42 PHOENIX ROAD

NOISE IMPACT ASSESSMENT

Ramboll UK

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42 PHOENIX ROAD

NOISE IMPACT ASSESSMENT FOR PLANNING

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		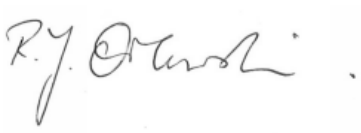
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1 EXECUTIVE SUMMARY

Ramboll Acoustics has been appointed to carry out a noise survey and assessment for the residential development at 42 Phoenix Road, London. The noise survey has been undertaken by Perttu Laukkanen AMIOA and Christina Higgins of Ramboll Acoustics.

This document summarises the methodology and results of the noise survey undertaken around the site and provides an assessment of the results in relation to achieving suitable internal ambient noise criteria within the proposed residential accommodation and in relation to limiting noise emissions from new building services plant affecting nearby properties.

The noise climate at the site is considered typical of a central London location away from the busy main streets. The main sources of noise being local noise from passing private cars and motorcycles, distant traffic noise from Eversholt Street and Euston Road and occasional aircraft noise.

At the front elevation of the building, daytime noise levels were up to L_{Aeq} 66 dB. Night time noise levels did not exceed L_{Aeq} 60 dB.

The lowest measured background noise level was L_{A90} 40 dB (night time) and L_{A90} 44 dB (daytime).These noise levels are representative of the quietest elevation to the rear of the building. Plant noise emission limits of 30 dB L_{Aeq} at the location of the nearest noise sensitive window are proposed in line with Camden Council policy. This will be achieved through careful selection of plant and implementing appropriate attenuation measures as necessary.

In terms of ventilation, acoustic trickle ventilators will be necessary to ensure that the external noise break-in is adequately controlled whilst providing the minimum background ventilation rate. With proposed trickle vents open, the internal ambient sound level requirements set in BS8233 will be met. However, windows may remain openable for rapid or purge ventilation, or at the occupant's choice accepting higher levels of noise inside the apartments.

The minimum glazing performance has also been determined for all elevations. Double glazed windows are required to all the elevations.

In summary, the proposed development is considered acceptable from an acoustic perspective, provided that the plant noise emission limits are met and that the external building envelope recommendations are followed.

2 INTRODUCTION

The proposed development comprises of a new residential building for student accommodation.

This report contains the methodology used for the noise survey undertaken on 6th – 10th February 2015. Results are detailed along with recommendations for the performance criteria of the building envelope and criteria for plant noise emissions.

3 RELEVANT POLICY, GUIDANCE AND LEGISLATION

3.1 British Standard BS 4142:2014 – 'Method for rating and assessing industrial and commercial sound'

BS 4142 can be used to assess whether noise sources of an industrial nature are likely to give rise to complaints from people residing in nearby dwellings.

The standard describes a method for assessing whether the noise levels from commercial premises are likely to give rise to complaints from people residing in the nearest residential premises.

The procedure in *BS 4142* for assessing the likelihood of complaints is to compare the predicted noise level from the source in question, the 'rating noise level', with the background noise level. The likelihood of complaints is assessed by subtracting the background noise level from the rating noise level.

BS 4142 states:

'a) Typically, the greater this difference, the greater the magnitude of the impact.

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.'

Noise rating penalties can be incurred where the noise generated has tonal (up to 6 dB), impulsive (up to 9 dB) or otherwise 'readily distinctive against the residual acoustic environment' (3 dB).

3.2 Camden Council Policy

In line with the advice in *BS 4142:*2014 – 'Method for rating and assessing industrial and commercial sound' and in an attempt to ensure that the likelihood of complaint is low, Camden Council Policy '*London Borough of Camden Replacement Unitary Development Plan, June 2006'* requires that noise emissions from any new plant associated with the building should be at least 10 dB below the lowest measured background noise level (L_{A90}).

3.3 British Standard BS 8233:2014 – 'Sound insulation and noise reduction for buildings – Code of Practice'

Guidance on the acceptable noise levels for areas inside residential rooms is given in *BS 8233*. An extract of the design criteria table is reproduced in Table 1.

