



Scotland England Green Link 2 - English Onshore Scheme

Environmental Statement:
Volume 3

Appendix 13C: Construction Noise Modelling

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For: National Grid Electricity Transmission

Tables

Table 13C-1: Construction Noise Modelling Phases	1
Table 13C-2: Sound Power Level of Construction Equipment	2
Table 13C-3: Predicted Daytime Construction Noise Level	6

Figures

Figure 13C-1: Receiver Location	8
Figure 13C-2: Construction Noise Contours.....	9

Appendix 13C Construction Noise Modelling

Noise modelling has been undertaken using CadnaA®, which is a sophisticated noise modelling software package that predicts noise levels based on the appropriate input data e.g. location and orientation of equipment and sound power data. The software package can take into account a variety of information about the site including demolition and construction noise sources. Construction noise has been calculated using the method set out in BS 5228-1.

The assumptions and parameters selected in noise modelling are the followings.

- An acoustically absorptive land cover is assumed for all project area, and the ground absorption coefficient is selected as 1 which represents a soft absorptive layer for grassed and agricultural fields.
- The receptors is located at 1.5 m a relative height from local ground level which represents a ground floor living/dining room or garden/outdoor usage during the day and evening time periods. Receiver height of 4 m are considered for night-time to represent first-floor bedroom.
- First order of reflections was considered in calculations.

The identified noise sensitive receptors (NSR) is shown in Figure 13C-1 below. As a construction noise model strategy, activities are considered under five Phases. Compound construction, haul access road construction; trenching works, horizontal directional drilling works; cable installation and jointing, construction of converter station, and landfall are considered as sub activities of construction. Phases developed by considering the mentioned activities are presented in Table 13C-1.

Table 13C-1: Construction Noise Modelling Phases

Activities	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
Converter Station Construction	-	-	-	-	+
Landfall Construction	-	-	-	+	-
Cable Installation	-	-	+	-	-
HDD	-	+	-	-	-
Trenching	-	+	-	-	-
Road Construction	+	-	-	-	-
Compounds	+	-	-	-	-

The estimated equipment for each construction activity, quantities and sound power levels are presented in Table 13C-2.

For the construction noise model, all the machine/equipment noise sources are assumed to be working for daytime period. All the sound power levels for the construction plants are taken from BS 5228-1.

Table 13C-2: Sound Power Level of Construction Equipment

Area	Work Package	Activity	Plant / Equipment	BS 5228 Reference	Sound Power L _w (dBA)	Quantity
Compound Areas	Landfall Construction	Clearing site	Tracked excavator	C.2, Item 2	105	1
		Clearing site	Wheeled backhoe loader	C.2, Item 8	96	1
		Clearing site	Dozer	C.2, Item 10	116	1
		Ground excavation/earthworks	Tracked excavator	C.2, Item 14	107	1
		Ground excavation/earthworks	Wheeled loader	C.2, Item 27	108	1
		Lifting	Wheeled mobile telescopic crane	C.4, Item 38	112	1
		Distribution of material	Dump truck (tipping fill)	C.2, Item 30	107	2
		Distribution of material	Telescopic handler	C.2, Item 35	99	1
		Mixing concrete	Cement mixer truck (discharging)	C.4, Item 18	103	1
		Power for site cabins	Diesel generator	C.6, Item 39	93	1
	Primary Compound Construction	Clearing site	Tracked excavator	C.2, Item 2	105	1
		Clearing site	Wheeled backhoe loader	C.2, Item 8	96	1
		Clearing site	Dozer	C.2, Item 10	116	1
		Ground excavation/earthworks	Tracked excavator	C.2, Item 14	107	1
		Ground excavation/earthworks	Wheeled loader	C.2, Item 27	108	1
		Lifting	Wheeled mobile telescopic crane	C.4, Item 38	112	1
		Distribution of material	Dump truck (tipping fill)	C.2, Item 30	107	2
		Distribution of material	Telescopic handler	C.2, Item 35	99	1
		Mixing concrete	Cement mixer truck (discharging)	C.4, Item 18	103	1
		Power for site cabins	Diesel generator	C.6, Item 39	93	1
	Secondary Compound Construction	Clearing site	Tracked excavator	C.2, Item 2	105	1
		Clearing site	Wheeled backhoe loader	C.2, Item 8	96	1
		Clearing site	Dozer	C.2, Item 10	116	1
		Ground excavation/earthworks	Tracked excavator	C.2, Item 14	107	1
		Ground excavation/earthworks	Wheeled loader	C.2, Item 27	108	1
		Lifting	Wheeled mobile telescopic crane	C.4, Item 38	112	1

