

A12 Chelmsford to A120 widening scheme

TR010060

6.3 ENVIRONMENTAL STATEMENT APPENDIX 12.4 CONSTRUCTION NOISE CALCULATIONS

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ENVIRONMENTAL STATEMENT
APPENDIX 12.4 CONSTRUCTION NOISE CALCULATIONS

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1 Introduction

- 1.1.1 Section 2 of this appendix lists the expected construction activities within each location of the proposed scheme. It also lists the expected time of the day when these activities may take place, together with an unmitigated predicted noise level at a nominal 10m.
- 1.1.2 The tables within Section 3 of this appendix then list the expected plant that would be used for used for each activity, together with the sound power level and the percentage on-time. These terms are described at the start of Section 3.

2 Construction activities by location

2.1.1 Tables 2.1 to 2.11 list the assumed construction activities to be undertaken at each location along the proposed scheme together with the calculated noise level at 10m. The column indicating the likely timing of the works is based on worst case estimates and is subject to change as the detailed design is completed, the construction methods confirmed, and programme develops. An activity marked as being undertaken during the day and night would not necessarily have an equal split of working time in these two periods.

Table 2.1 Construction activities and calculated noise levels at A12 junction 19 (Boreham interchange)

Activity	Likely timing of works Day (D) / Night (N) / Both (B)	L _{Aeq} at 10m, dB
Culverts	D	78.2
Archaeological / Ecological work	D	73.4
Service diversion	D	76.3
Fencing	D	80.5
Drainage (split to road (Southbound diverge) and central reserve re-construction)	D	79.5
Surface planing	N	82.7
Road surfacing	N	80.7
Kerb laying	D	71.6
De-vegetation	B	80.1
Bridge widening work (Hydro demolition)	B	81.1
New footbridge ¹ (Foundations)	D	81.7
New footbridge (Piling)	D	84.7
New footbridge (Erection)	B	79.6
Structures piling (including temporary sheet piling)	D	85.2
Structure formwork reinforcement and concreting	B	85.5
Structures backfilling	D	76.8

¹ The term 'footbridge' is used to describe bridges for walkers, cyclists and horse riders, as described in Chapter 2: The proposed scheme, of this Environmental Statement [TR010060/APP/6.1]

Activity	Likely timing of works Day (D) / Night (N) / Both (B)	L _{Aeq} at 10m, dB
Structures waterproofing	D	74.9
Beam installation	B	78.5
Bridge joints	B	80.4
Lifting pre-fabricated structures	B	74.9
Parapet Installation	B	84.3
Installation / removal of Vehicle Restraint System (VRS)	B	83.1
Earthworks	D	83.5

Table 2.2 Construction activities and calculated noise levels at Boreham

Activity	Likely timing of works Day (D) / Night (N) / Both (B)	L _{Aeq} at 10m, dB
Service diversion	D	76.3
Road surfacing	B	80.7

Table 2.3 Construction activities and calculated noise levels at Hatfield Peverel

Activity	Likely timing of works Day (D) / Night (N) / Both (B)	L _{Aeq} at 10m, dB
De-vegetation	N	80.1
Service diversion	D	76.3
Culverts	D	78.2
Archaeological / Ecological work	D	73.4
Fencing	D	80.5
Drainage	D	79.5
Structures demolition (Bridge demolition)	B	82.7
Structures demolition (Hydro demolition of River Ter Bridge (BE05))	B	81.1
Road stud removal	N	76.5
Surface planing	B	82.7
Road surfacing (temp carriageway construction and road surfacing)	B	80.7

Activity	Likely timing of works Day (D) / Night (N) / Both (B)	L_{Aeq} at 10m, dB
Kerb laying	D	71.6
Structures piling (including temporary sheet piling)	B	85.2
Structure formwork reinforcement and concreting	D	85.5
Structures Backfilling	D	76.8
Structure waterproofing	D	74.9
Lifting pre-fabricated structures	N	74.9
Central reserve hardening	N	80.7
Retaining walls piling	D	78.7
Retaining walls installation	B	85.3
Beam installation	N	78.5
Bridge joints	D	80.4
Installation / removal of VRS	B	83.1
Removal of street furniture	B	77.3
Construction compound (west of River Ter)	B	84.1
Slipform of central reserve	B	78.1