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

Table 1: Typical noise limits in non-domestic buildings

4 NOISE SURVEY

A noise survey was conducted by Perttu Laukkanen AMIOA and Christina Higgins AMIOA of Ramboll, in order to establish the baseline noise conditions at the site, against which an assessment of the potential impact of existing noise levels on the building envelope design and of plant noise emissions has been undertaken.

4.1 Site location

The site is located at 42 Phoenix Road within the predominantly residential area of Somers Town, London. The proposed building is bounded by Phoenix Road to the North, Chalton Street to the East, Maria Fidelis School to the West and overlooks the car parking area of the neighbouring residential block, Chalton House, to the south.

4.2 Attended noise measurements

Attended noise measurements were taken at the Phoenix Road façade (ST1) on 12th March 2015 between 0600hrs and 0800hrs. These measurements are considered to be representative of the highest night time and daytime levels at the North and East façades of the proposed development and are suitable for a worst case assessment of resulting internal noise levels. Measurement locations are shown in Figure 1.

Noise climate around the site during the attended measurements was dominated by passing cars, motorbikes, HGV's and pedestrians at Phoenix Road. Distant traffic noise from Eversholt Street and Euston Road also contributed to the measured noise levels. Two aircraft were also noticed during the attended measurements. However, the effect of these is considered to be minor.

4.3 Unattended noise measurements

Long term noise monitoring was undertaken on top of the roof of the 42 Phoenix Road between 20th and 25th February 2015 by Ramboll. Measured noise levels at the roof are considered to be representative of the noise levels at the south façade of the building and of the lower background noise level for setting building services noise emissions. The location of the measurement position in relation to the proposed development is shown in Figure 1.

Figure 1: Site plan showing the measurement position and results of the highest measured $L_{Aeq,15min}$ noise levels.

Figure 2: Sound level meter at measurement position ST1

Figure 3: Noise logger at measurement position LT1

4.4 Measurement Equipment

The attended and unattended noise measurements were carried out using the following equipment:

Unattended (LT1):

i. 01dB DUO noise logger, Class 1;
ii. 01dB DUO Sound Calibrator;
iii. Lightweight tripod.

Attended (ST1):

i. Norsonic 140 Type 1 Sound Level Meter (SLM);
ii. Norsonic Microphone with windshield;
iii. Norsonic Calibrator;
iv. Lightweight tripod.

4.5 Survey Conditions

Weather conditions during the noise survey were dry, clear and still.

4.6 Survey Results

Noise logger data is shown graphically in Figure 4. A summary of the results from unattended noise survey is shown in Table 3.

Location	Time Period	Average $L_{Aeq,1hr}$ (dB)	Highest $L_{Aeq,15min}$ (dB)	Lowest $L_{A90,15min}$ (dB)
ST1	Daytime (0700-2300 hrs)	63	66	48
	Night-time (2300-0700 hrs)	58	60	44

Table 2: Summary of the results from attended noise measurements at measurement position ST1

Location	Time Period (T)	Average $L_{Aeq,T}$ (dB)	Highest $L_{Aeq,15min}$ (dB)	Lowest $L_{A90,15min}$ (dB)
LT1	Daytime (0700-2300 hrs)	51	56	45
	Night-time (2300-0700 hrs)	48	54	40

Table 3: Summary of the results from unattended noise logging at measurement position LT1

