The Sizewell C Project

6.5 Volume 4 Southern Park and Ride

Chapter 4 Noise and Vibration

Appendix 4A Construction and Operational Noise Assessment

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Report

Sizewell C Project
Volume 4 Appendix 4A

Construction and Operational Noise Assessment

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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 A-D, as shown in **Figure 4.1** of **Chapter 4**. 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 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 enabling works. Predictions of construction sound levels at noise sensitive receptors from the phases that follow the formation of the bund therefore take account of the presence of a 3 metre high earth bund located as indicated in the Description of Development.

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 buildings, construction activity will move around the site as a whole. Sets of plant and equipment will therefore only likely be located at any one position for a period which may be as short as a few days. In the construction phase calculations, typical working areas have been assessed at points closest to each of the receptors and therefore predicted noise levels are considered to be representative of typical busy working days.

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 removal and reinstatements 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	Assume plant will operate only during 08:00 - 18:00 hours within overall working hours of 07:00 - 19:00 hours. Clearance of vegetation, erection of fencing, installation of cabins and creation of site entrance. Main works area centred on entrance. Chainsaws and brush cutters only likely to be required for occasional use. Temporary fencing not likely to be embedded in ground but Heras style fencing for compound and site entrance areas, and all working areas. Excavator not moving considerable distances but working within an area centred on site entrance off A12 therefore considered static for assessment.
Earthworks and excavation	Assume plant will operate only during 08:00 - 18:00 hours within overall working hours of 07:00 - 19:00 hours. Stage involves the removal of top-soil and sub-soil and formation of bunding. Assume one excavator removing soil in eastern half of site, the other at bund forming area. Assume one dozer with each excavator these activities static. Dumpers hauling material between positions, 32 dump truck movements per day. Central 500m long haul route for material movements across site.

Phase	Activities
Parking and circulation routes	Assume plant will operate only during 08:00 - 18:00 hours within overall working hours of 07:00 - 19:00 hours. Dump trucks delivering materials internally to where needed (32 movements per day), excavators moving it locally and vibratory roller compacting. Installation of drainage and kerbs so cutting and associated concreting and cutting plant - Central to site. Vibratory roller at work area generally closest to each receptor treat as stationary as traverse lengths so small compared with distance to receptor. Some plant assumed as centralised, with two work areas for kerbs etc simultaneously where excavators and dozers.
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, 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 round 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 noise levels during each construction phase at each of the four noise sensitive receptors is detailed in **Appendix 4B1**. 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 Ref.	Predicted Sound Level $L_{Aeq,day}$ dB					
	Enabling Works	Earthworks & Excavation	Parking & Circulation Routes	Utilities & Building Construction	Final Surfacing	Removal and Reinstatement

A	45	51	53	47	48	53
B	42	47	49	42	43	49
C	38	45	48	43	45	49
D	36	45	46	41	43	48

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 Wickham Market 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 **Chapter 4** and the estimated vehicle movements/changeovers that will take place during the shift change-over periods over the course of 24 hours as set out in the main **ES** noise and vibration chapter text.

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 569 vehicle movements and during the night (2300 to 0700 hours) there are predicted to be 283 movements.

15 Predicted sound levels at noise sensitive receptors for the proposed Wickham Market park and ride facility operational phase are illustrated as follows:

- $L_{Aeq,16hour\ daytime}$ – **Figure 4.5**;
- $L_{Aeq,8\ hour\ night\text{-}time}$ – **Figure 4.6**; and
- $L_{Amax\ day\ and\ night}$ – **Figure 4.7**.

