APPENDIX 8/A – GLOSSARY OF TERMINOLOGY

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided.

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale, is used. The decibel scale typically ranges from 0dB (the threshold of hearing) to over 120dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

Table A8/A-1
Typical Noise Levels found in Everyday Life

Sound Level	Typical Source
0dB(A)	Threshold of hearing
20 to 30dB(A)	Quiet bedroom at night
30 to 40dB(A)	Living room during the day
40 to 50dB(A)	Typical office
50 to 60dB(A)	Inside a car
60 to 70dB(A)	Typical high street
70 to 90dB(A)	Inside a factory
100 to 110dB(A)	Burglar alarm at 1m away
110 to 130dB(A)	Jet aircraft at take off
140dB(A)	Threshold of pain

Acoustic Terminology

dB (decibel) — The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure ($2x10^{-5}$ Pa).

dB(A) — A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.

L_{Aeq} — L_{Aeq} is defined as the notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the A-weighted fluctuating sound measured over that period.

L_{10} & L_{90} — If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L_{10} is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L_{90} is the 'average minimum level' and is often used to describe the background

noise. It is common practice to use the L_{10} index to describe traffic noise.

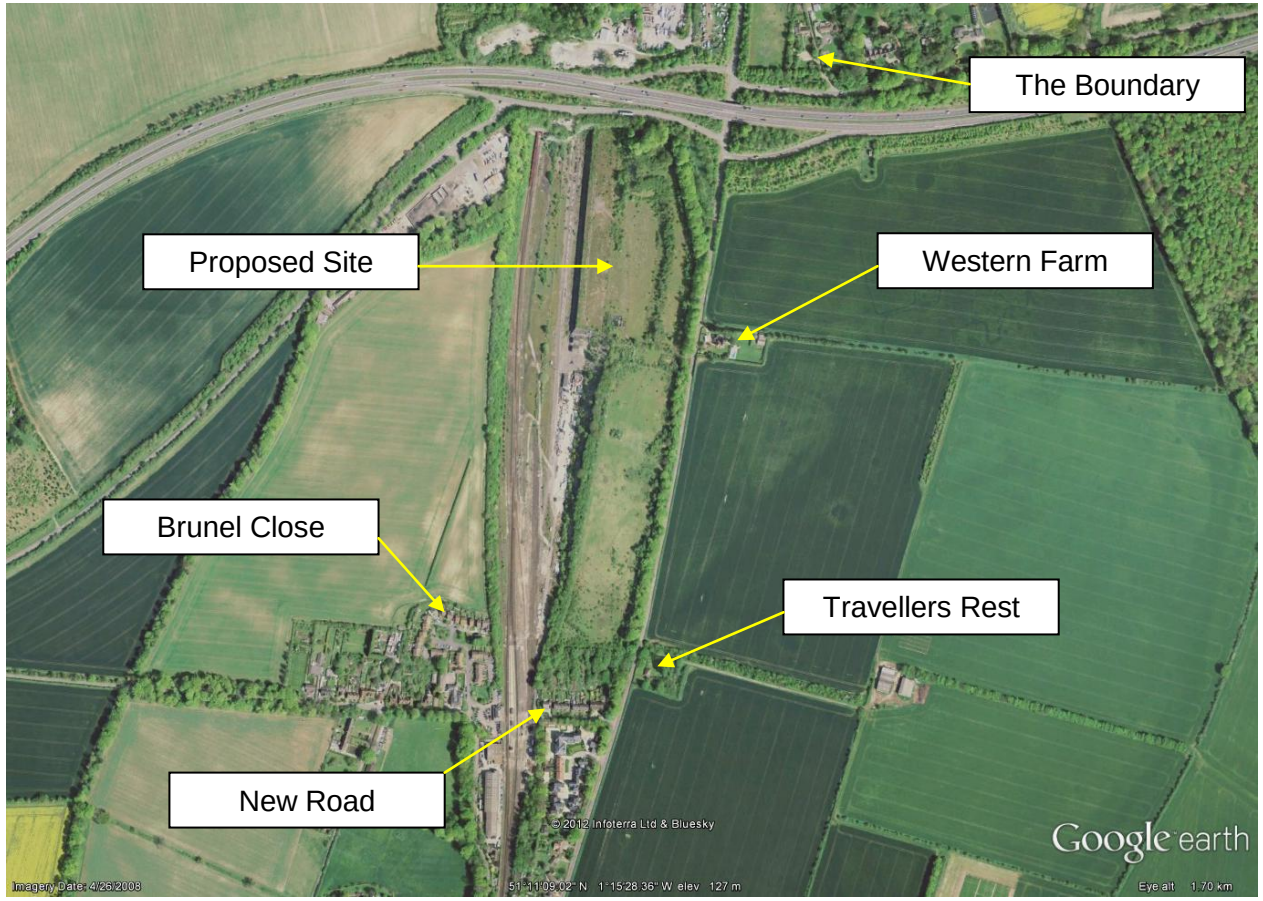
L_{Amax} — L_{Amax} is the maximum A-weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.