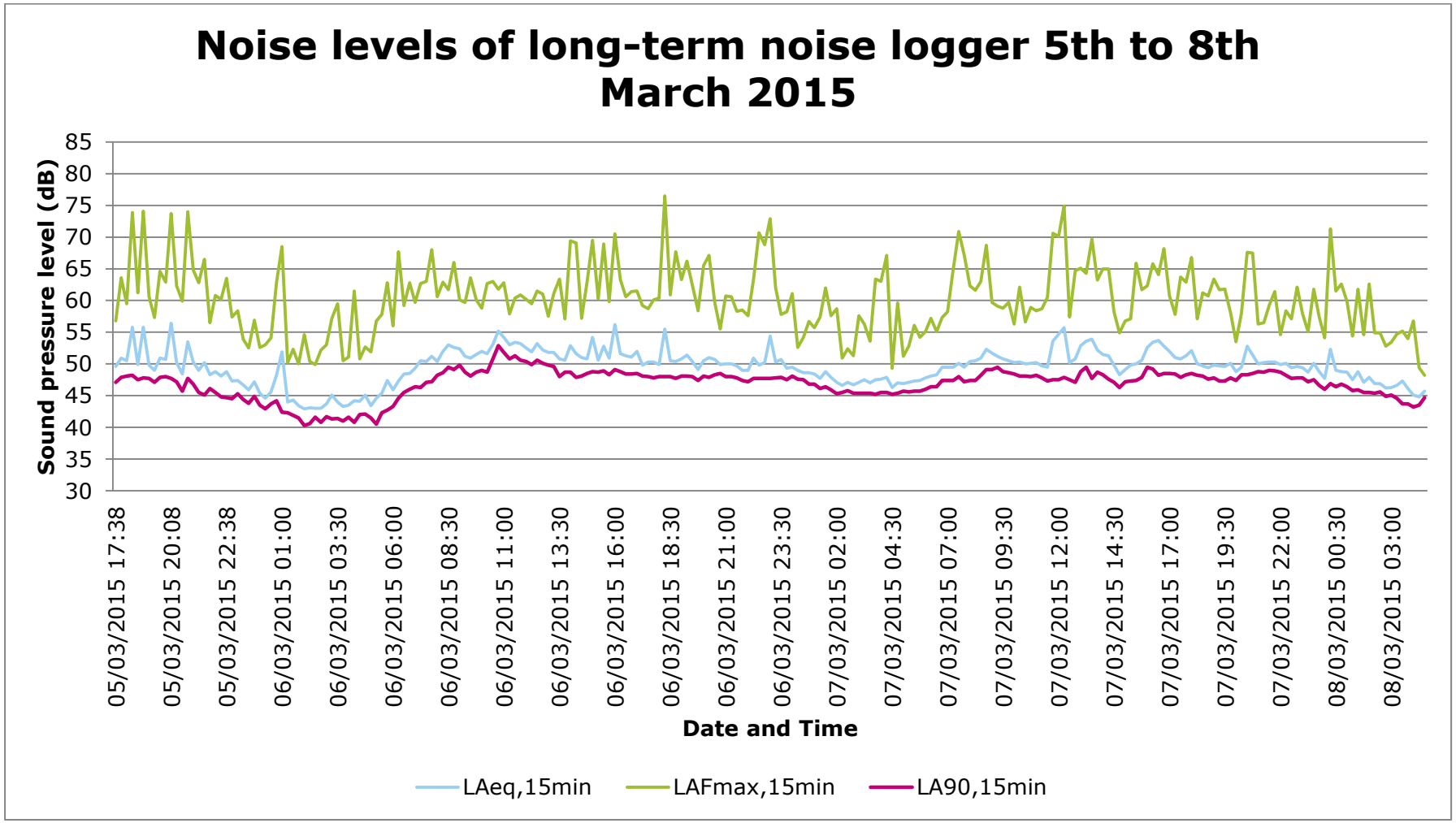

Figure 4: Graphical noise logger data

4.7 Discussion of results

In summary, the short term attended noise measurements of 58 dB L_{Aeq} during night-time and 63 dB during day-time have been used to calculate the resultant internal noise levels in habitable rooms on the North and East facades of the building.

On the rear elevation, the noise level used in the assessment is the average level measured from the noise logger, 48 dB L_{Aeq} during night-time and 51 dB during day-time.

It should be noted that the night-time levels represent the worst case scenario and therefore glazing and ventilation performance requirements are assessed against the night-time criteria.

5 ASSESSMENT

5.1 Plant Noise Emission Limits

Table 4 presents the lowest background noise level measured at the site, and the proposed plant noise emission limits for building services installations.

The limits have been set based on plant noise emissions being 10 dB(A) below the lowest measured background noise level, in accordance with Camden Council's requirements.