16 The noise sensitive receptor locations A, B, C and D 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	29	30	38
B	29	29	39
C	23	24	31
D	23	22	31

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

Enabling Works

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	Soft ground				
A	Excavator	108	300	58	0	5	+3	48	-3	45
B	Excavator	108	400	60	0	6	+3	45	-3	42
C	Excavator	108	600	64	0	6	+3	41	-3	38
D	Excavator	108	700	65	0	7	+3	39	-3	36

Earthworks & Excavation Phase

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	Soft ground				
A	Excavator1	108	340	59	0	5	+3	47	-2.3	45
B	Excavator1	108	520	62	0	6	+3	42	-2.3	40
C	Excavator1	108	900	67	0	6	+3	37	-2.3	35
D	Excavator1	108	700	65	0	7	+3	39	-2.3	37

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	Soft ground				
A	Excavator2	108	510	62	0	5	+3	44	-2.3	42
B	Excavator2	108	800	66	0	6	+3	39	-2.3	36
C	Excavator2	108	600	64	0	6	+3	41	-2.3	39
D	Excavator2	108	700	65	0	7	+3	39	-2.3	37
A	Dozer1	110	340	59	0	5	+3	49	-3.8	46
B	Dozer1	110	520	62	0	6	+3	44	-3.8	41
C	Dozer1	110	900	67	0	6	+3	39	-3.8	36
D	Dozer1	110	700	65	0	7	+3	41	-3.8	37
A	Dozer2	110	510	62	0	5	+3	46	-3.8	42
B	Dozer2	110	800	66	0	6	+3	41	-3.8	37
C	Dozer2	110	600	64	0	6	+3	43	-3.8	39
D	Dozer2	110	700	65	0	7	+3	41	-3.8	37
A	Dump Trucks	108	420	26	0	0	+3	43	-0.8	42
B	Dump Trucks	108	500	27	0	0	+3	42	-0.8	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	Soft ground				
C	Dump Trucks	108	750	29	0	0	+3	40	-0.8	40
D	Dump Trucks	108	700	28	0	0	+3	41	-0.8	40

Parking & 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	Soft ground				
A	Excavator1	108	340	59	0	5	+3	47	-2.3	45
B	Excavator1	108	520	62	0	6	+3	42	-2.3	40
C	Excavator1	108	900	67	5	0	+3	39	-2.3	37
D	Excavator1	108	850	67	5	0	+3	39	-2.3	37
A	Excavator2	108	510	62	0	5	+3	44	-2.3	42
B	Excavator2	108	800	66	0	6	+3	39	-2.3	36
C	Excavator2	108	600	64	5	0	+3	42	-2.3	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	Soft ground				
D	Excavator2	108	900	67	5	0	+3	39	-2.3	37
A	Dozer1	110	340	59	0	5	+3	49	-3.8	46
B	Dozer1	110	520	62	0	6	+3	44	-3.8	41
C	Dozer1	110	900	67	5	0	+3	41	-3.8	37
D	Dozer1	110	850	67	5	0	+3	41	-3.8	38
A	Dozer2	110	510	62	0	5	+3	46	-3.8	42
B	Dozer2	110	800	66	0	6	+3	41	-3.8	37
C	Dozer2	110	600	64	5	0	+3	44	-3.8	41
D	Dozer2	110	900	67	5	0	+3	41	-3.8	37
A	Dump Trucks	108	420	26	5	0	+3	38	-0.8	37
B	Dump trucks	108	500	27	0	0	+3	42	-0.8	41
C	Dump trucks	108	750	29	5	0	+3	35	-0.8	35
D	Dump trucks	108	700	28	5	0	+3	35	-0.8	34
A	All terrain crane	99	340	59	0	5	+3	38	-7.8	31
B	All terrain crane	99	520	62	0	6	+3	33	-7.8	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	Soft ground				
C	All terrain crane	99	600	64	0	6	+3	32	-7.8	24
D	All terrain crane	99	1000	68	0	7	+3	27	-7.8	19
A	Truck mounted concrete1	108	340	59	0	5	+3	47	-6.8	41
B	Truck mounted concrete1	108	520	62	0	6	+3	42	-6.8	36
C	Truck mounted concrete1	108	900	67	0	6	+3	37	-6.8	31
D	Truck mounted concrete1	108	850	67	0	7	+3	37	-6.8	30
A	Truck mounted concrete2	108	510	62	0	5	+3	44	-6.8	37
B	Truck mounted concrete2	108	800	66	0	6	+3	39	-6.8	32
C	Truck mounted concrete2	108	600	64	0	6	+3	41	-6.8	34
D	Truck mounted concrete2	108	900	67	0	7	+3	37	-6.8	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	Soft ground				
A	Concrete mixer truck	105	460	61	0	5	+3	42	-6.8	35
B	Concrete mixer truck	105	720	65	0	6	+3	37	-6.8	30
C	Concrete mixer truck	105	750	66	0	6	+3	36	-6.8	29
D	Concrete mixer truck	105	1000	68	0	7	+3	33	-6.8	26
A	Compressor	100	460	61	5	0	+3	37	-1.7	35
B	Compressor	100	720	65	0	6	+3	32	-1.7	30
C	Compressor	100	750	66	5	0	+3	32	-1.7	31
D	Compressor	100	1000	68	5	0	+3	30	-1.7	28
A	Concrete cutting	112	460	61	5	0	+3	49	-7.8	41
B	Concrete cutting	112	720	65	0	6	+3	44	-7.8	36
C	Concrete cutting	112	750	66	5	0	+3	44	-7.8	37
D	Concrete cutting	112	1000	68	5	0	+3	42	-7.8	34
A	Electric bolter1	105	340	59	0	5	+3	44	-9	35

