
Appendix 14.1 Noise Perception and Terminology

Between the quietest audible sound and the loudest tolerable sound there is a million to one ratio in sound pressure (measured in pascals, Pa). Because of this wide range a noise level scale based on logarithms is used in noise measurement called the decibel (dB) scale. Audibility of sound covers a range of approximately 0 to 140 dB.

The human ear system does not respond uniformly to sound across the detectable frequency range and consequently instrumentation used to measure noise is weighted to represent the performance of the ear. This is known as the 'A weighting' and annotated as dB (A). Table A1 below lists the sound pressure level in dB (A) for common situations.

Table A14.1.1: Sound Pressure Levels for a Range of Situations

Typical Noise Levels dB(A)	Example
0	Threshold of hearing
30	Rural area at night, still air
40	Public library Refrigerator humming at 2m
50	Quiet office, no machinery Boiling kettle at 0.5m
60	Normal conversation
70	Telephone ringing at 2m Vacuum cleaner at 3m
80	General factory noise level
100	Pneumatic drill at 5m
120	Discotheque - 1m in front of loudspeaker
140	Threshold of pain

The noise level at a measurement point is rarely steady, even in rural areas, and varies over a range dependent upon the effects of local noise sources. Close to a busy road, the noise level may vary over a range of 5 dB(A), whereas in a suburban area this may increase up to 40 dB(A) and more due to the multitude of noise sources in such areas (cars, dogs, aircraft etc.) and their variable operation. Furthermore, the range of night time noise levels will often be smaller and the levels significantly reduced compared to daytime levels.

The equivalent continuous A-weighted sound pressure level, L_{Aeq} , is the single number that represents the average sound energy measured over that period. The L_{Aeq} is the sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period.

Human subjects are generally only capable of noticing changes in noise levels of no less than 3 dB(A). It is generally accepted that a change of 10 dB(A) in an overall, steady noise level is perceived to the human ear as a doubling (or halving) of the noise level.

A parameter that is widely accepted as reflecting human perception of the ambient noise is the background noise level, L_{A90} . This is the noise level exceeded for 90% of the measurement period and generally reflects the noise level in the lulls between individual noise events. Over a 1-hour period the L_{A90} will be the noise level exceeded for 54 minutes.

The parameter L_{A10} is used to describe road traffic noise. This is the noise level exceeded for 10 % of the measurement period. Over a one hour period, the L_{A10} will be the noise level exceeded for 6 minutes.

Appendix 14.2 Noise Survey Details

Table A14.2.1: Instrumentation Employed in Noise Survey

Instrument	Serial Number
Brüel and Kjær 2260	2001556
Norsonic 140	1403883
Brüel and Kjær 2238	2562627
Brüel and Kjær 2238	2541000
Svantek 958	14693

Table A14.2.2: Meteorological Conditions During Survey

Date	Daytime		Night-time	
	Average Wind Speed (m/s)	Average Wind Direction	Average Wind Speed (m/s)	Average Wind Direction
16/07/2010	4	W	2	W
17/07/2010	6	W	3	SW
18/07/2010	4	SW	1	SW
19/07/2010	2	SW	2	SW
20/07/2010	2	SW	1	W
21/07/2010	4	SW	2	SW
22/07/2010	2	SW	1	N
23/07/2010	2	W	1	NW
24/07/2010	2	SW	1	W
25/07/2010	2	NW	1	NW
26/07/2010	3	NW	1	W
27/07/2010	2	W	1	W
28/07/2010	3	NW	1	NW
29/07/2010	3	NW	1	NW
30/07/2010	3	W	2	W
31/07/2010	2	W	1	W
01/08/2010	2	W	1	NW
02/08/2010	3	NW	0	W
03/08/2010	2	W	2	W