Location	Daytime (0700-2300hrs)		Night-time (2300-0700hrs)	
	Lowest Measured Background Noise Level $L_{A90,15min}$ dB	Plant Noise Emission Criterion (Rating Level) $L_{Aeq,15min}$ dB	Lowest Measured Background Noise Level $L_{A90,15min}$ dB	Plant Noise Emission Criterion (Rating Level) $L_{Aeq,15min}$ dB
NSR	45	35	40	30

Table 4: Daytime and night-time plant noise emission limits at the nearest sensitive receptor

All building services plant installations associated with the development will be designed not to exceed the above criteria. A further 5 dB penalty should be applied for any tonal or intermittent characteristics exhibited by the noise source.

5.2 Building envelope and ventilation

5.2.1 Bedrooms/living rooms with minimum background ventilation

The building envelope consists of cladding, glazing and ventilation openings. We have calculated the required acoustic performance for each element to ensure that the internal ambient noise levels set out in BS8233 (Table 1) are achieved in different type of rooms.

Calculations have been undertaken in octave bands using the spectrum of the average measured external noise levels as discussed in Section 4.7. Calculated building envelope acoustic performance requirements are shown in Table 5.

Facade		Glazing Performance (Rw)	Cladding Performance (Rw)	Attenuated Ventilator Performance OPEN Position (Dne,w)
Phoenix Road	Bedroom	38	45	33[(1)]
Chalton Street	Bedroom	38	45	33[(1)]
Rear elevation	Bedroom	32	45	33[(1)]
	Living/Kitchen	32	45	N/A[(2)]

[(1)]Assumes Sonovent compact 15 or similar trickle vents are used for background ventilation with a maximum total equivalent area of 25,000mm².

[(2)]Assumes open window with an area of 0.2m²

Table 5: Building envelope acoustic performance requirements at the required minimum background ventilation rate

5.3 Example build-ups

This section provides examples of typical construction build-ups for the building envelope that are capable of achieving the performance requirements of Table 5.

5.3.1 Cladding

In order to achieve the R_w 45 dB requirement, for brick areas, a 100 external brick façade with internal dry-lining and insulation would be suitable.

Cladding panels should consist of external insulated panel in combination with internal dry-lining. A suitable build-up to achieve the acoustic performance requirements would be:

- External cladding providing a minimum R_w of 28 dB.
- Internal dry-lining consisting of two layer of 12.5mm wallboard on 100mm min metal studs
- 50mm mineral wool 20-33Kg/m² in the cavity

5.3.2 Glazing

The following construction may be used to achieve the required acoustic performance:

Rw	Type	Construction build-up
38	Double Glazing	6mm glass /12mm air gap / 8.4mm acoustic laminated glass
32	Double Glazing	6mm glass /12mm air gap / 4mm glass

Table 8: Examples of external glazing construction build-ups

5.3.3 Ventilators

Examples of suitable ventilators are provided in Table 9.

$D_{ne,w}$	Type	
33	Sonovent® Compact 15 selfregulating window vent	

Table 9: Examples of ventilators

6 CONCLUSIONS

An environmental noise survey was undertaken at 42 Phoenix Road London, in order to establish the existing noise climate at the site.

Noise emission limit for new building services associated with the development have been set in accordance with Camden Council's requirements and based on the methodology in *BS 4142*.

An assessment of external noise break-in into the building has been undertaken, in accordance with guidance given in *BS 8233*, and the required sound insulation performance of the building envelope has been determined to achieve the required internal noise levels.

In summary, the proposed development is considered acceptable from an acoustic perspective, provided that the plant noise emission limits are met and that the external building envelope recommendations are followed.

