



The Sizewell C Project

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SHARPS REDMORE

ACOUSTIC CONSULTANTS ▪ Established 1990



Report

Sizewell C Project

Volume 3 Appendix 4A

Construction and Operational
Noise Assessment

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VOLUME 3 APPENDIX 4A: CONSTRUCTION AND OPERATIONAL NOISE ASSESSMENT

Construction noise assessment

- 1 Specific construction activities have been considered within each of the construction and post-operational phases, and the noise impacts then assessed at each of the noise sensitive receptors (and groups of noise sensitive receptors) labelled A-G, as shown in **Figure 4.1** of **Chapter 4** of this volume. The construction phases have been identified and described as follows:
 - enabling works, excavations and earthworks (including bund forming);
 - construction of parking and circulation routes;
 - utilities and building construction;
 - final surfacing of parking and circulation routes; and
 - removal and reinstatement (post-operation).
- 2 Each of the phases described above will involve a range of activities that will require the use of both fixed and mobile plant. Methods may vary between contractors however it is possible to undertake an assessment of the noise and vibration based on the expected methods of working gained from experience of similar developments.
- 3 For each set of activities, the sound power level of the required plant has then been used to predict the resultant façade sound level at each noise sensitive receptor in accordance with the methodology within British Standard BS 5228-1. These predictions at each receptor take into account ground absorption and any screening from natural or formed topography.
- 4 The formation of the bund will be undertaken early in the construction programme, following the site preparation works. Predictions of construction sound levels at seven locations representing noise sensitive receptors from the phases that follow the formation of the bund therefore take account of the presence of a 3 metre (m) high earth bund.
- 5 The time taken to complete each phase of the construction will vary in the length, and there may be some overlap between the phases. With the exception of the central facilities, construction activity will move around the site as a whole. Sets of plant or equipment will therefore only likely be located at any one position for a period which may be as short as a few days. Predicted levels are indicative of typical conditions for each phase.
- 6 Traverse lengths for mobile plant, and haul routes for movement of materials by dump trucks have been included in the predicted sound level calculations. Some materials are required to be imported to site, and therefore the expected peak number of vehicle movements has been adopted for the calculations to represent a robust worst case.
- 7 Finally, during the removal and reinstatement phase, it is assumed that the earth bund would be left in place till the end of the phase. Once dismantling of hard standing and

circulation routes has taken place, the earth bund will be reduced to ground level and the top-soil material distributed across the site during reinstatement to agricultural use.

8 **Table 1** shows the assumed activities for each phase.

Table 1: Assumed activities for each phase

Phase	Activities
Enabling works.	<p>Assume plant will operate only during 08:00 - 18:00 hours within overall working hours of 07:00 - 19:00 hours.</p> <p>Clearance of vegetation, erection of fencing, installation of cabins and creation of site entrance.</p> <p>Main works area centred on entrance. Chainsaws and brush cutters only likely to be required for occasional use.</p> <p>Temporary fencing not likely to be embedded in ground but Heras style fencing for compound and site entrance areas, and all working areas.</p> <p>Excavator not moving considerable distances but working within an area centred on site entrance off A12 therefore considered static for assessment.</p>
Earthworks and excavation.	<p>Assume plant will operate only during 08:00 - 18:00 hours within overall working hours of 07:00 - 19:00 hours.</p> <p>Stage involves the removal of top-soil and sub-soil and formation of bunding.</p> <p>Assume one excavator removing soil in eastern half of site, the other at bund forming area.</p> <p>Assume one dozer with each excavator these activities static.</p> <p>Dumpers hauling material between positions, 32 dump truck movements per day.</p> <p>Central 500m long haul route for material movements across site.</p>
Parking and circulation routes.	<p>Assume plant will operate only during 08:00 - 18:00 hours within overall working hours of 07:00 - 19:00 hours.</p> <p>Dump trucks delivering materials internally to where needed (32 movements per day), excavators moving it locally and vibratory roller compacting.</p> <p>Installation of drainage and kerbs so cutting and associated concreting and cutting plant - central to site.</p> <p>Vibratory roller at work area generally closest to each receptor, treat as stationary as traverse lengths, so small compared with distance to receptor.</p> <p>Some plant assumed as centralised, with two work areas for kerbs etc simultaneously where excavators and dozers.</p>

