relation to the installation of 3 no. external air source heat pump (ASHP) units at Unit 3a, Albany Road Trading Estate, Albany Road, Chorlton-Cum-Hardy, Manchester, M21 0AZ.

Noise levels as measured in-situ for the units have been used to calculate expected noise levels at the closest noise sensitive receptor in accordance with BS 4142:2014+A1:2019 for comparison with background sound levels measured on site as previously measured.

The calculations demonstrate that the proposal would ensure full compliance with Condition 4(b).

Further measurements at the closest noise sensitive receiver confirm that the calculations are valid, and that received noise levels fall within the required values.

No further mitigation measures would be required.

GLOSSARY OF ACOUSTIC TERMINOLOGY

Decibel scale - dB

The decibel (dB) is a relative unit of measurement used in acoustics. The dB is a logarithmic ratio between a measured level and a reference level of 0 dB (i.e the threshold of human hearing). Simply put, the decibel compresses the wide range of sounds we hear into more manageable numbers.

Addition of noise from several sources

Sound produced by multiple sound sources are added logarithmically e.g. power ratio of 2 = 3dB, power ratio of 10 = 10dB. Therefore, two equally intense sound sources operating simultaneously produce a sound level which is 3dB higher than a single source e.g. 60dB + 60dB = 63dB.

Subjective impression of noise

Human response to sound is highly individualized and often based on psychological factors such as emotion and expectation. Sensitivity to sound typically depends on the loudness, pitch, duration of the occurrence, and time of occurrence (e.g. a sound source could cause annoyance during the night where it would not during the day). The following table is a guide to explain increases or decreases in sound levels for many scenarios.

Change in sound level	Change in perceived loudness
1 dB	Imperceptible
3 dB	Just barely perceptible
6 dB	Clearly noticeable
10 dB	About twice as loud

'A' Weighted Frequency Filter - dB(A)

The human ear is not equally sensitive in all frequencies. The A-weighting filter was devised to take this into account when undertaking noise measurements and allows a sound level meter to replicate the human ears response to sound.

$L_{Aeq, T}$

Sound can fluctuate widely over a given period. L_{Aeq} is the A-weighted equivalent continuous sound level, with T denoting the time period over which the fluctuating sound levels were averaged e.g. $L_{Aeq, 16h}$ is the equivalent continuous noise level over an 16 hour period.

L_{A90}

A-weighted sound level exceeded for 90% of the measurement period, calculated via statistical analysis. The L_{A90} descriptor is typically used to establish background sound levels for noise impact assessments

L_{A10}

A-weighted sound level exceeded for 10% of the measurement period, calculated via statistical analysis.

L_{AFmax}

A-weighted sound level maximum sound pressure level that has been measured over a given time period

GLOSSARY OF ACOUSTIC TERMINOLOGY

Octave Bands

The audio or frequency spectrum of the human ear is in the range of 20Hz to 20 kHz. The spectrum tells how the energy of the sound signal is distributed in frequency. Octave bands divides the audio spectrum into 10 equal parts. The International Standards Organisation defines the centre frequency of these bands as 31.5Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1kHz, 2kHz, 4kHz, 8kHz and 16kHz.

Noise Rating (NR) Curves

A method of rating noise using a set of curves relating octave band sound pressure levels. Typically used for building services systems within offices

Airborne sound

Sound radiated from a source into the surrounding air e.g. musical instruments, tv/radio, machinery/equipment. Airborne sound insulation refers to the reduction or attenuation of airborne sound, usually via a solid partition between a source and receiver.

Impact sound

Sound resulting from the impact between colliding objects, e.g. footfall impact upon a floor. Impact sound insulation refers to the resistance of a floor to the transmission of impact sound, typically via the installation of a 'resilient layer'

Flanking sound

The transmission of airborne sound between two adjacent rooms by paths other than via the separating partition between the rooms, e.g. the abutment point of a wall and floor.

Structure-borne noise

Noise caused by the vibration of elements of a structure. This can result in reradiated noise, whereby the vibrating element transmits airborne sound into a space e.g. vibration caused by mechanical plant installed within a plant room which is not adequately isolated from the structure, or construction/demolition work in an adjacent building.

Reverberant sound

Sound in an enclosed space (usually a room), which results from repeated reflections at the boundaries. Reverberation time is the time taken for a steady sound level in an enclosed space to decay by 60dB, measured from the moment the sound source is switched off. A example of a typically reverberant space would be a classic church. Absorptive materials can be used to reduce reflections and reverberation times.

