

# Environmental Impact Assessment Report

Appendix C8 Noise and Vibration

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**Grangemouth Flood Protection Scheme 2024**  
**Falkirk Council**



**GRANGEMOUTH**  
Flood Protection Scheme  
Protecting the heart of our communities

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## Appendix C8.1 Noise emission database of construction plant equipment

Part 1 of BS 5228:2009+A1:2014 provides suitable methods for the calculation of noise from construction activities, including basic information regarding noise levels from a range of construction equipment. The construction noise levels have been predicted in accordance with BS 5228-1:2009+A1:2014 Annex F and sound emission levels, associated with the indicative list of construction plant and equipment derived for this assessment, have been sourced from BS 5228-1:2009+A1:2014 Annex C. Items of plant have been aligned with equivalent items provided in BS5228-1 to determine their noise emission. The selected A-weighted sound power levels have then been corrected so to consider the 'Percentage On-time' (portion of time in which the equipment is operating at its maximum power), and 'Duration of Activity' (amount of time in relation to the 'Shift Duration' in which the equipment is expected to operate).

Table B8.1 lists the assumed construction plant and equipment used as the noise source inputs for the construction noise model. It should be noted that the lists below do not form the full complement of plant and equipment for each construction activity. The table below contains those items of plant likely to be present during each construction activity operating at the same time and at the closest point to a receptor. This can therefore be considered for the noise calculations to be a largely single homogenous source for the type of works described.

**Table B8.1: Assumed list of noise emission data for construction plant and equipment – Construction phase**

Activity	BS 5228 / Source <sup>1</sup>		Plant Description	Quantity	Percentage On-Time <sup>2</sup>	Shift Duration, T (hrs)	Duration of Activity (hrs)	% Activity Time <sup>3</sup>	Lw (dB(A)) from single item <sup>4</sup>
	Table	Ref. No.							
Site Compound - Excavation Hardstanding & Offices	C.2.	12	Dozer	1	20%	10	8	80%	109
	C.4.	65	Tracked excavator	1	25%	10	8	80%	99
	C.4.	6	Dumper	1	20%	10	8	80%	107
	C.5.	21	Vibratory roller	1	20%	10	8	80%	108
	C.4.	53	Lorry with lifting boom	1	30%	10	8	80%	105
	C.4.	80	Diesel generator	1	50%	10	8	80%	88
Site Compound - Operation	C.4.	80	Diesel generator	1	50%	10	8	80%	88
	Manufacturer's data		General 4x4	2	20%	10	8	80%	108
	C.2.	34	Lorry (4-axle wagon)	1	10%	10	8	80%	108
Embankment Construction	C.2.	19	Tracked excavator	1	30%	10	8	80%	105
	C.3.	8	Vibratory piling rig	1	35%	10	8	80%	116

Activity	BS 5228 / Source <sup>1</sup>		Plant Description	Quantity	Percentage On-Time <sup>2</sup>	Shift Duration, T (hrs)	Duration of Activity (hrs)	% Activity Time <sup>3</sup>	Lw (dB(A)) from single item <sup>4</sup>
	Table	Ref. No.							
	C.2.	34	Lorry (4-axle wagon)	1	20%	10	8	80%	108
	C.2.	37	Roller (rolling fill)	1	20%	10	8	80%	107
	C.5.	31	Asphalt paver (+ tipper lorry)	1	15%	10	8	80%	105
	C.4.	14	Wheeled backhoe loader	1	15%	10	8	80%	95
	C.4.	4	Dumper	1	15%	10	8	80%	104
Sheet Pile Walls	C.2.	19	Tracked excavator	1	25%	10	8	80%	105
	C.3.	8	Vibratory piling rig	1	30%	10	8	80%	116
	C.3.	34	Gas cutter	1	10%	10	8	80%	96
	C.4.	20	Concrete mixer truck	1	15%	10	8	80%	108
	C.4.	33	Poker vibrator	1	10%	10	8	80%	106
	C.4.	86	Diesel generator	1	15%	10	8	80%	93
	C.4.	4	Dumper	1	20%	10	8	80%	104
Formwork Reinforcement & Concrete	C.1.	19	Lump Hammer	1	5%	10	8	80%	97
	C.4.	72	Hand-held circular saw (petrol-cutting concrete blocks)	1	10%	10	8	80%	107
	C.4.	20	Concrete mixer truck	1	25%	10	8	80%	108
	C.4.	33	Poker vibrator	1	15%	10	8	80%	106
	C.4.	86	Diesel generator	1	20%	10	8	80%	93
	C.4.	4	Dumper	1	15%	10	8	80%	104