APPENDIX 8/B – NOISE MONITORING EQUIPMENT

Table A8/B-1
Summary of Measured Noise Levels, free-field, dB

Location	Description of Equipment	Serial Number
All	Norsonic Nor-140 Type 1 Sound Level Meter	
	Norsonic 1251 Acoustic Calibrator	
	B&K 2238 Type 1 Sound Level Meter	
	Cirrus CR:531A Acoustic Calibrator	

APPENDIX 8/C – NOISE MONITORING LOCATIONS



APPENDIX 8/D – FULL SURVEY RESULTS

Table A8/D-1
Summary of Measured Noise Levels
Location 1, Western Farm, free-field, dB

Date	Time	$L_{Aeq,T}$	L_{A90}	L_{A10}	L_{Amax}
11/03/2012	00:36	49.5	43.0	53.0	60.2
	00:41	52.2	39.5	55.0	70.5
	00:46	44.9	36.5	48.5	56.0
	00:51	47.1	33.5	49.5	66.4
	00:56	46.7	36.0	49.5	66.5
	01:01	40.6	U/R	44.5	52.6
	11:32	58.8	53.5	59.5	79.5
	12:25	58.1	52.0	60.0	75.8
	13:17	58.0	51.0	60.0	76.5
	14:10	57.0	50.0	58.5	78.6
12/03/2012	00:28	51.1	38.0	54.0	63.3
	00:33	50.0	37.5	54.5	60.3
	00:38	52.0	46.0	55.0	60.5
	00:43	46.4	30.0	50.5	58.7
	00:48	47.3	29.0	51.0	56.8
	00:53	49.0	43.5	51.5	59.3
	11:01	58.5	53.5	61.0	76.0
	12:12	59.2	52.0	60.5	78.6
	13:16	57.8	51.5	59.5	78.0
	14:08	58.7	52.5	60.5	74.8

Table A8/D-2
Summary of Measured Noise Levels
Location 2, Travellers Rest, free-field, dB

Date	Time	$L_{Aeq,T}$	L_{A90}	L_{A10}	L_{Amax}
11/03/2012	01:10	36.3	31.0	38.0	61.5
	01:15	52.1	33.0	44.5	72.8
	01:20	40.8	37.0	43.5	48.0
	01:25	38.7	34.0	41.5	46.2
	01:30	38.1	34.5	40.5	46.0
	01:35	38.7	31.5	42.0	49.0
	11:50	57.4	47.0	58.5	78.5
	12:42	56.0	46.0	55.0	76.0
	13:35	55.9	44.5	57.5	75.6
	14:28	56.5	45.0	56.5	78.2
12/03/2012	01:03	43.0	35.5	45.5	63.1
	01:08	47.0	34.5	51.0	56.8
	01:13	42.7	29.0	46.0	52.7
	01:18	40.2	29.0	43.5	49.1
	01:23	44.6	38.0	47.5	57.8
	01:28	43.2	33.5	46.5	55.3
	11:18	57.4	45.0	56.5	80.2
	12:29	57.7	45.0	56.5	78.5
	13:33	57.7	45.0	57.0	81.2
	14:24	59.2	45.0	58.0	81.8

Table A8/D-3a
Summary of Measured Noise Levels
Location 3, Brunel Close, free-field, dB