Phase	Activities
Utilities and building construction.	Assume plant will operate only during 08:00 - 18:00 hours within overall working hours of 07:00 - 19:00 hours. Phase for construction of buildings and shelters, fencing and lighting. Fencing and lighting installation plant is single set, calculations are therefore worst case few days at each receptor till activity moves further away. Building construction assumed traditional and located as per plan.
Final surfacing.	Assume plant will operate only during 08:00 - 18:00 hours within overall working hours of 07:00 - 19:00 hours. Delivery of asphalt to site for immediate use. One set of equipment operating at only one place at any one time.
Removal and reinstatement.	Assume plant will operate only during 08:00 - 18:00 hours within overall working hours of 07:00 - 19:00 hours. Single set of equipment going around site breaking surfaced areas. Two sets of equipment plus vibratory roller (as per earth moving in Phase 2) to restore land levels.

- 9 The calculation of the predicted typical noise levels during each construction phase at each of the seven noise sensitive receptors is detailed in **Appendix 4A1** of this volume. These predictions are summarised in **Table 2**.

Table 2: Summary of predicted construction noise levels at the nearest noise sensitive receptor locations around the site

Receptor Reference	Predicted Sound Level $L_{Aeq,day}$ dB				
	Enabling Works, Earthworks & Excavation	Parking & Circulation Routes	Utilities & Building Construction	Final Surfacing	Removal and Reinstatement
A	62	63	58	62	65
B	63	66	61	66	67
C	66	65	66	68	68
D	64	60	60	63	67
E	61	57	57	55	61
F	54	52	55	49	56
G	57	53	53	63	59

Operational noise assessment

- 10 The SoundPLAN noise modelling software package has been used to predict the noise levels from the proposed operational park and ride facility at Darsham to the noise sensitive receptors around it.
- 11 SoundPLAN calculates L_{Aeq} levels at defined receptors in accordance with the appropriate British and International standards. The calculation is based on a number of input parameters, including; source noise level data, acoustic barriers, receptor positions, local topography and intervening ground conditions. In this instance, the appropriate standard for the prediction of noise propagation used was ISO 9613 – “Acoustics – Attenuation of Sound Outdoors – Part 2: General Method of Calculation”.
- 12 The model includes the location and dimensions of the physical elements of the proposed development such as location and dimensions of the buildings and shelters, parking areas, circulation routes etc, as well as the landform including the earth bunds.
- 13 The model has been programmed with the assumptions as set out in the noise and vibration chapter (**Chapter 4**). The estimated vehicle movements/changeovers that will take place during the shift change-over periods over the course of 24 hours is as set out in the **Volume 2 Chapter 11** which presents the road traffic noise assessment.
- 14 Details of the vehicle movements per shift changeover and period of the day that have been input into the predictive noise model, based on data from the transportation assessment. During the day (0700 to 2300 hours) there are predicted to be 1,732 vehicle movements and during the night (2300 to 0700 hours) there are predicted to be 809 movements.
- 15 Predicted sound levels at noise sensitive receptors for the proposed northern park and ride facility operational phase are illustrated as follows:
 - $L_{Aeq,16\text{hour daytime}}$ – **Figure 4.5**;
 - $L_{Aeq,8\text{ hour night-time}}$ – **Figure 4.6**; and
 - $L_{Amax\text{ day and night}}$ – **Figure 4.7**.
- 16 The noise sensitive receptor locations have been assessed from the predictive model, and the predicted operational noise level results are summarised in **Table 3**.

Table 3: Summary of predicted façade noise levels at noise sensitive receptors for operational phase of the park and ride facility

Receptor	Predicted level, dB		
	Day	Night	
	L _{Aeq, 16 h}	L _{Aeq, 8 h}	L _{Amax}
A	38	37	52
B	40	41	60
C	40	40	57
D	39	40	52
E	39	40	53
F	33	33	40
G	40	40	58

Appendix 4A1 Construction phase calculations (in accordance with BS 5228) to noise sensitive receptors.