A.1 NUMERICAL NOISE LOGGER DATA FROM LT1

Date and time	LAeq,15min	LAFmax,15min	LA90,15min
05/03/2015 17:38	49.6	56.8	47.1
05/03/2015 17:53	50.9	63.6	47.9
05/03/2015 18:08	50.5	59.5	48.1
05/03/2015 18:23	55.8	73.9	48.2
05/03/2015 18:38	49.9	61.2	47.5
05/03/2015 18:53	55.8	74.1	47.8
05/03/2015 19:08	49.8	60.6	47.7
05/03/2015 19:23	49	57.3	47.1
05/03/2015 19:38	50.9	64.6	47.9
05/03/2015 19:53	50.7	62.9	48
05/03/2015 20:08	56.4	73.7	47.7
05/03/2015 20:23	50.2	62.3	47.2
05/03/2015 20:38	48.4	59.9	45.7
05/03/2015 20:53	53.5	74	47.7
05/03/2015 21:08	50.3	64.8	46.8
05/03/2015 21:23	49	62.8	45.5
05/03/2015 21:38	50.2	66.5	45.1
05/03/2015 21:53	48.3	56.5	46.1
05/03/2015 22:08	48.8	60.8	45.5
05/03/2015 22:23	48.1	60.2	44.8
05/03/2015 22:38	48.8	63.5	44.7
05/03/2015 22:53	47.3	57.4	44.5
05/03/2015 23:08	47.4	58.4	45.3
05/03/2015 23:23	46.7	53.9	44.4
05/03/2015 23:38	45.9	52.5	43.8
05/03/2015 23:53	47.2	56.9	44.9
06/03/2015 00:00	45.4	52.6	43.5
06/03/2015 00:15	44.6	53	42.9
06/03/2015 00:30	45.6	54.1	43.7
06/03/2015 00:45	48.2	62.8	44.2
06/03/2015 01:00	51.9	68.5	42.4
06/03/2015 01:15	44	50.2	42.3
06/03/2015 01:30	44.3	52.3	41.9
06/03/2015 01:45	43.4	50	41.5
06/03/2015 02:00	42.9	54.6	40.3

Date and time	LAeq,15min	LAFmax,15min	LA90,15min
06/03/2015 02:15	43.1	50.4	40.6
06/03/2015 02:30	43	49.9	41.6
06/03/2015 02:45	43	52.2	40.8
06/03/2015 03:00	43.7	53	41.7
06/03/2015 03:15	45.1	57.2	41.3
06/03/2015 03:30	44	59.5	41.4
06/03/2015 03:45	43.3	50.5	41
06/03/2015 04:00	43.5	51.1	41.6
06/03/2015 04:15	44.2	61.5	40.8
06/03/2015 04:30	44.1	50.8	42
06/03/2015 04:45	45.1	52.7	42.1
06/03/2015 05:00	43.4	51.9	41.5
06/03/2015 05:15	44.6	56.8	40.5
06/03/2015 05:30	45.4	57.8	42.3
06/03/2015 05:45	47.4	62.8	42.7
06/03/2015 06:00	45.9	56	43.3
06/03/2015 06:15	47.3	67.7	44.6
06/03/2015 06:30	48.4	59.2	45.5
06/03/2015 06:45	48.5	62.8	46
06/03/2015 07:00	49.3	59.7	46.4
06/03/2015 07:15	50.5	62.7	46.3
06/03/2015 07:30	50.4	63	47.1
06/03/2015 07:45	51.2	68	47.2
06/03/2015 08:00	50.4	60.6	48.2
06/03/2015 08:15	52	62.9	48.6
06/03/2015 08:30	53	61.7	49.5
06/03/2015 08:45	52.6	66	49.1
06/03/2015 09:00	52.4	60.1	49.8
06/03/2015 09:15	51.2	59.7	48.7
06/03/2015 09:30	50.9	63.6	48.1
06/03/2015 09:45	51.5	60.1	48.7
06/03/2015 10:00	52	58.8	49
06/03/2015 10:15	51.6	62.7	48.7
06/03/2015 10:30	53.1	63	50.8
06/03/2015 10:45	55.2	61.8	52.9
06/03/2015 11:00	54.2	62.8	51.8