Date	Time	$L_{Aeq,T}$	L_{A90}	L_{A10}	L_{Amax}
11/03/2012	23:00	50.0	44.2	52.8	61.1
	23:15	49.3	43.2	51.9	57.5
	23:30	49.0	42.7	52.0	58.0
	23:45	50.0	41.2	53.7	59.2
	00:00	46.3	40.9	49.3	55.4
	00:15	47.8	40.8	51.3	57.0
	00:30	46.9	40.5	50.1	57.4
	00:45	41.7	36.1	45.0	52.6
	01:00	37.6	33.2	40.0	50.4
	01:15	39.5	34.0	42.7	49.5
	01:30	38.5	34.9	41.1	49.4
	01:45	43.6	37.3	47.0	54.1
	02:00	44.1	37.3	47.8	54.7
	02:15	45.0	31.6	48.8	56.0
	02:30	46.9	36.8	51.2	57.7
	02:45	45.6	33.5	49.9	57.0
	03:00	45.4	35.3	49.4	61.0
	03:15	46.6	37.5	50.3	58.0
	03:30	45.8	32.2	49.9	58.6
	03:45	46.2	36.8	50.0	57.2
	04:00	47.3	38.3	51.0	58.9
	04:15	46.3	36.4	49.6	55.4
	04:30	46.8	39.3	50.3	57.1
	04:45	46.0	38.4	49.4	56.1
	05:00	46.9	37.0	50.8	57.6
	05:15	49.0	41.1	52.2	58.7
	05:30	48.7	43.3	51.3	58.6
	05:45	49.4	44.4	52.1	58.3
	06:00	51.3	46.4	53.7	62.3
	06:15	48.4	45.0	50.7	57.8
	06:30	51.0	46.6	53.5	60.4
	06:45	50.8	47.2	53.1	64.4
	09:00	54.6	50.8	55.8	74.7
	09:30	54.3	51.6	56.0	73.3
	10:00	54.7	52.2	56.5	63.5

Date	Time	$L_{Aeq,T}$	L_{A90}	L_{A10}	L_{Amax}
	10:30	53.2	50.7	54.8	66.4

Table A8/D-3b
Summary of Measured Noise Levels
Location 3, Brunel Close, free-field, dB

Date	Time	$L_{Aeq,T}$	L_{A90}	L_{A10}	L_{Amax}
	23:00	46.6	42.1	49.3	59.1
	23:15	47.7	43.5	50.3	56.5
	23:30	46.5	39.6	49.8	56.3
	23:45	45.6	38.4	49.1	54.1
	00:00	48.2	41.3	51.3	59.2
	00:15	48.2	42.4	51.1	59.2
	00:30	48.1	37.1	51.8	58.5
	00:45	47.6	31.2	51.5	60.6
	01:00	46.4	34.4	49.9	56.8
	01:15	46.8	33.0	50.5	57.7
	01:30	42.2	30.9	45.8	53.9
	01:45	46.0	33.9	49.9	59.5
	02:00	43.3	33.0	47.2	54.6
	02:15	44.3	32.5	48.3	57.1
	02:30	43.2	32.6	46.3	56.7
	02:45	44.5	30.7	48.3	56.4
	03:00	47.4	38.5	51.0	59.0
12/03/2012	03:15	47.5	35.7	51.0	56.8
	03:30	46.1	32.7	49.7	57.8
	03:45	45.5	38.7	48.6	56.0
	04:00	48.5	42.5	51.7	58.8
	04:15	49.1	42.8	52.1	58.9
	04:30	49.3	43.6	52.5	59.2
	04:45	51.5	46.3	54.6	62.1
	05:00	52.0	47.5	54.6	60.3
	05:15	52.7	49.8	54.6	59.5
	05:30	53.3	51.1	55.0	60.8
	05:45	52.1	49.7	53.8	59.4
	06:00	51.2	49.2	52.9	57.2
	06:15	54.4	51.5	56.5	61.9
	06:30	55.7	53.6	57.4	65.5
	06:45	57.5	55.4	58.9	73.7
	09:30	49.9	46.4	51.1	69.8
	10:00	50.4	47.1	52.3	67.8
	10:30	52.2	48.5	54.1	71.7

