Appendix 17.3

Construction Noise Calculation Data

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Tables

1 Construction Noise

1.1 Data Tables

1.1.1 The tables in this section present the detailed assumptions and noise calculation information for the construction noise assessment.

1.1.2 Acoustic 'On-Times' have been derived based upon experience, given the definition of the term contained in BS5228-1:2009+A1:2014. The acoustic on-time is the period of time that the equipment is working at full power, or within 3dB of its maximum.

Table 1-1: Construction Plant Data

Phase	Plant	BS5228-1 ref	L_{WA} dB	Quantity	Multiple Plant L_{WA} dB	%Acoustic on-time
1, Site Clearance	Petrol driven chain saw (sawing timber)	C5.36	115	1	115	10
	Tracked Excavator	C5.18	108	4	114	30
	Lorry	C2.34	108	4	114	30
	Wheeled Excavator	C4.12	87	4	93	30
2, Compound Construction	Wheeled Backhoe Loader	C2.8	96	1	96	30
	Lorry	C2.34	108	1	108	10
	Vibratory Roller	C2.39	102	1	102	25
3, Compound Operation	Diesel Generator	C4.78	94	1	94	50
	Dumper	C4.9	105	2	108	20
	Wheeled Backhoe Loader	C2.8	96	1	96	30
	Lorry	C2.34	108	1	108	10
4, Stock Proofing	Tractor (towing trailer)	C4.75	107	1	107	25
	Post Rammer	MD*	113	1	113	20
	Hand-held circular saw	C5.36	115	1	115	10
	Nail Gun	MD*	120	1	120	5
5, Pre-Earthworks Drainage	Tracked Excavator	C5.18	108	2	111	30
	Wheeled Mobile Crane	C4.43	98	1	98	30
6, Earthworks General	Tracked Excavator	C5.18	108	2	111	30
	Articulated Dump Truck	C6.26	107	3	111.8	30
	Dozer (41t)	C2.10	108	2	111	25
	Lorry	C2.34	108	4	114	30
7, Earthworks, rolling and compaction	Mini excavator with hydraulic breaker	C5.2	111	1	111	40
	Dozer (41t)	C2.10	108	1	108	25
	Lorry	C2.34	108	2	111	30
8, Rock Breaking	Pulveriser mounted on excavator	C1.4	104	2	107	30
	Tracked Excavator	C6.5	114	2	117	30
	Dozer (41t)	C2.10	108	2	111	50
	Dump Truck	C6.31	115	1	115	50

Phase	Plant	BS5228-1 ref	L_{WA} dB	Quantity	Multiple Plant L_{WA} dB	%Acoustic on-time
9, Sub Formation	Tracked Excavator	C5.18	108	2	111	30
	Dozer (towing roller)	C2.36	109	2	112	40
	Articulated Dump Truck	C6.26	107	3	111.8	25
	Roller (rolling fill)	C2.37	107	2	110	30
10, Drainage	Tracked Excavator	C5.18	108	2	111	30
	Wheeled Mobile Crane	C4.43	98	1	98	30
11, Paving	Asphalt Paver	C5.31	105	2	108	40
	Vibratory compactor	C5.29	110	2	110	40
	Lorry	C2.34	108	2	111	30
	JCB Airmaster	MD*	101	1	101	40
	Pneumatic Breaker	C1.6	111	1	111	20
12, Central Reserve	Dozer (towing roller)	C2.36	109	2	112	40
	Wheeled Excavator	C4.12	87	4	93	30
	HH Circular saw	C5.36	115	1	115	10
13, Road Marking	Lorry	C2.34	108	2	111	30
14, Signage	Hydraulic Hammer Rig	C3.1	117	1	117	30
	Wheeled mobile crane	C4.43	98	1	98	30
	Gas Cutter	C3.34	96	1	96	10
	Lorry	C2.34	108	2	111	30
15, Spey Bridge Demolition – breaking and clearing	Hand Tools	MD*	87	2	90	35
	Mobile telescopic crane	C4.39	105	1	105	25
	Compressor	C5.5	93	2	96	40
	Hand-held circular saw	C4.72	107	1	107	10
	Hand held pneumatic breaker	C1.6	111	1	111	35
	Breaker mounted on wheeled backhoe	C1.1	120	1	120	30
	Road Planer	C5.7	110	1	110	40
	Wheeled Excavator	C4.10	94	2	97	40
	Lorry (4-axle wagon)	C2.34	108	2	111	25
16, Spey Bridge Demolition – Deck Removal	Mobile telescopic crane (100t)	C4.41	99	1	99	25
	Gas cutter	C1.18	107	1	107	10
	Lorry (44t)	C11.7	107	1	107	20
17, Spey Bridge Demolition – Pier Breakdown	Pulveriser mounted on excavator	C1.4	104	2	107	35
	Breaker mounted on excavator	C1.9	118	1	118	30
	Tracked excavator	C2.16	103	1	103	40
	Lorry (4-axle wagon)	C2.34	108	2	111	25
18, Bridge Foundation Construction	Crawler Mounted Rig	C3.3	116	1	116	50
	Tracked Excavator	C3.24	102	1	102	40
	Concrete Pump & cement mixer truck	C4.24	95	1	95	30