Activity	BS 5228 / Source <sup>1</sup>		Plant Description	Quantity	Percentage On-Time <sup>2</sup>	Shift Duration, T (hrs)	Duration of Activity (hrs)	% Activity Time <sup>3</sup>	Lw (dB(A)) from single item <sup>4</sup>
	Table	Ref. No.							
Seepage Barrier	C.2.	19	Tracked excavator	1	25%	10	8	80%	105
	C.3.	8	Vibratory piling rig	1	30%	10	8	80%	116
	C.3.	34	Gas cutter	1	10%	10	8	80%	96
	C.4.	24	Concrete pump + cement mixer truck	1	15%	10	8	80%	95
	C.4.	33	Poker vibrator	1	15%	10	8	80%	106
Flood Gate Construction	C.2.	19	Tracked excavator	1	25%	10	8	80%	105
	C.4.	20	Concrete mixer truck	1	20%	10	8	80%	108
	C.4.	33	Poker vibrator	1	20%	10	8	80%	106
	C.4.	86	Diesel generator	1	25%	10	8	80%	93
	C.4.	71	Circular bench saw (petrol-cutting concrete blocks)	1	5%	10	8	80%	113
	C.4.	53	Lorry with lifting boom	1	15%	10	8	80%	105
Road Works	C.4.	41	Mobile telescopic crane	1	15%	10	8	80%	99
	C.5.	7	Road planer	1	40%	10	8	80%	110
	C.2.	34	Lorry (4-axle wagon)	1	30%	10	8	80%	108
	C.4.	72	Hand-held circular saw (petrol-cutting concrete blocks)	1	5%	10	8	80%	107

Activity	BS 5228 / Source <sup>1</sup>		Plant Description	Quantity	Percentage On-Time <sup>2</sup>	Shift Duration, T (hrs)	Duration of Activity (hrs)	% Activity Time <sup>3</sup>	Lw (dB(A)) from single item <sup>4</sup>
	Table	Ref. No.							
	C.5.	31	Asphalt paver (+ tipper lorry)	1	30%	10	8	80%	105
	C.2.	37	Roller (rolling fill)	1	35%	10	8	80%	107
Temporary Culverts	C.2.	19	Tracked excavator	1	30%	10	8	80%	105
	C.4.	4	Dumper	1	50%	10	8	80%	104
	C.2.	41	Vibratory plate - Petrol	2	20%	10	8	80%	108
	C.2.	37	Roller (rolling fill)	1	10%	10	8	80%	107
	C.4.	88	Water pump (diesel)	1	50%	10	8	80%	96
	C.4.	41	Mobile telescopic crane	1	15%	10	8	80%	99
Ground Level Raising	C.2.	19	Tracked excavator	1	25%	10	8	80%	105
	C.2.	34	Lorry (4-axle wagon)	1	15%	10	8	80%	108
	C.4.	4	Dumper	1	20%	10	8	80%	104
	C.2.	37	Roller (rolling fill)	1	15%	10	8	80%	107
Coastal Revetment Works	C.4.	14	Wheeled backhoe loader	1	50%	10	8	80%	95
	C.2.	19	Tracked excavator	1	20%	10	8	80%	105
	C.2.	34	Lorry (4-axle wagon)	1	15%	10	8	80%	108
	C.4.	4	Dumper 75 kW	1	20%	10	8	80%	104
Bridge Works	C.4.	4	Dumper	1	15%	10	8	80%	104
	Manufacturer's data		Hammer Drill Under Load	1	25%	10	8	80%	101

