Noise Assessment for Proposed Residential Development at

17 Ham Road, Shoreham-by-Sea, West Sussex, BN43 6PA

For Wood and Associates LLP








Quality Management

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1 Introduction

1.1 The Acoustics Team of RPS Planning and Development (RPS) has been appointed by Wood and Associates LLP to undertake a noise assessment for the proposed development at 17 Ham Road, Shoreham-by-Sea, West Sussex BN43 6PA. The assessment is to discharge Planning Condition 8 of the planning consent (reference AWDM/0983/15) for the redevelopment of the existing building to become four flats and the construction of two semi-detached houses. The site is located within the administrative area of Adur District Council (ADC).

1.2 Planning Condition 8 states:

"No dwelling hereby approved shall be occupied unless and until a scheme of noise mitigation measures has been submitted to and approved by the Local Planning Authority to meet the following requirements:

a) The recommended standards in respect of external noise source set out in table 4 of BS 8233:2014[1] and the night time L_{Amax} level recommended in the WHO's Night Noise Guidelines for Europe (2009)[2]. Where, windows need to remain closed to meet this criteria whole house ventilation is considered to ensure thermal comfort can be managed inside the dwellings during the summer months.

b) the party wall with adjacent industrial unit (Caxton House) be designed to achieve a minimum airborne sound insulation value of 48dB (D_{nTw}+C_{tr} dB).

Reason: In the interests of the amenity of future occupiers in view of the fact that the site is adjacent to business uses and to comply with the National Planning Policy Framework."

1.3 The assessment has been undertaken based upon appropriate information on the proposed development provided by the client and its project team. RPS is a member of the Association of Noise Consultants (ANC), the representative body for acoustics consultancies, having demonstrated the necessary professional and technical competence. The assessment has been undertaken with integrity, objectivity and honesty in accordance with the Code of Conduct of the Institute of Acoustics (IOA) and ethically, professionally and lawfully in accordance with the Code of Ethics of the ANC.

1.4 The technical content of this assessment has been provided by RPS personnel, all of whom are corporate (MIOA) or non-corporate, associate members (AMIOA) of the IOA (the UK's professional body for those working in acoustics, noise and vibration). This report has been peer reviewed within the RPS team to ensure that it is technically robust and meets the requirements of our Quality Management System accredited to BS EN ISO 9001:2015.

[1] British Standard (BS) 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings'
[2] Night Noise Guidelines (NNG) for Europe (2009) published by the World Health Organisation (WHO)

2 Planning Policy and Relevant British Standard

National Planning Policy and Guidance on Noise

2.1 Appendix A provides a complete summary of the relevant guidance on national planning policy contained within the Noise Policy Statement for England (NPSE) [1], the National Planning Policy Framework (NPPF) [2] and published Planning Practice Guidance on Noise (PPG-N) [3]. These documents do not contain guidance in terms of numerical noise levels. Guidance is provided descriptively, which may be transposed to numerical noise levels for site-specific situations, using the methods contained BSs.

Local Planning Policy and Guidance on Noise

2.2 ADC is currently in the process of producing a new Local Plan document. From the saved policies of the 1996 Adur Local Plan, Policy AH2 is relevant for new residential development, it states:

"New residential development by way of infilling or redevelopment will be acceptable in the built-up area, providing the site is not allocated for any other purpose in this Local Plan. Any proposal will be expected to be designed so that:-

(d) it incorporates adequate standards of residential amenity for the new dwelling(s) in terms of open amenity space, daylight/sunlight, outlook, and privacy;

(f) it accords with the standards adopted by the District Planning Authority."

British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings'

2.3 BS 8233:2014 [4] provides guideline values for internal ambient noise levels in spaces when they are unoccupied. A summary of the levels recommended in paragraph 7.7.1 of sub clause 7.7 and Table 4 of BS 8233:2014 for rooms used for resting, dining and sleeping is provided in Table 2.1 below. The guideline values in Table 2.1 are annual average values and do not have to be achieved in all circumstances.

2.4 The guidance in paragraph 7.7.1 of Section 7.7 of BS 8233:2014 applies to external noise as it affects the internal acoustic environment from sources without a specific character. The paragraph states, including the accompanying note:

"… Occupants are usually more tolerant of noise without a specific character than, for example, that from neighbours which can trigger complex emotional reactions. …"

"NOTE Noise has a specific character if it contains features such as a distinguishable, discrete and continuous tone, is irregular enough to attract attention, or has strong low-frequency content, in which case lower noise limits might be appropriate."

Table 2.1: BS 8233:2014 Indoor Ambient Noise Levels for Dwellings

Activity	Location	07:00 to 23:00 hours	23:00 to 07:00 hours
Resting	Living room	35 dB $L_{Aeq,16h}$	-
Dining	Dining room / area	40 dB $L_{Aeq,16h}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16h}$	30 dB $L_{Aeq,8h}$

2.5 Note 7 of the following text states the following:

"NOTE 7 Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved."

2.6 In relation to external noise levels, the second paragraph of 7.7.3.2 states that:

"For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$ with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited."

The Night Noise Guidelines for Europe

2.7 The WHO and the European Commission sponsored guidance on night-time noise levels based upon scientific evidence for health effects from exposure to varying levels of transportation (air, road and rail) noise. The results of the study were published as the NNG document [5]. The report provides a summary of the results of research into the mental and physical effects of environmental night-time noise to people. NNG provides observed effect thresholds, i.e. the level above which an effect starts to occur or shows itself to be dependent on the exposure level. In the context of the NNG, these levels are commensurate with the Lowest Observed Adverse Effect Level (LOAEL). For waking up in the night and/or too early in the morning, NNG suggests the LOAEL is an internal sound level of 42 dB L_{Amax}.

2.8 The night-time noise indicator L_{night} is defined in the Environmental Noise Directive (END) [6] as an annual average L_{Aeq} over a period of 8 hours between 23:00 and 07:00 hours. The authors of the NNG recommend a threshold of 40 dB $L_{night,outside}$ to protect the public including vulnerable groups such as children and a threshold of 55 dB $L_{night,outside}$ as an interim target for countries where 40 dB $L_{night,outside}$ cannot be achieved in the short term.

2.9 The role of the NNG, and other similar reports commissioned by organisations such as WHO and the European Commission, is to provide information to the governments and policy makers within each country and/or member state so that national policy and standards PPG-N provides the UK Government's policies on noise that are relevant to planning and includes references to sleep disturbance. BS 8233:2014 provides guideline values for internal ambient noise levels that are desirable within houses in the UK.

2.10 On the basis of the above, the information contained within the NNG is not directly applicable to planning and/or permit applications in the UK because national policy and standards set the terms of reference for the assessment of night-time noise.

2.11 In terms of night-time L_{Amax} levels the GCN document does not explicitly provide recommended levels and instead refers to the Guidelines for Community Noise (GCN) document [7] published by the WHO in 2000. THE GCN suggests that internal L_{Amax} levels of 45 dB should be limited.

3 Baseline Conditions

3.1 The proposed development site is located immediately to the north of Ham Road and to the south of Shoreham-by-Sea Railway Station on the West Coastway Line. On the opposite side of Ham Road is a car park which serves the nearby supermarket. The site is occupied by an existing unoccupied building on the southern boundary of the site, an open area to the rear and a small car parking area to the west. A plan of the proposed site is provided in Figure 1.

3.2 The area is largely urban in nature with no large industrial sources of sound in the vicinity. It is considered that road traffic on Ham Road and the train movements on the West Coastway Line are the dominant sources of sound affecting the site.

Baseline Surveys

3.3 Two unattended baseline sound level surveys were deployed on site and ran from 11:15 hours on Wednesday 27th July 2016 until 14:20 hours on Friday 29th July 2016. The surveys were carried out to determine the existing levels of environmental sound affecting the proposed development area. A plan showing the approximate location of the measurement positions and site boundary is provided in Figure 1.

3.4 The first long term survey (LT1) was located towards the southern part of the site, approximately 0.5 m north of the front façade of the existing building (approximately 3 m from the road edge). The microphone was mounted on a pole 1.2 m above local ground level. Although the microphone was not in free-field conditions (less than 3.5 m from any reflecting surfaces, excluding the ground) it is considered that, as the reflective surface was perpendicular to the main source of noise and approximately 2.5 m from the microphone, no correction was needed to account for reflection. During the time spent on site setting up the long term survey, the following sound sources were noted affecting the site: road traffic on Ham Road, wind through trees, seagulls, idling cars, pedestrians, local and distant minor construction works and noise from announcements at Shoreham-by-Sea train station and rain movements

3.5 The second long term survey (LT2) was located 3 m south of the northern boundary and approximately 6 m south of the Shoreham-by-Sea southern platform edge. The microphone was mounted on a pole 1.2 m above local ground level and in a free-field position. During the time spent on site setting up and collecting the survey, the following sound sources were noted affecting the site: trains pulling into and away from the station, announcements from the railway station, train movements, road traffic on Ham road, seagulls, wind through trees, aircraft passing overhead, nearby construction work and a car alarm.

3.6 All sound level measurements were made using ‘Class 1’ Rion NL-52 sound level meters (SLMs) in accordance with BS 7445-2:1991 [8]. Both SLMs were calibrated before and checked after use with a Rion NC-74 calibrator with no significant drift occurring.

3.7 Meteorological conditions were monitored on set-up and collection of the surveys and data from the Shoreham College site (from the MetWOW website) for the survey period have been used. Measured wind speeds on set-up and collection were low, ranging between 0.9 and 3.7 m/s and did not exceed 6.3 m/s during the survey period (it is also likely that wind speeds on site were lower than those measured at Shoreham College due to the sheltered nature of the site). Rainfall accumulation did not exceed 1.2 mm during the survey period. On this basis no data have been excluded from the analysis due to meteorological conditions.

3.8 A summary of the measured data is provided in Table 3.1 and Table 3.2 below; further details are provided in Appendix B. For the daytime period, on the 27th and 29th July, full periods were not measured; however, it is considered that, as there is only a small overlap of hours measured during these two days, a linear average of all daytime periods gives a representative level for each location.

Table 3.1: Summary of Baseline Sound Level Data

Survey Location	Survey Period	$L_{Aeq,T}$ (dB)	L_{Amax} (dB)
LT1	Daytime (07:00 to 23:00 hours)	61	92
	Night-time (23:00 to 07:00 hours)	52	81
LT2	Daytime (07:00 to 23:00 hours)	56	97
	Night-time (23:00 to 07:00 hours)	51	85

3.9 With reference to the design drawings (TA 841/20 A, TA 841/21 A and TA 841/22 A), survey location LT2 was located approximately 15 m north of proposed north facing facades and 6 m south of the railway. As monitored levels at LT2 will have been dominated by train movements, sound levels at the location of the north facing facades will be lower due to the increased distance of the façade from the railway.

3.10 On this basis, the measured sound level data at location LT2 have been corrected to provide the calculated sound levels at the location of the proposed north facing façade. Survey location LT1 was setup in a location representative of south facing facades and therefore no distance correction is required. Table 3.2 below provides a summary of sound levels at the location of proposed facades.

Table 3.2: Summary of Facade Sound Levels

Facades	Period	$L_{Aeq,T}$ (dB)	L_{Amax} (dB)
South Facing	Daytime (07:00 to 23:00 hours)	61	92
	Night-time (23:00 to 07:00 hours)	52	81
North Facing	Daytime (07:00 to 23:00 hours)	50[1]	86[2]
	Night-time (23:00 to 07:00 hours)	45[1]	74[2]

Notes:

1. $L_{Aeq,T}$ values have been corrected on the basis of line source spreading $L_2 = L_1 - |10\log(R_1/R_2)|$
2. L_{AFmax} values have been corrected on the basis of point source spreading $L_2 = L_1 - |20\log(R_1/R_2)|$

4 Noise Assessment

Internal Sound Levels

4.1 With reference to paragraph G.1 of BS 8233:2014, an estimate of the internal sound levels within typical dwellings may be determined on the basis of the sound reduction provided by the windows. Research contained within Report NANR 116 [9] finds that a window partially open to provide background ventilation provides approximately 15 dB $D_{A,road}$ of attenuation to road traffic noise.

4.2 On this basis, and with reference to the design targets contained within BS 8233:2014 that are reproduced in Table 2.1 of this report, satisfactory internal acoustic environments are likely to be achievable with no acoustic treatments in areas of the site where the external environmental noise level is no greater than 50 dB $L_{Aeq,16h}$ and 45 dB $L_{Aeq,8h}$ during the daytime and night-time periods, respectively. Where external sound levels exceed these criteria, habitable rooms (living rooms and bedrooms) are likely to require suitable ventilation systems as an alternative to opening the windows.

4.3 The specific acoustic performance requirements of the glazing and ventilation system are dependent on the exact layout and orientation of the buildings, room size, wall and roof design etc. However, an estimation of the sound level difference across a 'standard' façade design[3] for a typical dwelling room type and size is around 25 dB $D_{2m,n}$. For dwellings built with this façade attenuation, satisfactory internal acoustic environments are likely to be achieved where the external sound level is no greater than 60 dB $L_{Aeq,16h}$ and 55 dB $L_{Aeq,8h}$ during the daytime and night-time periods, respectively.

4.4 Where external sound levels are greater than 60 dB $L_{Aeq,16h}$ or 55 dB $L_{Aeq,8h}$, then an 'enhanced façade design' would be required. This normally entails the specification of an alternative means of ventilation, such as passive acoustic trickle ventilators and, if necessary, the specification of windows with enhanced sound reduction performance. For a typical dwelling with standard double glazed windows, the specification of passive acoustic trickle vents with a sound reduction of 40 dB $D_{n,e,w}$ would achieve an overall façade sound reduction value of around 30 dB $D_{2m,n}$.

4.5 Table 4.1 below provides a summary of the external sound levels and the façade type required to achieve suitable internal sound levels for typical habitable room types and sizes.

[3] 'Brick and block' external wall; '4-(6)-6 double glazing'; and 0.08 m^2 trickle ventilator.

Table 4.1: Façade Reduction with Various Façade Elements

External Sound Level (Day / Night)	Façade Type	Façade Sound Reduction (dB)
>60 dB $L_{Aeq,16h}$ or > 55 dB $L_{Aeq,8h}$	Enhanced[1]	30
50 – 60 dB $L_{Aeq,16h}$ or 45 – 55 dB $L_{Aeq,8h}$	Standard[2]	25
<50 dB $L_{Aeq,16h}$ and < 45 dB $L_{Aeq,8h}$	Partially Open Windows	15

NOTES:
1 Based on brick and block' external wall; '4-(6)-6 double glazing; and 0.08 m^2 acoustic trickle ventilator achieving 40 dB $D_{n,e,w.}$
2 Based on brick and block' external wall; '4-(6)-6 double glazing'; and 0.08 m^2 standard trickle ventilator.

4.6 With reference to the measured levels in Table 3.2, south facing facades were measured to have representative external levels of 61 dB $L_{Aeq,16h}$ and 52 dB $L_{Aeq,8h}$ for the daytime and night-time periods respectively and therefore there is a required façade attenuation of 26 dB. On this basis habitable rooms with south facing facades will require the 'Enhanced' façade type in order to achieve acceptable internal ambient noise levels.

4.7 With reference to the measured levels in Table 3.2, north facing facades were calculated to have representative external levels of 50 dB $L_{Aeq,16h}$ and 45 dB $L_{Aeq,8h}$ for the daytime and night-time periods respectively and, therefore, there is a required façade attenuation of 15 dB. On this basis, partially open windows would provide sufficient attenuation without the requirement for an additional method of ventilation. However, it would still be recommended that windows are fitted with standard trickle ventilators as it may be the case that during certain periods, sound levels from the railway are higher (such as during periods the wind is from a northerly direction) and, therefore, appropriate internal sound levels can still be achieved.

Night-time Maximum Noise Levels

4.8 For the purposes of assessing night-time maximum noise levels, assessment criteria have been based on guidance from the NNG document. With regards to night-time maximum noise levels the NNG document states the following:

"If negative effects on sleep are to be avoided the equivalent sound pressure level should not exceed 30 dBA indoors for continuous noise. If the noise is not continuous, sleep disturbance correlates best with L_{Amax} and effects have been observed at 45 dB or less. This is particularly true if the background level is low. Noise events exceeding 45 dBA should therefore be limited if possible."