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	Soft ground				
B	Electric bolter1	105	520	62	0	6	+3	39	-9	30
C	Electric bolter1	105	900	67	0	6	+3	34	-9	25
D	Electric bolter1	105	850	67	0	7	+3	34	-9	25
A	Electric bolter2	105	510	62	0	5	+3	41	-9	32
B	Electric bolter2	105	800	66	0	6	+3	36	-9	27
C	Electric bolter2	105	600	64	0	6	+3	38	-9	29
D	Electric bolter2	105	900	67	0	7	+3	34	-9	25
A	Diesel water pump1	93	340	59	0	5	+3	32	-4.8	28
B	Diesel water pump1	93	520	62	0	6	+3	27	-4.8	23
C	Diesel water pump1	93	900	67	5	0	+3	24	-4.8	19
D	Diesel water pump1	93	850	67	5	0	+3	24	-4.8	20
A	Diesel water pump2	93	510	62	5	0	+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	Soft ground				
B	Diesel water pump2	93	800	66	0	6	+3	24	-4.8	19
C	Diesel water pump2	93	600	64	5	0	+3	27	-4.8	23
D	Diesel water pump2	93	900	67	5	0	+3	24	-4.8	19
A	Diesel generator	93	460	61	5	0	+3	30	-2	28
B	Diesel generator	93	720	65	0	6	+3	25	-2	23
C	Diesel generator	93	750	66	5	0	+3	25	-2	23
D	Diesel generator	93	1000	68	5	0	+3	23	-2	21
A	Vibratory roller	110	340	59	0	5	+3	49	-3.8	46
B	Vibratory roller	110	400	60	0	6	+3	47	-3.8	43
C	Vibratory roller	110	600	64	5	0	+3	44	-3.8	41
D	Vibratory roller	110	850	67	5	0	+3	41	-3.8	38

