Technical Appendix 12.7 Construction Noise Impact Assessment

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1. Introduction

The purpose of this appendix is to provide the conservative assumptions of equipment utilisation used for the Construction Noise Impact Assessment (CNIA) as well as the results of that assessment.

A table is provided with the expected equipment for each construction phase, as well as the percentage of time each piece of equipment is expected to be used in a standard working day. Information was collated from estimations provided by the Principal Contractor, and sound power levels from Annex C of BS5228-1 Code of practice for noise and vibration control on construction and open sites. Results of calculations to obtain a corrected sound power level based on the expected quantity and on time of the equipment have also been included. If changes occur to the planned equipment an updated CNIA will be prepared.

A table is provided with the predicted noise levels at the NSRs for each construction phase and distance to the proposed works. The results have been compared to the construction noise limit of 65dB for daytime working hours, as defined in BS5228-1. The assessment follows *British Standard 5228-1:2009 +A1:2014 (BS5228), Code of Practice for Noise and Vibration Control on Construction and Open Sites*, and the results are discussed in **Chapter 12 – Noise and Vibration** of the Environmental Impact Assessment.

2. Construction Equipment

Table 2-1 Construction Equipment and Associated Noise Levels for BULK EARTH WORKS

Plant Item	BS 5228 Reference	Quantity	Utilisation %	Sound Pressure @ 10m(dB(A))	Sound Pressure @ 10m corrected for quantity and utilisation (dB(A))
Tracked Excavator	C4.17 Tracked excavator	2	80%	71	73
Tipper Wagons	D3.112 Tipper lorry	4	100%	85	91
Breaker	C5.6 Hand-held pneumatic breaker	1	50%	95	92
Water Pump	C2.45 Water pump	2	100%	73	76
Total					95

Table 2-2 Construction Equipment and Associated Noise Levels for CIVIL WORKS

Plant Item	BS 5228 Reference	Quantity	Utilisation %	Sound Pressure @ 10m(dB(A))	Sound Pressure @ 10m corrected for quantity and utilisation (dB(A))
Tracked Excavator	C4.17 Tracked excavator	2	50%	71	71
Tipper Wagons	D3.112 Tipper lorry	2	100%	85	88
Vibrating Roller	C5.21 Vibratory roller	1	50%	74	71
Concrete Wagon	C4.24 Concrete pump + cement mixer truck (discharging)	2	20%	67	63
Water Pump	C2.45 Water pump	1	10%	73	63
Total					88

Table 2-3 Construction Equipment and Associated Noise Levels for TRANSFORMER INSTALLATION

Plant Item	BS 5228 Reference	Quantity	Utilisation %	Sound Pressure @ 10m(dB(A))	Sound Pressure @ 10m corrected for quantity and utilisation (dB(A))
Mobile Telescopic Crane	C4.38 Wheeled Mobile telescopic crane	1	90%	78	78
Lorry	C2.34 Lorry	1	50%	80	77
Total					80

Table 2-4 Construction Equipment and Associated Noise Levels for BALANCE OF PLANT WORK

Plant Item	BS 5228 Reference	Quantity	Utilisation %	Sound Pressure @ 10m(dB(A))	Sound Pressure @ 10m corrected for quantity and utilisation (dB(A))
Roto Telehandler	C4.54 Telescopic handler	1	50%	79	76
MEWP	C4.57 Lifting platform	2	50%	67	67
Total					77

Table 2-5 Construction Equipment and Associated Noise Levels for BUNDING, LANDSCAPING AND REMOVAL OF TEMPORARY LAYDOWN AND WELFARE

Plant Item	BS 5228 Reference	Quantity	Utilisation %	Sound Pressure @ 10m(dB(A))	Sound Pressure @ 10m corrected for quantity and utilisation (dB(A))
Tracked Excavator	C4.17 Tracked excavator	1	60%	71	69
Dumper Wagons	C4.4 Dumper	1	60%	76	74
Hiab Wagon	C4.53 Lorry with lifting boom	1	50%	77	74
Tipper Wagon	D3.112 Tipper lorry	1	100%	85	85
Total					86

3. Construction Noise Assessment Results

3.1 Calculation Assumptions

- Ground absorption factor 0.5 for mixed soft and hard ground
- Free-field
- No change in elevation or screening between source and receiver

3.2 Assessment Results to Edge of Site

Table 3-1 BS 5228 Assessment – SIMULTANEOUS PHASES

NSR	Shortest distance to the edge of the site (m)	Total Equivalent Noise Level at 10 m from Simultaneous Works (dB)	Sound Pressure Level at Receptor (dB)	Construction Noise Exceedance
1	146	96	71	6
2	158	96	70	5
3	164	96	70	5
4	143	96	71	6
5	1147	96	51	-14
6	490	96	59	-6
7	472	96	59	-6

Table 3-2 BS 5228 Assessment – BULK EARTH WORKS

NSR	Shortest distance to the edge of the site (m)	Total Equivalent Noise Level at 10 m from Bulk Earth Works (dB)	Sound Pressure Level at Receptor (dB)	Construction Noise Exceedance
1	146	95	69	4
2	158	95	69	4
3	164	95	68	3
4	143	95	70	5
5	1147	95	49	-16
6	490	95	58	-7
7	472	95	58	-7