4.9 On the basis that the south and north facing facades achieve a facade sound reduction value of 30 dB and 25 dB respectively (with windows closed) in order to ensure a satisfactory internal acoustic environment, as detailed in paragraphs 4.6 and 4.7, internal levels will not exceed 45 dB(A) unless the external sound level exceeds 75 dB(A) and 70 dB(A) at the south and north facing facades respectively.

4.10 Analysis of the 5-minute survey data at LT1 (representative of south facing facades) shows that, during the night-time period, the maximum sound level exceeded 75 dB L_{AFmax}, on average,

seven times per night, out of a total of 96, 5-minute periods. Therefore, it is considered that the internal maximum levels during the night-time do not normally exceed 45 dB L_{Amax} and such instances are limited.

4.11 Analysis of the 5-minute data for the north facing façade shows that, during the night-time period, the maximum sound level, exceeded 70 dB L_{AFmax}, on average, four times per night, out of a total of 96, 5-minute periods. Therefore, it is considered that the internal maximum levels during the night-time do not normally exceed 45 dB L_{Amax} and such instances are limited.

4.12 On the basis of the façade sound levels (provided in Table 3.2), design targets contained within BS 8233:2014, design targets contained within the GCN and the façade sound reduction values (provided in Table 3.2), the facades requiring either an enhanced or standard design are indicated on Figure 2.

4.13 It should be noted that although the assessment has been based on the provision of an alternative to opening windows, in order to provide background ventilation, openable windows can still be used to provide quick purge ventilation if/when required.

Party Wall Assessment

4.14 In order to determine the current performance of the party wall between Caxton House and 17 Ham Road, airborne sound insulation tests (SIT) were undertaken on Friday 2nd September 2016. The survey was carried out in full accordance with BS EN ISO 140-4 [10].

4.15 For the SIT, a loudspeaker was placed in the 'source room' (on the Caxton House side of the party wall), in two positions to achieve a good spatial average. The loudspeaker was a Brüel & Kjær type 4292 omni-directional sound source. The sound signal used in the testing was white noise generated using a transmitter from the SLM, to a receiver built into the amplifier.

4.16 The average source noise level was measured over five microphone positions for a period of six seconds for each position. The room on the other side of the party wall is the "receiver room" (on the 17 Ham Road side of the party wall). The noise level from the source room was measured in the receiver room over five microphone positions for a period of six seconds for each position.

4.17 The difference in source and receiver room noise levels was measured using a spatial average over the measurement positions and calculated for each wall and floor in accordance with BS EN ISO 140-4:1998. The resulting frequency dependent level differences are converted into "a single number characterising the acoustical performance" using the method given in BS EN ISO 717-1:2013 [11], namely the weighted standardised level difference ($D_{nT,w}$ + C_{tr}). Appendix C summarises the calculation and rating methods.

4.18 The reverberation time and background noise was measured (in accordance with the methodology contained within BS EN ISO 140 part 4) in the receiving room. The reverberation time was measured over six measurement locations, at two loudspeaker locations. The average background noise level was measured over 12 microphone positions for a period of six seconds for each position.

4.19 Two tests were carried out; one at ground floor level (Part A); and one at first floor level (Part B). A summary of the results of the tests are provided below in Table 4.2.

Table 4.2: Façade Reduction with Various Façade Elements

Part	Floor	Measured Airborne SI Value $D_{nT,w} + C_{tr}$ (dB)	Required Airborne SI Value $D_{nT,w} + C_{tr}$ (dB)	Meets Criteria
A	Ground	41	48	No
B	First	55		Yes

4.20 As detailed in Table 4.2 above, the party wall at ground floor level currently has an airborne sound insulation value of 41 dB $D_{nT,w}+C_{tr}$ and, as such, does not meet the minimum performance requirement specified in Planning Condition 8 and further work is required to improve the airborne sound insulation value by at least 7 dB.

4.21 Possible methods for improving the airborne SI performance include the application of an appropriate acoustic panel, or stud wall system comprising a layer of dense mineral wool and a layer of acoustic wallboard. In addition, it would be recommended that, prior to installing any panel or additional stud wall, that the existing wall is 'made good', i.e. by infilling any cracks and/or openings.

4.22 Proprietary acoustic panels are available that fix to the exiting party wall that increase the mass of the wall and include attenuating materials, both aspects which act to improve the airborne sound insulation value by up to 13 dB. One such panel is manufactured by the company 'SoundStop' and marketed under the name 'SoundStop Panels'[4]. The panels (52 mm thick) would be fixed to the wall with adhesive and sealed around the edges with acoustic sealant. The panels should be cut and fitted snuggly to the existing party wall leaving no gaps or spaces.

4.23 On the basis of the above, if the ground floor party wall is 'made good' and a proprietary acoustic panel system fitted, the airborne sound insulation value would be expected to be around 54 dB $D_{nT,w}+C_{tr}$ and would therefore meet the minimum performance requirement as part of Planning Condition 8 which can then be discharged.

4.24 As detailed in Table 4.2, the party wall SIT at first floor level gave an airborne sound insulation value of 55 dB $D_{nT,w}+C_{tr}$ and, as such, meets the minimum performance requirement specified in Planning Condition 8. On this basis, the condition is discharged for this floor.

[4] http://www.soundstop.co.uk/solutions/wall_solutions/wall_solution_1.php

5 Summary and Conclusions

5.1 The Acoustics Team of RPS Planning and Development (RPS) has been appointed by Wood and Associates LLP to undertake a noise assessment for the proposed development at 17 Ham Road, Shoreham-by-Sea, West Sussex BN43 6PA. The assessment is to discharge Planning Condition 8 of the planning consent (reference AWDM/0983/15) for the redevelopment of the existing building to become four flats and the construction of two semi-detached houses. The site is located within the administrative area of Adur District Council (ADC).

5.2 Environmental sound levels were determined from two long term unattended surveys. The main sound sources affecting the site are road traffic on Ham Road and train movements on the West Coastway Line.

5.3 For PC 8a, through appropriate design, the proposed residential development would be subject to satisfactory internal and external acoustic environments with respect to British Standard (BS) 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' and the WHO's Night Noise Guidelines for Europe (2009).

5.4 For PC 8b, airborne sound insulation tests (SIT) were undertaken to determine the existing SI performance of the party wall between 17 Ham Road and Caxton House. The results of the SITs show that the first floor party wall has an airborne sound insulation value of 55 dB $D_{nT,w}+C_{tr}$, meeting the requirements of PC 8b. The existing ground floor party wall has an airborne sound insulation value of 41 dB $D_{nT,w}+C_{tr}$, and ,as such, requires an improvement of at least 7 dB to meet the requirements of Planning Condition 8b. The fixing of proprietary acoustic panels to the ground floor party wall would act to increase the SI value to be around 54 dB $D_{nT,w}+C_{tr,}$ therefore meeting the requirements of PC 8b and allowing this condition to be discharged.

5.5 On the basis of the above, the proposed development accords with both national (Noise Policy Statement for England, National Planning Policy Framework and Planning Practice Guidance on Noise) and, through the internal treatment to the party wall at ground floor level, Planning Condition 8a and b of Adur District Council's Planning Decision can be discharged.

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10 British Standard (BS) EN ISO 140-4: 1998. Acoustics: Measurement of sound insulation in buildings and of building elements. Part 4: Field measurements of airborne sound insulation between rooms. 1998.

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Figures



Survey Location

Site Boundary

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Notes

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Figure 1: Baseline Survey Locations and Site

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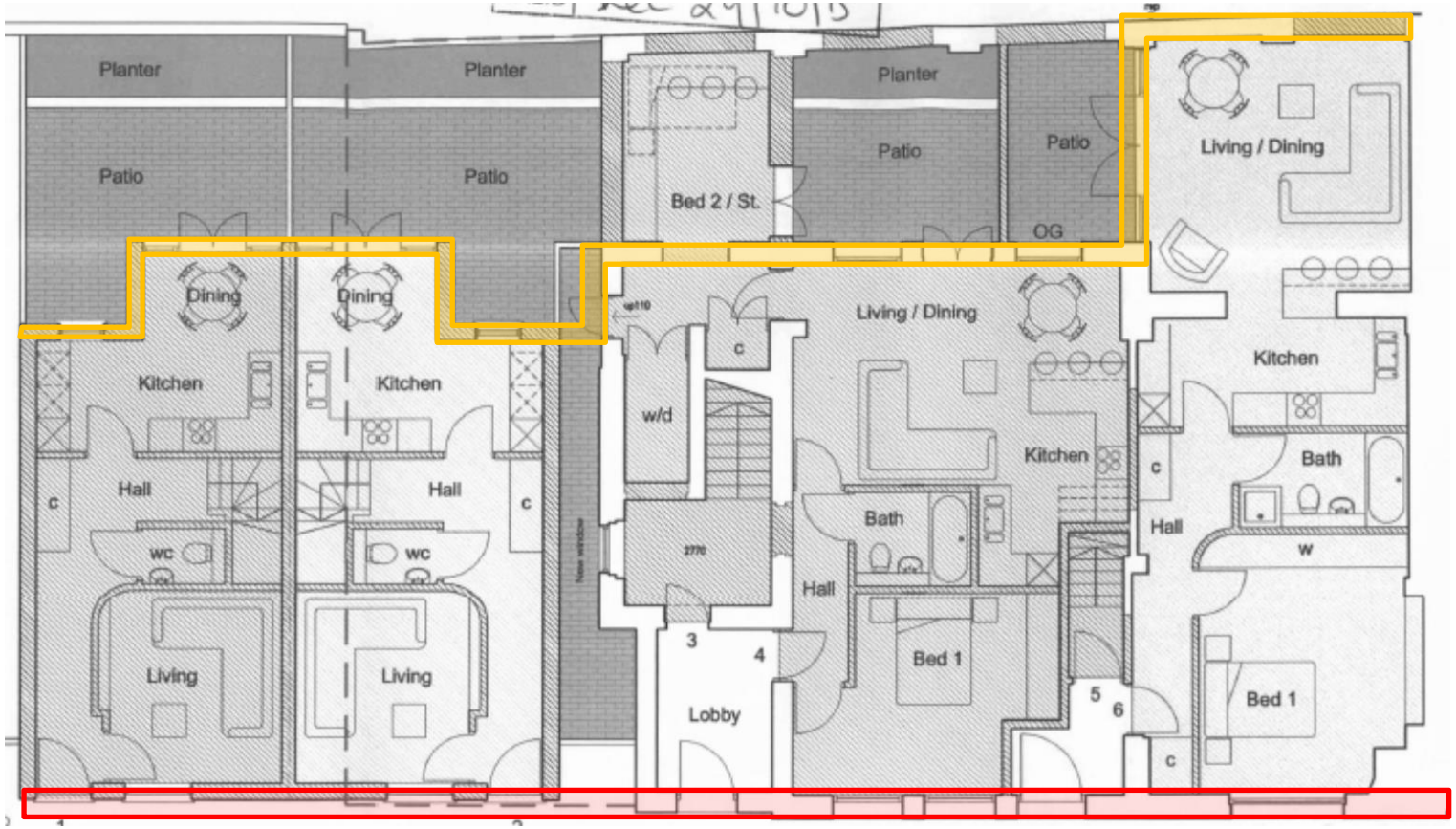

North

Enhanced Façade

Standard Façade

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Project: 17 Ham Road

Job Ref: JAE 9040

File location: O:\Jobs_9001-9900\9040e\Rev0

Date: 08/2016	**Rev: 0**
Drawn: JA	**Checked:**

Figure 2: Façade Requirements

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Appendices

Appendix A: National Planning Policy and Guidance

National Planning Policy Framework

A.1 The National Planning Policy Framework (NPPF) [1], published in March 2012, sets out the Governments planning policies for England. The document does not contain any specific noise policy, or noise limits but it provides a framework for local people and local authorities to produce their own local and neighbourhood plans, which reflect the needs and priorities of their communities.

A.2 In Section 11, 'Conserving and enhancing the natural environment', paragraph 123 relates to noise and states:

'123. Planning policies and decisions should aim to:

- *avoid noise from giving rise to significant adverse impacts[27] on health and quality of life as a result of new development;*
- *mitigate and reduce to a minimum other adverse impacts[27] on health and quality of life arising from noise from new development, including through the use of conditions;*
- *recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established;[28] and*
- *identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.'*

27 See Explanatory Note to the Noise Policy Statement for England (Department for the Environment, Food and Rural Affairs).
28 Subject to the provisions of the Environmental Protection Act 1990 and other relevant law.'

A.3 The first bullet point refers to 'significant adverse impacts' which relates to the 'significant observed adverse effect level' (SOAEL) in the Noise Policy Statement for England (NPSE) [2], though the term 'effect' is used instead of the term 'impact' although these have been deemed to be interchangeable in this context. Therefore, given the comments above on the NPSE with regard to assessment methods and criteria, the current content of the NPPF does not require any change in previously adopted approaches.

1 Department for Communities and Local Government. National Planning Policy Framework: HMSO. March 2012.
2 Department for Environment, Food and Rural Affairs. Noise Policy Statement for England. Defra. 2010.

Noise Policy Statement for England

A.4 The Noise Policy Statement for England (NPSE) [3], published in March 2010 by Defra, aims to provide clarity regarding current policies and practices to enable noise management decisions to be made within the wider context, at the most appropriate level, in a cost-effective manner and in a timely fashion.

A.5 Paragraph 1.6 of the NPSE sets out the long-term vision and aims of Government noise policy:

"Noise Policy Vision

Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development."

"Noise Policy Aims

Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *avoid significant adverse impacts on health and quality of life;*
- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life."*

A.6 The aims require that all reasonable steps should be taken to avoid, mitigate and minimise adverse effects on health and quality of life whilst also taking into account the guiding principles of sustainable development, which include social, economic, environmental and health considerations.

A.7 With regard to the terms 'significant adverse' and 'adverse' included in the 'Noise Policy Aims', these are explained further in the 'Explanatory Note' as relating to established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation which are:

'NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on human health and quality of life due to noise.

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.'

A.8 Defra has then extended these concepts for the purpose of the NPSE to introduce the concept of:

'SOAEL – Significant Observed Adverse Effect Level

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3 Department for Environment, Food and Rural Affairs. Noise Policy Statement for England. Defra. 2010.

This is the level above which significant adverse effects on health and quality of life occur.'

A.9 The accompanying explanation states:

'It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available'.

A.10 With regard to 'further evidence', Defra has commissioned research to try and identify the levels at which the above effects occur but this is not yet in the public domain. However, early indications are that this research has been largely inconclusive. On this basis, and until further guidance becomes available, and given that there is no specific guidance in the NPPF on noise, there is no justification to vary assessment methods and criteria from those previously adopted from British Standards etc.

Planning Practice Guidance - Noise (PPGN)

A.11 The Government has published Planning Practice Guidance on a range of subjects including noise [4].The guidance forms part of the NPPF and provides advice on how to deliver its policies. The PPGN reiterates general guidance on noise policy and assessment methods provided in the NPPF, NPSE and British Standards (BSs) and contains examples of acoustic environments commensurate with various effect levels. Paragraph 006 of the PPGN explains that:

'The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation.'

A.12 According to the PPGN, factors that can influence whether noise could be of concern include:

- the source and absolute level of the noise together with the time of day it occurs;
- for non-continuous sources of noise, the number of noise events, and the frequency and pattern of occurrence of the noise;
- the spectral content and the general character of the noise;
- the local topology and topography along with the existing and, where appropriate, the planned character of the area.

4 Department for Communities and Local Government. National Planning Practice Guidance

- where applicable, the cumulative impacts of more than one source should be taken into account along with the extent to which the source of noise is intermittent and of limited duration;
- whether adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time;
- in cases where existing noise sensitive locations already experience high noise levels, a development that is expected to cause even a small increase in the overall noise level may result in a significant adverse effect occurring even though little to no change in behaviour would be likely to occur;
- where relevant, Noise Action Plans, and, in particular the Important Areas identified through the process associated with the Environmental Noise Directive and corresponding regulations;
- the effect of noise on wildlife;
- if external amenity spaces are an intrinsic part of the overall design, the acoustic environment of those spaces; and
- the potential effect on an existing business of a new residential development being located close to it as the existing noise levels from the business may be regarded as unacceptable by the new residents and subject to enforcement action.