Phase	Plant	BS5228-1 ref	L_{WA} dB	Quantity	Multiple Plant L_{WA} dB	%Acoustic on-time
	Concrete Mixer Truck	C4.27	107	1	107	20
	Petrol HH Circular Saw	C4.70	119	1	119	10
	Lorry (44t)	C11.4	111	1	111	20
	Wheeled mobile crane	C4.43	98	1	98	30
	Wheeled mobile telescopic crane	C4.38	106	1	106	25
	Diesel Generator	C4.86	93	1	93	80
19, Bridge Abutment	Petrol HH Circular Saw	C4.70	119	1	119	10
	Wheeled mobile telescopic crane	C4.38	106	1	106	25
	Lorry (44t)	C11.4	111	1	111	20
	Tracked Excavator	C3.24	102	2	105	30
	Concrete Mixer Truck & Truck Mounted Concrete Pump	C4.32	106	1	106	50
	Poker Vibrator	C4.34	97	1	97	30
	Vibratory Tamper	C4.35	91	1	91	40
20, Bridge Deck	Lorry (44t)	C11.4	111	1	111	20
	Wheeled mobile telescopic crane	C4.38	106	2	109	25
	Concrete Mixer Truck & Truck Mounted Concrete Pump	C4.32	106	1	106	50
	Compressor	C5.5	93	1	93	50
	Poker Vibrator	C4.34	97	1	97	30
	Vibratory Tamper	C4.35	91	1	91	40
MD* = Manufacturers Data						

1.1.3 It is assumed that there will not be any particular screening between construction activities and receptors. The ground cover has been assumed to be acoustically soft.

1.1.4 The times of operation of the construction works themselves; a typical 12-hour working day is assumed, (0700-1900) during the week. It is assumed that construction activities will take place for 10-hours, allowing for breaks.

1.1.5 The closest residential receptors are within about 10m of the scheme boundary, at Railabeag, Knappach and Mains of Balavil. Residential receptors are located at various distances from about 10m all the way out to the edge of the study area. The designated sites and NMUs also cover a wide area, some immediately adjacent to the A9, and covering ground out to the edge of the study area and beyond. As such this assessment considered potential construction noise levels at 10m, and at various distances away from the works to provide an indication of changes in construction noise over distance.

1.1.6 The calculated noise level from construction activities in each construction phase are presented in **Table 1-2.**

Table 1-2: Prediction Construction Noise Levels in each Construction Phase, $L_{Aeq,T}$ dB

Construction Phase	Distances					
	10m	20m	50m	100m	200m	350m
1	86.8	80.8	71.4	63.8	56.3	50.2
2	74.8	68.8	59.3	51.8	44.3	38.2
3	77.5	71.5	62.0	54.5	47.0	40.9
4	85.5	79.5	70.0	62.5	55.0	48.9
5	80.2	74.2	64.7	57.2	49.7	43.6
6	87.0	81.0	71.5	64.0	56.5	50.4
7	84.4	78.4	68.9	61.4	53.9	47.8
8	90.1	84.1	74.6	67.1	59.6	53.5
9	86.5	80.5	71.0	63.5	56.0	49.9
10	80.2	74.2	64.7	57.2	49.7	43.6
11	86.6	80.6	71.1	63.6	56.1	50.0
12	84.0	78.0	68.5	61.0	53.5	47.4
13	80.0	74.0	64.5	57.0	49.5	43.4
14	87.0	81.0	71.5	64.0	56.5	50.4
15	90.6	84.5	75.1	67.6	60.0	54.0
16	76.5	70.5	61.0	53.5	46.0	39.9
17	88.1	82.1	72.7	65.1	57.6	51.5
18	89.5	83.4	74.0	66.5	58.9	52.8
19	85.9	79.8	70.4	62.9	55.3	49.2
20	83.3	77.3	67.9	60.3	52.8	46.7

1.1.7 The total noise level from construction activities in each construction phase are presented in **Table 1-3**. The total construction noise level includes the contribution from the existing baseline noise level, included in the first row of the Table for information.

Table 1-3: Prediction Total Noise Levels in each Construction Phase, $L_{Aeq,T}$ dB

Construction Phase	Distance					
	10m	20m	50m	100m	200m	350m
Measured $L_{Aeq,T}$ dB	(MP9) 61.3	(MP9) 61.3	(MP15) 52.8	(MP17) 52.0	(MP13) 52.0	(MP16) 45.9
1	86.9	80.9	71.4	64.1	57.7	51.6
2	75.0	69.5	60.2	54.9	52.7	46.6
3	77.6	71.9	62.5	56.4	53.2	47.1
4	85.5	79.5	70.1	62.9	56.7	50.7
5	80.3	74.4	65.0	58.3	54.0	47.9
6	87.0	81.0	71.6	64.3	57.8	51.7
7	84.4	78.4	69.0	61.9	56.0	49.9
8	90.1	84.1	74.6	67.2	60.3	54.2
9	86.5	80.5	71.1	63.8	57.4	51.3
10	80.3	74.4	65.0	58.3	54.0	47.9

Construction Phase	Distance					
	10m	20m	50m	100m	200m	350m
11	86.6	80.6	71.2	63.9	57.5	51.4
12	84.0	78.1	68.7	61.5	55.8	49.7
13	80.0	74.2	64.8	58.2	53.9	47.8
14	87.0	81.0	71.6	64.3	57.8	51.7
15	90.6	84.6	75.1	67.7	60.7	54.6
16	76.6	71.0	61.7	55.8	53.0	46.9
17	88.1	82.1	72.7	65.3	58.7	52.6
18	89.5	83.5	74.0	66.6	59.7	53.6
19	85.9	79.9	70.5	63.2	57.0	50.9
20	83.4	77.4	68.0	60.9	55.4	49.3