Figure A14.2.1: Measured Noise Levels at Location LT1

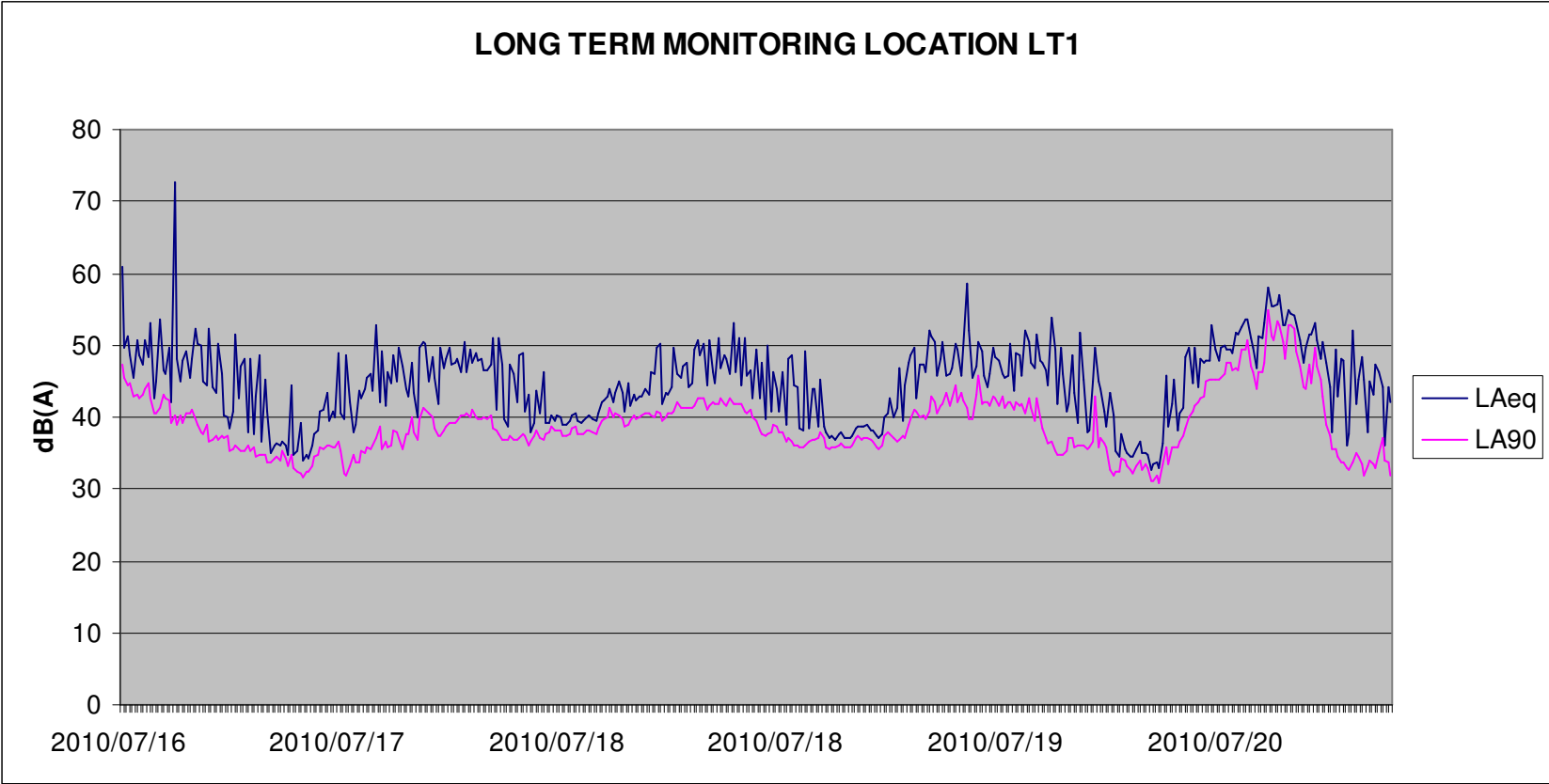


Figure A14.2.2: Measured Noise Levels at Location LT2

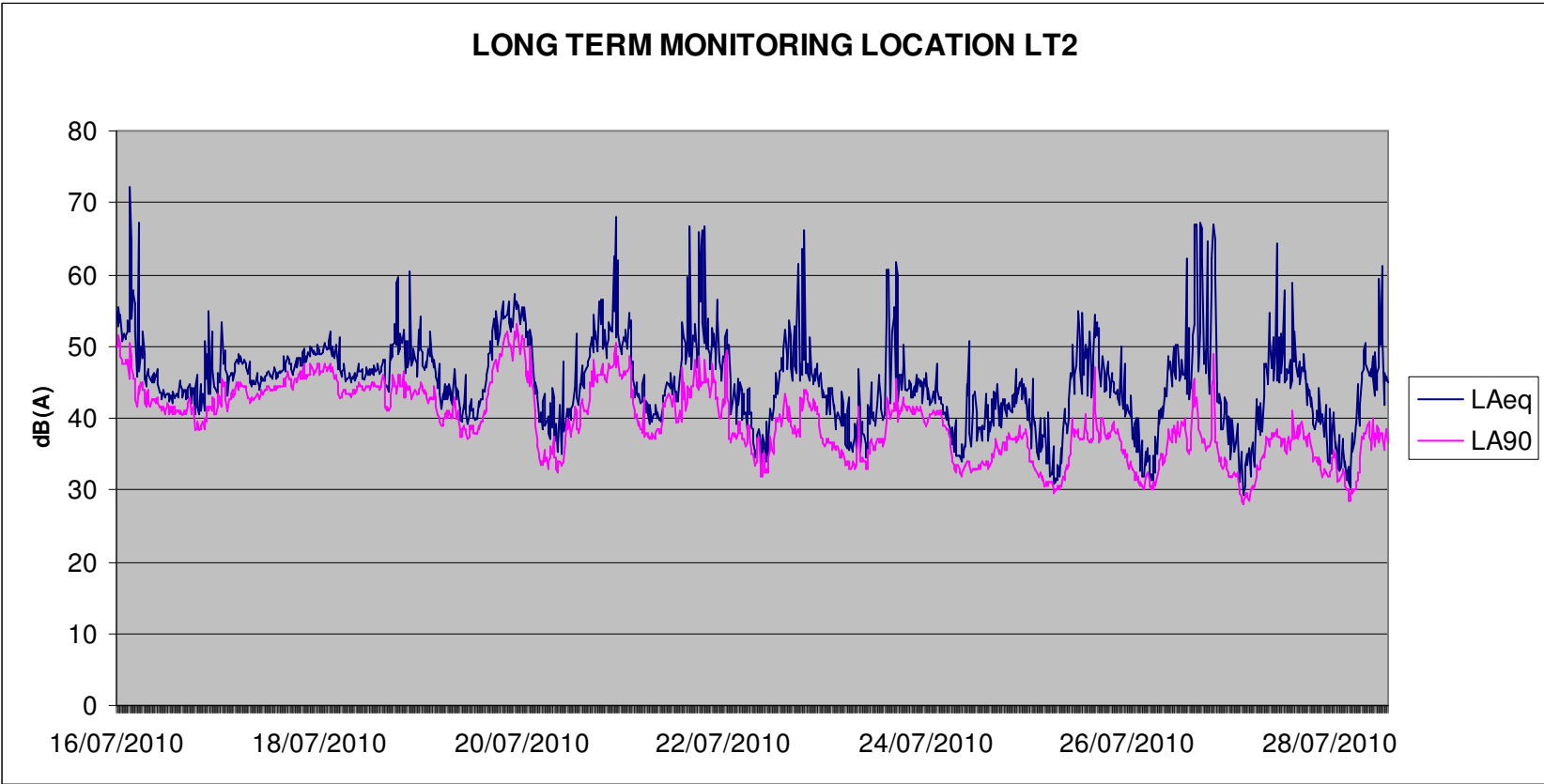
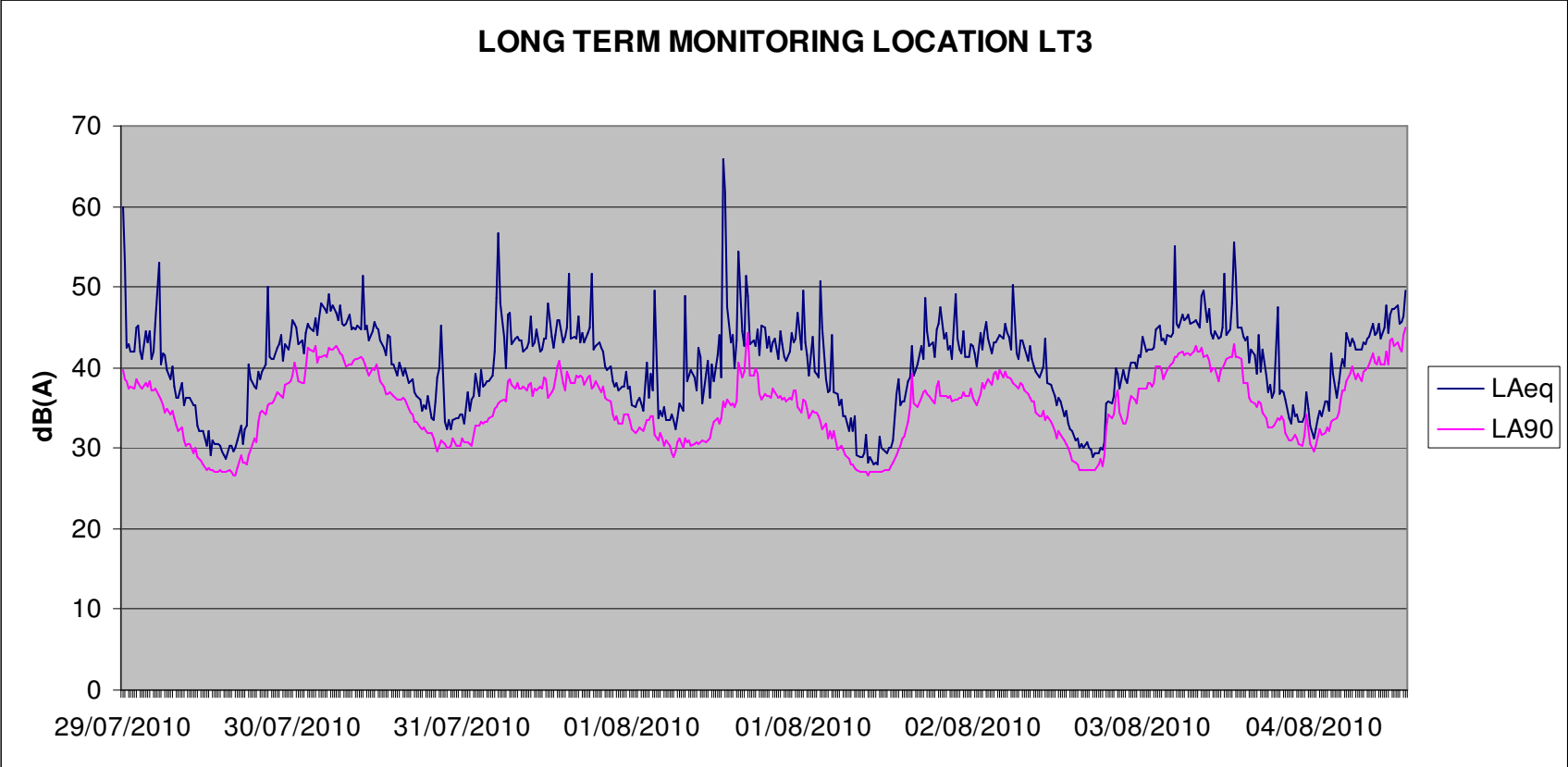


Figure A14.2.3: Measured Noise Levels at Location LT3



Appendix 14.3 Construction Noise

Table A14.3.1: Selected Receptors and Minimum Distances to Construction Activities

Construction Activity	Distance to Construction Activities (metres)				
	C1 25-36 Talbot Gardens	C2 1-12 Talbot Gardens	C3 13-18 Savage Road	C4 471 Wolseley Road	C5 21 Hamoaze Avenue
Site Clearance	22	34	87	112	108
Earthworks	27	39	92	117	113
Excavations and Foundations	37	60	118	155	204
Piling	105	65	118	155	204
Slab Construction	37	60	118	155	204
Steelwork Construction	37	60	118	155	204
Services and Finishing	37	60	118	155	204
Access Roads/ Car Parking	43	49	102	127	123

Assumptions
 For the prediction of typical construction noise levels, the following has been assumed:

- There is line of sight between the construction activities and the nearest noise sensitive properties.
- Earthworks are to be undertaken 10 metres around all construction works.
- Site clearance is undertaken 5 metres around all earthworks.