A.13 The PPGN provides a relationship between various perceptions of noise, effect level and required action in accordance with the NPPF. This is reproduced in Table 2, below.

Table 2: Noise Exposure Hierarchy Based On the Likely Average Response

Perception	Increasing Effect Level	Action
Not noticeable	No Observed Effect	No specific measures required
Noticeable and not intrusive	No Observed Adverse Effect	No specific measures required
LOAEL		
Noticeable and intrusive	Observed Adverse Effect	Mitigate and reduce to a minimum
SOAEL		
Noticeable and disruptive	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Unacceptable Adverse Effect	Prevent

A.14 The PPGN describes noise that is not noticeable to be at levels below the NOEL. It describes a range of noise exposure that is noticeable but not to the extent there is a perceived change in quality of life. Noise exposures in this range are below the LOAEL and need no mitigation. On this basis, the audibility of noise from a development is not, in itself, a criterion to judge noise effects that is commensurate with national planning policy.

A.15 The PPGN suggests that noise exposures above the LOAEL cause small changes in behaviour. Examples of noise exposures above the LOAEL provided in the PPGN is having to turn up the volume on the television; needing to speak more loudly to be heard; where there is no alternative ventilation, closing windows for some of the time because of the noise; or, a potential for some reported sleep disturbance. In line with the NPPF and NPSE, the PPGN states that consideration needs to be given to mitigating and minimising effects above the LOAEL but taking account of the economic and social benefits being derived from the activity causing the noise.

A.16 The PPGN suggests that noise exposures above the SOAEL cause material changes in behaviour. Examples of noise exposures above the SOAEL provided in the PPGN are, where there is no alternative ventilation, keeping windows closed for most of the time or avoiding certain activities during periods when the noise is present; and/or there is a potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. In line with the NPPF and NPSE, the PPGN states that effects above the SOAEL should be avoided and that whilst the economic and social benefits being derived from the activity causing the noise must be taken into account, such exposures are undesirable.

A.17 The PPGN suggests that a noise impact may be partially offset if the residents of affected dwellings have access to a relatively quiet part of their dwelling, private external amenity area and/or external public or private amenity space nearby.

Appendix B: Baseline Sound Level Survey Data

Sound Level Survey Record

Location	LT1 - Front Façade, Ham Road
Purpose of Monitoring	Baseline
Relevant Guidance / Standard	BS 7445-1:2003 / BS 7445-2:1991 / BS 4142:2014 / BS 8233:2014

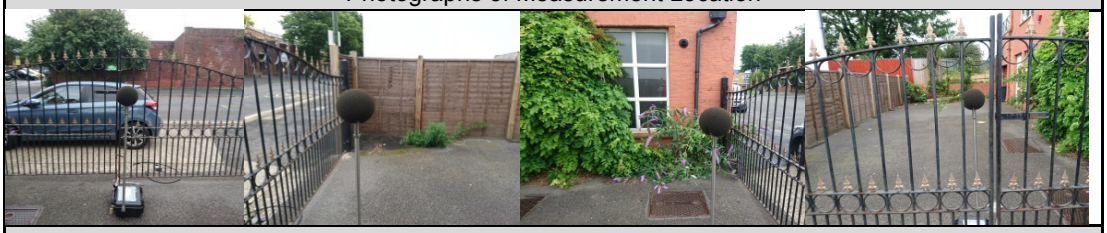
Sound Measurement System

RPS ID	Manufacturer / Model	Serial Number	Last Lab Verification	Filename	Memory Card ID
24	RION NL-31	352030	03/12/2014	1	

Microphone Height	Measurement Interval	Dynamic Range	Time Weighting	Frequency Weighting	Façade / Freefield	Photo?
1.2 m	100 ms	20 - 110	Fast	A	Freefield	x

		START		END	
Personnel		JA		JA	
Date / time		27/07/2016 11:25		27/07/2016 14:00	
Calibrator	RPS ID	14		33	
	Manufacturer / Model	RION NC-74		RION NC-74	
	Serial Number	110118		34472822	
	Date last verification	01/04/2016		19/10/2015	
	Reference level	94.0		94.0	
	Meter reading	94.0		93.9	
Weather	Wind speed (m/s) & dir'n 1	1.5	SE	2.4	S
	Wind speed (m/s) & dir'n 2	0.9	SE	2.2	S
	Wind speed (m/s) & dir'n 3	0.8	SE	2.1	S
	Wind speed (m/s) & dir'n Av.	1.1	SE	2.2	S
	Cloud cover (100%= 8 oktas)	8		2	
	Temperature (degrees Celsius)	20		24.8	
	Relative Humidity (%)	-		56	
	Subjective description / additional details				

Photographs of Measurement Location



Description of site (location of equipment, general surroundings, nature of ground between NSR and sound source(s) (hard/ soft ground, topography, intervening features, reflecting surfaces))

Behind gates to west of building. 3.5 m from west boundary fence, 2.5 m from building, 3 m from road

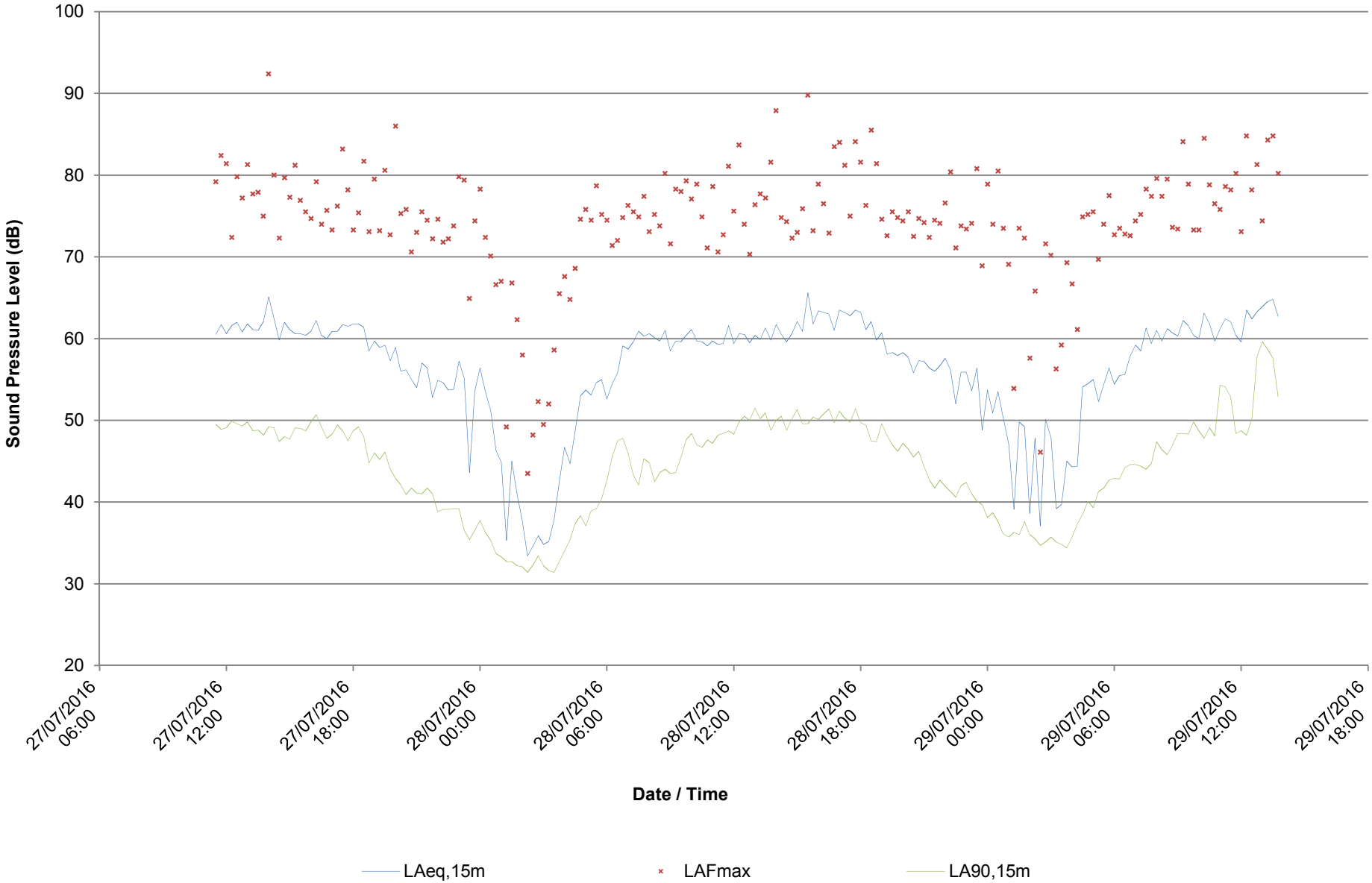
Description of sound environment at start of survey (principal environmental and natural sound sources, which sources are dominant, character of the sound environment cf. to the character of the new source)

Road, wind, seagulls, idling cars, pedestrians

Description of sound environment at end of survey (principal environmental and natural sound sources, which sources are dominant, character of the sound environment cf. to the character of the new source)

Road, small diesel plant engine, distant sawing, pedestrians, train platform jingle

LT1 - Time History



Start	Valid Time	$L_{Aeq,5min}$ (dB)	L_{AFmax} (dB)	$L_{A10,5min}$ (dB)	$L_{A90,5min}$ (dB)
27/07/2016 11:25	05:00.0	62	74	65	49
27/07/2016 11:30	05:00.0	60	75	64	50
27/07/2016 11:35	05:00.0	61	79	64	51
27/07/2016 11:40	05:00.0	60	73	65	49
27/07/2016 11:45	05:00.0	62	82	65	48
27/07/2016 11:50	05:00.0	62	81	65	51
27/07/2016 11:55	05:00.0	61	75	65	49
27/07/2016 12:00	05:00.0	60	81	63	48
27/07/2016 12:05	05:00.0	61	72	65	49
27/07/2016 12:10	05:00.0	62	74	66	52
27/07/2016 12:15	05:00.0	61	72	65	49
27/07/2016 12:20	05:00.0	62	72	66	49
27/07/2016 12:25	05:00.0	62	72	67	51
27/07/2016 12:30	05:00.0	63	80	67	49
27/07/2016 12:35	05:00.0	61	73	66	50
27/07/2016 12:40	05:00.0	61	71	66	50
27/07/2016 12:45	05:00.0	60	77	65	50
27/07/2016 12:50	05:00.0	61	77	66	49
27/07/2016 12:55	05:00.0	61	71	66	49
27/07/2016 13:00	05:00.0	62	72	67	51
27/07/2016 13:05	05:00.0	63	81	65	50
27/07/2016 13:10	05:00.0	60	71	65	49
27/07/2016 13:15	05:00.0	59	74	63	48
27/07/2016 13:20	05:00.0	61	78	65	48
27/07/2016 13:25	05:00.0	62	74	66	52
27/07/2016 13:30	05:00.0	60	72	65	49
27/07/2016 13:35	05:00.0	61	72	65	50
27/07/2016 13:40	05:00.0	62	78	66	49
27/07/2016 13:45	05:00.0	63	75	67	50
27/07/2016 13:50	05:00.0	63	75	67	49
27/07/2016 13:55	05:00.0	61	72	65	46
27/07/2016 14:00	05:00.0	63	75	67	50
27/07/2016 14:05	05:00.0	61	72	65	50
27/07/2016 14:10	05:00.0	68	92	67	48
27/07/2016 14:15	05:00.0	62	73	67	48
27/07/2016 14:20	05:00.0	64	80	67	49
27/07/2016 14:25	05:00.0	62	75	66	50
27/07/2016 14:30	05:00.0	59	72	64	48
27/07/2016 14:35	05:00.0	59	70	63	47
27/07/2016 14:40	05:00.0	61	72	65	48
27/07/2016 14:45	05:00.0	62	75	66	49
27/07/2016 14:50	05:00.0	63	80	66	47
27/07/2016 14:55	05:00.0	60	71	65	48
27/07/2016 15:00	05:00.0	62	72	66	48
27/07/2016 15:05	05:00.0	61	70	65	49
27/07/2016 15:10	05:00.0	61	77	65	47
27/07/2016 15:15	05:00.0	60	74	64	50
27/07/2016 15:20	05:00.0	60	72	64	47
27/07/2016 15:25	05:00.0	62	81	66	50
27/07/2016 15:30	05:00.0	61	77	65	49
27/07/2016 15:35	05:00.0	61	72	65	49
27/07/2016 15:40	05:00.0	60	73	64	49
27/07/2016 15:45	05:00.0	59	71	64	49
27/07/2016 15:50	05:00.0	61	76	66	48
27/07/2016 15:55	05:00.0	60	69	65	49
27/07/2016 16:00	05:00.0	62	74	66	50
27/07/2016 16:05	05:00.0	60	72	64	50
27/07/2016 16:10	05:00.0	61	75	66	50
27/07/2016 16:15	05:00.0	62	73	67	49
27/07/2016 16:20	05:00.0	63	79	66	51

Start	Valid Time	$L_{Aeq,5min}$ (dB)	L_{AFmax} (dB)	$L_{A10,5min}$ (dB)	$L_{A90,5min}$ (dB)
27/07/2016 16:25	05:00.0	62	72	66	53
27/07/2016 16:30	05:00.0	61	73	66	51
27/07/2016 16:35	05:00.0	60	74	63	50
27/07/2016 16:40	05:00.0	60	72	66	48
27/07/2016 16:45	05:00.0	60	72	65	49
27/07/2016 16:50	05:00.0	61	76	64	48
27/07/2016 16:55	05:00.0	59	71	64	46
27/07/2016 17:00	05:00.0	61	71	65	49
27/07/2016 17:05	05:00.0	62	73	66	48
27/07/2016 17:10	05:00.0	60	72	65	49
27/07/2016 17:15	05:00.0	62	76	66	49
27/07/2016 17:20	05:00.0	60	70	65	50
27/07/2016 17:25	05:00.0	61	71	65	50
27/07/2016 17:30	05:00.0	61	71	66	50
27/07/2016 17:35	05:00.0	64	83	66	53
27/07/2016 17:40	05:00.0	59	74	63	47
27/07/2016 17:45	05:00.0	63	78	66	47
27/07/2016 17:50	05:00.0	62	76	66	47
27/07/2016 17:55	05:00.0	60	72	65	48
27/07/2016 18:00	05:00.0	61	70	66	49
27/07/2016 18:05	05:00.0	62	73	67	50
27/07/2016 18:10	05:00.0	62	73	67	47
27/07/2016 18:15	05:00.0	62	74	67	49
27/07/2016 18:20	05:00.0	62	75	67	50
27/07/2016 18:25	05:00.0	61	70	66	47
27/07/2016 18:30	05:00.0	59	72	63	48
27/07/2016 18:35	05:00.0	59	71	64	48
27/07/2016 18:40	05:00.0	64	82	66	49
27/07/2016 18:45	05:00.0	59	70	63	45
27/07/2016 18:50	05:00.0	59	71	64	47
27/07/2016 18:55	05:00.0	58	73	62	44
27/07/2016 19:00	05:00.0	60	80	64	44
27/07/2016 19:05	05:00.0	59	74	64	47
27/07/2016 19:10	05:00.0	60	79	62	47
27/07/2016 19:15	05:00.0	59	72	63	47
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27/07/2016 19:35	05:00.0	58	72	63	45
27/07/2016 19:40	05:00.0	58	76	62	47
27/07/2016 19:45	05:00.0	59	73	63	47
27/07/2016 19:50	05:00.0	58	73	61	44
27/07/2016 19:55	05:00.0	53	70	55	43
27/07/2016 20:00	05:00.0	58	72	63	44
27/07/2016 20:05	05:00.0	52	68	55	42
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27/07/2016 20:30	05:00.0	55	72	58	41
27/07/2016 20:35	05:00.0	58	76	61	41
27/07/2016 20:40	05:00.0	55	69	57	41
27/07/2016 20:45	05:00.0	54	70	56	42
27/07/2016 20:50	05:00.0	56	69	60	42
27/07/2016 20:55	05:00.0	54	71	58	42
27/07/2016 21:00	05:00.0	45	60	48	40
27/07/2016 21:05	05:00.0	54	68	57	42
27/07/2016 21:10	05:00.0	57	73	60	43
27/07/2016 21:15	05:00.0	58	76	61	43
27/07/2016 21:20	05:00.0	55	73	54	41

