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Scheme: 14 Eton Road Construction Works
Title: Baseline Noise Survey

1.0 Introduction

Ion Acoustics is appointed by ADL Planning to produce a construction noise assessment which will form a part of a Construction Management Plan (CMP) for a proposed development at 14 Eton Road, London, NW3.
The proposal is to demolish and rebuild the garden room and lower a part of the garden, both of which will require some excavation work. This technical note describes the background noise survey undertaken on the site on 24th – 25th July 2017, which will later form a part of the construction noise assessment.

2.0 Baseline Noise Survey

Procedure
A noise survey was carried out at 14 Eton Road in London on 24th – 25th July 2017 in order to establish typical noise levels in the area. All measurements were made using a Larson-Davis LD-820 sound level meter fitted with a 01dB BAP 21 windshield and calibrated using a Brüel & Kjær Type 4231 calibrator. The microphone was tripod mounted at a height of approximately 1.5m, in excess of 3.5m away from the nearest vertical reflective surface. The recorded values are therefore considered free-field.

Figure 1 – Measurement location MU1, microphone circled in orange

Figure 2 – Aerial photo of the area indicating the measurement position with site highlighted (© Google Maps)

Noise Climate

The noise climate on site was fairly typical of an urban location. It consisted of road traffic noise, aircraft flying overhead, local resident activity and nearby construction noise. Also noted while on site was the presence of noise from nearby vegetation. While the wind itself was not particularly strong, there are many trees and shrubs in the area. There was some construction activity at the location during the survey, the noisiest being concrete drilling a few meters away from the measurement microphone. These periods, visible on the graph in Figure 2, have been excluded from the calculation of typical values.

Measured Noise Levels

Figure 2 below presents the measured noise levels in terms of ambient level (dB L_{Aeq}) for the measurement period (15-minutes) as well as the L_{AFmax} and L_{A90}. The ambient noise level (L_{Aeq}) is defined as the steady-state noise level with the same energy as the actual fluctuating noise. It is effectively the average level. The L_{AMax} is simply the maximum noise level during the period. The L_{A90} is a statistical measure of the variation of noise and is defined as the noise levels exceeded for 90% of the measurement period. It is chosen to represent the background noise, that is the underlying noise typically from distant traffic in the absence of short-term events. For a 15-minute period the L_{A90} therefore represents the quietest 90 seconds.

In absence of construction noise, the noise environment is fairly steady, with daytime L_{Aeq} levels around 50dB and the L_{A90} between 40-45dB. There are a few periods where the L_{Aeq} is higher, which could have been due to activity in the garden, or birdsong. Night time levels are in order of 40-50dB L_{Aeq} and 30-40dB L_{A90}, however they are not relevant for this assessment since construction activity will only take place during daytime working hours. The recorded noise levels are summarised in Table 1, and tabulated at the end of the document.