Enabling works, earthworks & excavations.

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
A	Tracked excavator1	108	140	51	0	3	60	-2.3	58
B	Tracked excavator1	108	120	50	0	3	61	-2.3	59
C	Tracked excavator1	108	90	47	0	3	64	-2.3	62
D	Tracked excavator1	108	130	50	0	3	61	-2.3	58
E	Tracked excavator1	108	170	53	0	3	58	-1.2	57
F	Tracked excavator1	108	370	59	0	3	52	-2.3	49
G	Tracked excavator1	108	250	56	0	3	55	-1.2	54
A	Tracked excavator2	108	500	62	0	3	49	-2.3	47

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
B	Tracked excavator2	108	300	58	0	3	53	-2.3	51
C	Tracked excavator2	108	230	55	0	3	56	-2.3	53
D	Tracked excavator2	108	160	52	0	3	59	-2.3	57
E	Tracked excavator2	108	450	61	0	3	50	-2.3	48
F	Tracked excavator2	108	700	65	0	3	46	-1.8	44
G	Tracked excavator2	108	700	65	0	3	46	-1.2	45
A	Dozer1	110	140	51	0	3	62.1	-3.8	58
B	Dozer1	110	120	50	0	3	63.4	-3.8	60
C	Dozer1	110	90	47	0	3	65.9	-3.8	62
D	Dozer1	110	130	50	0	3	62.7	-3.8	59
E	Dozer1	110	170	53	0	3	60.4	-3.8	57

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
F	Dozer1	110	370	59	0	3	53.6	-3.8	50
G	Dozer1	110	250	56	0	3	57.0	-3.8	53
A	Dozer2	110	500	62	0	3	51.0	-3.8	47
B	Dozer2	110	300	58	0	3	55.5	-3.8	52
C	Dozer2	110	230	55	0	3	57.8	-3.8	54
D	Dozer2	110	160	52	0	3	60.9	-3.8	57
E	Dozer2	110	450	61	0	3	51.9	-3.8	48
F	Dozer2	110	700	65	0	3	48.1	-3.8	44
G	Dozer2	110	700	65	0	3	48.1	-3.8	44
A	Dump trucks	108	140			3	47.8	-0.8	47
B	Dump trucks	108	120			3	48.5	-0.8	48
C	Dump trucks	108	90			3	49.7	-0.8	49
D	Dump trucks	108	130			3	48.1	-0.8	47
E	Dump trucks	108	170			3	46.9	-0.8	46
F	Dump trucks	108	370			3	43.6	-0.8	43

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
G	Dump trucks	108	250			3	45.3	-0.8	44

Parking and circulation routes.

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
A	Tracked excavator1	108	150	52	0	3	59	-2.3	57
B	Tracked excavator1	108	110	49	0	3	62	-2.3	60
C	Tracked excavator1	108	150	52	0	3	59	-2.3	57
D	Tracked excavator1	108	260	56	5	3	50	-2.3	47
E	Tracked excavator1	108	200	54	5	3	52	-2.3	50
F	Tracked excavator1	108	390	60	5	3	46	-2.3	44

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
G	Tracked excavator1	108	300	58	5	3	48	-2.3	46
A	Tracked excavator2	108	460	61	0	3	50	-2.3	47
B	Tracked excavator2	108	420	60	0	3	51	-2.3	48
C	Tracked excavator2	108	260	56	5	3	50	-2.3	47
D	Tracked excavator2	108	130	50	5	3	56	-2.3	53
E	Tracked excavator2	108	440	61	5	3	45	-2.3	43
F	Tracked excavator2	108	500	62	5	3	44	-2.3	42
G	Tracked excavator2	108	900	67	5	3	39	-2.3	37
A	All terrain crane	99	220	55	0	3	47	-7.8	39
B	All terrain crane	99	170	53	0	3	49	-7.8	42