Start	Valid Time	$L_{Aeq,5min}$ (dB)	L_{AFmax} (dB)	$L_{A10,5min}$ (dB)	$L_{A90,5min}$ (dB)
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27/07/2016 21:30	05:00.0	57	72	60	43
27/07/2016 21:35	05:00.0	56	71	58	41
27/07/2016 21:40	05:00.0	57	75	54	42
27/07/2016 21:45	05:00.0	54	71	56	42
27/07/2016 21:50	05:00.0	51	72	51	40
27/07/2016 21:55	05:00.0	52	66	55	41
27/07/2016 22:00	05:00.0	58	75	60	41
27/07/2016 22:05	05:00.0	53	69	54	39
27/07/2016 22:10	05:00.0	52	67	54	39
27/07/2016 22:15	05:00.0	49	67	46	39
27/07/2016 22:20	05:00.0	57	72	60	41
27/07/2016 22:25	05:00.0	55	72	58	39
27/07/2016 22:30	05:00.0	50	64	52	39
27/07/2016 22:35	05:00.0	56	72	56	40
27/07/2016 22:40	05:00.0	54	69	55	39
27/07/2016 22:45	05:00.0	54	69	56	38
27/07/2016 22:50	05:00.0	54	74	55	41
27/07/2016 22:55	05:00.0	52	68	54	40
27/07/2016 23:00	05:00.0	53	69	54	40
27/07/2016 23:05	05:00.0	50	66	52	39
27/07/2016 23:10	05:00.0	61	80	60	39
27/07/2016 23:15	05:00.0	52	69	52	38
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28/07/2016 02:05	05:00.0	41	58	36	33
28/07/2016 02:10	05:00.0	35	52	35	32
28/07/2016 02:15	05:00.0	34	41	35	32
28/07/2016 02:20	05:00.0	33	38	34	32

Start	Valid Time	$L_{Aeq,5min}$ (dB)	L_{AFmax} (dB)	$L_{A10,5min}$ (dB)	$L_{A90,5min}$ (dB)
28/07/2016 02:25	05:00.0	34	44	35	30
28/07/2016 02:30	05:00.0	35	48	35	32
28/07/2016 02:35	05:00.0	34	39	35	33
28/07/2016 02:40	05:00.0	35	43	36	32
28/07/2016 02:45	05:00.0	35	43	36	34
28/07/2016 02:50	05:00.0	36	49	37	33
28/07/2016 02:55	05:00.0	37	52	38	33
28/07/2016 03:00	05:00.0	36	50	36	33
28/07/2016 03:05	05:00.0	34	37	35	32
28/07/2016 03:10	05:00.0	35	43	37	31
28/07/2016 03:15	05:00.0	35	42	37	34
28/07/2016 03:20	05:00.0	34	42	36	32
28/07/2016 03:25	05:00.0	36	52	37	31
28/07/2016 03:30	05:00.0	41	59	43	33
28/07/2016 03:35	05:00.0	35	46	36	30
28/07/2016 03:40	05:00.0	35	41	37	31
28/07/2016 03:45	05:00.0	35	47	37	33
28/07/2016 03:50	05:00.0	47	66	42	34
28/07/2016 03:55	05:00.0	37	54	37	32
28/07/2016 04:00	05:00.0	46	68	44	34
28/07/2016 04:05	05:00.0	49	66	52	36
28/07/2016 04:10	05:00.0	42	66	44	34
28/07/2016 04:15	05:00.0	42	65	45	34
28/07/2016 04:20	05:00.0	46	60	50	38
28/07/2016 04:25	05:00.0	45	57	48	39
28/07/2016 04:30	05:00.0	51	69	54	39
28/07/2016 04:35	05:00.0	48	63	50	37
28/07/2016 04:40	05:00.0	46	62	49	37
28/07/2016 04:45	05:00.0	56	75	56	39
28/07/2016 04:50	05:00.0	53	71	52	39
28/07/2016 04:55	05:00.0	43	58	46	38
28/07/2016 05:00	05:00.0	54	76	49	37
28/07/2016 05:05	05:00.0	55	71	54	36
28/07/2016 05:10	05:00.0	52	70	53	38
28/07/2016 05:15	05:00.0	54	70	54	38
28/07/2016 05:20	05:00.0	55	75	53	39
28/07/2016 05:25	05:00.0	47	62	51	39
28/07/2016 05:30	05:00.0	44	55	47	39
28/07/2016 05:35	05:00.0	58	79	56	40
28/07/2016 05:40	05:00.0	52	68	52	39
28/07/2016 05:45	05:00.0	57	75	58	41
28/07/2016 05:50	05:00.0	55	73	54	41
28/07/2016 05:55	05:00.0	51	70	50	40
28/07/2016 06:00	05:00.0	49	69	47	42
28/07/2016 06:05	05:00.0	56	75	54	45
28/07/2016 06:10	05:00.0	48	61	50	44
28/07/2016 06:15	05:00.0	53	70	54	45
28/07/2016 06:20	05:00.0	57	71	57	47
28/07/2016 06:25	05:00.0	52	69	52	45
28/07/2016 06:30	05:00.0	55	71	55	47
28/07/2016 06:35	05:00.0	55	70	56	48
28/07/2016 06:40	05:00.0	57	72	59	48
28/07/2016 06:45	05:00.0	57	69	60	50
28/07/2016 06:50	05:00.0	61	74	65	48
28/07/2016 06:55	05:00.0	59	75	63	47
28/07/2016 07:00	05:00.0	59	72	62	47
28/07/2016 07:05	05:00.0	58	75	61	46
28/07/2016 07:10	05:00.0	59	76	62	46
28/07/2016 07:15	05:00.0	61	74	66	46
28/07/2016 07:20	05:00.0	58	73	63	44

Start	Valid Time	$L_{Aeq,5min}$ (dB)	L_{AFmax} (dB)	$L_{A10,5min}$ (dB)	$L_{A90,5min}$ (dB)
28/07/2016 07:25	05:00.0	59	76	61	42
28/07/2016 07:30	05:00.0	61	75	66	41
28/07/2016 07:35	05:00.0	61	75	66	44
28/07/2016 07:40	05:00.0	61	73	66	45
28/07/2016 07:45	05:00.0	59	72	64	44
28/07/2016 07:50	05:00.0	60	73	65	46
28/07/2016 07:55	05:00.0	61	77	66	48
28/07/2016 08:00	05:00.0	59	71	64	44
28/07/2016 08:05	05:00.0	62	73	67	45
28/07/2016 08:10	05:00.0	61	73	66	46
28/07/2016 08:15	05:00.0	62	75	67	44
28/07/2016 08:20	05:00.0	58	71	63	42
28/07/2016 08:25	05:00.0	60	75	65	42
28/07/2016 08:30	05:00.0	59	74	64	46
28/07/2016 08:35	05:00.0	58	70	63	43
28/07/2016 08:40	05:00.0	61	74	67	44
28/07/2016 08:45	05:00.0	59	75	62	42
28/07/2016 08:50	05:00.0	64	80	67	46
28/07/2016 08:55	05:00.0	59	74	63	45
28/07/2016 09:00	05:00.0	59	72	63	44
28/07/2016 09:05	05:00.0	60	71	65	42
28/07/2016 09:10	05:00.0	57	70	61	44
28/07/2016 09:15	05:00.0	59	74	63	45
28/07/2016 09:20	05:00.0	61	78	65	44
28/07/2016 09:25	05:00.0	59	72	63	42
28/07/2016 09:30	05:00.0	58	71	62	44
28/07/2016 09:35	05:00.0	61	78	64	45
28/07/2016 09:40	05:00.0	60	75	64	48
28/07/2016 09:45	05:00.0	59	70	63	47
28/07/2016 09:50	05:00.0	60	71	65	48
28/07/2016 09:55	05:00.0	62	79	66	48
28/07/2016 10:00	05:00.0	61	76	66	47
28/07/2016 10:05	05:00.0	61	71	66	49
28/07/2016 10:10	05:00.0	61	77	65	49
28/07/2016 10:15	05:00.0	59	72	64	47
28/07/2016 10:20	05:00.0	58	72	62	46
28/07/2016 10:25	05:00.0	62	79	64	48
28/07/2016 10:30	05:00.0	60	73	65	47
28/07/2016 10:35	05:00.0	58	75	62	46
28/07/2016 10:40	05:00.0	60	74	64	48
28/07/2016 10:45	05:00.0	57	71	61	46
28/07/2016 10:50	05:00.0	60	69	65	49
28/07/2016 10:55	05:00.0	60	70	64	49
28/07/2016 11:00	05:00.0	60	71	65	48
28/07/2016 11:05	05:00.0	59	71	65	48
28/07/2016 11:10	05:00.0	60	79	62	46
28/07/2016 11:15	05:00.0	59	70	63	49
28/07/2016 11:20	05:00.0	59	71	64	47
28/07/2016 11:25	05:00.0	60	70	65	49
28/07/2016 11:30	05:00.0	60	71	64	49
28/07/2016 11:35	05:00.0	59	71	63	48
28/07/2016 11:40	05:00.0	59	73	64	49
28/07/2016 11:45	05:00.0	60	73	64	50
28/07/2016 11:50	05:00.0	59	73	64	47
28/07/2016 11:55	05:00.0	64	81	67	50
28/07/2016 12:00	05:00.0	60	72	64	47
28/07/2016 12:05	05:00.0	60	76	64	50
28/07/2016 12:10	05:00.0	59	73	63	48
28/07/2016 12:15	05:00.0	59	70	63	50
28/07/2016 12:20	05:00.0	59	70	63	49

Start	Valid Time	$L_{Aeq,5min}$ (dB)	L_{AFmax} (dB)	$L_{A10,5min}$ (dB)	$L_{A90,5min}$ (dB)
28/07/2016 12:25	05:00.0	63	84	66	50
28/07/2016 12:30	05:00.0	61	74	65	50
28/07/2016 12:35	05:00.0	60	72	64	50
28/07/2016 12:40	05:00.0	60	71	64	52
28/07/2016 12:45	05:00.0	60	70	65	49
28/07/2016 12:50	05:00.0	59	70	63	51
28/07/2016 12:55	05:00.0	59	70	63	50
28/07/2016 13:00	05:00.0	61	70	65	51
28/07/2016 13:05	05:00.0	60	74	64	52
28/07/2016 13:10	05:00.0	61	76	65	51
28/07/2016 13:15	05:00.0	61	78	64	52
28/07/2016 13:20	05:00.0	59	73	64	50
28/07/2016 13:25	05:00.0	59	71	63	50
28/07/2016 13:30	05:00.0	61	72	65	51
28/07/2016 13:35	05:00.0	62	77	65	51
28/07/2016 13:40	05:00.0	61	73	66	51
28/07/2016 13:45	05:00.0	59	73	63	48
28/07/2016 13:50	05:00.0	61	82	64	49
28/07/2016 13:55	05:00.0	59	71	63	49
28/07/2016 14:00	05:00.0	59	74	63	50
28/07/2016 14:05	05:00.0	58	82	61	49
28/07/2016 14:10	05:00.0	65	88	66	51
28/07/2016 14:15	05:00.0	59	71	64	50
28/07/2016 14:20	05:00.0	62	75	65	52
28/07/2016 14:25	05:00.0	60	75	64	50
28/07/2016 14:30	05:00.0	60	70	64	51
28/07/2016 14:35	05:00.0	58	69	63	48
28/07/2016 14:40	05:00.0	61	74	65	48
28/07/2016 14:45	05:00.0	60	72	64	51
28/07/2016 14:50	05:00.0	59	71	63	49
28/07/2016 14:55	05:00.0	62	71	67	50
28/07/2016 15:00	05:00.0	62	73	67	50
28/07/2016 15:05	05:00.0	62	73	66	51
28/07/2016 15:10	05:00.0	62	72	67	52
28/07/2016 15:15	05:00.0	61	76	64	51
28/07/2016 15:20	05:00.0	61	74	65	49
28/07/2016 15:25	05:00.0	61	74	65	49
28/07/2016 15:30	05:00.0	62	75	66	49
28/07/2016 15:35	05:00.0	69	90	68	49
28/07/2016 15:40	05:00.0	63	75	67	51
28/07/2016 15:45	05:00.0	61	73	65	50
28/07/2016 15:50	05:00.0	61	72	66	51
28/07/2016 15:55	05:00.0	63	73	68	50
28/07/2016 16:00	05:00.0	64	79	68	51
28/07/2016 16:05	05:00.0	64	75	68	50
28/07/2016 16:10	05:00.0	63	75	67	48
28/07/2016 16:15	05:00.0	64	77	68	51
28/07/2016 16:20	05:00.0	63	73	67	51
28/07/2016 16:25	05:00.0	62	73	67	51
28/07/2016 16:30	05:00.0	63	73	67	52
28/07/2016 16:35	05:00.0	63	72	68	52
28/07/2016 16:40	05:00.0	63	73	68	51
28/07/2016 16:45	05:00.0	60	71	64	49
28/07/2016 16:50	05:00.0	61	84	65	50
28/07/2016 16:55	05:00.0	62	73	66	50
28/07/2016 17:00	05:00.0	63	73	67	51
28/07/2016 17:05	05:00.0	62	72	67	50
28/07/2016 17:10	05:00.0	65	84	68	53
28/07/2016 17:15	05:00.0	63	81	68	50
28/07/2016 17:20	05:00.0	63	72	67	51

Start	Valid Time	$L_{Aeq,5min}$ (dB)	L_{AFmax} (dB)	$L_{A10,5min}$ (dB)	$L_{A90,5min}$ (dB)
28/07/2016 17:25	05:00.0	63	74	68	50
28/07/2016 17:30	05:00.0	63	75	68	51
28/07/2016 17:35	05:00.0	63	72	68	50
28/07/2016 17:40	05:00.0	62	75	67	50
28/07/2016 17:45	05:00.0	63	73	67	52
28/07/2016 17:50	05:00.0	64	73	68	51
28/07/2016 17:55	05:00.0	64	84	67	50
28/07/2016 18:00	05:00.0	64	75	68	50
28/07/2016 18:05	05:00.0	64	82	68	50
28/07/2016 18:10	05:00.0	62	75	66	49
28/07/2016 18:15	05:00.0	62	75	66	51
28/07/2016 18:20	05:00.0	60	76	65	49
28/07/2016 18:25	05:00.0	61	74	66	49
28/07/2016 18:30	05:00.0	63	86	65	47
28/07/2016 18:35	05:00.0	60	75	65	47
28/07/2016 18:40	05:00.0	62	73	67	48
28/07/2016 18:45	05:00.0	61	81	64	48
28/07/2016 18:50	05:00.0	59	72	63	47
28/07/2016 18:55	05:00.0	59	73	64	48
28/07/2016 19:00	05:00.0	60	75	64	49
28/07/2016 19:05	05:00.0	61	72	66	51
28/07/2016 19:10	05:00.0	61	73	65	50
28/07/2016 19:15	05:00.0	59	73	64	48
28/07/2016 19:20	05:00.0	58	71	62	49
28/07/2016 19:25	05:00.0	57	70	61	48
28/07/2016 19:30	05:00.0	59	73	62	49
28/07/2016 19:35	05:00.0	57	76	58	46
28/07/2016 19:40	05:00.0	59	75	63	47
28/07/2016 19:45	05:00.0	55	68	59	46
28/07/2016 19:50	05:00.0	60	75	65	47
28/07/2016 19:55	05:00.0	57	69	61	46
28/07/2016 20:00	05:00.0	59	74	62	47
28/07/2016 20:05	05:00.0	58	73	62	47
28/07/2016 20:10	05:00.0	58	71	61	47
28/07/2016 20:15	05:00.0	58	76	60	48
28/07/2016 20:20	05:00.0	57	75	60	46
28/07/2016 20:25	05:00.0	58	71	62	46
28/07/2016 20:30	05:00.0	55	69	57	46
28/07/2016 20:35	05:00.0	52	65	55	45
28/07/2016 20:40	05:00.0	58	73	60	46
28/07/2016 20:45	05:00.0	59	75	62	46
28/07/2016 20:50	05:00.0	56	73	58	47
28/07/2016 20:55	05:00.0	56	70	60	46
28/07/2016 21:00	05:00.0	57	74	60	46
28/07/2016 21:05	05:00.0	54	69	56	44
28/07/2016 21:10	05:00.0	59	71	64	45
28/07/2016 21:15	05:00.0	57	70	62	44
28/07/2016 21:20	05:00.0	57	70	59	45
28/07/2016 21:25	05:00.0	56	72	57	42
28/07/2016 21:30	05:00.0	56	73	59	43
28/07/2016 21:35	05:00.0	52	73	49	41
28/07/2016 21:40	05:00.0	58	75	59	42
28/07/2016 21:45	05:00.0	60	74	63	44
28/07/2016 21:50	05:00.0	48	69	49	42
28/07/2016 21:55	05:00.0	56	73	58	43
28/07/2016 22:00	05:00.0	55	70	57	42
28/07/2016 22:05	05:00.0	58	77	60	42
28/07/2016 22:10	05:00.0	59	76	61	43
28/07/2016 22:15	05:00.0	56	73	58	41
28/07/2016 22:20	05:00.0	55	73	58	42