Table A14.3.2: Assumed Construction Plant

Construction Activity	Plant	Sound Power Level L _w dB(A)	No. of Plant	Overall L _w dB(A)	On-time (% of shift)	Reference
Site Clearance	Chainsaw	114	1	114	10	BS 5228 Table D.2 no. 14
	Dozer	108	1	108	50	BS 5228 Table C.2 ave no.'s 10-13
	Dumper	111	1	111	50	BS 5228 Table C.2 ave no.'s 30-31
	Scraper	110	1	110	50	BS 5228 Table D.9 no. 14
	Loading lorries	106	1	106	83	BS 5228 Table C.2 ave no.'s 26-28
Earthworks	Excavator (tracked)	110	1	110	50	BS 5228 Table D.3 ave no.'s 34-40
	Dumper	111	1	111	50	BS 5228 Table C.2 ave no.'s 30-31
	Dozer	108	1	108	50	BS 5228 Table C.2 ave no.'s 10-13
	Lorries/hr	105	3	110	50	BS 5228 Table D.7 ave no.'s 121-122
Excavations and foundations	Excavator (tracked)	110	1	110	50	BS 5228 Table D.3 ave no.'s 34-40
	Loader (tracked)	112	1	112	50	BS 5228 Table D.3 ave no.'s 7-21
	Lorry	105	1	105	50	BS 5228 Table D.7 ave no.'s 121-122
	Cement mixer truck	105	1	105	50	BS 5228 Table C.4 ave no.'s 18 & 20
	Concrete pump	107	1	107	50	BS 5228 Table D.6 ave no.'s 34 & 36
	Compressor	104	3	109	50	BS 5228 Table D.7 ave no.'s 18-22
	Poker vibrator	98	3	104	50	BS 5228 Table D.6 no. 40
Piling	Crane mounted auger	114	1	114	83	BS 5228 Table D.4 ave no.'s 33-39, 41-42
	Electric water pumps	103	2	106	83	BS 5228 Table D.7 ave no.'s 66-74
	Crane	97	1	97	83	BS 5228 Table C.3 ave no.'s 28-30
Slab Construction	Cement mixer truck	105	1	105	50	BS 5228 Table C.4 ave no.'s 18 & 20
	Concrete pump	107	1	107	50	BS 5228 Table D.6 ave no.'s 34 & 36
	Compressor	104	3	109	50	BS 5228 Table D.7 ave no.'s 18-22
	Poker vibrator	98	3	104	50	BS 5228 Table D.6 no. 40
Steelwork Construction / Plant Installation	Crane	106	1	106	50	BS 5228 Table C.4 no. 38
	Generator	102	1	102	50	BS 5228 Table C.4 no. 32
	Electric drills	104	2	107	33	BS 5228 Table D.6 no. 54
	Metal cutter	107	2	110	33	BS 5228 Table C.1 no. 18
	Pneumatic bolter	107	2	110	33	BS 5228 Table D.6 no. 54
	Lorries/hr	105	6	113	50	BS 5228 Table D.7 ave no.'s 121-122
Finishing and Fitting	Generator	94	2	97	50	BS 5228 Table C.4 no. 85
	Welding plant	102	1	102	50	BS 5228 Table C.3 no. 31
	Electric drills	104	2	107	50	BS 5228 Table D.6 no. 54
	Lorries/hr	105	3	110	50	BS 5228 Table D.7 ave no.'s 121-122
Access Road Construction	Road roller	108	1	108	50	BS 5228 Table C.5 no. 19
	Excavator (tracked)	110	1	110	50	BS 5228 Table D.3 ave no.'s 34-40

Construction Activity	Plant	Sound Power Level L_w dB(A)	No. of Plant	Overall L_w dB(A)	On-time (% of shift)	Reference
	Dumper	101	1	101	50	BS 5228 Table D.7 ave no.'s 81-92
	Asphalt spreader	110	1	110	50	BS 5228 Table D.8 no. 21

Table A14.3.3: Predicted Unmitigated Construction Noise Levels (10 hour day)

Construction Activity	Predicted $L_{Aeq,10h}$ Noise Level (dB)				
	C1	C2	C3	C4	C5
Site Clearance	78	75	69	67	67
Earthworks (buildings)	79	76	71	69	69
Excavations and Foundations	77	76	68	66	63
Piling	68	72	67	65	62
Slab Construction	74	70	64	62	59
Steelwork Construction	76	71	66	63	61
Services and Finishing	72	68	63	60	58
Access Roads/ Car Parking	74	70	65	63	63

Table A14.3.4: Predicted Unmitigated Construction Noise Levels (worst-case 3 hours)

Construction Activity	Predicted $L_{Aeq,3h}$ Noise Level (dB)				
	C1	C2	C3	C4	C5
Site Clearance	80	77	71	69	69
Earthworks (buildings)	80	77	72	70	70
Excavations and Foundations	78	77	69	67	64
Piling	69	73	68	65	63
Slab Construction	75	71	65	63	60
Steelwork Construction	77	73	67	65	3
Services and Finishing	74	70	65	62	60
Access Roads/ Car Parking	75	71	65	63	64

Table A14.3.5: Predicted Unmitigated Construction Noise Levels (worst-case 5 mins)

Construction Activity	Predicted $L_{Aeq,5mins}$ Noise Level (dB)				
	C1	C2	C3	C4	C5
Site Clearance	84	81	74	71	72
Earthworks (buildings)	80	78	72	70	71
Excavations and Foundations	79	77	70	68	65
Piling	69	73	68	66	63
Slab Construction	76	72	66	64	61
Steelwork Construction	79	75	69	67	65
Services and Finishing	77	73	68	65	63
Access Roads/ Car Parking	75	71	66	64	64

Table A14.3.6: Construction Noise Assessment - Receptor C1 (10 hour day)