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
C	All terrain crane	99	120	50	0	3	52	-7.8	45
D	All terrain crane	99	200	54	5	3	43	-7.8	35
E	All terrain crane	99	220	55	5	3	42	-7.8	34
F	All terrain crane	99	500	62	5	3	35	-7.8	27
G	All terrain crane	99	380	60	5	3	37	-7.8	30
A	Truck mounted concrete1	108	150	52	0	3	59	-6.8	53
B	Truck mounted concrete1	108	110	49	0	3	62	-6.8	55
C	Truck mounted concrete1	108	150	52	0	3	59	-6.8	53
D	Truck mounted concrete1	108	260	56	5	3	50	-6.8	43
E	Truck mounted concrete1	108	200	54	5	3	52	-6.8	45
F	Truck mounted concrete1	108	390	60	5	3	46	-6.8	39

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
G	Truck mounted concrete1	108	300	58	5	3	48	-6.8	42
A	Truck mounted concrete2	108	460	61	0	3	50	-6.8	43
B	Truck mounted concrete2	108	420	60	0	3	51	-6.8	44
C	Truck mounted concrete2	108	260	56	5	3	50	-6.8	43
D	Truck mounted concrete2	108	130	50	5	3	56	-6.8	49
E	Truck mounted concrete2	108	440	61	5	3	45	-6.8	38
F	Truck mounted concrete2	108	500	62	5	3	44	-6.8	37
G	Truck mounted concrete2	108	900	67	5	3	39	-6.8	32
A	Concrete mixer truck	105	220	55	0	3	53	-6.8	46

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
B	Concrete mixer truck	105	170	53	0	3	55	-6.8	49
C	Concrete mixer truck	105	120	50	0	3	58	-6.8	52
D	Concrete mixer truck	105	200	54	5	3	49	-6.8	42
E	Concrete mixer truck	105	220	55	5	3	48	-6.8	41
F	Concrete mixer truck	105	500	62	5	3	41	-6.8	34
G	Concrete mixer truck	105	380	60	5	3	43	-6.8	37
A	Compressor	100	220	55	0	3	48	-1.8	46
B	Compressor	100	170	53	0	3	50	-1.8	49
C	Compressor	100	120	50	0	3	53	-1.8	52
D	Compressor	100	200	54	5	3	44	-1.8	42
E	Compressor	100	220	55	5	3	43	-1.8	41

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
F	Compressor	100	500	62	5	3	36	-1.8	34
G	Compressor	100	380	60	5	3	38	-1.8	37
A	Concrete cutting	112	220	55	0	3	60	-7.8	52
B	Concrete cutting	112	170	53	0	3	62	-7.8	55
C	Concrete cutting	112	120	50	0	3	65	-7.8	58
D	Concrete cutting	112	200	54	5	3	56	-7.8	48
E	Concrete cutting	112	220	55	5	3	55	-7.8	47
F	Concrete cutting	112	500	62	5	3	48	-7.8	40
G	Concrete cutting	112	380	60	5	3	50	-7.8	43
A	Electric Bolter1	105	150	52	0	3	56	-9.0	47
B	Electric Bolter1	105	110	49	0	3	59	-9.0	50
C	Electric Bolter1	105	150	52	0	3	56	-9.0	47
D	Electric Bolter1	105	260	56	5	3	47	-9.0	38
E	Electric Bolter1	105	200	54	5	3	49	-9.0	40
F	Electric Bolter1	105	390	60	5	3	43	-9.0	34

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
G	Electric Bolter1	105	300	58	5	3	45	-9.0	36
A	Electric Bolter2	105	460	61	0	3	47	-9.0	38
B	Electric Bolter2	105	420	60	0	3	48	-9.0	39
C	Electric Bolter2	105	260	56	5	3	47	-9.0	38
D	Electric Bolter2	105	130	50	5	3	53	-9.0	44
E	Electric Bolter2	105	440	61	5	3	42	-9.0	33
F	Electric Bolter2	105	500	62	5	3	41	-9.0	32
G	Electric Bolter2	105	900	67	5	3	36	-9.0	27
A	Diesel water pump1	93	150	52	0	3	44	-4.8	40
B	Diesel water pump1	93	110	49	0	3	47	-4.8	42
C	Diesel water pump1	93	150	52	0	3	44	-4.8	40
D	Diesel water pump1	93	260	56	5	3	35	-4.8	30