Start	Valid Time	$L_{Aeq,5min}$ (dB)	L_{AFmax} (dB)	$L_{A10,5min}$ (dB)	$L_{A90,5min}$ (dB)
28/07/2016 22:25	05:00.0	57	80	57	41
28/07/2016 22:30	05:00.0	54	71	56	41
28/07/2016 22:35	05:00.0	53	68	55	41
28/07/2016 22:40	05:00.0	44	63	46	40
28/07/2016 22:45	05:00.0	57	74	59	42
28/07/2016 22:50	05:00.0	56	73	56	42
28/07/2016 22:55	05:00.0	53	71	54	42
28/07/2016 23:00	05:00.0	57	73	61	44
28/07/2016 23:05	05:00.0	56	69	61	42
28/07/2016 23:10	05:00.0	54	71	55	42
28/07/2016 23:15	05:00.0	53	70	51	42
28/07/2016 23:20	05:00.0	48	65	47	41
28/07/2016 23:25	05:00.0	56	74	49	40
28/07/2016 23:30	05:00.0	53	70	54	40
28/07/2016 23:35	05:00.0	59	81	54	40
28/07/2016 23:40	05:00.0	54	76	48	42
28/07/2016 23:45	05:00.0	48	65	47	41
28/07/2016 23:50	05:00.0	50	69	47	40
28/07/2016 23:55	05:00.0	48	66	46	39
29/07/2016 00:00	05:00.0	49	68	43	38
29/07/2016 00:05	05:00.0	57	79	50	38
29/07/2016 00:10	05:00.0	50	68	47	39
29/07/2016 00:15	05:00.0	41	50	44	38
29/07/2016 00:20	05:00.0	54	74	48	39
29/07/2016 00:25	05:00.0	51	70	47	40
29/07/2016 00:30	05:00.0	50	69	48	41
29/07/2016 00:35	05:00.0	58	81	48	39
29/07/2016 00:40	05:00.0	39	47	41	37
29/07/2016 00:45	05:00.0	47	63	47	36
29/07/2016 00:50	05:00.0	49	64	52	37
29/07/2016 00:55	05:00.0	53	74	48	36
29/07/2016 01:00	05:00.0	52	69	43	35
29/07/2016 01:05	05:00.0	37	49	37	36
29/07/2016 01:10	05:00.0	38	44	40	36
29/07/2016 01:15	05:00.0	41	54	41	37
29/07/2016 01:20	05:00.0	39	52	39	36
29/07/2016 01:25	05:00.0	37	43	38	36
29/07/2016 01:30	05:00.0	49	69	48	35
29/07/2016 01:35	05:00.0	44	62	43	36
29/07/2016 01:40	05:00.0	52	74	45	36
29/07/2016 01:45	05:00.0	53	72	48	37
29/07/2016 01:50	05:00.0	43	63	42	38
29/07/2016 01:55	05:00.0	45	59	47	38
29/07/2016 02:00	05:00.0	38	45	39	36
29/07/2016 02:05	05:00.0	40	58	40	36
29/07/2016 02:10	05:00.0	39	54	39	36
29/07/2016 02:15	05:00.0	47	65	46	36
29/07/2016 02:20	05:00.0	51	66	55	35
29/07/2016 02:25	05:00.0	37	43	38	36
29/07/2016 02:30	05:00.0	37	44	39	36
29/07/2016 02:35	05:00.0	38	46	39	36
29/07/2016 02:40	05:00.0	37	44	39	33
29/07/2016 02:45	05:00.0	52	70	48	35
29/07/2016 02:50	05:00.0	37	45	38	36
29/07/2016 02:55	05:00.0	51	72	40	35
29/07/2016 03:00	05:00.0	52	70	45	36
29/07/2016 03:05	05:00.0	39	46	40	37
29/07/2016 03:10	05:00.0	38	48	40	35
29/07/2016 03:15	05:00.0	41	56	42	37
29/07/2016 03:20	05:00.0	36	48	38	35

Start	Valid Time	$L_{Aeq,5min}$ (dB)	L_{AFmax} (dB)	$L_{A10,5min}$ (dB)	$L_{A90,5min}$ (dB)
29/07/2016 03:25	05:00.0	38	48	41	35
29/07/2016 03:30	05:00.0	39	53	42	36
29/07/2016 03:35	05:00.0	42	59	45	35
29/07/2016 03:40	05:00.0	37	57	38	35
29/07/2016 03:45	05:00.0	39	54	38	35
29/07/2016 03:50	05:00.0	35	38	37	34
29/07/2016 03:55	05:00.0	49	69	41	35
29/07/2016 04:00	05:00.0	43	67	42	35
29/07/2016 04:05	05:00.0	45	61	49	35
29/07/2016 04:10	05:00.0	44	58	48	37
29/07/2016 04:15	05:00.0	45	60	49	37
29/07/2016 04:20	05:00.0	44	55	47	38
29/07/2016 04:25	05:00.0	44	61	47	37
29/07/2016 04:30	05:00.0	45	60	49	37
29/07/2016 04:35	05:00.0	49	64	52	42
29/07/2016 04:40	05:00.0	58	75	60	43
29/07/2016 04:45	05:00.0	56	70	58	42
29/07/2016 04:50	05:00.0	56	75	57	41
29/07/2016 04:55	05:00.0	48	64	50	39
29/07/2016 05:00	05:00.0	54	74	53	39
29/07/2016 05:05	05:00.0	49	66	52	39
29/07/2016 05:10	05:00.0	58	76	59	42
29/07/2016 05:15	05:00.0	54	69	59	41
29/07/2016 05:20	05:00.0	52	70	50	41
29/07/2016 05:25	05:00.0	49	63	52	43
29/07/2016 05:30	05:00.0	56	74	55	41
29/07/2016 05:35	05:00.0	54	70	51	42
29/07/2016 05:40	05:00.0	53	71	56	43
29/07/2016 05:45	05:00.0	56	71	59	43
29/07/2016 05:50	05:00.0	58	78	57	43
29/07/2016 05:55	05:00.0	55	72	57	43
29/07/2016 06:00	05:00.0	51	68	52	42
29/07/2016 06:05	05:00.0	56	72	56	44
29/07/2016 06:10	05:00.0	55	73	55	43
29/07/2016 06:15	05:00.0	56	72	59	43
29/07/2016 06:20	05:00.0	56	74	57	43
29/07/2016 06:25	05:00.0	54	68	55	43
29/07/2016 06:30	05:00.0	58	73	61	44
29/07/2016 06:35	05:00.0	54	69	53	45
29/07/2016 06:40	05:00.0	54	71	55	44
29/07/2016 06:45	05:00.0	59	73	62	46
29/07/2016 06:50	05:00.0	56	71	58	44
29/07/2016 06:55	05:00.0	58	71	62	45
29/07/2016 07:00	05:00.0	57	73	58	44
29/07/2016 07:05	05:00.0	58	73	62	45
29/07/2016 07:10	05:00.0	61	74	67	44
29/07/2016 07:15	05:00.0	58	75	59	44
29/07/2016 07:20	05:00.0	56	71	58	45
29/07/2016 07:25	05:00.0	61	74	65	44
29/07/2016 07:30	05:00.0	59	73	63	44
29/07/2016 07:35	05:00.0	62	76	67	44
29/07/2016 07:40	05:00.0	63	78	66	44
29/07/2016 07:45	05:00.0	60	77	64	44
29/07/2016 07:50	05:00.0	59	72	63	45
29/07/2016 07:55	05:00.0	59	71	65	46
29/07/2016 08:00	05:00.0	58	72	62	47
29/07/2016 08:05	05:00.0	62	80	64	50
29/07/2016 08:10	05:00.0	63	73	67	47
29/07/2016 08:15	05:00.0	59	71	63	47
29/07/2016 08:20	05:00.0	61	77	65	47

Start	Valid Time	$L_{Aeq,5min}$ (dB)	L_{AFmax} (dB)	$L_{A10,5min}$ (dB)	$L_{A90,5min}$ (dB)
29/07/2016 08:25	05:00.0	58	70	62	46
29/07/2016 08:30	05:00.0	59	72	63	45
29/07/2016 08:35	05:00.0	62	80	66	45
29/07/2016 08:40	05:00.0	62	76	66	47
29/07/2016 08:45	05:00.0	60	70	65	45
29/07/2016 08:50	05:00.0	61	74	66	48
29/07/2016 08:55	05:00.0	61	73	66	49
29/07/2016 09:00	05:00.0	61	73	66	48
29/07/2016 09:05	05:00.0	59	71	64	48
29/07/2016 09:10	05:00.0	61	73	65	49
29/07/2016 09:15	05:00.0	59	72	64	48
29/07/2016 09:20	05:00.0	65	84	66	49
29/07/2016 09:25	05:00.0	61	79	65	48
29/07/2016 09:30	05:00.0	63	77	67	49
29/07/2016 09:35	05:00.0	58	71	62	48
29/07/2016 09:40	05:00.0	63	79	66	49
29/07/2016 09:45	05:00.0	61	73	65	49
29/07/2016 09:50	05:00.0	60	72	64	50
29/07/2016 09:55	05:00.0	60	73	64	50
29/07/2016 10:00	05:00.0	59	72	63	48
29/07/2016 10:05	05:00.0	61	73	66	49
29/07/2016 10:10	05:00.0	59	73	64	49
29/07/2016 10:15	05:00.0	65	85	65	49
29/07/2016 10:20	05:00.0	62	74	67	47
29/07/2016 10:25	05:00.0	61	71	65	48
29/07/2016 10:30	05:00.0	59	72	63	49
29/07/2016 10:35	05:00.0	59	70	64	48
29/07/2016 10:40	05:00.0	65	79	67	50
29/07/2016 10:45	05:00.0	61	77	65	51
29/07/2016 10:50	05:00.0	59	73	64	47
29/07/2016 10:55	05:00.0	59	72	63	49
29/07/2016 11:00	05:00.0	62	74	66	55
29/07/2016 11:05	05:00.0	61	76	65	55
29/07/2016 11:10	05:00.0	60	71	64	54
29/07/2016 11:15	05:00.0	63	79	65	54
29/07/2016 11:20	05:00.0	62	73	66	54
29/07/2016 11:25	05:00.0	62	71	66	54
29/07/2016 11:30	05:00.0	60	73	64	53
29/07/2016 11:35	05:00.0	62	72	67	54
29/07/2016 11:40	05:00.0	63	78	67	52
29/07/2016 11:45	05:00.0	60	74	65	49
29/07/2016 11:50	05:00.0	58	69	63	48
29/07/2016 11:55	05:00.0	62	80	66	49
29/07/2016 12:00	05:00.0	59	70	63	50
29/07/2016 12:05	05:00.0	60	73	65	49
29/07/2016 12:10	05:00.0	60	72	65	47
29/07/2016 12:15	05:00.0	60	71	65	50
29/07/2016 12:20	05:00.0	66	85	67	49
29/07/2016 12:25	05:00.0	63	83	65	47
29/07/2016 12:30	05:00.0	60	71	64	49
29/07/2016 12:35	05:00.0	62	78	65	52
29/07/2016 12:40	05:00.0	64	72	68	52
29/07/2016 12:45	05:00.0	64	81	67	58
29/07/2016 12:50	05:00.0	62	72	66	57
29/07/2016 12:55	05:00.0	63	75	67	59
29/07/2016 13:00	05:00.0	64	74	67	60
29/07/2016 13:05	05:00.0	64	72	68	60
29/07/2016 13:10	05:00.0	63	74	66	59
29/07/2016 13:15	05:00.0	64	82	67	59
29/07/2016 13:20	05:00.0	63	74	66	59

Start	Valid Time	$L_{Aeq,5min}$ (dB)	L_{AFmax} (dB)	$L_{A10,5min}$ (dB)	$L_{A90,5min}$ (dB)
29/07/2016 13:25	05:00.0	66	84	68	58
29/07/2016 13:30	05:00.0	64	79	67	57
29/07/2016 13:35	05:00.0	66	85	67	58
29/07/2016 13:40	05:00.0	65	79	68	58
29/07/2016 13:45	05:00.0	64	80	68	57
29/07/2016 13:50	05:00.0	62	76	66	51
29/07/2016 13:55	05:00.0	61	75	64	51
29/07/2016 14:00	05:00.0	62	79	65	52

Sound Level Survey Record

Location			LT2 - Rear of Building, Railway Station			
Purpose of Monitoring			Baseline			
Relevant Guidance / Standard			BS 7445-1:2003 / BS 7445-2:1991 / BS 4142:2014 / BS 8233:2014			
Sound Measurement System						
RPS ID	Manufacturer / Model		Serial Number	Last Lab Verification	Filename	Memory Card ID
100	RION NA-28		1291243	06/08/2014	1	
Microphone Height	Measurement Interval	Dynamic Range	Time Weighting	Frequency Weighting	Façade / Freefield	Photo?
1.2 m	100 ms	20 - 110	Fast	A	Freefield	x

		START		END	
Personnel		JA		JA	
Date / time		27/07/2016 11:20		27/07/2016 14:15	
Calibrator	RPS ID	14		33	
	Manufacturer / Model	RION NC-74		RION NC-74	
	Serial Number	110118		34472822	
	Date last verification	01/04/2016		19/10/2015	
	Reference level	94.0		94.0	
	Meter reading	94.0		93.9	
Weather	Wind speed (m/s) & dir'n 1	1.5	SE	3.7	S
	Wind speed (m/s) & dir'n 2	0.9	SE	2.5	S
	Wind speed (m/s) & dir'n 3	0.8	SE	2.5	S
	Wind speed (m/s) & dir'n Av.	1.1	SE	2.9	S
	Cloud cover (100%= 8 oktas)	8		2	
	Temperature (degrees Celsius)	20		25.5	
	Relative Humidity (%)	-		56	
	Subjective description / additional details				

