Scottish & Southern Electricity Networks

TRANSMISSION

Dunoon to Loch Long 132 kV OHL Rebuild Environmental Impact Assessment Report Volume 4 | Technical Appendix

Appendix 11.4 - Noise and Vibration Source Assumptions

Scottish & Southern Electricity Networks
TRANSMISSION

TECHNICAL APPENDIX 11.4 NOISE AND VIBRATION SOURCE ASSUMPTIONS

Construction Noise Assessment Assumptions

The following table shows the noise levels associated with the construction activities with reference to BS 5228:2009+A1:2014. In **Table 1** the number of items and the percentage on time during a typical working day are presented. The results relate to a noise level at 10 m from the activity.

The resultant noise levels presented in the tables correspond to each construction activity identified within the construction programme with the highest noise levels, as a typical worst-case.

Table 1: Noise Level Assumptions – Construction Activities

Construction Activity	Name	No.	On-time %	BS 5288 Equipment	Octave band sound pressure level at 10 m (Hz)								dBA
					63	125	250	500	1k	2k	4k	8k	
Tree Felling	Tractor	2	80	Tractor (towing trailer)	93	86	76	76	73	72	64	59	79
	Post Rammer	2	1	Pneumatic hammer	-	-	-	-	-	-	-	-	89
	Nail gun	3	1	Handheld cordless nail gun	63	65	65	66	65	69	64	61	73
	Tracker Excavator	2	80	Tracked excavator	75	76	72	68	65	63	57	49	71
	Woodchipper	1	80	Hand-held circular saw (petrol-cutting concrete blocks)	69	75	77	74	71	70	74	69	79
	Chainsaw	3	50	Hand-held circular saw (petrol-cutting concrete blocks)	69	75	77	74	71	70	74	69	79
Pre-Construction - Site investigations	Hagglund	3	50	Lorry	73	78	78	78	74	73	68	66	80
	360 Excavator, 15 T	1	25	Tracked excavator	75	76	72	68	65	63	57	49	71
	Hiab	1	5	Lorry	73	78	78	78	74	73	68	66	80
	Pick up	1	5	Road lorry (empty)	81	79	75	70	70	70	68	65	76
Borrow Pit - Stone Processing	Mobile Crusher, 38 T	1	80	Tracked semi-mobile crusher	98	98	97	94	91	88	82	72	96
	360 Excavator, 20 T	2	50	Tracked excavator	75	76	72	68	65	63	57	49	71
	Dumper, 2 T	1	75	Dumper	-	-	-	-	-	-	-	-	74
	Excavated material lorries (8 wheeled)	1	50	Lorry	73	78	78	78	74	73	68	66	80

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Construction Activity	Name	No.	On-time %	BS 5288 Equipment	Octave band sound pressure level at 10 m (Hz)								dBA
					63	125	250	500	1k	2k	4k	8k	
Civils - Road Installation	Hiab	1	10	Lorry	73	78	78	78	74	73	68	66	80
	Small Vibrating Roller	1	25	Vibratory roller	82	78	67	71	67	64	60	57	73
	Tracked excavator (22 T)	1	75	Tracked excavator	83	79	78	76	74	71	65	60	79
	Dumper, 2 T	1	75	Dumper	-	-	-	-	-	-	-	-	74
	Excavated material lorries (8 wheeled)	1	50	Lorry	73	78	78	78	74	73	68	66	80
	Front End loader	1	5	Wheeled loader (loading lorry)	92	84	83	77	76	74	71	62	82
	Forklift	1	10	Site forklift truck (at 10 km/h)	-	-	-	-	-	-	-	-	76
Civils - Rock breaking	Excavator mounted rock breaker	1	50	Excavator mounted rock breaker	91	89	85	89	87	87	84	80	93
	Dumper, 2 T	1	50	Dumper	-	-	-	-	-	-	-	-	74
	Tracked excavator (22 T)	1	50	Tracked excavator	83	79	78	76	74	71	65	60	79
	Excavated material lorries (8 wheeled)	1	50	Excavated material lorries (8 wheeled)	73	78	78	78	74	73	68	66	80
Civils - Re-instatement	Tracked excavator (22 T)	1	75	Tracked excavator	83	79	78	76	74	71	65	60	79
	Dumper, 2 T	1	50	Dumper	-	-	-	-	-	-	-	-	74
	Delivery lorry	1	10	Lorry	73	78	78	78	74	73	68	66	80
	Excavated material lorries (8 wheeled)	1	50	Lorry	73	78	78	78	74	73	68	66	80
	Hiab	1	10	Lorry	73	78	78	78	74	73	68	66	80
Foundation Installation	Circular saw/Cut off saw/Disc cutter	1	5	Circular bench saw (petrol-cutting concrete blocks)	85	74	72	70	72	76	82	77	85
	Piling Rig	1	80	Hydraulic hammer rig	82	82	82	89	83	78	75	70	89
	360 Excavator, 20 T	1	50	Tracked excavator	75	76	72	68	65	63	57	49	71
	Delivery lorry	1	10	Lorry	73	78	78	78	74	73	68	66	80
	Piling rig	1	50	Hydraulic hammer rig	80	87	88	84	83	78	74	65	87
	Concrete mixer truck	1	15	Concrete mixer truck	83	74	66	69	70	78	60	55	80