**Table 2.4 Construction activities and calculated noise levels for the new A12 junction
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Activity	Likely timing of works Day (D) / Night (N) / Both (B)	L_{Aeq} at 10m, dB
De-vegetation	D	80.1
Culverts	D	78.2
Archaeological / Ecological work	D	73.4
Gantry / light column foundations	D	82.2
Duct laying	D	77.8
Gantry construction	D	84.4
Lighting construction	D	70.5
Fencing	D	80.5

Activity	Likely timing of works Day (D) / Night (N) / Both (B)	L _{Aeq} at 10m, dB
Earthworks	D	83.5
Drainage	D	79.5
Road stud removal	N	76.5
Surface planing	B	82.7
Road surfacing	B	80.7
Kerb laying	D	71.6
Structures piling (including temporary sheet piling)	B	85.2
Structure formwork reinforcement and concreting	B	85.5
Structures backfilling	D	76.8
Structure waterproofing	D	74.9
Lifting pre-fabricated structures	N	74.9
Landscaping	D	75.9
Beam installation	N	78.5
Bridge joints	D	80.4
Installation / removal of VRS	B	83.1
Removal of street furniture	B	77.3
Service diversion	B	76.3
Access road (temporary and permanent)	B	78.9
Gantry decommissioning	N	85.4
Slipform of central reserve	B	78.1

Table 2.5 Construction activities and calculated noise levels for the Witham bypass widening, including the new A12 junction 22

Activity	Likely timing of works Day (D) / Night (N) / Both (B)	L _{Aeq} at 10m, dB
De-vegetation	B	80.1
Culverts	D	78.2
Archaeological / Ecological work	D	73.4
Gantry / light column foundations	D	82.2

Activity	Likely timing of works Day (D) / Night (N) / Both (B)	L_{Aeq} at 10m, dB
Duct laying	D	77.8
Gantry construction	B	84.4
Lighting construction	D	70.5
Service diversion	D	76.3
Fencing	D	80.5
Earthworks	D	83.5
Drainage	D	79.5
Structures demolition (Bridge demolition)	B	82.7
Structures demolition (Hydro demolition of Olivers Bridge and Benton Bridge)	B	81.1
Road stud removal	N	76.5
Surface planing	D	82.7
Road surfacing	B	80.7
Traffic management compound operation	B	72.2
Noise barrier removal	D	86.4
Installing noise barriers	D	81.0
Kerb laying	D	71.6
Structures piling (including temporary sheet piling)	B	85.2
Structure formwork reinforcement and concreting	D	85.5
Structures backfilling	D	76.8
Structure waterproofing	D	74.9
Lifting pre-fabricated structures	N	74.9
Central reserve hardening	N	80.7
Retaining walls piling	D	78.7
Retaining walls installation	B	85.3
Beam installation	N	78.5
Bridge joints	D	80.4
New footbridge (Foundations)	D	81.7

Activity	Likely timing of works Day (D) / Night (N) / Both (B)	L_{Aeq} at 10m, dB
New footbridge (Piling)	D	84.7
New footbridge (Erection)	B	79.6
Installation / removal of VRS	B	83.1
Removal of street furniture	B	77.3
Micro piling (Oliver's Bridge)	B	74.2
Bridge bearing replacement	B	75.4
Slipform of central reserve	B	78.1

Table 2.6 Construction activities and calculated noise levels at Rivenhall End

Activity	Likely timing of works Day (D) / Night (N) / Both (B)	L_{Aeq} at 10m, dB
De-vegetation	D	80.1
Culverts	D	78.2
Archaeological / Ecological work	D	73.4
Gantry / light column foundations	D	82.2
Duct laying	D	77.8
Gantry construction	D	84.4
Lighting construction	D	70.5
Service diversion	D	76.3
Fencing	D	80.5
Building demolition	D	81.8
Earthworks	D	83.5
Drainage	D	79.5
Road stud removal	N	76.5
Road surfacing	D	80.7
Installation of noise barriers	D	81.0
Kerb laying	D	71.6
Structures piling (including temporary sheet piling)	B	85.2