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
E	Diesel water pump1	93	200	54	5	3	37	-4.8	32
F	Diesel water pump1	93	390	60	5	3	31	-4.8	26
G	Diesel water pump1	93	300	58	5	3	33	-4.8	29
A	Diesel water pump2	93	460	61	0	3	35	-4.8	30
B	Diesel water pump2	93	420	60	0	3	36	-4.8	31
C	Diesel water pump2	93	260	56	5	3	35	-4.8	30
D	Diesel water pump2	93	130	50	5	3	41	-4.8	36
E	Diesel water pump2	93	440	61	5	3	30	-4.8	25
F	Diesel water pump2	93	500	62	5	3	29	-4.8	24

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
G	Diesel water pump2	93	900	67	5	3	24	-4.8	19
A	Diesel generator	93	220	55	0	3	41	-2.0	39
B	Diesel generator	93	170	53	0	3	43	-2.0	41
C	Diesel generator	93	120	50	0	3	46	-2.0	44
D	Diesel generator	93	200	54	5	3	37	-2.0	35
E	Diesel generator	93	220	55	5	3	36	-2.0	34
F	Diesel generator	93	500	62	5	3	29	-2.0	27
G	Diesel generator	93	380	60	5	3	31	-2.0	29
A	Vibratory roller	110	150	52	0	3	61	-3.8	58
B	Vibratory roller	110	110	49	0	3	64	-3.8	60
C	Vibratory roller	110	150	52	0	3	61	-3.8	58
D	Vibratory roller	110	260	56	5	3	52	-3.8	48
E	Vibratory roller	110	200	54	5	3	54	-3.8	50
F	Vibratory roller	110	390	60	5	3	48	-3.8	44

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
G	Vibratory roller	110	300	58	5	3	50	-3.8	47

Utilities and buildings construction.

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
A	All terrain crane	99	250	56	0	3	46	-7.8	38
B	All terrain crane	99	180	53	0	3	49	-7.8	41
C	All terrain crane	99	100	48	0	3	54	-7.8	46
D	All terrain crane	99	130	50	5	3	47	-7.8	39
E	All terrain crane	99	475	62	5	3	35	-7.8	28
F	All terrain crane	99	800	66	5	3	31	-7.8	23
G	All terrain crane	99	990	68	5	3	29	-7.8	21
A	Truck mounted concrete1	108	300	58	0	3	53	-6.0	47
B	Truck mounted concrete1	108	240	56	0	3	55	-6.0	49

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
C	Truck mounted concrete1	108	90	47	0	3	64	-6.0	58
D	Truck mounted concrete2	108	110	49	5	3	57	-6.0	51
E	Truck mounted concrete2	108	220	55	5	3	51	-6.0	45
F	Truck mounted concrete2	108	530	62	5	3	44	-6.0	37
G	Truck mounted concrete2	108	700	65	5	3	41	-6.0	35
A	Truck mounted concrete2	108	250	56	0	3	55	-6.0	49
B	Truck mounted concrete2	108	180	53	0	3	58	-6.0	52
C	Truck mounted concrete2	108	100	48	0	3	63	-6.0	57
D	Truck mounted concrete2	108	130	50	5	3	56	-6.0	50

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
E	Truck mounted concrete2	108	475	62	5	3	44	-6.0	38
F	Truck mounted concrete2	108	800	66	5	3	40	-6.0	34
G	Truck mounted concrete2	108	990	68	5	3	38	-6.0	32
A	Concrete mixer truck	105	300	58	0	3	50	-6.0	44
B	Concrete mixer truck	105	240	56	0	3	52	-6.0	46
C	Concrete mixer truck	105	90	47	0	3	61	-6.0	55
D	Concrete mixer truck	105	110	49	5	3	54	-6.0	48
E	Concrete mixer truck	105	220	55	5	3	48	-6.0	42
F	Concrete mixer truck	105	530	62	5	3	41	-6.0	34