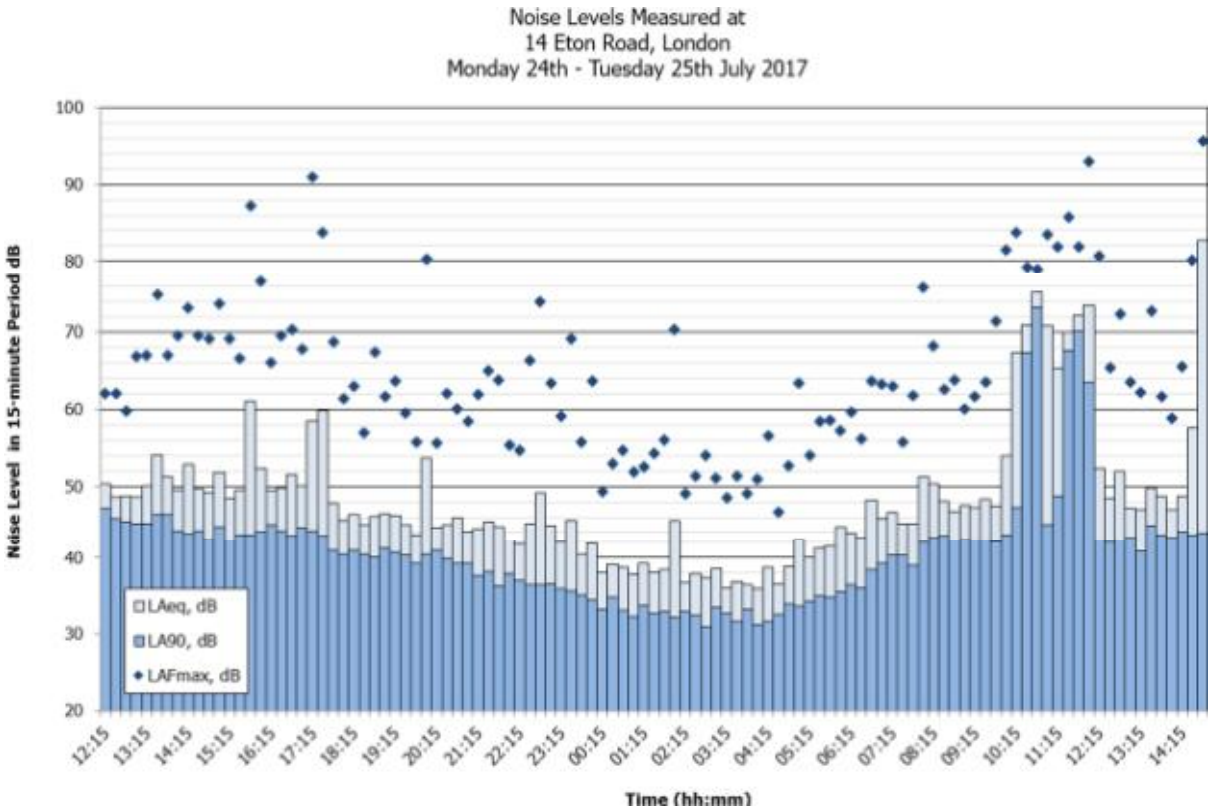

Figure 3 – Noise levels measured at 14 Eton Road

Table 1: Summarised noise levels recorded at 14 Eton Road

Day period	L_{Aeq} (dB)
Day (07:00 – 19:00)	52.0
Evening (19:00 – 23:00)	46.7
Night (23:00 – 07:00)	41.5

3.0 BS5228:2009

BS 5228: 2009 *"Code of Practice for noise and vibration control on construction and open sites"* provides methods for prediction and assessment of construction noise and vibration. The standard also provides advice on methods of noise and vibration control and reducing impact. The standard is in two parts: Part 1 addresses noise and Part 2 vibration.

There are no noise limits within the main text of BS5228:2009 and in fact, the preferred approach is to use 'best practicable means' to reduce noise rather than setting limits. This strategy will be adopted here. Nevertheless, a number of possible construction noise significance thresholds are presented within BS5228-1 Annex E for *"projects of significant size such as the construction of a new railway or trunk road"*. Although this is a relatively small construction project, these provide a useful reference. The simplest construction noise criterion is a fixed daytime limit of 70dB(A) for urban areas away from main roads. However, as baseline ambient noise levels have been measured, BS5228-1 Annex E provides two methods to set a significance threshold: Example 1 "the ABC method" and Example Method 2, a 5dB change limit.
For Example 1, measured noise levels are below the Category A daytime threshold of 65 dB L_{Aeq} and therefore a significant effect is deemed to apply when noise levels exceed 65 dB L_{Aeq}.

Example 2 is applicable to residential buildings. Section E3.3 states:

"Noise levels generated from site activities are deemed to be potentially significant if the total noise (pre-construction ambient plus site noise) exceeds the pre-construction ambient noise by 5dB or more, subject to a lower cut off of 65dB $L_{Aeq,t}$ from site noise alone for the daytime … and a duration of one month or more, unless works of a shorter duration are likely result in [a] significant effect."

Pre-construction environmental noise levels have been at the centre of the development site have been documented above as L_{Aeq} 52dB over the 12-hour measurement period from 07:00 to 19.00 hrs. A value 5dB above this is 57 dB L_{Aeq} but this is below the lower cut-off limit of 65dB $L_{Aeq,T}$ applies and therefore a significance threshold of 65 dB L_{Aeq} can be derived.

Both thresholds give a value of 65dB $L_{Aeq,\ 12\text{-}hour}$ and therefore threshold will be used as a target to limit the effect of construction works. In addition best practicable means will be used to minimise noise.