Activity	Likely timing of works Day (D) / Night (N) / Both (B)	L _{Aeq} at 10m, dB
Structure formwork reinforcement and concreting	D	85.5
Structures backfilling	D	76.8
Structure waterproofing	D	74.9
Lifting pre-fabricated structures	D	74.9
Landscaping	D	75.9
New footbridge (Foundations)	D	81.7
New footbridge (Piling)	D	84.7
New footbridge (Erection)	B	79.6
Installation / removal of VRS	B	83.1
Removal of street furniture	B	77.3
Temporary bridge construction	B	79.2
Slipform of central reserve	B	78.1

Table 2.7 Construction activities and calculated noise levels for the Kelvedon bypass widening, including the new junction 24 works

Activity	Likely timing of works Day (D) / Night (N) / Both (B)	L _{Aeq} at 10m, dB
De-vegetation	N	80.1
Culverts	D	78.2
Archaeological / Ecological work	D	73.4
Gantry / light column foundations	D	82.2
Duct laying	D	77.8
Gantry construction	B	84.4
Lighting construction	D	70.5
Service diversion	D	76.3
Fencing	D	80.5
Building demolition	D	81.8
Earthworks	D	83.5
Drainage	D	79.5

Activity	Likely timing of works Day (D) / Night (N) / Both (B)	L _{Aeq} at 10m, dB
Structures demolition (Bridge demolition)	B	82.7
Structures demolition (Hydro demolition of Cranes Bridge and Ashmans Bridge)		81.1
Road stud removal	N	76.5
Surface planing	N	82.7
Road surfacing	B	80.7
Kerb laying	D	71.6
Structures piling (including temporary sheet piling)	B	85.2
Structure formwork reinforcement and concreting	D	85.5
Structures backfilling	D	76.8
Structure waterproofing	D	74.9
Lifting pre-fabricated structures	N	74.9
Central reserve hardening	N	80.7
Retaining walls piling	D	78.7
Retaining walls installation	D	85.3
Beam installation	N	78.5
Bridge joints	D	80.4
Installation / removal of VRS	B	83.1
Removal of street furniture	B	77.3
Slipform of central reserve	B	78.1

Table 2.8 Construction activities and calculated noise levels for the offline section between junction 24 and junction 25

Activity	Likely timing of works Day (D) / Night (N) / Both (B)	L _{Aeq} at 10m, dB
De-vegetation	D	80.1
Culverts	D	78.2
Archaeological / Ecological work	D	73.4
Gantry / light column foundations	D	82.2

Activity	Likely timing of works Day (D) / Night (N) / Both (B)	L_{Aeq} at 10m, dB
Duct laying	D	77.8
Gantry construction	D	84.4
Lighting construction	D	70.5
Service diversion	D	76.3
Fencing	D	80.5
Earthworks	D	83.5
Drainage	D	79.5
Road stud removal	N	76.5
Surface planning	D	82.7
Road surfacing	D	80.7
Installing noise barriers	D	81.0
Slipform of central reserve	D	78.1
Kerb laying	D	71.6
Structures piling (including temporary sheet piling)	B	85.2
Structure formwork reinforcement and concreting	D	85.5
Structures backfilling	D	76.8
Structure waterproofing	D	74.9
Lifting pre-fabricated structures	D	74.9
Landscaping	D	75.9
New footbridge (Foundations)	D	81.7
New footbridge (Piling)	D	84.7
New footbridge (Erection)	B	79.6
Installation / removal of VRS	B	83.1
Removal of street furniture	B	77.3
Roundabout works on existing A12	B	80.4
Beam installation	D	78.5
Bridge joints	D	80.4

Activity	Likely timing of works Day (D) / Night (N) / Both (B)	L _{Aeq} at 10m, dB
Lifting pre-fabricated structures	B	74.9
Parapet installation	D	84.3

Table 2.9 Construction activities and calculated noise levels at Marks Tey

Activity	Likely timing of works Day (D) / Night (N) / Both (B)	L _{Aeq} at 10m, dB
Culverts	D	78.2
Archaeological / Ecological work	D	73.4
Gantry / light column foundations	D	82.2
Duct laying	D	77.8
Gantry construction	D	84.4
Lighting construction	D	70.5
Fencing	D	80.5
Earthworks	D	83.5
Drainage	D	79.5
Road stud removal	N	76.5
Surface planing	N	82.7
Road surfacing	D	80.7
Kerb laying	D	71.6
Retaining walls piling	D	78.7
Retaining walls installation	D	85.3
De-vegetation	B	80.1
Structures piling (including temporary sheet piling)	B	85.2
Structure formwork reinforcement and concreting	D	85.5
Structures backfilling	D	76.8
Installation / removal of VRS	B	83.1
Removal of street furniture	B	77.3
New footbridge (Foundations)	D	81.7