Area	Work Package	Activity	Plant / Equipment	BS 5228 Reference	Sound Power L _w (dBA)	Quantity
		Distribution of material	Dump truck (tipping fill)	C.2, Item 30	107	2
		Distribution of material	Telescopic handler	C.2, Item 35	99	1
		Mixing concrete	Cement mixer truck (discharging)	C.4, Item 18	103	1
		Power for site cabins	Diesel generator	C.6, Item 39	93	1
Access Roads	Access Roads	Earthworks	Bulldozer	C.5, Item 15	111	1
		Earthworks	Articulated dump truck	C.5, Item 16	109	1
		General wheeled loader operations	Loading sand to lorry	C.10, Item 6	113	1
		Breaking up concrete	Breaker mounted on wheeled backhoe	C.1, Item 2	120	1
		Rolling and compaction	Roller (rolling fill)	C.2, Item 37	107	1
All Site	Trench Excavation	Trenching	Tracked excavator	C.4, Item 63	105	2
		Trenching	Wheeled backhoe loader	C.4, Item 66	97	2
		Pumping water	Water pump	C.2, Item 45	93	2
		Distribution of materials	Dumper	C.4, Item 9	105	2
		Breaking up concrete	Breaker mounted on wheeled backhoe	C.1, Item 2	120	2
All Site	Cable Installation	Lifting	Wheeled mobile telescopic crane	C.4, Item 38	106	2
		Dumping load	Dump truck	C.6, Item 24	114	4
		Lifting	Telescopic handler	C.4, Item 55	98	4
		Rolling and compaction	Vibratory roller	C.5, Item 27	95	2
		Craneage for piling (lifting piles, casings, etc)	Tracked mobile crane	C.3, Item 28	95	1
HDD	Directional Drill	Directional drilling	Directional drill (generator)	C.2, Item 44	105	1
		Pumping water	Water pump	C.2, Item 45	93	1
		Lorry movements on access road	Lorry	C.11, Item 5	108	1
Converter Station	Earthworks	Earthworks	Bulldozer	C.5, Item 15	111	2
		Earthworks	Articulated dump truck	C.5, Item 16	109	20
		Earthworks	Tracked excavator	C.5, Item 18	108	2
		Front end loaders	Wheeled loader (loading lorry)	C.6, Item 33	110	4

Area	Work Package	Activity	Plant / Equipment	BS 5228 Reference	Sound Power L _w (dBA)	Quantity
Converter Station	Civil Engineering Works	Distribution of materials	Articulated dump truck	C.5, Item 16	104	5
		Lifting	Wheeled mobile telescopic crane	C.4, Item 38	106	2
		Power for welder	Diesel generator	C.4, Item 85	94	1
		Sweeping and dust suppression	Road sweeper	C.4, Item 90	104	1
		Continuous flight auger piling – cast in situ	Concrete pump	C.3, Item 25	106	1
		Mixing concrete	Cement mixer truck (discharging)	C.4, Item 18	103	1
		Dumping load	Dump truck	C.6, Item 24	114	2
	Building Works	Breaking up/cutting steel	Gas cutter	C.1, Item 18	107	3
		Breaking up/cutting steel	Tracked excavator	C.1, Item 17	111	2
		Distribution of material	Lorry	C.2, Item 34	108	4
		Distribution of material	Telescopic handler	C.2, Item 35	99	2
		Pre-cast concrete piling – hydraulic hammer	Hydraulic hammer rig	C.3, Item 1	117	1
		Craneage for piling (lifting piles, casings, etc)	Wheeled mobile crane	C.3, Item 30	98	4
		Welding / cutting steel piles	Hand-held welder (welding piles)	C.3, Item 31	101	4
		Welding / cutting steel piles	Generator for welding	C.3, Item 32	101	4
		Welding / cutting steel piles	Gas cutter (cutting top of pile)	C.3, Item 34	96	4
		Welding / cutting steel piles	Hand-held gas cutter	C.3, Item 35	93	4
		Lifting	Mobile telescopic crane	C.4, Item 41	99	2
		Lifting	Tower crane	C.4, Item 48	104	3
		Lifting	Lifting platform	C.4, Item 57	95	4
		Lifting	Site lift for workers	C.4, Item 62	94	4
		Core drilling concrete	Core drill (electric)	C.4, Item 69	113	2
		Cutting concrete blocks / paving slabs	Hand-held circular saw (petrol-cutting concrete blocks)	C.4, Item 72	107	2
		Moving equipment	Tractor (towing equipment)	C.4, Item 74	108	2