Table 3-3 BS 5228 Assessment – CIVIL WORKS

NSR	Shortest distance to the edge of the site (m)	Total Equivalent Noise Level at 10 m from Civil Works (dB)	Sound Pressure Level at Receptor (dB)	Construction Noise Exceedance
1	146	88	63	-2
2	158	88	62	-3
3	164	88	62	-3
4	143	88	63	-2
5	1147	88	43	-22
6	490	88	51	-14
7	472	88	52	-13

Table 3-4 BS 5228 Assessment – TRANSFORMER INSTALLATION

NSR	Shortest distance to the edge of the site (m)	Total Equivalent Noise Level at 10 m from Transformer installation (dB)	Sound Pressure Level at Receptor (dB)	Construction Noise Exceedance
1	146	80	55	-10
2	158	80	54	-11
3	164	80	54	-11
4	143	80	55	-10
5	1147	80	35	-30
6	490	80	43	-22
7	472	80	44	-21

Table 3-5 BS 5228 Assessment – BALANCE OF PLANT WORK

NSR	Shortest distance to the edge of the site (m)	Total Equivalent Noise Level at 10 m from Balance of Plant Work (dB)	Sound Pressure Level at Receptor (dB)	Construction Noise Exceedance
1	146	77	51	-14
2	158	77	51	-14
3	164	77	50	-15
4	143	77	52	-13
5	1147	77	31	-34
6	490	77	39	-26
7	472	77	40	-25

Table 3-6 BS 5228 Assessment – BUNDING, LANDSCAPING AND REMOVAL OF TEMPORARY LAYDOWN AND WELFARE

NSR	Shortest distance to the edge of the site (m)	Total Equivalent Noise Level at 10 m from Bunding Works (dB)	Sound Pressure Level at Receptor (dB)	Construction Noise Exceedance
1	146	86	61	-4
2	158	86	60	-5
3	164	86	59	-6
4	143	86	61	-4
5	1147	86	40	-25
6	490	86	49	-16
7	472	86	49	-16

3.3 Assessment Results to Centre of Site

Table 3-7 BS 5228 Assessment – SIMULTANEOUS PHASES

NSR	Shortest distance to the centre of the site (m)	Total Equivalent Noise Level at 10 m from Bunding Works (dB)	Sound Pressure Level at Receptor (dB)	Construction Noise Exceedance
1	278	96	65	0
2	284	96	64	-1
3	273	96	65	0
4	268	96	65	0
5	1341	96	49	-16
6	701	96	56	-9
7	553	96	58	-7

Table 3-8 BS 5228 Assessment – BULK EARTH WORKS

NSR	Shortest distance to the centre of the site (m)	Total Equivalent Noise Level at 10 m from Bulk Earth Works (dB)	Sound Pressure Level at Receptor (dB)	Construction Noise Exceedance
1	278	95	63	-2
2	284	95	63	-2
3	273	95	63	-2
4	268	95	64	-1
5	1341	95	48	-17
6	701	95	54	-11
7	553	95	56	-9

Table 3-9 BS 5228 Assessment – CIVIL WORKS

NSR	Shortest distance to the centre of the site (m)	Total Equivalent Noise Level at 10 m from Civil Works (dB)	Sound Pressure Level at Receptor (dB)	Construction Noise Exceedance
1	278	88	57	-8
2	284	88	57	-8
3	273	88	57	-8
4	268	88	57	-8
5	1341	88	41	-24
6	701	88	48	-17
7	553	88	50	-15

Table 3-10 BS 5228 Assessment – TRANSFORMER INSTALLATION

NSR	Shortest distance to the centre of the site (m)	Total Equivalent Noise Level at 10 m from Transformer installation (dB)	Sound Pressure Level at Receptor (dB)	Construction Noise Exceedance
1	278	80	49	-16
2	284	80	49	-16
3	273	80	49	-16
4	268	80	49	-16
5	1341	80	33	-32
6	701	80	40	-25
7	553	80	42	-23

Table 3-11 BS 5228 Assessment – BALANCE OF PLANT WORK

NSR	Shortest distance to the centre of the site (m)	Total Equivalent Noise Level at 10 m from Balance of Plant Work (dB)	Sound Pressure Level at Receptor (dB)	Construction Noise Exceedance
1	278	77	45	-20
2	284	77	45	-20
3	273	77	45	-20
4	268	77	45	-20
5	1341	77	30	-35
6	701	77	36	-29
7	553	77	38	-27

Table 3-12 BS 5228 Assessment – BUNDING, LANDSCAPING AND REMOVAL OF TEMPORARY LAYDOWN AND WELFARE

NSR	Shortest distance to the centre of the site (m)	Total Equivalent Noise Level at 10 m from Bunding Works (dB)	Sound Pressure Level at Receptor (dB)	Construction Noise Exceedance
1	278	86	54	-11
2	284	86	54	-11
3	273	86	54	-11
4	268	86	55	-10
5	1341	86	39	-26
6	701	86	45	-20
7	553	86	48	-17