Table 2: Overall dB(A) noise levels

Time	L_{Aeq} dB	$L_{Amax,F}$ dB	L_{AF90} dB	Time	L_{Aeq} dB	$L_{Amax,F}$ dB	L_{AF90} dB
24/07/2017 12:15	50.4	62.1	47.1	25/07/2017 00:15	38.1	49.4	33.2
24/07/2017 12:30	48.6	62.1	45.8	25/07/2017 00:30	39.1	52.9	34.8
24/07/2017 12:45	48.7	59.8	45.4	25/07/2017 00:45	38.7	54.7	33.1
24/07/2017 13:00	48.6	66.9	45.1	25/07/2017 01:00	37.8	51.9	32.3
24/07/2017 13:15	50.1	67.0	45.2	25/07/2017 01:15	39.3	52.5	33.8
24/07/2017 13:30	54.1	74.9	46.3	25/07/2017 01:30	38.1	54.3	32.7
24/07/2017 13:45	51.3	67.0	46.3	25/07/2017 01:45	38.4	56.1	32.9
24/07/2017 14:00	49.6	69.5	44.2	25/07/2017 02:00	45.6	70.4	32.1
24/07/2017 14:15	52.9	73.2	43.8	25/07/2017 02:15	36.7	49.1	32.9
24/07/2017 14:30	49.7	69.6	44.2	25/07/2017 02:30	37.9	51.4	32.4
24/07/2017 14:45	49.1	69.1	43.0	25/07/2017 02:45	37.4	54.0	30.9
24/07/2017 15:00	51.8	73.7	44.8	25/07/2017 03:00	38.6	51.1	33.5
24/07/2017 15:15	48.5	69.1	42.9	25/07/2017 03:15	36.1	48.6	32.7
24/07/2017 15:30	49.5	66.6	43.6	25/07/2017 03:30	36.9	51.4	31.6
24/07/2017 15:45	61.1	87.2	43.7	25/07/2017 03:45	36.5	49.1	33.2
24/07/2017 16:00	52.4	76.6	44.0	25/07/2017 04:00	35.9	51.0	31.2
24/07/2017 16:15	49.4	66.1	45.0	25/07/2017 04:15	38.7	56.6	31.6
24/07/2017 16:30	49.8	69.6	44.2	25/07/2017 04:30	36.6	46.7	32.5
24/07/2017 16:45	51.5	70.4	43.5	25/07/2017 04:45	38.8	52.7	33.9
24/07/2017 17:00	50.1	67.8	44.6	25/07/2017 05:00	43.0	63.4	33.6
24/07/2017 17:15	58.5	90.9	44.2	25/07/2017 05:15	40.1	54.0	34.3
24/07/2017 17:30	59.8	83.7	43.5	25/07/2017 05:30	41.3	58.5	35.0
24/07/2017 17:45	47.8	68.8	41.0	25/07/2017 05:45	41.5	58.6	34.8
24/07/2017 18:00	45.6	61.4	40.5	25/07/2017 06:00	44.7	57.2	35.5
24/07/2017 18:15	46.4	63.0	41.0	25/07/2017 06:15	43.9	59.7	36.5
24/07/2017 18:30	45.0	57.0	40.5	25/07/2017 06:30	43.2	56.2	36.0
24/07/2017 18:45	46.1	67.4	40.1	25/07/2017 06:45	48.2	63.6	38.4
24/07/2017 19:00	46.5	61.7	41.2	25/07/2017 07:00	45.8	63.3	39.3
24/07/2017 19:15	46.2	63.7	40.7	25/07/2017 07:15	46.6	63.0	40.3
24/07/2017 19:30	45.0	59.5	40.3	25/07/2017 07:30	45.2	55.8	40.3
24/07/2017 19:45	43.6	55.8	39.2	25/07/2017 07:45	45.1	61.8	39.0
24/07/2017 20:00	53.7	80.3	40.4	25/07/2017 08:00	51.3	75.8	42.1
24/07/2017 20:15	44.6	55.6	41.0	25/07/2017 08:15	50.4	68.2	43.2
24/07/2017 20:30	45.0	62.1	39.9	25/07/2017 08:30	48.1	62.6	43.5
24/07/2017 20:45	45.9	60.1	39.3	25/07/2017 08:45	46.7	63.8	42.7
24/07/2017 21:00	44.0	58.4	39.2	25/07/2017 09:00	47.5	60.1	43.0
24/07/2017 21:15	44.5	61.9	37.7	25/07/2017 09:15	47.3	61.7	42.8
24/07/2017 21:30	45.4	65.0	38.2	25/07/2017 09:30	48.4	63.5	42.8
24/07/2017 21:45	44.8	63.8	36.3	25/07/2017 09:45	47.4	71.4	42.2
24/07/2017 22:00	42.4	55.4	37.9	25/07/2017 10:00	53.9	81.5	43.6
24/07/2017 22:15	41.8	54.7	37.0	25/07/2017 10:15	67.4	83.7	47.3
24/07/2017 22:30	45.2	66.3	36.4	25/07/2017 10:30	71.0	79.2	67.3
24/07/2017 22:45	49.2	74.0	36.5	25/07/2017 10:45	75.2	78.9	73.2
24/07/2017 23:00	44.9	63.4	36.6	25/07/2017 11:00	70.8	83.5	45.0
24/07/2017 23:15	42.1	59.1	35.9	25/07/2017 11:15	65.4	81.8	48.8
24/07/2017 23:30	45.6	69.1	35.6	25/07/2017 11:30	70.0	85.7	67.6
24/07/2017 23:45	40.5	55.8	35.1	25/07/2017 11:45	72.1	81.8	70.2
25/07/2017 00:00	41.9	63.6	34.5	25/07/2017 12:00	73.5	93.0	63.5

Time	L_{Aeq} dB	$L_{Amax,F}$ dB	L_{AF90} dB
25/07/2017 12:15	52.3	80.6	42.8
25/07/2017 12:30	48.5	65.4	42.1
25/07/2017 12:45	51.9	72.4	42.8
25/07/2017 13:00	47.1	63.5	43.3
25/07/2017 13:15	47.0	62.2	40.8
25/07/2017 13:30	49.8	72.8	44.9
25/07/2017 13:45	48.7	61.6	43.7
25/07/2017 14:00	47.0	58.8	43.2
25/07/2017 14:15	48.8	65.5	44.1
25/07/2017 14:30	57.6	80.1	43.6
25/07/2017 14:45	82.7	95.6	43.9