Date	Time	$L_{Aeq,T}$	L_{A90}	L_{A10}	L_{Amax}
	11:00	52.0	48.6	54.1	61.7

Table A8/D-4
Summary of Measured Noise Levels
Location 4, The Boundary, free-field, dB

Date	Time	$L_{Aeq,T}$	L_{A90}	L_{A10}	L_{Amax}
11/03/2012	00:00	53.1	48.5	55.5	63.4
	00:05	52.6	40.0	56.5	63.1
	00:10	52.7	45.5	55.5	65.7
	00:15	53.5	43.0	57.5	62.8
	00:20	53.2	44.5	56.5	63.6
	00:25	52.0	41.0	55.5	63.6
	12:00	57.4	51.8	59.6	75.7
	12:30	55.6	50.9	57.3	72.6
	13:00	55.3	51.0	58.0	68.7
	13:30	55.6	51.0	56.8	72.1
12/03/2012	23:53	52.7	40.5	56.5	66.0
	23:58	52.2	41.5	56.0	63.6
	00:03	52.8	42.5	56.5	61.5
	00:08	53.3	38.0	56.0	69.3
	00:13	50.9	39.5	54.5	59.7
	00:18	50.4	43.5	53.5	60.0
	12:15	53.8	51.2	55.5	61.7
	12:45	53.3	50.7	55.1	64.1
	13:15	54.1	50.6	55.5	73.7
	13:45	53.7	50.6	55.6	73.0

Table A8/D-5
Summary of Measured Noise Levels
Location 5, New Road, free-field, dB

Date	Time	$L_{Aeq,T}$	L_{A90}	L_{A10}	L_{Amax}
11/03/2012	01:43	38.0	32.0	41.0	59.5
	01:48	38.2	33.0	41.5	48.4
	01:53	38.1	32.5	41.5	47.7
	01:58	37.9	33.5	41.0	44.8
	02:03	36.9	31.0	40.5	46.4
	02:08	40.7	33.0	44.5	53.2
	12:08	46.5	42.0	49.0	64.8
	13:00	49.7	40.5	52.0	66.2
	13:52	53.8	40.0	56.0	73.2
	14:44	52.7	40.5	53.5	69.0
12/03/2012	01:35	36.5	28.5	39.0	60.8
	01:40	34.2	27.0	37.0	47.6
	01:45	34.8	30.0	37.5	44.9
	01:50	37.3	28.5	41.0	49.4
	01:55	40.8	30.5	44.5	49.6
	02:00	36.4	28.5	39.5	50.7
	11:36	58.1	40.5	49.5	82.1
	12:57	67.0	42.0	71.5	80.3
	13:49	61.9	41.5	56.0	82.0
	14:52	64.5	39.5	53.5	85.3

APPENDIX 8/E – LIST OF PLANT

Table A8/E-1
Construction Plant Employed - General

Operation	Plant	No. Of Plant	Plant L_{WA} dB	Est. %age On-time
Site Preparation	Tracked Excavator	1	108	50
	Dozer	1	109	-
Piling Operations	Piling Equipment	1	115	50
Foundation Works	Tracked Excavator	1	108	50
	Concrete Pump	2	107	50
	Concrete Truck	2	108	50
Building Works	Mobile Crane	1	110	50
	Hand Tools	2	111	25
	Compressor	1	100	100
	Generator	1	93	100

APPENDIX 8/F – LIMITATIONS TO THIS REPORT

This entails a physical investigation of the site with a sufficient number of sample measurements to provide quantitative information concerning the type and degree of noise and vibration affecting the site. The objectives of the investigation have been limited to establishing sources of noise and vibration material to carrying out an appropriate assessment.

The number and duration of noise and vibration measurements have been chosen to give reasonably representative information on the environment within the agreed time, and the locations of measurements have been restricted to the areas unoccupied by building(s) that are easily accessible without undue risk to our staff.

As with any sampling, the number of sampling points and the methods of sampling and testing cannot preclude the existence of “hotspots” where noise or vibration levels may be significantly higher than those actually measured due to previously unknown or unrecognised noise or vibration emitters. Furthermore, noise or vibration sources may be intermittent or fluctuate in intensity and consequently may not be present or may not be present in full intensity for some or all of the survey duration.