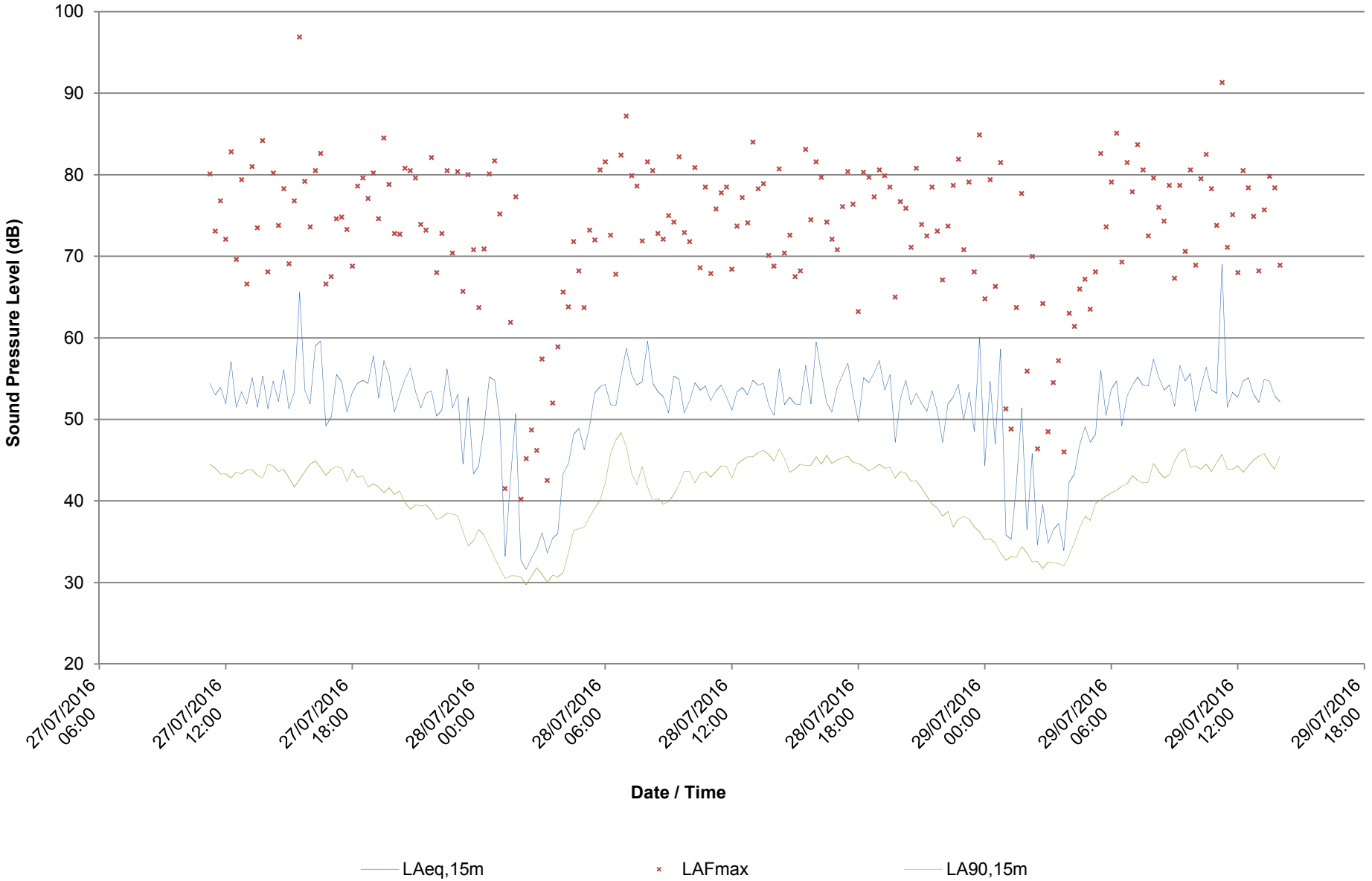
Photographs of Measurement Location





Description of site (location of equipment, general surroundings, nature of ground between NSR and sound source(s) (hard/ soft ground, topography, intervening features, reflecting surfaces))
Approximately 3m from northern boundary, 5.5m from railway platform edge, 15 m from rear facade. Hard ground to noise sources
Description of sound environment at start of survey (principal environmental and natural sound sources, which sources are dominant, character of the sound environment cf. to the character of the new source)
Passing trains, train announcements, road, seagulls, wind
Description of sound environment at end of survey (principal environmental and natural sound sources, which sources are dominant, character of the sound environment cf. to the character of the new source)
Train movements, train announcements and jingle, aircraft, train crossing alarm, hammering, car alarm distant saw, seagulls, wind

LT2 - Time History



Start	Valid Time	$L_{Aeq,5min}$ (dB)	L_{AFmax} (dB)	$L_{A10,5min}$ (dB)	$L_{A90,5min}$ (dB)
27/07/2016 11:20	05:00.0	55	80	52	44
27/07/2016 11:25	05:00.0	54	72	52	44
27/07/2016 11:30	05:00.0	53	73	54	44
27/07/2016 11:35	05:00.0	55	73	55	46
27/07/2016 11:40	05:00.0	48	63	50	44
27/07/2016 11:45	05:00.0	55	77	48	43
27/07/2016 11:50	05:00.0	46	55	49	44
27/07/2016 11:55	05:00.0	56	74	50	44
27/07/2016 12:00	05:00.0	54	66	58	43
27/07/2016 12:05	05:00.0	48	63	51	43
27/07/2016 12:10	05:00.0	52	72	54	44
27/07/2016 12:15	05:00.0	58	83	56	43
27/07/2016 12:20	05:00.0	59	80	47	43
27/07/2016 12:25	05:00.0	52	67	55	43
27/07/2016 12:30	05:00.0	47	59	49	43
27/07/2016 12:35	05:00.0	54	70	56	44
27/07/2016 12:40	05:00.0	51	69	52	44
27/07/2016 12:45	05:00.0	56	79	51	43
27/07/2016 12:50	05:00.0	46	61	48	43
27/07/2016 12:55	05:00.0	53	70	51	44
27/07/2016 13:00	05:00.0	47	62	49	43
27/07/2016 13:05	05:00.0	55	67	59	46
27/07/2016 13:10	05:00.0	49	65	51	44
27/07/2016 13:15	05:00.0	55	71	57	44
27/07/2016 13:20	05:00.0	57	81	52	44
27/07/2016 13:25	05:00.0	53	67	56	44
27/07/2016 13:30	05:00.0	48	61	50	44
27/07/2016 13:35	05:00.0	47	63	51	43
27/07/2016 13:40	05:00.0	55	74	57	45
27/07/2016 13:45	05:00.0	59	84	50	43
27/07/2016 13:50	05:00.0	45	52	48	42
27/07/2016 13:55	05:00.0	54	73	52	43
27/07/2016 14:00	05:00.0	52	67	55	45
27/07/2016 14:05	05:00.0	52	68	55	45
27/07/2016 14:10	05:00.0	49	66	52	44
27/07/2016 14:15	05:00.0	52	66	55	46
27/07/2016 14:20	05:00.0	56	80	51	44
27/07/2016 14:25	05:00.0	55	72	53	44
27/07/2016 14:30	05:00.0	47	58	49	44
27/07/2016 14:35	05:00.0	49	64	54	44
27/07/2016 14:40	05:00.0	56	74	56	43
27/07/2016 14:45	05:00.0	55	66	59	44
27/07/2016 14:50	05:00.0	57	78	58	44
27/07/2016 14:55	05:00.0	56	75	54	44
27/07/2016 15:00	05:00.0	54	67	58	43
27/07/2016 15:05	05:00.0	51	69	54	43
27/07/2016 15:10	05:00.0	46	59	48	43
27/07/2016 15:15	05:00.0	57	77	59	44
27/07/2016 15:20	05:00.0	46	63	46	42
27/07/2016 15:25	05:00.0	49	66	53	41
27/07/2016 15:30	05:00.0	70	97	56	44
27/07/2016 15:35	05:00.0	55	72	56	44
27/07/2016 15:40	05:00.0	47	63	49	42
27/07/2016 15:45	05:00.0	46	60	49	43
27/07/2016 15:50	05:00.0	55	79	52	43
27/07/2016 15:55	05:00.0	55	72	54	45
27/07/2016 16:00	05:00.0	53	74	53	45
27/07/2016 16:05	05:00.0	51	65	54	44
27/07/2016 16:10	05:00.0	52	68	55	45
27/07/2016 16:15	05:00.0	59	81	62	45

Start	Valid Time	$L_{Aeq,5min}$ (dB)	L_{AFmax} (dB)	$L_{A10,5min}$ (dB)	$L_{A90,5min}$ (dB)
27/07/2016 16:20	05:00.0	61	78	61	46
27/07/2016 16:25	05:00.0	53	71	54	44
27/07/2016 16:30	05:00.0	63	83	60	46
27/07/2016 16:35	05:00.0	55	78	56	44
27/07/2016 16:40	05:00.0	57	80	55	43
27/07/2016 16:45	05:00.0	46	56	48	43
27/07/2016 16:50	05:00.0	48	61	51	44
27/07/2016 16:55	05:00.0	52	67	53	43
27/07/2016 17:00	05:00.0	48	61	51	44
27/07/2016 17:05	05:00.0	49	63	53	44
27/07/2016 17:10	05:00.0	52	68	55	44
27/07/2016 17:15	05:00.0	56	75	59	46
27/07/2016 17:20	05:00.0	56	70	58	45
27/07/2016 17:25	05:00.0	54	70	53	44
27/07/2016 17:30	05:00.0	50	63	54	44
27/07/2016 17:35	05:00.0	58	75	60	45
27/07/2016 17:40	05:00.0	51	68	54	43
27/07/2016 17:45	05:00.0	46	65	48	43
27/07/2016 17:50	05:00.0	54	73	50	43
27/07/2016 17:55	05:00.0	48	61	51	42
27/07/2016 18:00	05:00.0	53	69	55	44
27/07/2016 18:05	05:00.0	49	63	53	44
27/07/2016 18:10	05:00.0	56	68	60	44
27/07/2016 18:15	05:00.0	52	69	55	43
27/07/2016 18:20	05:00.0	58	79	55	44
27/07/2016 18:25	05:00.0	50	69	51	43
27/07/2016 18:30	05:00.0	47	58	49	42
27/07/2016 18:35	05:00.0	57	71	60	44
27/07/2016 18:40	05:00.0	56	80	54	44
27/07/2016 18:45	05:00.0	54	68	57	44
27/07/2016 18:50	05:00.0	44	60	46	41
27/07/2016 18:55	05:00.0	57	77	59	42
27/07/2016 19:00	05:00.0	46	58	47	42
27/07/2016 19:05	05:00.0	56	80	57	42
27/07/2016 19:10	05:00.0	61	80	62	45
27/07/2016 19:15	05:00.0	50	64	54	42
27/07/2016 19:20	05:00.0	53	72	55	43
27/07/2016 19:25	05:00.0	54	75	49	41
27/07/2016 19:30	05:00.0	60	85	60	44
27/07/2016 19:35	05:00.0	57	79	60	41
27/07/2016 19:40	05:00.0	45	59	46	40
27/07/2016 19:45	05:00.0	58	78	59	42
27/07/2016 19:50	05:00.0	56	79	57	42
27/07/2016 19:55	05:00.0	44	55	46	41
27/07/2016 20:00	05:00.0	47	61	50	41
27/07/2016 20:05	05:00.0	47	63	51	41
27/07/2016 20:10	05:00.0	54	73	58	40
27/07/2016 20:15	05:00.0	53	68	55	41
27/07/2016 20:20	05:00.0	52	67	56	42
27/07/2016 20:25	05:00.0	54	73	53	41
27/07/2016 20:30	05:00.0	54	67	55	40
27/07/2016 20:35	05:00.0	52	66	55	39
27/07/2016 20:40	05:00.0	57	81	52	40
27/07/2016 20:45	05:00.0	42	50	44	39
27/07/2016 20:50	05:00.0	57	81	49	40
27/07/2016 20:55	05:00.0	59	76	49	39
27/07/2016 21:00	05:00.0	46	58	50	39
27/07/2016 21:05	05:00.0	50	65	54	40
27/07/2016 21:10	05:00.0	57	80	57	43
27/07/2016 21:15	05:00.0	50	67	53	40

Start	Valid Time	$L_{Aeq,5min}$ (dB)	L_{AFmax} (dB)	$L_{A10,5min}$ (dB)	$L_{A90,5min}$ (dB)
27/07/2016 21:20	05:00.0	48	66	51	40
27/07/2016 21:25	05:00.0	54	74	49	39
27/07/2016 21:30	05:00.0	47	61	51	39
27/07/2016 21:35	05:00.0	57	73	60	40
27/07/2016 21:40	05:00.0	44	55	46	40
27/07/2016 21:45	05:00.0	57	82	54	40
27/07/2016 21:50	05:00.0	49	65	53	39
27/07/2016 21:55	05:00.0	46	58	50	38
27/07/2016 22:00	05:00.0	55	68	60	38
27/07/2016 22:05	05:00.0	44	63	44	38
27/07/2016 22:10	05:00.0	40	49	43	38
27/07/2016 22:15	05:00.0	44	60	45	38
27/07/2016 22:20	05:00.0	50	67	54	38
27/07/2016 22:25	05:00.0	54	73	51	39
27/07/2016 22:30	05:00.0	44	60	45	38
27/07/2016 22:35	05:00.0	57	79	57	40
27/07/2016 22:40	05:00.0	59	81	45	38
27/07/2016 22:45	05:00.0	40	46	42	38
27/07/2016 22:50	05:00.0	47	63	50	40
27/07/2016 22:55	05:00.0	56	70	59	39
27/07/2016 23:00	05:00.0	53	66	59	38
27/07/2016 23:05	05:00.0	40	46	43	38
27/07/2016 23:10	05:00.0	56	80	46	39
27/07/2016 23:15	05:00.0	42	56	46	37
27/07/2016 23:20	05:00.0	48	66	48	38
27/07/2016 23:25	05:00.0	39	48	42	36
27/07/2016 23:30	05:00.0	37	56	39	34
27/07/2016 23:35	05:00.0	38	50	41	34
27/07/2016 23:40	05:00.0	57	80	54	43
27/07/2016 23:45	05:00.0	47	71	51	35
27/07/2016 23:50	05:00.0	38	56	40	35
27/07/2016 23:55	05:00.0	39	53	42	35
28/07/2016 00:00	05:00.0	44	64	46	37
28/07/2016 00:05	05:00.0	39	45	41	36
28/07/2016 00:10	05:00.0	47	61	51	37
28/07/2016 00:15	05:00.0	53	71	50	40
28/07/2016 00:20	05:00.0	46	63	47	35
28/07/2016 00:25	05:00.0	43	63	45	36
28/07/2016 00:30	05:00.0	53	72	45	35
28/07/2016 00:35	05:00.0	49	67	45	34
28/07/2016 00:40	05:00.0	59	80	42	34
28/07/2016 00:45	05:00.0	48	66	47	34
28/07/2016 00:50	05:00.0	36	46	38	34
28/07/2016 00:55	05:00.0	59	82	40	32
28/07/2016 01:00	05:00.0	33	44	35	32
28/07/2016 01:05	05:00.0	42	64	36	32
28/07/2016 01:10	05:00.0	54	75	40	32
28/07/2016 01:15	05:00.0	34	42	36	32
28/07/2016 01:20	05:00.0	34	40	35	31
28/07/2016 01:25	05:00.0	32	37	33	30
28/07/2016 01:30	05:00.0	32	40	34	31
28/07/2016 01:35	05:00.0	39	58	36	31
28/07/2016 01:40	05:00.0	46	62	47	32
28/07/2016 01:45	05:00.0	33	44	35	31
28/07/2016 01:50	05:00.0	33	41	35	31
28/07/2016 01:55	05:00.0	55	77	38	30
28/07/2016 02:00	05:00.0	32	40	33	30
28/07/2016 02:05	05:00.0	33	39	35	32
28/07/2016 02:10	05:00.0	33	38	35	31
28/07/2016 02:15	05:00.0	32	45	34	30