Activity	BS 5228 / Source <sup>1</sup>		Plant Description	Quantity	Percentage On-Time <sup>2</sup>	Shift Duration, T (hrs)	Duration of Activity (hrs)	% Activity Time <sup>3</sup>	Lw (dB(A)) from single item <sup>4</sup>
	Table	Ref. No.							
	C.4.	20	Concrete mixer truck	1	20%	10	8	80%	108
	C.4.	33	Poker vibrator	1	15%	10	8	80%	106
	C.4.	86	Diesel generator	1	20%	10	8	80%	93
	C.4.	72	Hand-held circular saw (petrol-cutting concrete blocks)	1	10%	10	8	80%	107
Flow control structure	C.4.	88	Water pump (diesel)	1	50%	10	8	80%	96
	C.2.	19	Tracked excavator	1	25%	10	8	80%	105
	C.4.	20	Concrete mixer truck	1	20%	10	8	80%	108
	C.4.	33	Poker vibrator	1	20%	10	8	80%	106
	C.4.	86	Diesel generator	1	25%	10	8	80%	93
	C.4.	71	Circular bench saw (petrol-cutting concrete blocks)	1	10%	10	8	80%	113
Building Demolition	C.2.	24	Tracked excavator	1	30%	10	8	80%	101
	C.4.	2	Dumper	1	30%	10	8	80%	104
	C.1.	5	Pulveriser mounted on backhoe	1	20%	10	8	80%	100
Footpath Construction	C.4.	14	Wheeled backhoe loader	1	25%	10	8	80%	95
	C.4.	4	Dumper	1	20%	10	8	80%	104
	C.2.	40	Vibratory roller	1	25%	10	8	80%	101

Activity	BS 5228 / Source <sup>1</sup>		Plant Description	Quantity	Percentage On-Time <sup>2</sup>	Shift Duration, T (hrs)	Duration of Activity (hrs)	% Activity Time <sup>3</sup>	Lw (dB(A)) from single item <sup>4</sup>
	Table	Ref. No.							
	C.2.	34	Lorry (4-axle wagon)	1	10%	10	8	80%	108
Relining Works	C.1.	5	Pulveriser mounted on backhoe	1	20%	12	8	67%	100
	C.4.	4	Dumper	1	20%	12	8	67%	104
	C.4.	24	Concrete pump + cement mixer truck	1	30%	12	8	67%	95
Kiosk foundations	C.2.	24	Tracked excavator	1	30%	10	8	80%	101
	C.4.	4	Dumper	1	20%	10	8	80%	104
	C.4.	24	Concrete pump + cement mixer truck	1	20%	10	8	80%	95
	C.4.	33	Poker vibrator	1	10%	10	8	80%	106
	C.4.	41	Mobile telescopic crane	1	15%	10	8	80%	99
	C.6.	19	Road lorry	1	10%	10	8	80%	104
Kiosk installation	C.4.	41	Mobile telescopic crane	1	20%	10	8	80%	99
	C.6.	19	Road lorry	1	20%	10	8	80%	104
Vegetation Clearance	Manufacturer's data		Chain Saw	1	20%	10	8	80%	114
	Manufacturer's data		Brushcutter	1	25%	10	8	80%	110
	Manufacturer's data		Large Wood Chipper	1	20%	10	8	80%	120
	Manufacturer's data		General 4x4	1	20%	10	8	80%	108



Activity	BS 5228 / Source <sup>1</sup>		Plant Description	Quantity	Percentage On-Time <sup>2</sup>	Shift Duration, T (hrs)	Duration of Activity (hrs)	% Activity Time <sup>3</sup>	Lw (dB(A)) from single item <sup>4</sup>
	Table	Ref. No.							
Service Diversion	C.4.	70	Petrol hand-held circular saw	1	10%	10	8	80%	119
	C.2.	19	Tracked excavator	1	20%	10	8	80%	105
	C.2.	34	Lorry (4-axle wagon)	1	10%	10	8	80%	108
	C.5.	5	Compressor for hand-held pneumatic breaker	1	25%	10	8	80%	93
	C.1.	6	Hand held pneumatic breaker	1	20%	10	8	80%	111
	C.2.	41	Vibratory plate - Petrol	1	20%	10	8	80%	108

<sup>1</sup> Data from Annex C of BS5228:2009+A1:2014. Code of practice for noise and vibration control on construction and open sites – Part 1: Noise.

<sup>2</sup> Estimated time the plant item will be operating at full power.

<sup>3</sup> Percentage of time the activity will take place, i.e. assumed to be 8 hours out of the 10 hour shift the activity will occur.

<sup>4</sup> Sound power level in decibels (dB) of a single item of plant.