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
G	Concrete mixer truck	105	700	65	5	3	38	-6.0	32
A	Compressor	100	300	58	0	3	45	-1.8	44
B	Compressor	100	240	56	0	3	47	-1.8	46
C	Compressor	100	90	47	0	3	56	-1.8	54
D	Compressor	100	110	49	5	3	49	-1.8	47
E	Compressor	100	220	55	5	3	43	-1.8	41
F	Compressor	100	530	62	5	3	36	-1.8	34
G	Compressor	100	700	65	5	3	33	-1.8	31
A	Concrete cutting	112	300	58	0	3	57	-7.8	50
B	Concrete cutting	112	240	56	0	3	59	-7.8	52
C	Concrete cutting	112	90	47	0	3	68	-7.8	60
D	Concrete cutting	112	110	49	5	3	61	-7.8	53
E	Concrete cutting	112	220	55	5	3	55	-7.8	47
F	Concrete cutting	112	530	62	5	3	48	-7.8	40

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
G	Concrete cutting	112	700	65	5	3	45	-7.8	37
A	Electric Bolter1	105	300	58	0	3	50	-9.0	41
B	Electric Bolter1	105	240	56	0	3	52	-9.0	43
C	Electric Bolter1	105	90	47	0	3	61	-9.0	52
D	Electric Bolter1	105	110	49	5	3	54	-9.0	45
E	Electric Bolter1	105	220	55	5	3	48	-9.0	39
F	Electric Bolter1	105	530	62	5	3	41	-9.0	31
G	Electric Bolter1	105	700	65	5	3	38	-9.0	29
A	Electric Bolter2	105	250	56	0	3	52	-9.0	43
B	Electric Bolter2	105	180	53	0	3	55	-9.0	46
C	Electric Bolter2	105	100	48	0	3	60	-9.0	51
D	Electric Bolter2	105	130	50	5	3	53	-9.0	44
E	Electric Bolter2	105	475	62	5	3	41	-9.0	32
F	Electric Bolter2	105	800	66	5	3	37	-9.0	28
G	Electric Bolter2	105	990	68	5	3	35	-9.0	26

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
A	Diesel water pump1	93	250	56	0	3	40	-4.8	35
B	Diesel water pump1	93	180	53	0	3	43	-4.8	38
C	Diesel water pump1	93	100	48	0	3	48	-4.8	43
D	Diesel water pump1	93	130	50	5	3	41	-4.8	36
E	Diesel water pump1	93	475	62	5	3	29	-4.8	25
F	Diesel water pump1	93	800	66	5	3	25	-4.8	20
G	Diesel water pump1	93	990	68	5	3	23	-4.8	18
A	Diesel water pump2	93	250	56	0	3	40	-4.8	35
B	Diesel water pump2	93	180	53	0	3	43	-4.8	38

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
C	Diesel water pump2	93	100	48	0	3	48	-4.8	43
D	Diesel water pump2	93	130	50	5	3	41	-4.8	36
E	Diesel water pump2	93	475	62	5	3	29	-4.8	25
F	Diesel water pump2	93	800	66	5	3	25	-4.8	20
G	Diesel water pump2	93	990	68	5	3	23	-4.8	18
A	Diesel generator	93	250	56	0	3	40	-2.0	38
B	Diesel generator	93	180	53	0	3	43	-2.0	41
C	Diesel generator	93	100	48	0	3	48	-2.0	46
D	Diesel generator	93	130	50	5	3	41	-2.0	39
E	Diesel generator	93	220	55	5	3	36	-2.0	34
F	Diesel generator	93	530	62	5	3	29	-2.0	26
G	Diesel generator	93	700	65	5	3	26	-2.0	24

Final surfacing.