Construction Activity	Site Clearance	Earthworks	Excavations and Foundations	Piling	Slab Construction	Steelwork Construction	Services and Finishing	Access Roads/ Car parking
Ambient noise levels (façade) L_{Aeq} dB	57							
Rounded L_{Aeq} dB	55							
Acceptable L_{Aeq} (10 hrs)	70							
Predicted Noise Level $L_{Aeq,10h}$ dB	78	79	77	68	74	76	72	74
Level Above Acceptable L_{Aeq} dB	+8	+9	+7	-2	+4	+6	+2	+4
Significance of Effect	High	High	High	None	Med	High	Low	Med

Table A14.3.7: Construction Noise Assessment - Receptor C2 (10 hour day)

Construction Activity	Site Clearance	Earthworks	Excavations and Foundations	Piling	Slab Construction	Steelwork Construction	Services and Finishing	Access Roads/ Car parking
Ambient noise levels (façade) L _{Aeq} dB	57							
Rounded L _{Aeq} dB	55							
Acceptable L _{Aeq} (10 hrs)	70							
Predicted Noise Level L _{Aeq,10h} dB	75	76	76	72	70	71	68	70
Level Above Acceptable L _{Aeq} dB	+5	+6	+6	+2	0	+1	-2	0
Significance of Effect	Med	High	High	Low	None	Neg	None	None

Table A14.3.8: Construction Noise Assessment - Receptor C3 (10 hour day)

Construction Activity	Site Clearance	Earthworks	Excavations and Foundations	Piling	Slab Construction	Steelwork Construction	Services and Finishing	Access Roads/ Car parking
Ambient noise levels (façade) L _{Aeq} dB	59							
Rounded L _{Aeq} dB	60							
Acceptable L _{Aeq} (10 hrs)	75							
Predicted Noise Level L _{Aeq,10h} dB	69	71	68	67	64	66	63	65
Level Above Acceptable L _{Aeq} dB	-6	-4	-7	-8	-11	-9	-12	-10
Significance of Effect	None	None	None	None	None	None	None	None

Table A14.3.9: Construction Noise Assessment - Receptor C4 (10 hour day)

Construction Activity	Site Clearance	Earthworks	Excavations and Foundations	Piling	Slab Construction	Steelwork Construction	Services and Finishing	Access Roads/ Car parking
Ambient noise levels (façade) L _{Aeq} dB	53							
Rounded L _{Aeq} dB	55							
Acceptable L _{Aeq} (10 hrs)	70							
Predicted Noise Level L _{Aeq,10h} dB	67	69	66	65	62	63	60	63
Level Above Acceptable L _{Aeq} dB	-3	-1	-4	-5	-8	-7	-10	-3
Significance of Effect	None	None	None	None	None	None	None	None

Table A14.3.10: Construction Noise Assessment - Receptor C5 (10 hour day)

Construction Activity	Site Clearance	Earthworks	Excavations and Foundations	Piling	Slab Construction	Steelwork Construction	Services and Finishing	Access Roads/ Car parking
Ambient noise levels (façade) L _{Aeq} dB	53							
Rounded L _{Aeq} dB	55							
Acceptable L _{Aeq} (10 hrs)	70							
Predicted Noise Level L _{Aeq,10h} dB	67	69	63	62	59	61	58	63
Level Above Acceptable L _{Aeq} dB	-3	-1	-7	-8	-11	-9	-12	-7
Significance of Effect	None	None	None	None	None	None	None	None

Table A14.3.11: Construction Noise Assessment - Receptor C1 (worst-case 3 hour period)

Construction Activity	Site Clearance	Earthworks	Excavations and Foundations	Piling	Slab Construction	Steelwork Construction	Services and Finishing	Access Roads/ Car parking
Ambient noise levels (façade) L _{Aeq} dB	57							
Rounded L _{Aeq} dB	55							
Acceptable L _{Aeq} (3 hrs)	74							
Predicted Noise Level L _{Aeq,3h} dB	80	80	78	69	75	77	74	75
Level Above Acceptable L _{Aeq} dB	+6	+6	+4	-5	+1	+3	0	+1
Significance of Effect	High	High	Med	None	Neg	Low	None	Neg

Table A14.3.12: Construction Noise Assessment - Receptor C2 (worst-case 3 hour period)

Construction Activity	Site Clearance	Earthworks	Excavations and Foundations	Piling	Slab Construction	Steelwork Construction	Services and Finishing	Access Roads/ Car parking
Ambient noise levels (façade) L _{Aeq} dB	57							
Rounded L _{Aeq} dB	55							
Acceptable L _{Aeq} (3 hrs)	74							
Predicted Noise Level L _{Aeq,3h} dB	77	77	77	73	71	73	70	71
Level Above Acceptable L _{Aeq} dB	+3	+3	+3	-1	-3	-1	-4	-3
Significance of Effect	Low	Low	Low	None	None	None	None	None

Table A14.3.13: Construction Noise Assessment - Receptor C3 (worst-case 3 hour period)

Construction Activity	Site Clearance	Earthworks	Excavations and Foundations	Piling	Slab Construction	Steelwork Construction	Services and Finishing	Access Roads/ Car parking
Ambient noise levels (façade) L _{Aeq} dB	59							
Rounded L _{Aeq} dB	60							
Acceptable L _{Aeq} (3 hrs)	79							
Predicted Noise Level L _{Aeq,3h} dB	71	72	69	68	65	67	65	65
Level Above Acceptable L _{Aeq} dB	-8	-7	-10	-11	-14	-12	-14	-14
Significance of Effect	None	None	None	None	None	None	None	None

Table A14.3.14: Construction Noise Assessment - Receptor C4 (worst-case 3 hour period)