Activity	Likely timing of works Day (D) / Night (N) / Both (B)	L _{Aeq} at 10m, dB
New footbridge (Piling)	D	84.7
New footbridge (Erection)	B	79.6
Slipform of central reserve	B	78.1

Table 2.10 Construction activities and calculated noise levels at the two main construction compounds

Activity	Likely timing of works Day (D) / Night (N) / Both (B)	L _{Aeq} at 10m, dB
De-vegetation	D	80.1
Service diversion	D	76.3
Earthworks	D	83.5
Fencing	D	80.5
Compound construction (buildings installation)	D	88.0
Concrete batching plant	B	80.1
Asphalt plant (only at compound 1 J20b)	B	79.9
Surfacing	D	80.7
Drainage	D	79.5
Archaeology	D	73.4

Table 2.11 Construction activities and calculated noise levels at the borrow pits

Activity	Likely timing of works Day (D) / Night (N) / Both (B)	L _{Aeq} at 10m, dB
De-vegetation	D	80.1
Fencing	D	80.5
Earthworks	D	83.5
Construction of access (surfacing & planing)	D	78.9
Construction of haul routes	D	78.9
Borrow pit operation	D	90.0
Material processing	D	84.6

Activity	Likely timing of works Day (D) / Night (N) / Both (B)	L _{Aeq} at 10m, dB
De-watering (assuming the use of a generator)	B	65.8

3 Construction plant

- 3.1.1 Tables 3.1 to 3.54 list the assumed plant for each activity listed in Section 2 of this appendix.
- 3.1.2 The 'Plant Description' in the second column within each table are the descriptors given in BS 5228-1:2009+A1:2014 (British Standards Institution, 2014). Where no reference is provided in column 1 within each table, the information is from a source other than BS 5228 (e.g. manufacturers data, measured levels). Some minor works, both in terms of duration and noise level produced, are excluded from the lists and subsequent assessment. The tables contain those items of plant likely to be in close proximity to a receptor and can therefore be considered for the noise calculations to be a largely single, homogenous source for the type of works described.
- 3.1.3 The percentage acoustic on-time for the activities within these calculations is defined as the period at which the equipment is operating within 3 dB of the maximum – in laymans terms this can be considered as the percentage of the time operating that the equipment is running at full power.
- 3.1.4 Ground cover has been assumed to be a mixture of acoustically hard and soft surfaces. Road surfaces and areas of water are hard ground, urban areas assumed to be 50% soft and agricultural/grassland/parkland areas as 100% soft. No additional screening between construction activities and receptors has been included within the assessment, other than the natural landform and existing buildings.
- 3.1.5 The calculations undertaken have used the 'Sound Power' method contained in BS 5228-1:2009+A1:2014 (British Standards Institution, 2014), corrected for the likely hours of operation of the construction works (assumed to be 83% of a working period). The sound output considered in mobile plants listed with an asterisk (*) considers the drive-by maximum sound pressure level.

Table 3.1 De-vegetation

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
Manufacturer's data	Brushcutter	110	1	15%
Manufacturer's data	Chainsaw	114	1	10%
Measured data	Tractor mounted flail	103	1	20%
C.4.74	Tractor (towing equipment)	108	1	20%

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.4.6	Dumper	107	1	25%
Manufacturer's data	General 4x4	108	1	10%
C.4.67	Mini tracked excavator	102	1	30%
Manufacturer's Data	Large Chipper	120	1	20%

Table 3.2 Service diversion

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
Manufacturer's data	Cable winch	93	1	25%
C.4.67	Mini tracked excavator	102	1	30%
C.4.6	Dumper	107	1	25%
C.2.39	Vibratory roller	102	1	20%
C.2.41	Vibratory plate	108	1	20%

Table 3.3 Fencing

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.4.74	Tractor (towing equipment)	108	1	30%
Manufacturer's data	Post rammer	113	1	25%
C.2.8	Wheeled backhoe loader	96	1	20%
C.4.20	Concrete mixer truck	108	1	25%