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
A	Tracked excavator	108	160	52	0	3	59	-7.8	51
B	Tracked excavator	108	110	49	0	3	62	-7.8	54
C	Tracked excavator	108	80	46	5	3	60	-7.8	52
D	Tracked excavator	108	80	46	5	3	60	-7.8	52
E	Tracked excavator	108	80	46	5	3	60	-7.8	52
F	Tracked excavator	108	100	48	5	3	58	-7.8	50
G	Tracked excavator	108	120	50	5	3	56	-7.8	49
A	Auger Drill	107	160	52	0	3	58	-7.8	50
B	Auger Drill	107	110	49	0	3	61	-7.8	53
C	Auger Drill	107	80	46	5	3	59	-7.8	51

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
D	Auger Drill	107	80	46	5	3	59	-7.8	51
E	Auger Drill	107	80	46	5	3	59	-7.8	51
F	Auger Drill	107	100	48	5	3	57	-7.8	49
G	Auger Drill	107	120	50	5	3	55	-7.8	48
A	Flat bed lorry	108	160	52	0	3	59	-10.8	48
B	Flat bed lorry	108	110	49	0	3	62	-10.8	51
C	Flat bed lorry	108	80	46	5	3	60	-10.8	49
D	Flat bed lorry	108	80	46	5	3	60	-10.8	49
E	Flat bed lorry	108	80	46	5	3	60	-10.8	49
F	Flat bed lorry	108	100	48	5	3	58	-10.8	47
G	Flat bed lorry	108	120	50	5	3	56	-10.8	46
A	All terrain crane	99	160	52	0	3	50	-7.8	42
B	All terrain crane	99	110	49	0	3	53	-7.8	45

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
C	All terrain crane	99	80	46	5	3	51	-7.8	43
D	All terrain crane	99	80	46	5	3	51	-7.8	43
E	All terrain crane	99	80	46	5	3	51	-7.8	43
F	All terrain crane	99	100	48	5	3	49	-7.8	41
G	All terrain crane	99	120	50	5	3	47	-7.8	40
A	Road Planer	110	160	52	0	3	61	-3.8	57
B	Road Planer	110	110	49	0	3	64	-3.8	60
C	Road Planer	110	80	46	0	3	67	-3.8	63
D	Road Planer	110	80	46	5	3	62	-3.8	58
E	Road Planer	110	220	55	5	3	53	-3.8	49
F	Road Planer	110	400	60	5	3	48	-3.8	44
G	Road Planer	110	80	46	5	3	62	-3.8	58

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
A	Motor Grader	112	160	52	0	3	63	-3.8	59
B	Motor Grader	112	110	49	0	3	66	-3.8	62
C	Motor Grader	112	80	46	0	3	69	-3.8	65
D	Motor Grader	112	80	46	5	3	64	-3.8	60
E	Motor Grader	112	220	55	5	3	55	-3.8	51
F	Motor Grader	112	400	60	5	3	50	-3.8	46
G	Motor Grader	112	80	46	5	3	64	-3.8	60
A	Road roller	110	160	52	0	3	61	-6.0	55
B	Road roller	110	110	49	0	3	64	-6.0	58
C	Road roller	110	80	46	0	3	67	-6.0	61
D	Road roller	110	80	46	5	3	62	-6.0	56
E	Road roller	110	220	55	5	3	53	-6.0	47
F	Road roller	110	400	60	5	3	48	-6.0	42
G	Road roller	110	80	46	5	3	62	-6.0	56

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
A	Asphalt paver a tipper	105	160	52	0	3	56	-6.0	50
B	Asphalt paver a tipper	105	110	49	0	3	59	-6.0	53
C	Asphalt paver a tipper	105	80	46	0	3	62	-6.0	56
D	Asphalt paver a tipper	105	80	46	5	3	57	-6.0	51
E	Asphalt paver a tipper	105	220	55	5	3	48	-6.0	42
F	Asphalt paver a tipper	105	400	60	5	3	43	-6.0	37
G	Asphalt paver a tipper	105	80	46	5	3	57	-6.0	51

Removal and reinstatement.