Start	Valid Time	$L_{Aeq,5min}$ (dB)	L_{AFmax} (dB)	$L_{A10,5min}$ (dB)	$L_{A90,5min}$ (dB)
28/07/2016 02:20	05:00.0	31	38	32	29
28/07/2016 02:25	05:00.0	31	36	33	30
28/07/2016 02:30	05:00.0	33	42	35	31
28/07/2016 02:35	05:00.0	33	49	33	31
28/07/2016 02:40	05:00.0	33	40	34	31
28/07/2016 02:45	05:00.0	34	43	35	32
28/07/2016 02:50	05:00.0	34	39	36	32
28/07/2016 02:55	05:00.0	34	46	36	31
28/07/2016 03:00	05:00.0	39	57	42	32
28/07/2016 03:05	05:00.0	33	39	35	31
28/07/2016 03:10	05:00.0	33	40	35	31
28/07/2016 03:15	05:00.0	35	41	37	32
28/07/2016 03:20	05:00.0	34	42	37	31
28/07/2016 03:25	05:00.0	32	43	34	29
28/07/2016 03:30	05:00.0	38	52	40	31
28/07/2016 03:35	05:00.0	33	40	36	30
28/07/2016 03:40	05:00.0	34	46	36	31
28/07/2016 03:45	05:00.0	33	41	35	30
28/07/2016 03:50	05:00.0	34	42	37	31
28/07/2016 03:55	05:00.0	39	59	36	31
28/07/2016 04:00	05:00.0	36	54	39	30
28/07/2016 04:05	05:00.0	47	66	46	33
28/07/2016 04:10	05:00.0	42	65	43	32
28/07/2016 04:15	05:00.0	39	58	41	32
28/07/2016 04:20	05:00.0	47	64	50	36
28/07/2016 04:25	05:00.0	44	55	48	37
28/07/2016 04:30	05:00.0	47	61	50	39
28/07/2016 04:35	05:00.0	47	62	52	36
28/07/2016 04:40	05:00.0	50	72	47	36
28/07/2016 04:45	05:00.0	49	68	47	36
28/07/2016 04:50	05:00.0	50	65	54	37
28/07/2016 04:55	05:00.0	48	67	50	37
28/07/2016 05:00	05:00.0	44	63	48	37
28/07/2016 05:05	05:00.0	45	58	49	37
28/07/2016 05:10	05:00.0	48	64	53	37
28/07/2016 05:15	05:00.0	45	58	49	38
28/07/2016 05:20	05:00.0	52	73	49	38
28/07/2016 05:25	05:00.0	47	65	50	40
28/07/2016 05:30	05:00.0	57	72	60	39
28/07/2016 05:35	05:00.0	47	64	49	39
28/07/2016 05:40	05:00.0	48	64	50	39
28/07/2016 05:45	05:00.0	57	81	55	39
28/07/2016 05:50	05:00.0	49	71	50	41
28/07/2016 05:55	05:00.0	51	74	47	40
28/07/2016 06:00	05:00.0	50	66	54	41
28/07/2016 06:05	05:00.0	47	57	49	43
28/07/2016 06:10	05:00.0	58	82	56	46
28/07/2016 06:15	05:00.0	48	58	51	44
28/07/2016 06:20	05:00.0	55	73	56	47
28/07/2016 06:25	05:00.0	50	66	52	46
28/07/2016 06:30	05:00.0	53	68	53	47
28/07/2016 06:35	05:00.0	52	68	55	48
28/07/2016 06:40	05:00.0	50	63	51	47
28/07/2016 06:45	05:00.0	54	68	56	50
28/07/2016 06:50	05:00.0	58	82	54	49
28/07/2016 06:55	05:00.0	51	62	52	47
28/07/2016 07:00	05:00.0	57	79	56	47
28/07/2016 07:05	05:00.0	61	87	58	46
28/07/2016 07:10	05:00.0	58	79	59	46
28/07/2016 07:15	05:00.0	58	80	58	46

Start	Valid Time	$L_{Aeq,5min}$ (dB)	L_{AFmax} (dB)	$L_{A10,5min}$ (dB)	$L_{A90,5min}$ (dB)
28/07/2016 07:20	05:00.0	56	73	55	44
28/07/2016 07:25	05:00.0	46	56	49	42
28/07/2016 07:30	05:00.0	58	79	59	42
28/07/2016 07:35	05:00.0	50	65	55	42
28/07/2016 07:40	05:00.0	45	57	47	43
28/07/2016 07:45	05:00.0	49	64	53	44
28/07/2016 07:50	05:00.0	56	72	57	45
28/07/2016 07:55	05:00.0	56	69	59	45
28/07/2016 08:00	05:00.0	58	82	56	42
28/07/2016 08:05	05:00.0	63	80	63	41
28/07/2016 08:10	05:00.0	53	69	56	42
28/07/2016 08:15	05:00.0	57	81	58	41
28/07/2016 08:20	05:00.0	47	62	49	41
28/07/2016 08:25	05:00.0	54	73	48	39
28/07/2016 08:30	05:00.0	55	73	56	42
28/07/2016 08:35	05:00.0	51	72	55	41
28/07/2016 08:40	05:00.0	53	72	54	39
28/07/2016 08:45	05:00.0	57	72	61	41
28/07/2016 08:50	05:00.0	45	59	47	39
28/07/2016 08:55	05:00.0	46	63	50	40
28/07/2016 09:00	05:00.0	51	75	52	40
28/07/2016 09:05	05:00.0	51	66	55	40
28/07/2016 09:10	05:00.0	51	67	54	41
28/07/2016 09:15	05:00.0	57	73	59	45
28/07/2016 09:20	05:00.0	55	74	56	40
28/07/2016 09:25	05:00.0	54	71	53	40
28/07/2016 09:30	05:00.0	48	61	51	41
28/07/2016 09:35	05:00.0	56	72	58	43
28/07/2016 09:40	05:00.0	57	82	52	43
28/07/2016 09:45	05:00.0	46	58	49	43
28/07/2016 09:50	05:00.0	48	57	50	44
28/07/2016 09:55	05:00.0	54	73	51	45
28/07/2016 10:00	05:00.0	49	60	52	43
28/07/2016 10:05	05:00.0	49	64	52	44
28/07/2016 10:10	05:00.0	56	72	58	46
28/07/2016 10:15	05:00.0	58	81	57	43
28/07/2016 10:20	05:00.0	44	54	45	42
28/07/2016 10:25	05:00.0	52	74	56	43
28/07/2016 10:30	05:00.0	55	69	59	43
28/07/2016 10:35	05:00.0	52	64	55	43
28/07/2016 10:40	05:00.0	54	69	57	44
28/07/2016 10:45	05:00.0	56	79	53	44
28/07/2016 10:50	05:00.0	49	61	51	43
28/07/2016 10:55	05:00.0	54	71	52	45
28/07/2016 11:00	05:00.0	52	67	56	43
28/07/2016 11:05	05:00.0	52	67	55	43
28/07/2016 11:10	05:00.0	53	68	57	43
28/07/2016 11:15	05:00.0	53	65	56	44
28/07/2016 11:20	05:00.0	54	76	52	44
28/07/2016 11:25	05:00.0	54	72	49	43
28/07/2016 11:30	05:00.0	53	70	55	44
28/07/2016 11:35	05:00.0	55	78	56	46
28/07/2016 11:40	05:00.0	54	74	52	44
28/07/2016 11:45	05:00.0	47	55	49	44
28/07/2016 11:50	05:00.0	48	67	49	44
28/07/2016 11:55	05:00.0	57	79	58	45
28/07/2016 12:00	05:00.0	53	68	58	42
28/07/2016 12:05	05:00.0	51	68	51	43
28/07/2016 12:10	05:00.0	49	60	51	45
28/07/2016 12:15	05:00.0	52	70	53	45

Start	Valid Time	$L_{Aeq,5min}$ (dB)	L_{AFmax} (dB)	$L_{A10,5min}$ (dB)	$L_{A90,5min}$ (dB)
28/07/2016 12:20	05:00.0	56	74	54	44
28/07/2016 12:25	05:00.0	51	65	55	44
28/07/2016 12:30	05:00.0	50	58	52	46
28/07/2016 12:35	05:00.0	52	67	55	45
28/07/2016 12:40	05:00.0	57	77	55	45
28/07/2016 12:45	05:00.0	54	72	52	45
28/07/2016 12:50	05:00.0	48	62	50	46
28/07/2016 12:55	05:00.0	55	74	53	46
28/07/2016 13:00	05:00.0	58	84	60	45
28/07/2016 13:05	05:00.0	53	70	55	46
28/07/2016 13:10	05:00.0	50	65	53	45
28/07/2016 13:15	05:00.0	53	64	55	48
28/07/2016 13:20	05:00.0	55	78	52	46
28/07/2016 13:25	05:00.0	54	72	52	45
28/07/2016 13:30	05:00.0	56	79	54	46
28/07/2016 13:35	05:00.0	50	65	53	46
28/07/2016 13:40	05:00.0	55	69	58	47
28/07/2016 13:45	05:00.0	52	67	55	46
28/07/2016 13:50	05:00.0	48	59	50	45
28/07/2016 13:55	05:00.0	53	70	54	46
28/07/2016 14:00	05:00.0	49	61	52	45
28/07/2016 14:05	05:00.0	52	69	54	45
28/07/2016 14:10	05:00.0	50	63	53	45
28/07/2016 14:15	05:00.0	56	79	56	47
28/07/2016 14:20	05:00.0	57	81	56	47
28/07/2016 14:25	05:00.0	56	73	57	46
28/07/2016 14:30	05:00.0	49	64	50	46
28/07/2016 14:35	05:00.0	54	70	54	46
28/07/2016 14:40	05:00.0	51	66	54	45
28/07/2016 14:45	05:00.0	50	63	52	44
28/07/2016 14:50	05:00.0	53	73	56	42
28/07/2016 14:55	05:00.0	54	72	49	45
28/07/2016 15:00	05:00.0	49	60	53	44
28/07/2016 15:05	05:00.0	54	67	58	45
28/07/2016 15:10	05:00.0	51	68	54	43
28/07/2016 15:15	05:00.0	52	68	55	45
28/07/2016 15:20	05:00.0	52	66	55	45
28/07/2016 15:25	05:00.0	51	67	55	44
28/07/2016 15:30	05:00.0	54	70	54	45
28/07/2016 15:35	05:00.0	56	73	58	45
28/07/2016 15:40	05:00.0	59	83	51	44
28/07/2016 15:45	05:00.0	51	66	55	45
28/07/2016 15:50	05:00.0	55	75	52	45
28/07/2016 15:55	05:00.0	47	58	48	44
28/07/2016 16:00	05:00.0	54	67	57	47
28/07/2016 16:05	05:00.0	64	82	59	47
28/07/2016 16:10	05:00.0	51	64	55	44
28/07/2016 16:15	05:00.0	52	66	55	43
28/07/2016 16:20	05:00.0	58	80	57	46
28/07/2016 16:25	05:00.0	55	76	57	46
28/07/2016 16:30	05:00.0	49	60	51	45
28/07/2016 16:35	05:00.0	54	74	55	45
28/07/2016 16:40	05:00.0	52	69	53	46
28/07/2016 16:45	05:00.0	47	56	49	44
28/07/2016 16:50	05:00.0	47	53	48	45
28/07/2016 16:55	05:00.0	54	72	50	45
28/07/2016 17:00	05:00.0	48	62	51	45
28/07/2016 17:05	05:00.0	54	66	56	46
28/07/2016 17:10	05:00.0	56	71	58	46
28/07/2016 17:15	05:00.0	57	76	59	47

Start	Valid Time	$L_{Aeq,5min}$ (dB)	L_{AFmax} (dB)	$L_{A10,5min}$ (dB)	$L_{A90,5min}$ (dB)
28/07/2016 17:20	05:00.0	52	67	54	45
28/07/2016 17:25	05:00.0	55	73	53	45
28/07/2016 17:30	05:00.0	56	74	59	46
28/07/2016 17:35	05:00.0	55	74	55	45
28/07/2016 17:40	05:00.0	59	80	57	46
28/07/2016 17:45	05:00.0	46	55	48	45
28/07/2016 17:50	05:00.0	55	73	51	45
28/07/2016 17:55	05:00.0	54	76	56	45
28/07/2016 18:00	05:00.0	49	61	51	45
28/07/2016 18:05	05:00.0	49	63	51	45
28/07/2016 18:10	05:00.0	51	63	55	44
28/07/2016 18:15	05:00.0	53	69	55	46
28/07/2016 18:20	05:00.0	59	80	60	46
28/07/2016 18:25	05:00.0	46	57	47	43
28/07/2016 18:30	05:00.0	48	59	52	44
28/07/2016 18:35	05:00.0	59	80	61	45
28/07/2016 18:40	05:00.0	47	59	49	43
28/07/2016 18:45	05:00.0	55	76	56	44
28/07/2016 18:50	05:00.0	54	72	52	44
28/07/2016 18:55	05:00.0	57	77	60	44
28/07/2016 19:00	05:00.0	48	58	50	44
28/07/2016 19:05	05:00.0	50	63	53	45
28/07/2016 19:10	05:00.0	62	81	62	48
28/07/2016 19:15	05:00.0	47	62	49	44
28/07/2016 19:20	05:00.0	48	62	51	43
28/07/2016 19:25	05:00.0	58	80	57	45
28/07/2016 19:30	05:00.0	55	79	58	45
28/07/2016 19:35	05:00.0	57	77	55	44
28/07/2016 19:40	05:00.0	54	73	56	44
28/07/2016 19:45	05:00.0	45	53	47	43
28/07/2016 19:50	05:00.0	46	57	47	43
28/07/2016 19:55	05:00.0	50	65	53	43
28/07/2016 20:00	05:00.0	50	65	54	44
28/07/2016 20:05	05:00.0	48	63	49	44
28/07/2016 20:10	05:00.0	56	77	53	43
28/07/2016 20:15	05:00.0	51	65	55	43
28/07/2016 20:20	05:00.0	52	67	55	43
28/07/2016 20:25	05:00.0	58	76	59	43
28/07/2016 20:30	05:00.0	48	62	52	43
28/07/2016 20:35	05:00.0	56	71	59	43
28/07/2016 20:40	05:00.0	46	64	48	42
28/07/2016 20:45	05:00.0	57	81	51	43
28/07/2016 20:50	05:00.0	48	69	49	42
28/07/2016 20:55	05:00.0	46	60	48	43
28/07/2016 21:00	05:00.0	49	65	53	42
28/07/2016 21:05	05:00.0	51	66	55	42
28/07/2016 21:10	05:00.0	55	74	55	41
28/07/2016 21:15	05:00.0	50	65	54	41
28/07/2016 21:20	05:00.0	46	64	48	42
28/07/2016 21:25	05:00.0	54	73	51	40
28/07/2016 21:30	05:00.0	49	66	52	40
28/07/2016 21:35	05:00.0	54	68	59	39
28/07/2016 21:40	05:00.0	56	79	51	40
28/07/2016 21:45	05:00.0	47	59	50	39
28/07/2016 21:50	05:00.0	55	73	48	39
28/07/2016 21:55	05:00.0	44	58	47	39
28/07/2016 22:00	05:00.0	50	67	54	38
28/07/2016 22:05	05:00.0	44	63	44	38
28/07/2016 22:10	05:00.0	44	60	47	39
28/07/2016 22:15	05:00.0	51	69	52	40

Start	Valid Time	$L_{Aeq,5min}$ (dB)	L_{AFmax} (dB)	$L_{A10,5min}$ (dB)	$L_{A90,5min}$ (dB)
28/07/2016 22:20	05:00.0	47	63	50	39
28/07/2016 22:25	05:00.0	55	74	51	38
28/07/2016 22:30	05:00.0	55	79	47	37
28/07/2016 22:35	05:00.0	54	73	50	37
28/07/2016 22:40	05:00.0	43	61	41	37
28/07/2016 22:45	05:00.0	50	65	55	37
28/07/2016 22:50	05:00.0	44	60	46	38
28/07/2016 22:55	05:00.0	58	82	59	39
28/07/2016 23:00	05:00.0	53	71	46	38
28/07/2016 23:05	05:00.0	48	65	48	39
28/07/2016 23:10	05:00.0	41	53	43	38
28/07/2016 23:15	05:00.0	44	56	47	38
28/07/2016 23:20	05:00.0	58	79	50	38
28/07/2016 23:25	05:00.0	40	48	42	38
28/07/2016 23:30	05:00.0	40	49	43	36
28/07/2016 23:35	05:00.0	53	68	56	40
28/07/2016 23:40	05:00.0	42	54	45	37
28/07/2016 23:45	05:00.0	56	76	45	37
28/07/2016 23:50	05:00.0	60	82	51	37
28/07/2016 23:55	05:00.0	62	85	44	35
29/07/2016 00:00	05:00.0	42	61	43	36
29/07/2016 00:05	05:00.0	39	53	42	34
29/07/2016 00:10	05:00.0	48	65	50	37
29/07/2016 00:15	05:00.0	38	48	40	35
29/07/2016 00:20	05:00.0	55	74	54	36
29/07/2016 00:25	05:00.0	58	79	42	35
29/07/2016 00:30	05:00.0	39	51	41	36
29/07/2016 00:35	05:00.0	51	66	55	37
29/07/2016 00:40	05:00.0	40	58	43	34
29/07/2016 00:45	05:00.0	59	81	42	34
29/07/2016 00:50	05:00.0	51	78	44	34
29/07/2016 00:55	05:00.0	61	82	37	33
29/07/2016 01:00	05:00.0	37	51	38	33
29/07/2016 01:05	05:00.0	35	44	37	33
29/07/2016 01:10	05:00.0	35	48	37	33
29/07/2016 01:15	05:00.0	35	43	37	34
29/07/2016 01:20	05:00.0	36	44	37	34
29/07/2016 01:25	05:00.0	35	49	36	33
29/07/2016 01:30	05:00.0	38	54	41	33
29/07/2016 01:35	05:00.0	44	64	38	33
29/07/2016 01:40	05:00.0	43	58	45	33
29/07/2016 01:45	05:00.0	37	48	40	34
29/07/2016 01:50	05:00.0	39	57	40	34
29/07/2016 01:55	05:00.0	56	78	46	36
29/07/2016 02:00	05:00.0	36	48	38	34
29/07/2016 02:05	05:00.0	35	50	36	33
29/07/2016 02:10	05:00.0	38	56	38	34
29/07/2016 02:15	05:00.0	37	54	39	33
29/07/2016 02:20	05:00.0	50	70	53	33
29/07/2016 02:25	05:00.0	40	58	42	32
29/07/2016 02:30	05:00.0	34	44	35	32
29/07/2016 02:35	05:00.0	35	43	36	33
29/07/2016 02:40	05:00.0	35	46	37	33
29/07/2016 02:45	05:00.0	33	45	35	31
29/07/2016 02:50	05:00.0	43	64	42	33
29/07/2016 02:55	05:00.0	35	44	36	33
29/07/2016 03:00	05:00.0	35	49	37	32
29/07/2016 03:05	05:00.0	35	43	36	33
29/07/2016 03:10	05:00.0	35	41	36	32
29/07/2016 03:15	05:00.0	37	55	39	33