Construction Activity	Site Clearance	Earthworks	Excavations and Foundations	Piling	Slab Construction	Steelwork Construction	Services and Finishing	Access Roads/ Car parking
Ambient noise levels (façade) L _{Aeq} dB	53							
Rounded L _{Aeq} dB	55							
Acceptable L _{Aeq} (3 hrs)	74							
Predicted Noise Level L _{Aeq,3h} dB	69	70	67	65	63	65	62	63
Level Above Acceptable L _{Aeq} dB	-5	-4	-7	-9	-11	-9	-12	-11
Significance of Effect	None	None	None	None	None	None	None	None

Table A14.3.15: Construction Noise Assessment - Receptor C5 (worst-case 3 hour period)

Construction Activity	Site Clearance	Earthworks	Excavations and Foundations	Piling	Slab Construction	Steelwork Construction	Services and Finishing	Access Roads/ Car parking
Ambient noise levels (façade) L _{Aeq} dB	53							
Rounded L _{Aeq} dB	55							
Acceptable L _{Aeq} (3 hrs)	74							
Predicted Noise Level L _{Aeq,3h} dB	69	70	64	63	60	63	60	64
Level Above Acceptable L _{Aeq} dB	-5	-4	-10	-11	-14	-11	-14	-10
Significance of Effect	None	None	None	None	None	None	None	None

Table A14.3.16: Construction Noise Assessment - Receptor C1 (worst-case 5 min period)

Construction Activity	Site Clearance	Earthworks	Excavations and Foundations	Piling	Slab Construction	Steelwork Construction	Services and Finishing	Access Roads/ Car parking
Ambient noise levels (façade) L _{Aeq} dB	57							
Rounded L _{Aeq} dB	55							
Acceptable L _{Aeq} (5 mins)	86							
Predicted Noise Level L _{Aeq,5min} dB	84	80	79	69	76	79	77	75
Level Above Acceptable L _{Aeq} dB	-2	-6	-7	-17	-10	-7	-9	-11
Significance of Effect	None	None	None	None	None	None	None	None

Table A14.3.17: Construction Noise Assessment - Receptor C2 (worst-case 5 min period)

Construction Activity	Site Clearance	Earthworks	Excavations and Foundations	Piling	Slab Construction	Steelwork Construction	Services and Finishing	Access Roads/ Car parking
Ambient noise levels (façade) L _{Aeq} dB	57							
Rounded L _{Aeq} dB	55							
Acceptable L _{Aeq} (5 mins)	86							
Predicted Noise Level L _{Aeq,5min} dB	81	78	77	73	72	75	73	71
Level Above Acceptable L _{Aeq} dB	-5	-8	-9	-13	-14	-11	-13	-15
Significance of Effect	None	None	None	None	None	None	None	None

Table A14.3.18: Construction Noise Assessment - Receptor C3 (worst-case 5 min period)

Construction Activity	Site Clearance	Earthworks	Excavations and Foundations	Piling	Slab Construction	Steelwork Construction	Services and Finishing	Access Roads/ Car parking
Ambient noise levels (façade) L _{Aeq} dB	59							
Rounded L _{Aeq} dB	60							
Acceptable L _{Aeq} (5 mins)	91							
Predicted Noise Level L _{Aeq,5min} dB	74	72	70	68	66	69	68	66
Level Above Acceptable L _{Aeq} dB	-17	-19	-21	-23	-25	-22	-23	-25
Significance of Effect	None	None	None	None	None	None	None	None

Table A14.3.19: Construction Noise Assessment - Receptor C4 (worst-case 5 min period)

Construction Activity	Site Clearance	Earthworks	Excavations and Foundations	Piling	Slab Construction	Steelwork Construction	Services and Finishing	Access Roads/ Car parking
Ambient noise levels (façade) L _{Aeq} dB	53							
Rounded L _{Aeq} dB	55							
Acceptable L _{Aeq} (5 mins)	86							
Predicted Noise Level L _{Aeq,5min} dB	71	70	68	66	64	67	65	64
Level Above Acceptable L _{Aeq} dB	-15	-16	-18	-20	-22	-19	-21	-22
Significance of Effect	None	None	None	None	None	None	None	None

Table A14.3.20: Construction Noise Assessment - Receptor C5 (worst-case 5 min period)

Construction Activity	Site Clearance	Earthworks	Excavations and Foundations	Piling	Slab Construction	Steelwork Construction	Services and Finishing	Access Roads/ Car parking
Ambient noise levels (façade) L _{Aeq} dB	53							
Rounded L _{Aeq} dB	55							
Acceptable L _{Aeq} (5 mins)	86							
Predicted Noise Level L _{Aeq,5min} dB	72	71	65	63	61	65	63	64
Level Above Acceptable L _{Aeq} dB	-14	-15	-21	-23	-25	-21	-23	-22
Significance of Effect	None	None	None	None	None	None	None	None

Table A14.3.21: Construction Traffic Noise Assessment

Road Link	2011 Baseline				2011 With Construction Traffic				Change in BNL
	Flow (18h AAWT)	%HGV	Speed (kph)	BNL (L _{A10,18h})	Flow (18h AAWT)	%HGV	Speed (kph)	BNL (L _{A10,18h})	
Link between Site Roundabout and Wolseley Rd / Weston Mill Drive junction	6995	3.2	32	63.6	7453	5.0	32	64.6	1.0
Weston Mill Drive east of Wolseley Rd junction	22866	2.0	48	69.5	23324	2.6	48	69.8	0.3
Weston Mill Drive east of Ferndale Road	22704	2.4	48	69.6	23162	3.0	48	69.9	0.3
Weston Mill Drive west of A38	22752	2.2	48	69.6	23210	2.8	48	69.9	0.3
A38 westbound on-slip - one way flows	6360	1.8	64	65.5	6589	2.9	64	66.0	0.5
A38 westbound off-slip - one way flows	4666	2.3	64	64.3	4895	3.7	64	64.9	0.6
A38 Eastbound on-slip - one way flows	5918	2.7	64	65.4	6147	3.8	64	65.9	0.5
A38 Eastbound off-slip - one way flows	5826	2.1	64	65.2	6055	3.2	64	65.7	0.5
A38 westbound (west of Weston Mill Drive) - one way flows	26520	5.4	104	76.3	26978	5.9	104	76.4	0.2
A38 westbound (east of Weston Mill Drive) - one way flows	24826	5.7	104	76.0	25284	6.2	104	76.2	0.2
A38 eastbound (west of Weston Mill Drive) - one way flows	24981	5.6	107	76.2	25439	6.1	107	76.4	0.2
A38 eastbound (east of Weston Mill Drive) - one way flows	25072	5.7	107	76.3	25530	6.2	107	76.4	0.2