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
A	Tracked excavator1	108	140	51	0	3	60	-2.3	58
B	Tracked excavator1	108	120	50	0	3	61	-2.3	59
C	Tracked excavator1	108	90	47	0	3	64	-2.3	62
D	Tracked excavator1	108	130	50	0	3	61	-2.3	58
E	Tracked excavator1	108	170	53	0	3	58	-2.3	56
F	Tracked excavator1	108	370	59	0	3	52	-2.3	49
G	Tracked excavator1	108	250	56	0	3	55	-2.3	53
A	Tracked excavator2	108	500	62	0	3	49	-2.3	47
B	Tracked excavator2	108	300	58	0	3	53	-2.3	51

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
C	Tracked excavator2	108	230	55	0	3	56	-2.3	53
D	Tracked excavator2	108	160	52	0	3	59	-2.3	57
E	Tracked excavator2	108	450	61	0	3	50	-2.3	48
F	Tracked excavator2	108	700	65	0	3	46	-2.3	44
G	Tracked excavator2	108	700	65	0	3	46	-2.3	44
A	All terrain crane	99	125	50	0	3	52	-7.8	44
B	All terrain crane	99	100	48	0	3	54	-7.8	46
C	All terrain crane	99	80	46	0	3	56	-7.8	48
D	All terrain crane	99	100	48	0	3	54	-7.8	46

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
E	All terrain crane	99	250	56	0	3	46	-7.8	38
F	All terrain crane	99	460	61	0	3	41	-7.8	33
G	All terrain crane	99	250	56	0	3	46	-7.8	38
A	Breaker on back hoe	120	125	50	5	3	68	-7.8	60
B	Breaker on back hoe	120	100	48	5	3	70	-7.8	62
C	Breaker on back hoe	120	90	47	5	3	71	-7.8	63
D	Breaker on back hoe	120	100	48	5	3	70	-7.8	62
E	Breaker on back hoe	120	250	56	5	3	62	-7.8	54
F	Breaker on back hoe	120	460	61	5	3	57	-7.8	49

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
G	Breaker on back hoe	120	250	56	5	3	62	-7.8	54
A	Vibratory roller	110	125	50	0	3	63	-3.8	59
B	Vibratory roller	110	100	48	0	3	65	-3.8	61
C	Vibratory roller	110	80	46	5	3	62	-3.8	58
D	Vibratory roller	110	100	48	5	3	60	-3.8	56
E	Vibratory roller	110	250	56	5	3	52	-3.8	48
F	Vibratory roller	110	460	61	5	3	47	-3.8	43
G	Vibratory roller	110	250	56	5	3	52	-3.8	48
A	Dozer1	110	140	51	0	3	62	-3.8	58
B	Dozer1	110	120	50	0	3	63	-3.8	60

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
C	Dozer1	110	90	47	0	3	66	-3.8	62
D	Dozer1	110	130	50	0	3	63	-3.8	59
E	Dozer1	110	170	53	0	3	60	-3.8	57
F	Dozer1	110	370	59	0	3	54	-3.8	50
G	Dozer1	110	250	56	0	3	57	-3.8	53
A	Dozer2	110	500	62	0	3	51	-3.8	47
B	Dozer2	110	300	58	0	3	55	-3.8	52
C	Dozer2	110	230	55	0	3	58	-3.8	54
D	Dozer2	110	160	52	0	3	61	-3.8	57
E	Dozer2	110	450	61	0	3	52	-3.8	48
F	Dozer2	110	700	65	0	3	48	-3.8	44
G	Dozer2	110	700	65	0	3	48	-3.8	44
A	Dump trucks	108	140			3	48	-0.8	47
B	Dump trucks	108	120			3	48	-0.8	48
C	Dump trucks	108	90			3	50	-0.8	49

Receptor	Plant item	L _{WA'} (dB)	Distance (m)	Attenuation (dB)		Façade reflection correction	Resultant L _{Aeq,T} (dB)	Correction for on-time (dB)	Predicted L _{Aeq,12hour} (dB)
				Distance	Screening				
D	Dump trucks	108	130			3	48	-0.8	47
E	Dump trucks	108	170			3	47	-0.8	46
F	Dump trucks	108	370			3	44	-0.8	43
G	Dump trucks	108	250			3	45	-0.8	44