Utilities & Building 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	Soft ground				
A	All terrain crane	99	470	61	0	5	+3	36	-7.8	28
B	All terrain crane	99	700	65	0	6	+3	31	-7.8	23
C	All terrain crane	99	750	66	0	6	+3	30	-7.8	22
D	All terrain crane	99	900	67	0	7	+3	28	-7.8	20
A	Truck mounted concrete1	108	470	61	0	5	+3	45	-6	39
B	Truck mounted concrete1	108	700	65	0	6	+3	40	-6	34
C	Truck mounted concrete1	108	750	66	0	6	+3	39	-6	33
D	Truck mounted concrete1	108	900	67	0	7	+3	37	-6	31
A	Truck mounted concrete2	108	470	61	0	5	+3	45	-6	39
B	Truck mounted concrete2	108	700	65	0	6	+3	40	-6	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	Soft ground				
C	Truck mounted concrete2	108	750	66	0	6	+3	39	-6	33
D	Truck mounted concrete2	108	900	67	0	7	+3	37	-6	31
A	Concrete mixer truck	105	470	61	0	5	+3	42	-6	36
B	Concrete mixer truck	105	700	65	0	6	+3	37	-6	31
C	Concrete mixer truck	105	750	66	0	6	+3	36	-6	30
D	Concrete mixer truck	105	900	67	0	7	+3	34	-6	28
A	Compressor	100	470	61	5	0	+3	37	-1.8	35
B	Compressor	100	700	65	0	6	+3	32	-1.8	30
C	Compressor	100	750	66	5	0	+3	32	-1.8	31
D	Compressor	100	900	67	5	0	+3	31	-1.8	29
A	Concrete cutting	112	470	61	5	0	+3	49	-7.8	41
B	Concrete cutting	112	700	65	0	6	+3	44	-7.8	36

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	Soft ground				
C	Concrete cutting	112	750	66	5	0	+3	44	-7.8	37
D	Concrete cutting	112	900	67	5	0	+3	43	-7.8	35
A	Electric bolter1	105	470	61	0	5	+3	42	-9	33
B	Electric bolter1	105	700	65	0	6	+3	37	-9	28
C	Electric bolter1	105	750	66	0	6	+3	36	-9	27
D	Electric bolter1	105	900	67	0	7	+3	34	-9	25
A	Electric bolter2	105	470	61	0	5	+3	42	-9	33
B	Electric bolter2	105	700	65	0	6	+3	37	-9	28
C	Electric bolter2	105	750	66	0	6	+3	36	-9	27
D	Electric bolter2	105	900	67	0	7	+3	34	-9	25
A	Diesel water pump1	93	470	61	5	0	+3	30	-4.8	25
B	Diesel water pump1	93	700	65	0	6	+3	25	-4.8	20
C	Diesel water pump1	93	750	66	5	0	+3	25	-4.8	21

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	Soft ground				
D	Diesel water pump1	93	900	67	5	0	+3	24	-4.8	19
A	Diesel water pump2	93	470	61	5	0	+3	30	-4.8	25
B	Diesel water pump2	93	700	65	0	6	+3	25	-4.8	20
C	Diesel water pump2	93	750	66	5	0	+3	25	-4.8	21
D	Diesel water pump2	93	900	67	5	0	+3	24	-4.8	19
A	Diesel generator	93	470	61	5	0	+3	30	-2	28
B	Diesel generator	93	700	65	0	6	+3	25	-2	23
C	Diesel generator	93	750	66	5	0	+3	25	-2	23
D	Diesel generator	93	900	67	5	0	+3	24	-2	22
A	Tracked excavator	108	450	61	0	5	+3	45	-7.8	37
B	Tracked excavator	108	710	65	0	6	+3	41	-7.8	33
C	Tracked excavator	108	650	64	5	0	+3	44	-7.8	36

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	Soft ground				
D	Tracked excavator	108	820	66	5	0	+3	42	-7.8	34
A	Auger drill	107	450	61	0	5	+3	44	-7.8	36
B	Auger drill	107	710	65	0	6	+3	39	-7.8	31
C	Auger drill	107	650	64	5	0	+3	41	-7.8	33
D	Auger drill	107	820	66	5	0	+3	39	-7.8	31
A	Flat bed lorry	108	450	61	0	5	+3	45	-10.8	34
B	Flat bed lorry	108	710	65	0	6	+3	40	-10.8	29
C	Flat bed lorry	108	650	64	5	0	+3	42	-10.8	31
D	Flat bed lorry	108	820	66	5	0	+3	40	-10.8	29
A	All terrain crane	99	450	61	0	5	+3	36	-7	29
B	All terrain crane	99	710	65	0	6	+3	31	-7	24
C	All terrain crane	99	650	64	5	0	+3	33	-7	26
D	All terrain crane	99	820	66	5	0	+3	31	-7	24