Area	Work Package	Activity	Plant / Equipment	BS 5228 Reference	Sound Power L _w (dBA)	Quantity
		Power for site cabins	Diesel generator	C.6, Item 39	93	2
		Power for welder	Diesel generator	C.4, Item 85	94	2
Converter Station	Cable Installation	Trenching	Tracked excavator	C.4, Item 63	105	1
		Trenching	Wheeled backhoe loader	C.4, Item 66	97	1
		Pumping water	Water pump	C.2, Item 45	93	1
		Distribution of materials	Dumper	C.4, Item 9	105	2
		Breaking up concrete	Breaker mounted on wheeled backhoe	C.1, Item 2	120	1
		Rotary bored piling – cast in situ	Compressor for mini piling	C.3, Item 19	103	1
		Sheet steel piling – hydraulic jacking	Piling	C.3, Item 9	91	2
		Lifting	Wheeled mobile telescopic crane	C.4, Item 38	106	2
		Dumping load	Dump truck	C.6, Item 24	114	2
		Lifting	Telescopic handler	C.4, Item 55	98	1
		Rolling and compaction	Vibratory roller	C.5, Item 27	95	1
		Mechanical &Electrical Works	Lifting	Wheeled mobile telescopic crane	C.4, Item 38	106
	Lifting		Mobile telescopic crane	C.4, Item 39	105	3
	Power for welder		Diesel generator	C.4, Item 85	94	3
	Welding / cutting steel piles		Hand-held welder (welding piles)	C.3, Item 31	101	3
	Welding / cutting steel piles		Generator for welding	C.3, Item 32	101	3
Welding / cutting steel piles	Hand-held gas cutter		C.3, Item 35	93	3	
HDD	Directional Drill	Directional drilling	Directional drill (generator)	C.2, Item 44	105	1
		Pumping water	Water pump	C.2, Item 45	93	1
		Lorry movements on access road	Lorry	C.11, Item 5	108	1

Noise modelling results at the 74 receiver positions for five construction Phases are presented in **Table 13C-3**. The noise contour maps are shown in **Figure 13C-2**.

Table 13C-3: Predicted Daytime Construction Noise Level

ID	L _{day} (dBA)				
	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
Rec01	60	54	53	53	-
Rec02	61	56	54	31	-
Rec03	60	56	54	26	-
Rec04	57	52	51	29	-
Rec05	56	52	50	25	-
Rec06	56	50	48	22	-
Rec07	59	55	53	-	-
Rec08	57	53	51	-	-
Rec09	65	58	55	-	-
Rec10	61	55	53	-	-
Rec11	63	57	54	-	-
Rec12	59	54	52	-	-
Rec13	56	52	49	-	-
Rec14	67	63	61	-	-
Rec15	61	56	52	-	-
Rec16	66	59	57	-	-
Rec17	61	55	53	-	-
Rec18	63	58	57	-	-
Rec19	64	60	58	-	-
Rec20	60	55	53	-	-
Rec21	58	53	51	-	-
Rec22	65	61	59	-	-
Rec23	71	66	64	-	-
Rec24	61	56	54	-	-
Rec25	62	59	57	-	-
Rec26	61	59	57	-	-
Rec27	55	53	51	-	-
Rec28	54	52	50	-	-
Rec29	59	57	55	-	-
Rec30	60	56	55	-	-
Rec31	53	50	48	-	-
Rec32	59	57	55	-	-
Rec33	59	57	55	-	-
Rec34	58	55	53	-	-
Rec35	58	54	52	-	-
Rec36	66	61	58	-	-
Rec37	64	61	59	-	-
Rec38	57	50	48	-	-
Rec39	59	56	54	-	-
Rec40	58	52	50	-	-
Rec41	64	61	60	-	-
Rec42	64	61	60	-	-
Rec43	64	62	60	-	-
Rec44	59	57	55	-	-
Rec45	59	57	55	-	-
Rec46	64	60	58	-	-
Rec47	68	56	54	-	-
Rec48	61	57	55	-	-

L _{day} (dBA)					
ID	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
Rec49	67	59	57	-	-
Rec50	67	61	58	-	-
Rec51	57	53	51	-	-
Rec52	61	58	56	-	-
Rec53	63	58	55	-	-
Rec54	70	63	60	-	-
Rec55	66	60	58	-	-
Rec56	70	65	61	-	-
Rec57	63	54	51	-	-
Rec58	70	64	61	-	44
Rec59	68	56	54	-	38
Rec60	73	69	67	-	50
Rec61	66	61	59	-	49
Rec62	76	56	53	-	63
Rec63	64	59	57	-	49
Rec64	69	67	65	-	53
Rec65	58	46	44	-	55