Start	Valid Time	$L_{Aeq,5min}$ (dB)	L_{AFmax} (dB)	$L_{A10,5min}$ (dB)	$L_{A90,5min}$ (dB)
29/07/2016 03:20	05:00.0	36	44	37	33
29/07/2016 03:25	05:00.0	37	53	37	32
29/07/2016 03:30	05:00.0	35	45	37	33
29/07/2016 03:35	05:00.0	38	51	42	33
29/07/2016 03:40	05:00.0	38	57	41	32
29/07/2016 03:45	05:00.0	34	46	36	33
29/07/2016 03:50	05:00.0	34	44	35	32
29/07/2016 03:55	05:00.0	33	41	35	32
29/07/2016 04:00	05:00.0	43	63	42	33
29/07/2016 04:05	05:00.0	36	47	38	33
29/07/2016 04:10	05:00.0	44	58	47	37
29/07/2016 04:15	05:00.0	45	61	49	35
29/07/2016 04:20	05:00.0	43	59	45	35
29/07/2016 04:25	05:00.0	43	56	46	35
29/07/2016 04:30	05:00.0	41	57	44	36
29/07/2016 04:35	05:00.0	49	66	53	39
29/07/2016 04:40	05:00.0	47	62	50	39
29/07/2016 04:45	05:00.0	49	64	52	40
29/07/2016 04:50	05:00.0	51	67	55	40
29/07/2016 04:55	05:00.0	45	62	48	37
29/07/2016 05:00	05:00.0	45	64	47	37
29/07/2016 05:05	05:00.0	49	63	53	39
29/07/2016 05:10	05:00.0	47	58	50	39
29/07/2016 05:15	05:00.0	48	60	53	40
29/07/2016 05:20	05:00.0	50	68	52	39
29/07/2016 05:25	05:00.0	47	60	50	40
29/07/2016 05:30	05:00.0	61	83	60	41
29/07/2016 05:35	05:00.0	46	61	48	40
29/07/2016 05:40	05:00.0	44	59	46	40
29/07/2016 05:45	05:00.0	54	74	57	41
29/07/2016 05:50	05:00.0	45	59	48	40
29/07/2016 05:55	05:00.0	47	60	50	41
29/07/2016 06:00	05:00.0	52	70	55	41
29/07/2016 06:05	05:00.0	46	62	49	41
29/07/2016 06:10	05:00.0	57	79	55	41
29/07/2016 06:15	05:00.0	47	64	49	41
29/07/2016 06:20	05:00.0	59	85	56	41
29/07/2016 06:25	05:00.0	46	58	49	41
29/07/2016 06:30	05:00.0	52	69	53	42
29/07/2016 06:35	05:00.0	46	63	48	41
29/07/2016 06:40	05:00.0	48	62	51	43
29/07/2016 06:45	05:00.0	52	67	55	42
29/07/2016 06:50	05:00.0	56	82	49	42
29/07/2016 06:55	05:00.0	45	54	48	42
29/07/2016 07:00	05:00.0	54	65	59	43
29/07/2016 07:05	05:00.0	53	70	56	43
29/07/2016 07:10	05:00.0	55	78	56	43
29/07/2016 07:15	05:00.0	58	84	56	44
29/07/2016 07:20	05:00.0	55	73	51	42
29/07/2016 07:25	05:00.0	45	56	47	42
29/07/2016 07:30	05:00.0	58	81	58	43
29/07/2016 07:35	05:00.0	53	73	56	43
29/07/2016 07:40	05:00.0	44	54	46	42
29/07/2016 07:45	05:00.0	51	66	54	42
29/07/2016 07:50	05:00.0	55	72	54	42
29/07/2016 07:55	05:00.0	55	73	59	43
29/07/2016 08:00	05:00.0	51	64	55	44
29/07/2016 08:05	05:00.0	61	80	58	45
29/07/2016 08:10	05:00.0	53	70	55	45
29/07/2016 08:15	05:00.0	56	75	54	43

Start	Valid Time	$L_{Aeq,5min}$ (dB)	L_{AFmax} (dB)	$L_{A10,5min}$ (dB)	$L_{A90,5min}$ (dB)
29/07/2016 08:20	05:00.0	57	76	58	46
29/07/2016 08:25	05:00.0	49	62	52	44
29/07/2016 08:30	05:00.0	47	58	50	43
29/07/2016 08:35	05:00.0	56	72	56	43
29/07/2016 08:40	05:00.0	54	74	56	44
29/07/2016 08:45	05:00.0	59	79	50	43
29/07/2016 08:50	05:00.0	46	54	48	43
29/07/2016 08:55	05:00.0	47	59	49	43
29/07/2016 09:00	05:00.0	52	64	55	46
29/07/2016 09:05	05:00.0	49	63	52	45
29/07/2016 09:10	05:00.0	53	67	56	45
29/07/2016 09:15	05:00.0	59	79	59	47
29/07/2016 09:20	05:00.0	52	69	55	46
29/07/2016 09:25	05:00.0	56	72	56	46
29/07/2016 09:30	05:00.0	55	69	58	47
29/07/2016 09:35	05:00.0	57	71	61	47
29/07/2016 09:40	05:00.0	50	65	52	46
29/07/2016 09:45	05:00.0	58	81	51	45
29/07/2016 09:50	05:00.0	50	67	51	45
29/07/2016 09:55	05:00.0	56	75	54	43
29/07/2016 10:00	05:00.0	51	64	55	44
29/07/2016 10:05	05:00.0	48	64	51	44
29/07/2016 10:10	05:00.0	53	69	56	45
29/07/2016 10:15	05:00.0	58	80	56	45
29/07/2016 10:20	05:00.0	47	69	49	44
29/07/2016 10:25	05:00.0	49	65	52	44
29/07/2016 10:30	05:00.0	55	70	59	46
29/07/2016 10:35	05:00.0	59	83	54	44
29/07/2016 10:40	05:00.0	53	70	55	44
29/07/2016 10:45	05:00.0	56	78	51	45
29/07/2016 10:50	05:00.0	46	57	48	44
29/07/2016 10:55	05:00.0	54	72	54	43
29/07/2016 11:00	05:00.0	56	74	59	46
29/07/2016 11:05	05:00.0	49	64	52	44
29/07/2016 11:10	05:00.0	52	68	54	45
29/07/2016 11:15	05:00.0	54	69	55	46
29/07/2016 11:20	05:00.0	74	91	60	46
29/07/2016 11:25	05:00.0	56	76	51	45
29/07/2016 11:30	05:00.0	51	71	55	43
29/07/2016 11:35	05:00.0	54	71	50	44
29/07/2016 11:40	05:00.0	47	58	49	44
29/07/2016 11:45	05:00.0	56	75	54	44
29/07/2016 11:50	05:00.0	47	56	50	44
29/07/2016 11:55	05:00.0	53	70	50	44
29/07/2016 12:00	05:00.0	55	68	59	45
29/07/2016 12:05	05:00.0	51	66	56	45
29/07/2016 12:10	05:00.0	51	67	55	44
29/07/2016 12:15	05:00.0	52	68	53	44
29/07/2016 12:20	05:00.0	59	81	54	44
29/07/2016 12:25	05:00.0	46	62	48	43
29/07/2016 12:30	05:00.0	50	66	54	43
29/07/2016 12:35	05:00.0	55	72	56	44
29/07/2016 12:40	05:00.0	57	78	56	46
29/07/2016 12:45	05:00.0	51	64	55	46
29/07/2016 12:50	05:00.0	47	56	50	45
29/07/2016 12:55	05:00.0	56	75	54	45
29/07/2016 13:00	05:00.0	49	61	51	46
29/07/2016 13:05	05:00.0	50	64	54	45
29/07/2016 13:10	05:00.0	55	68	58	45
29/07/2016 13:15	05:00.0	52	67	54	46

Start	Valid Time	$L_{Aeq,5min}$ (dB)	L_{AFmax} (dB)	$L_{A10,5min}$ (dB)	$L_{A90,5min}$ (dB)
29/07/2016 13:20	05:00.0	56	76	56	46
29/07/2016 13:25	05:00.0	56	74	57	46
29/07/2016 13:30	05:00.0	48	60	51	44
29/07/2016 13:35	05:00.0	58	80	56	45
29/07/2016 13:40	05:00.0	51	74	51	45
29/07/2016 13:45	05:00.0	55	78	53	44
29/07/2016 13:50	05:00.0	47	53	49	44
29/07/2016 13:55	05:00.0	53	72	52	44
29/07/2016 14:00	05:00.0	54.3	67.2	58.2	47.2
29/07/2016 14:05	05:00.0	49.4	64.7	52	45.2
29/07/2016 14:10	05:00.0	51.6	68.9	53.7	44.6
29/07/2016 14:15	05:00.0	58.9	81.3	57.6	47.1

Appendix C: Sound Insulation Survey Data

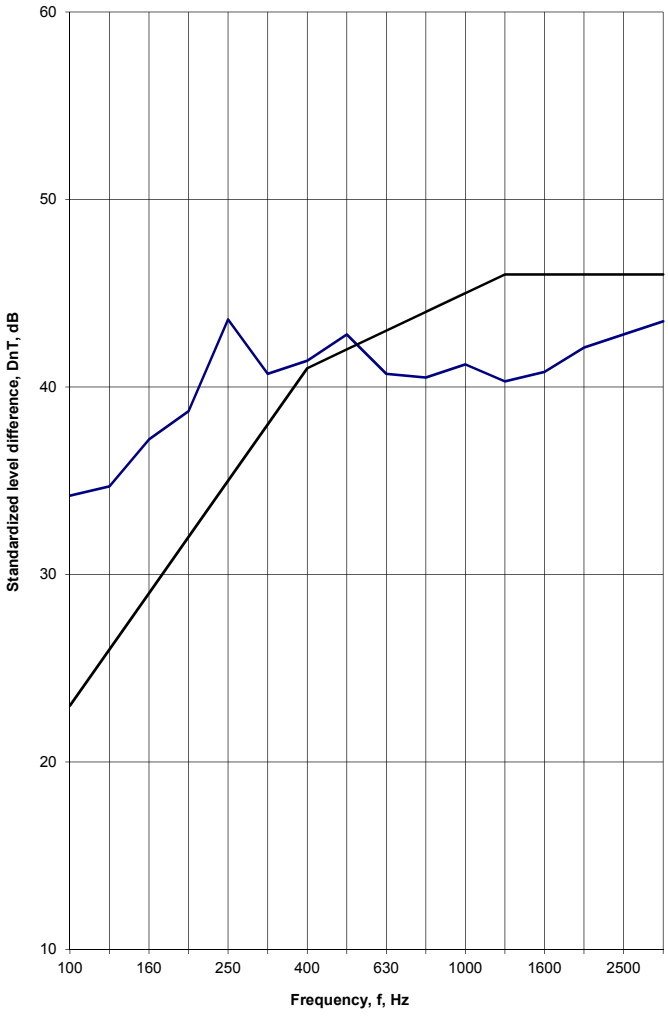
Standardized level difference according to ISO 140-4
Field Measurements of airborne sound insulation between rooms

Job No: **JAE9040** **Job Name:** **17 Ham Road**
Client: **NA** **Date of test:** 2-Sep-16

Description and identification of the building construction and test arrangement, direction of measurement: Caxton House to 17 Ham Road: Pary Wall: Construction Details Unkown

Ground Floor

Frequency f Hz	D_{nT} (one-third octave) dB
100	34.2
125	34.7
160	37.2
200	38.7
250	43.6
315	40.7
400	41.4
500	42.8
630	40.7
800	40.5
1000	41.2
1250	40.3
1600	40.8
2000	42.1
2500	42.8
3150	43.5
$D_{nT,w}$	42
Ctr	-1
C	-1
$D_{nT,w} + C_{tr}$	41



ANC Registration Number: Name of tester: Peter Barling
No. of Test Report:
Test ID: 3
Date: 2-Sep-16

RPS

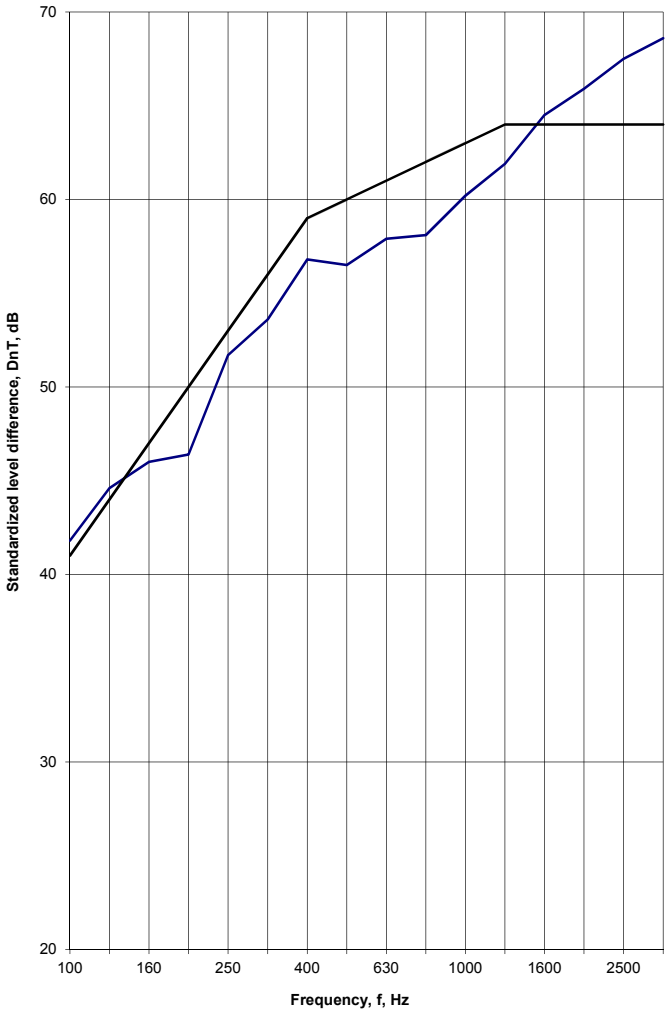
Standardized level difference according to ISO 140-4
Field Measurements of airborne sound insulation between rooms

Job No: JAE9040 **Job Name:** 17 Ham Road
Client: NA **Date of test:** 2-Sep-16

Description and identification of the building construction and test arrangement, direction of measurement: Caxton House to 17 Ham Road: Pary Wall: Construction Details Unkown

First Floor

Frequency f Hz	D_{nT} (one-third octave) dB
100	41.8
125	44.6
160	46.0
200	46.4
250	51.7
315	53.6
400	56.8
500	56.5
630	57.9
800	58.1
1000	60.2
1250	≥ 61.9
1600	≥ 64.5
2000	≥ 65.9
2500	≥ 67.5
3150	≥ 68.6
$D_{nT,w}$	60
Ctr	-5
C	-1
$D_{nT,w} + C_{tr}$	55



ANC Registration Number:
No. of Test Report:
Test ID: 3
Date: 2-Sep-16

Name of tester: Peter Barling

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