Table 3.4 Earthworks

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.2.14	Tracked excavator	107	2	30%
C.8.16	Articulated dump truck	109	2	25%
C.2.34	Lorry (4-axle wagon)	108	2	25%
C.2.37	Roller (rolling fill)	107	1	30%
C.6.28	Crawler mounted dozer	113	1	25%

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.4.75	Tractor (towing trailer)	107	1	10%
C.2.34	Lorry (4-axle wagon)	108	1	10%

Table 3.5 Drainage

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.2.20	Tracked excavator	96	1	30%
C.4.67	Mini tracked excavator	102	1	30%
C.4.6	Dumper 60 kW	107	2	25%
C.2.39	Vibratory roller	102	1	20%
C.2.41	Vibratory plate - Petrol	108	1	20%
C.2.34	Lorry (4-axle wagon)	108	1	25%
C.4.24	Concrete pump + cement mixer truck (discharging)	95	1	30%
Manufacturer's Data	General 4x4	108	1	10%

Table 3.6 Road construction

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.2.14	Tracked excavator	107	2	30%
C.6.16	Articulated dump truck (empty)	116	2	25%
C.2.37	Roller (rolling fill)	107	1	30%
C.6.28	Crawler mounted dozer	113	1	25%
C.2.34	Lorry (4-axle wagon)	108	2	25%
C.4.75	Tractor (towing trailer)	107	1	10%
C.2.34	Lorry (4-axle wagon)	108	1	10%

Table 3.7 Borrow pit operations

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.6.39	Diesel generator	93	4	75%

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
Manufacturer's data	Vehicles	98	2	40%
C.2.14	Tracked excavator	107	4	40%
C.6.16	Articulated dump truck (empty)	116	6	25%
C.4.75	Tractor (towing trailer)	107	1	20%
C.2.37	Roller	107	1	30%
C.6.28	Crawler mounted dozer	113	1	25%

Table 3.8 Materials processing

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.1.15	Tracked crusher	112	1	50%
C.10.14	Screen stockpiler	109	1	50%
C.2.28	Wheeled loader	104	1	30%
C.4.1	Articulated dump truck	109	2	25%
C.2.34	Lorry (4-axle wagon)	108	2	40%

Table 3.9 Compound construction

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.2.8	Wheeled backhoe loader	96	1	40%
C.2.20	Tracked excavator	96	4	40%
C.4.1	Articulated dump truck	109	6	25%
C.2.37	Roller (rolling fill)	107	1	35%
C.2.41	Vibratory plate - petrol	108	1	25%
C.4.23	Small cement mixer	89	1	20%
C.2.34	Lorry (4-axle wagon)	108	2	30%
C.4.53	Lorry with lifting boom	105	1	40%
C.4.70	Petrol hand-held circular saw	119	1	10%
C.4.39	Mobile telescopic crane	105	2	15%

Table 3.10 Demolition operations

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.2.16	Tracked excavator	103	1	40%
C.1.3	Pulveriser mounted on excavator	108	1	30%
C.1.9	Breaker mounted on excavator	118	1	10%
C.3.34	Gas cutter	96	1	10%
C.4.77	Diesel generator	88	1	50%
C.5.5	Compressor	93	1	25%
C.1.6	Hand held breaker	111	1	25%
C.2.34	Lorry (4-axle wagon)	108	1	30%
C.4.70	Petrol hand-held circular saw	119	1	10%
C.4.75	Tractor (towing trailer)	107	1	20%
C.4.54	Telescopic Handler	107	1	25%

Table 3.11 Surface planing

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.5.7	Road planer	110	1	40%
C.5.11	Wheeled excavator	101	1	25%
C.4.70	Petrol hand-held circular saw	119	1	10%
C.2.34	Lorry (4-axle wagon)	108	2	15%

Table 3.12 Road surfacing (including white lining)

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.2.37	Roller (rolling fill)	107	1	40%
C.5.31	Asphalt paver (+ tipper lorry)	105	1	35%
C.5.19	Road roller	108	1	30%
C.4.72	Hand-held circular saw	107	1	5%
C.5.7	Road planer	110	1	20%
C.5.5	Compressor for hand-held pneumatic breaker	93	1	40%

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
Manufacturer's data	Mounted scabbler	97	1	25%
Measured data	Hydro-blaster	101	1	10%
Measured data	Road marking vehicles	111	1	10%