Date and time	LAeq,15min	LAFmax,15min	LA90,15min
06/03/2015 11:15	53	57.9	50.8
06/03/2015 11:30	53.4	60.4	51.3
06/03/2015 11:45	53.2	60.9	50.6
06/03/2015 12:00	52.5	60.2	50.4
06/03/2015 12:15	51.9	59.5	49.9
06/03/2015 12:30	53.2	61.5	50.6
06/03/2015 12:45	52.2	61	50.1
06/03/2015 13:00	51.8	57.5	49.8
06/03/2015 13:15	51.8	61.1	49.6
06/03/2015 13:30	50.8	63.4	48
06/03/2015 13:45	50.6	57.1	48.7
06/03/2015 14:00	52.9	69.4	48.7
06/03/2015 14:15	51.6	69.1	47.9
06/03/2015 14:30	51	57.2	48.1
06/03/2015 14:45	50.8	62.9	48.5
06/03/2015 15:00	54.2	69.5	48.8
06/03/2015 15:15	50.6	60.3	48.7
06/03/2015 15:30	52.8	68.9	48.9
06/03/2015 15:45	50.9	59.8	48.3
06/03/2015 16:00	56.2	70.5	49.1
06/03/2015 16:15	51.6	63.3	48.8
06/03/2015 16:30	51.3	60.6	48.4
06/03/2015 16:45	51.1	61.4	48.4
06/03/2015 17:00	52	61.5	48.5
06/03/2015 17:15	49.8	59.2	48.1
06/03/2015 17:30	50.3	58.7	48
06/03/2015 17:45	50.3	60.1	47.8
06/03/2015 18:00	49.9	60.4	48
06/03/2015 18:15	55.5	76.5	48
06/03/2015 18:30	50.5	60.9	48
06/03/2015 18:45	50.4	67.7	47.7
06/03/2015 19:00	50.8	63.3	48.1
06/03/2015 19:15	51.4	66.2	48.1
06/03/2015 19:30	50.4	62.4	48
06/03/2015 19:45	49.1	58.4	47.4
06/03/2015 20:00	50.5	65.5	48.1

Date and time	LAeq,15min	LAFmax,15min	LA90,15min
06/03/2015 20:15	51	67.1	47.9
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06/03/2015 20:45	49.9	55.5	48.5
06/03/2015 21:00	50	60.7	48
06/03/2015 21:15	50	60.6	48
06/03/2015 21:30	49.7	58.3	47.8
06/03/2015 21:45	49	58.5	47.4
06/03/2015 22:00	49	57.6	47.2
06/03/2015 22:15	50.9	63.3	47.7
06/03/2015 22:30	49.8	70.7	47.7
06/03/2015 22:45	50.2	68.8	47.7
06/03/2015 23:00	54.4	72.9	47.7
06/03/2015 23:15	50.3	62	47.8
06/03/2015 23:30	50.7	57.8	47.9
06/03/2015 23:45	49.3	58.2	47.5
07/03/2015 00:00	49.5	61.1	48.1
07/03/2015 00:15	49	52.6	47.6
07/03/2015 00:30	48.6	54.2	47.5
07/03/2015 00:45	48.6	56.7	46.8
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07/03/2015 01:15	47.7	57.4	46.1
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07/03/2015 01:45	47.9	57.6	45.9
07/03/2015 02:00	47.1	58.7	45.3
07/03/2015 02:15	46.6	50.9	45.5
07/03/2015 02:30	47.1	52.4	45.8
07/03/2015 02:45	46.7	51.3	45.4
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07/03/2015 04:15	47.9	67.1	45.5
07/03/2015 04:30	46.3	49.3	45.2
07/03/2015 04:45	47	59.6	45.4
07/03/2015 05:00	46.9	51.2	45.7

Date and time	LAeq,15min	LAFmax,15min	LA90,15min
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07/03/2015 05:45	47.4	54.2	45.7
07/03/2015 06:00	47.8	55.1	46
07/03/2015 06:15	48.1	57.2	46.4
07/03/2015 06:30	48.3	55.1	46.4
07/03/2015 06:45	49.5	57.3	47.4
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07/03/2015 07:15	49.5	65	47.4
07/03/2015 07:30	50.1	70.9	48
07/03/2015 07:45	49.5	67.2	47.2
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07/03/2015 08:15	50.5	61.6	47.4
07/03/2015 08:30	50.9	63	48.2
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07/03/2015 10:30	50	56.6	48.1
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07/03/2015 13:00	52.9	65.1	48.8
07/03/2015 13:15	53.6	64.3	49.5
07/03/2015 13:30	53.9	69.7	47.7
07/03/2015 13:45	52.2	63.2	48.7
07/03/2015 14:00	51.5	65	48.3