BNL = Basic Noise Level, which is the calculated road traffic noise level at a reference distance of 10 metres from the edge of the carriageway.

Appendix 14.4 Operational Noise

Table A14.4.1: External Plant Sound Power Level Data Employed in Operational Noise Model

Plant Item	Octave Band Linear Sound Power Level (dB)									Overall A-Wt Level dB(A)
	31Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
ACC Lower Fan	96	87	82	81	88	76	72	66	58	86
ACC Upper Fan	94	85	80	79	86	74	70	64	56	84
Stack	58	62	71	82	85	78	75	63	64	84
Exhaust Steam Pipe	35	52	63	69	78	83	78	70	60	85
Transformer	69	75	77	72	72	66	61	56	49	72
Recoolers (Full Load - Daytime)	62	67	72	77	81	85	84	78	72	89
Recoolers (Half Load - Daytime)	55	60	65	70	74	78	77	71	65	82
Waste HGV Pass-By (23 in / 23 out per hour)	128	128	121	119	116	112	110	104	100	118
Bottom Ash HGV Pass-By (1 in / 1 out per hour)	114	114	107	105	102	98	96	90	86	104
Bicarb HGV Pass-By (1 in / 1 out per hour)	114	114	107	105	102	98	96	90	86	104

Table A14.4.2: Internal Reverberant Sound Pressure Level Data Employed in Operational Noise Model

Plant Area	Octave Band Linear Sound Pressure Level (dB)									Overall A-Wt Level dB(A)
	31Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
Turbine Hall	49	56	71	75	80	81	85	81	77	89
Boiler House	51	59	73	76	83	81	79	73	70	86
Waste Tipping Hall (Daytime)	46	56	64	70	78	81	79	72	58	85
Waste Tipping Hall (Night-time)	31	43	47	59	66	65	61	50	36	68
Water Treatment	50	58	72	75	82	80	78	72	69	85
ID Fan House	54	62	76	79	86	84	82	76	73	89
Filter House	51	59	73	76	83	81	79	73	70	86
Waste Bunker	41	48	56	66	71	74	73	65	60	78
Bicarb Mill Building	48	56	69	78	89	88	82	78	68	91
Workshop (Daytime)	50	58	72	75	82	80	78	72	69	85
Workshop (Night-time – on rare occasions)	45	53	67	70	77	75	73	67	64	80
Baling Store (during normal plant operation)	41	48	56	66	71	74	73	65	60	78
Baling Store (during baling operations)	45	52	60	70	75	78	77	69	64	82
Turbine Hall (maintenance work during baling)	45	53	67	70	77	75	73	67	64	80
Boiler House (maintenance work during baling)	45	53	67	70	77	75	73	67	64	80

Table A14.4.3: Building Fabric Sound Reduction Index Data Employed in Operational Noise Model

Plant Area	Octave Band SRI (dB)									R _w
	31Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
Wall Construction;- Turbine Hall/Waste Bunker/Baling Area	29	33	37	38	44	53	60	67	67	49
Wall Construction;- Boiler House/ID fan House/Tipping Hall/Water Treatment/ Workshop/ Bicarb Mill/Filter House	17	19	21	31	40	50	54	57	62	41
Roof Construction;- Turbine Hall/Waste Bunker/Baling Area/Boiler House/ID Fan House/ Tipping Hall/Water Treatment/ Workshop/Bicarb Mill/Filter House	11	17	21	22	27	43	57	65	54	32
Roller Shutter Door;- Turbine Hall/Boiler House/ID Fan House/	15	19	23	22	26	34	31	25	20	29
Roller Shutter Door;- Tipping Hall/Water Treatment/Workshop	10	14	18	17	21	29	26	20	15	24
Ventilation Louvres;- Turbine Hall/Boiler House/Baling Area/Bicarb Mill/Filter House	1	3	10	21	40	49	47	29	25	33
Ventilation Louvres;- ID Fan House/	0	1	4	10	19	24	17	10	10	20
Ventilation Louvres;- Tipping Hall/Water Treatment	0	0	2	4	9	21	21	12	10	16

Table A14.4.4: Operational Traffic Noise Assessment (with Growth)