Construction Activity	Name	No.	On-time %	BS 5288 Equipment	Octave band sound pressure level at 10 m (Hz)								dBA
					63	125	250	500	1k	2k	4k	8k	
	Dumper, 2 T	1	40	Dumper	-	-	-	-	-	-	-	-	74
	Concrete pump	1	5	Concrete pump	84	76	70	71	73	73	66	58	78
	Vibratory Plate (petrol)	1	15	Vibratory plate (petrol)	70	74	71	78	74	75	63	58	80
Tower Erection	Hiab	1	15	Lorry	73	78	78	78	74	73	68	66	80
	360 Excavator, 20 T	1	50	Tracked excavator	75	76	72	68	65	63	57	49	71
	Mobile Crane 55 T	1	20	Tracked mobile crane	81	77	69	67	62	60	61	51	70
	Delivery lorry	1	10	Lorry	73	78	78	78	74	73	68	66	80
Conductor Works	Delivery lorry	1	10	Lorry	73	78	78	78	74	73	68	66	80
	Puller/Tensioner	1	75	Tractor (towing equipment)	79	71	78	75	78	70	61	55	80
	Winch Tractor	1	15	Tractor (towing equipment)	79	71	78	75	78	70	61	55	80
	Argo/Soft Track	2	15	Tracked excavator	75	76	72	68	65	63	57	49	71

Indicative helicopter noise emissions are based on an estimate of 145 dB L_{wA} during overflight and 122 dB L_{wA} when idling on the ground, based on the European Union Aviation Safety Agency (EASA) aircraft noise data. The activity is assumed to operate at 150 m off the ground during helicopter flights and 4 m height during idling activities.

Construction Vibration Source Assumptions

The following assumptions relate to the construction vibration assessment:

- Nominal energy in joules for hammer in use in piling – 85000 W;
- Scaling factor depending on probability of predicted value being exceeded for vibratory piling set to 60 for 50 %, 126 for 33 %, and 266 for 5 %; and
- Scaling factor depending on probability of predicted value being exceeded for steady state vibratory rollers and compactors set to 65 for 50 %, 106 for 67 %, and 177 for 95 %.

Vibratory roller and compactor data from TRL 429, shown in **Table 2** below.

Table 2: Assumptions for Construction Vibration Assessment

Plant Model	Type	No. of Drums	Drum Width (m)	Mass per m width (kg/m)		High Setting		
				Front	Rear	Amplitude of Drum Vibration (mm)	Frequency (Hz)	Centrifugal Force (kN)
Bomag BW161AD	Twin Smooth Drum roller – JCB Size	2	1.6	2680	2740	0.91	30	58

Haul Route / Access Routes Vehicle Movement Assumptions

Although the daily activity along haul routes from the public roads will vary throughout the activity, typical haul route movements along access points to OHL tower locations are shown below in **Table 3**. HGV movements have been derived from the construction traffic data provided in **Chapter 13 Traffic and Transport**.

Table 3 – Indicative one-way HGV movements (12 hours)

Link ID	No of access points	Indicative one-way HGV movements (12 hours)
1	1	5
2	2, 3 & 4	30
3	5, 6, 7 * 8	10
4	9 & 10	45
5	11	5
6	12, 13, 14, 15, 16	10
7	17	5

Link IDs and access points identified within Table 3 above in are identified within in **Chapter 13 Traffic and Transport**.