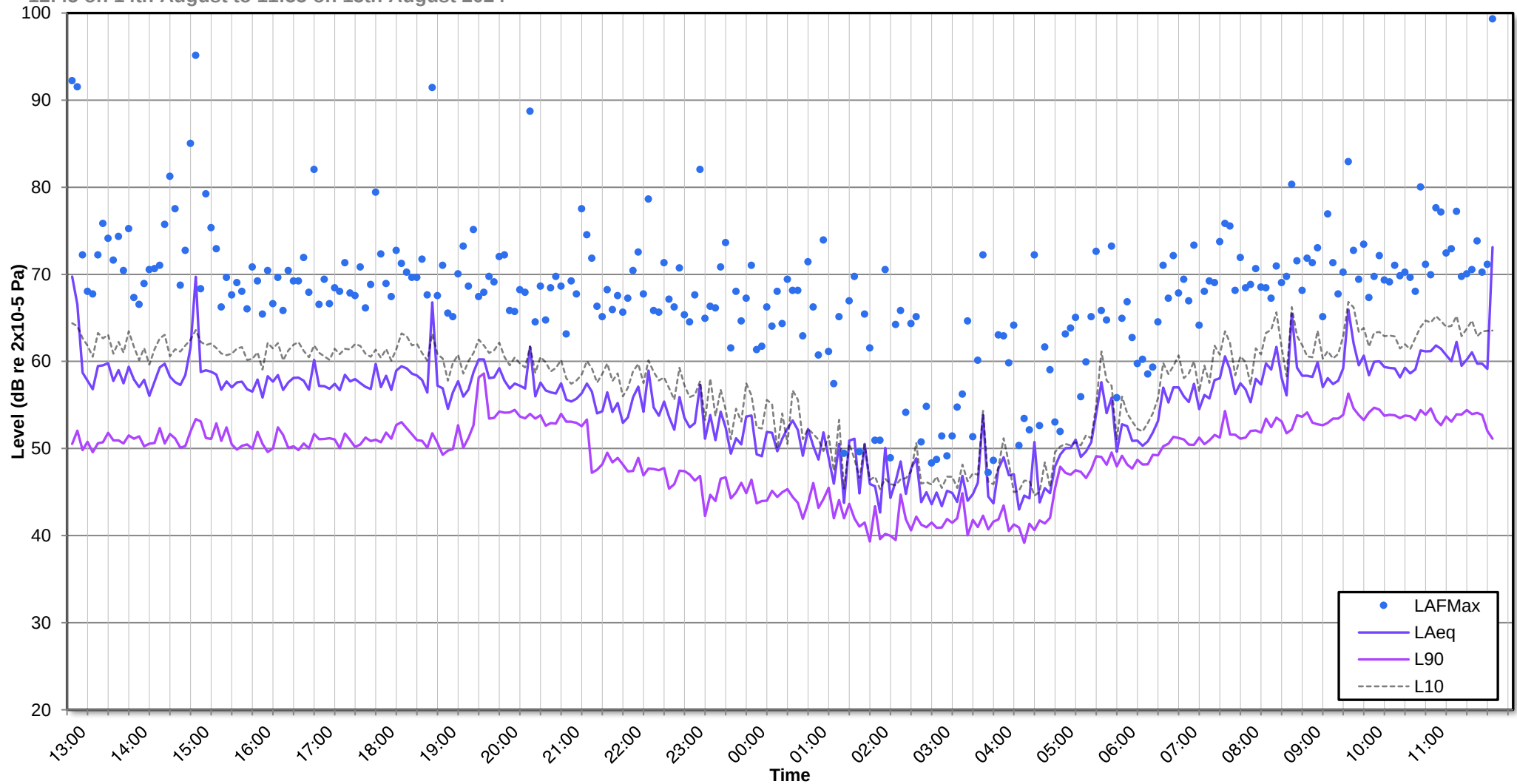
APPENDIX B

ENVIRONMENTAL NOISE TIME HISTORY

20864.PCD-RPT.01

Noise Monitoring Time History

12:45 on 14th August to 11:55 on 15th August 2024



APPENDIX C

PLANT NOISE CALCULATIONS

Source: Proposed ASHP Units	Frequency, Hz								dB(A)
Receiver: Residential Receiver to West	63	125	250	500	1k	2k	4k	8k	
3 no. ASHP as installed, heating sound pressure level at 1m	73	72	73	68	64	59	54	50	70
Minimum attenuation provided by distance (23m), dB	-27	-27	-27	-27	-27	-27	-27	-27	
Total Noise Emissions from Condenser Units, dB	46	45	46	41	37	32	27	23	43
BS4142 Acoustic Feature Corrections									
Tonality	0	0	0	0	0	0	0	0	0
Impulsivity	0	0	0	0	0	0	0	0	0
Intermittency	0	0	0	0	0	0	0	0	0
Total Rating Noise Level of all Plant Unit Installations at Receiver	46	45	46	41	37	32	27	23	43