Date and time	LAeq,15min	LAFmax,15min	LA90,15min
07/03/2015 14:15	51.3	65	47.6
07/03/2015 14:30	49.8	58.2	47.1
07/03/2015 14:45	48.3	54.9	46.3
07/03/2015 15:00	49.1	56.8	47.2
07/03/2015 15:15	49.8	57.1	47.3
07/03/2015 15:30	50	65.9	47.4
07/03/2015 15:45	50.6	61.7	47.9
07/03/2015 16:00	52.6	62.3	49.5
07/03/2015 16:15	53.4	65.8	49.2
07/03/2015 16:30	53.7	64.1	48.2
07/03/2015 16:45	52.8	68.2	48.5
07/03/2015 17:00	52	60.8	48.5
07/03/2015 17:15	51	57.8	48.4
07/03/2015 17:30	50.8	63.7	47.9
07/03/2015 17:45	51.3	62.9	48.3
07/03/2015 18:00	52.1	66.8	48.5
07/03/2015 18:15	50	57.1	48.2
07/03/2015 18:30	49.7	61.2	48.1
07/03/2015 18:45	49.4	60.7	47.6
07/03/2015 19:00	49.8	63.4	47.8
07/03/2015 19:15	49.7	61.7	47.3
07/03/2015 19:30	49.6	61.8	47.3
07/03/2015 19:45	50.1	58.1	47.8
07/03/2015 20:00	48.8	53.5	47.4
07/03/2015 20:15	49.5	58	48.3
07/03/2015 20:30	52.8	67.6	48.3
07/03/2015 20:45	51.4	67.5	48.5
07/03/2015 21:00	50	56.3	48.8
07/03/2015 21:15	50.2	56.5	48.7
07/03/2015 21:30	50.3	59.3	49
07/03/2015 21:45	50.3	61.4	48.9
07/03/2015 22:00	49.9	54.6	48.7
07/03/2015 22:15	50.1	58.4	48.2
07/03/2015 22:30	49.4	57.1	47.7
07/03/2015 22:45	49.6	62.1	47.8
07/03/2015 23:00	49.4	57.9	47.8

Date and time	LAeq,15min	LAFmax,15min	LA90,15min
07/03/2015 23:15	48.7	55.1	47.2
07/03/2015 23:30	50.1	61.8	47.5
07/03/2015 23:45	48.8	57.4	46.6
08/03/2015 00:00	47.7	54.1	46
08/03/2015 00:15	52.3	71.3	46.9
08/03/2015 00:30	49	61.5	46.4
08/03/2015 00:45	48.8	62.6	46.8
08/03/2015 01:00	48.7	59.8	46.4
08/03/2015 01:15	47.5	54.4	45.8
08/03/2015 01:30	48.8	61.8	45.9
08/03/2015 01:45	47.1	54.6	45.5
08/03/2015 02:00	47.9	62.6	45.5
08/03/2015 02:15	46.9	54.9	45.4
08/03/2015 02:30	46.9	54.9	45.6
08/03/2015 02:45	46.2	52.8	44.9
08/03/2015 03:00	46.3	53.4	45.1
08/03/2015 03:15	46.6	54.7	44.6
08/03/2015 03:30	47.3	55.2	43.7
08/03/2015 03:45	46.1	54	43.7
08/03/2015 04:00	45.1	56.8	43.2
08/03/2015 04:15	44.8	49.4	43.5
08/03/2015 04:30	45.7	48.2	44.7

A.2 NUMERICAL NOISE DATA FROM ST1

Date and time	LAeq,15min	LAFmax,15min	LA90,15min
(2015/03/12 06:04:28.00)	58.2	92.1	61.1
(2015/03/12 06:15:02.00)	52.5	83.7	61.6
(2015/03/12 06:30:02.00)	58.3	84.7	61.3
(2015/03/12 06:45:02.00)	60	86.7	62.5
(2015/03/12 07:00:02.00)	59.6	89.6	62.9
(2015/03/12 07:15:02.00)	66	91.9	65
(2015/03/12 07:30:02.00)	62.8	92.2	64
(2015/03/12 07:45:02.00)	59	86.3	64

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