Final Surfacing Phase

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	Soft ground				
A	Road planer	110	450	61	0	5	+3	47	-3.8	43
B	Road planer	110	710	65	0	6	+3	42	-3.8	38
C	Road planer	110	650	64	5	0	+3	44	-3.8	40
D	Road planer	110	820	66	5	0	+3	42	-3.8	38
A	Motor grader	112	450	61	0	5	+3	49	-3.8	45
B	Motor grader	112	710	65	0	6	+3	44	-3.8	40
C	Motor grader	112	650	64	5	0	+3	46	-3.8	42
D	Motor grader	112	820	66	5	0	+3	44	-3.8	40
A	Road roller	110	450	61	0	5	+3	47	-6	41
B	Road roller	110	710	65	0	6	+3	42	-6	36
C	Road roller	110	650	64	5	0	+3	44	-6	38
D	Road roller	110	820	66	5	0	+3	42	-6	36
A	Asphalt paver a tipper	105	450	61	0	5	+3	42	-6	36

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	Soft ground				
B	Asphalt paver a tipper	105	710	65	0	6	+3	37	-6	31
C	Asphalt paver a tipper	105	650	64	5	0	+3	39	-6	33
D	Asphalt paver a tipper	105	820	66	5	0	+3	37	-6	31

Removal & Reinstatement Phase

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	Soft ground				
A	Excavator1	108	340	59	0	5	+3	47	-6	41
B	Excavator1	108	400	60	0	6	+3	45	-6	39
C	Excavator1	108	600	64	5	0	+3	42	-6	36
D	Excavator1	108	700	65	5	0	+3	41	-6	35
A	Excavator2	108	340	59	0	5	+3	47	-6	41
B	Excavator2	108	400	60	0	6	+3	45	-6	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	Soft ground				
C	Excavator2	108	600	64	5	0	+3	42	-6	36
D	Excavator2	108	700	65	5	0	+3	41	-6	35
A	Dozer1	110	340	59	0	5	+3	49	-3.8	46
B	Dozer1	110	520	62	0	6	+3	44	-3.8	41
C	Dozer1	110	900	67	0	6	+3	39	-3.8	36
D	Dozer1	110	700	65	0	7	+3	41	-3.8	37
A	Dozer2	110	510	62	0	5	+3	46	-3.8	42
B	Dozer2	110	800	66	0	6	+3	41	-3.8	37
C	Dozer2	110	600	64	0	6	+3	43	-3.8	39
D	Dozer2	110	700	65	0	7	+3	41	-3.8	37
A	Dump trucks	108	420	26	0	0	+3	43	-0.8	42
B	Dump trucks	108	500	27	0	0	+3	42	-0.8	41
C	Dump trucks	108	750	29	0	0	+3	40	-0.8	40
D	Dump trucks	108	700	28	0	0	+3	40	-0.8	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	Soft ground				
A	All terrain crane	99	450	61	0	5	+3	36	-7.8	28
B	All terrain crane	99	710	65	0	6	+3	31	-7.8	23
C	All terrain crane	99	650	64	0	6	+3	31	-7.8	23
D	All terrain crane	99	820	66	0	7	+3	28	-7.8	21
A	Breaker on backhoe	120	450	61	0	5	+3	57	-7.8	49
B	Breaker on backhoe	120	710	65	0	6	+3	52	-7.8	44
C	Breaker on backhoe	120	650	64	5	0	+3	54	-7.8	46
D	Breaker on backhoe	120	820	66	5	0	+3	52	-7.8	44
A	Vibratory roller	110	450	61	0	5	+3	47	-3.8	43
B	Vibratory roller	110	710	65	0	6	+3	42	-3.8	38
C	Vibratory roller	110	650	64	5	0	+3	44	-3.8	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	Soft ground				
D	Vibratory roller	110	820	66	5	0	+3	42	-3.8	38