Road Link	2014 Do Minimum (Base + Growth)				2014 Do Something (Do Minimum + Development traffic)				Change in BNL
	Flow (18h AAWT)	%HGV	Speed (kph)	BNL (L _{A10,18h})	Flow (18h AAWT)	%HGV	Speed (kph)	BNL (L _{A10,18h})	
Link between Site Roundabout and Wolseley Rd / Weston Mill Drive junction	7184	3.2	32	63.7	7519	6.8	32	65.3	1.6
Wolseley Rd south of Weston Mill Drive junction	28439	1.4	48	70.2	28534	1.7	48	70.4	0.1
Wolseley Rd south of Saltash Rd junction	15109	1.3	48	67.5	15193	1.8	48	67.7	0.2
Weston Mill Drive east of Wolseley Rd junction	23484	2.0	48	69.7	23713	2.8	48	70.0	0.3
Weston Mill Drive east of Ferndale Road	23318	2.4	48	69.7	23541	3.1	48	70.1	0.3
Weston Mill Drive west of A38	23367	2.2	48	69.7	23590	3.0	48	70.0	0.3
Saltash Rd	14714	1.6	48	67.5	14725	1.7	48	67.5	0.0
Wolseley Rd (north of Weston Mill Drive junction) - one way flows	13732	1.0	48	66.9	13743	1.1	48	66.9	0.0
Ferndale Rd	4268	1.8	48	62.2	4268	1.8	48	62.2	0.0
Carlton Terrace	2809	1.1	48	60.1	2815	1.3	48	60.2	0.1
A38 westbound on-slip - one way flows	6532	1.8	64	65.6	6544	2.0	64	65.7	0.1
A38 westbound off-slip - one way flows	4792	2.3	64	64.4	4891	4.0	64	65.0	0.6
A38 Eastbound on-slip - one way flows	6078	2.7	64	65.6	6177	4.0	64	66.0	0.4
A38 Eastbound off-slip - one way flows	5984	2.1	64	65.3	5996	2.2	64	65.4	0.1
A38 westbound (west of Weston Mill Drive) - one way flows	27237	5.4	104	76.4	27250	5.4	104	76.4	0.0
A38 westbound (east of Weston Mill Drive) - one way flows	25497	5.7	104	76.1	25596	6.1	104	76.2	0.1
A38 eastbound (west of Weston Mill Drive) - one way flows	25656	5.6	107	76.4	25669	5.6	107	76.4	0.0
A38 eastbound (east of Weston Mill Drive) - one way flows	25750	5.7	107	76.4	25849	6.0	107	76.5	0.1
Wolseley Rd north of Barne Rd junction- two way	3392	1.1	48	60.9	3392	1.1	48	60.9	0.0
Barne Rd east of Wolseley Rd junction - two way	9946	1.0	48	65.5	9946	1.0	48	65.5	0.0
Barne Rd west of Wolseley Rd junction - two way	6749	1.0	48	63.9	6749	1.0	48	63.9	0.0

BNL = Basic Noise Level, which is the calculated road traffic noise level at a reference distance of 10 metres from the edge of the carriageway.

Table A14.4.5: Operational Traffic Noise Assessment (with Growth + Potential Committed)

Road Link	2014 Do Minimum (Base + Growth + Potential Committed)				2014 Do Something (Do Minimum + Development traffic)				Change in BNL
	Flow (18h AAWT)	%HGV	Speed (kph)	BNL (L _{A10,18h})	Flow (18h AAWT)	%HGV	Speed (kph)	BNL (L _{A10,18h})	
Link between Site Roundabout and Wolseley Rd / Weston Mill Drive junction	7333	3.1	32	63.8	7668	6.6	32	65.3	1.6
Wolseley Rd south of Weston Mill Drive junction	29526	1.4	48	70.4	29621	1.6	48	70.5	0.1
Wolseley Rd south of Saltash Rd junction	16181	1.2	48	67.7	16264	1.6	48	67.9	0.2
Weston Mill Drive east of Wolseley Rd junction	25935	1.8	48	70.0	26164	2.5	48	70.3	0.3
Weston Mill Drive east of Ferndale Road	24188	2.3	48	69.9	24411	3.0	48	70.2	0.3
Weston Mill Drive west of A38	24237	2.1	48	69.8	24460	2.9	48	70.1	0.3
Saltash Rd	14730	1.6	48	67.5	14741	1.7	48	67.5	0.0
Wolseley Rd (north of Weston Mill Drive junction) - one way flows	15082	0.9	48	67.3	15093	1.0	48	67.3	0.0
Ferndale Rd	7955	0.9	48	64.5	7955	0.9	48	64.5	0.0
Carlton Terrace	3335	0.9	48	60.7	3341	1.1	48	60.8	0.1
A38 westbound on-slip - one way flows	6749	1.8	64	65.8	6762	1.9	64	65.8	0.0
A38 westbound off-slip - one way flows	5010	2.2	64	64.6	5108	3.8	64	65.1	0.5
A38 Eastbound on-slip - one way flows	6295	2.6	64	65.7	6394	3.9	64	66.1	0.4
A38 Eastbound off-slip - one way flows	6201	2.0	64	65.5	6214	2.1	64	65.5	0.1
A38 westbound (west of Weston Mill Drive) - one way flows	27454	5.4	104	76.4	27467	5.4	104	76.4	0.0
A38 westbound (east of Weston Mill Drive) - one way flows	25715	5.7	104	76.2	25814	6.0	104	76.2	0.1
A38 eastbound (west of Weston Mill Drive) - one way flows	25874	5.5	107	76.4	25887	5.5	107	76.4	0.0
A38 eastbound (east of Weston Mill Drive) - one way flows	25968	5.6	107	76.4	26066	5.9	107	76.5	0.1
Wolseley Rd north of Barne Rd junction- two way	3392	1.1	48	60.9	3392	1.1	48	60.9	0.0
Barne Rd east of Wolseley Rd junction - two way	9946	1.0	48	65.5	9946	1.0	48	65.5	0.0
Barne Rd west of Wolseley Rd junction - two way	6749	1.0	48	63.9	6749	1.0	48	63.9	0.0

BNL = Basic Noise Level, which is the calculated road traffic noise level at a reference distance of 10 metres from the edge of the carriageway.

Appendix 14.5

Technical Note Regarding BS4142 Penalty