Table 3.13 Installation of noise barriers

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.3.4	Hydraulic hammer rig	105	1	50%
C.4.53	Lorry with lifting boom	105	1	10%
C.2.34	Lorry (4-axle wagon)	108	1	15%
C.4.70	Petrol hand-held circular saw	119	1	5%
Manufacturer's data	Tractor with auger & post rammer	107	1	35%
Measured data	Impact wrench	110	2	5%

Table 3.14 Slipforming of central reserve

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
Manufacturer's data	Slipformer	109	1	45%
C.4.21	Large lorry concrete mixer	105	1	40%

Table 3.15 Kerb laying

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
Manufacturer's data	Kerb lifter	100	1	10%
C.2.16	Tracked excavator	103	1	40%
C.4.18	Cement mixer truck (discharging)	103	1	10%

Table 3.16 Gantry / Lighting column foundations

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.2.16	Tracked excavator	103	1	50%
C.4.70	Petrol hand-held circular saw	119	1	10%
C.2.34	Lorry (4-axle wagon)	108	1	15%
C.4.21	Large lorry concrete mixer	105	1	35%
C.4.28	Concrete mixer truck (discharging) & pump	103	1	35%
C.4.33	Poker vibrator	106	2	10%
C.4.35	Vibratory tamper	91	1	10%
C.4.77	Diesel generator	88	1	50%
Manufacturer's data	Hammer Drill Under Load	101	1	10%

Table 3.17 Gantry construction

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.4.38	Wheeled mobile telescopic crane	106	1	40%
C.4.57	Lifting platform	95	2	20%
C.5.5	Compressor	93	1	30%
C.1.6	Hand held	111	1	25%
Measured data	Impact wrench	110	4	40%

Table 3.18 Lighting construction

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.4.10	Wheeled excavator	94	1	20%
C.4.21	Large lorry concrete mixer	105	1	15%
C.4.53	Lorry with lifting boom	105	1	10%

Table 3.19 Culvert construction

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.2.16	Tracked excavator	103	1	35%
C.4.4	Dumper	104	1	20%
C.2.34	Lorry (4-axle wagon)	108	1	25%
C.2.37	Roller (rolling fill)	107	1	30%
C.2.41	Vibratory plate - petrol	108	1	10%
C.4.41	Mobile telescopic crane	99	1	10%
C.5.5	Compressor	93	1	25%
C.2.45	Water pump	93	1	20%
C.1.18	Gas cutter	107	1	20%
Manufacturer's data	Scabber	97	1	20%
C.5.5	Compressor	93	1	25%

Table 3.20 Archaeological / Ecological work

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.4.67	Mini tracked excavator	102	1	30%
C.4.6	Dumper	107	1	25%

Table 3.21 Structures piling

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.3.8	Vibratory piling rig	116	1	35%
C.3.2	Hydraulic hammer rig	115	1	5%
C.3.20	Mini tracked excavator	96	1	30%
C.2.16	Tracked excavator	103	1	30%
C.4.4	Dumper	104	1	25%
C.2.34	Lorry (4-axle wagon)	108	1	25%
Measured data	Jetwash unit	96	1	10%
C.4.38	Wheeled mobile telescopic crane	106	1	40%

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.4.50	Tracked mobile crane	99	1	35%
C.11.13	44t HGV	106	1	15%

Table 3.22 Structures formwork reinforcement and concrete

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On- Time
C.2.7	14t Tracked Excavator	98	1	30%
C.2.41	Vibratory plate - petrol	108	1	10%
C.4.33	Poker vibrator	106	2	10%
Manufacturer's data	Hammer Drill Under Load	101	1	10%
C.4.70	Petrol hand-held circular saw	119	1	5%
C.4.28	Concrete mixer truck (discharging) & pump	103	2	35%
C.5.5	Compressor	93	1	30%
C.4.38	Wheeled mobile telescopic crane	106	1	40%
C.4.54	Telescopic handler	107	1	25%
Measured data	Nail gun	120	1	15%
C.4.57	Lifting platform	95	2	25%
C.2.41	Vibratory plate - petrol	108	1	10%
C.2.37	Roller (rolling fill)	107	1	30%

Table 3.23 Structures backfilling

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.2.21	Tracked Excavator	99	1	35%
C.4.6	Dumper	107	1	30%
C.2.34	Lorry	108	1	10%
C.2.37	Roller (rolling fill)	107	1	25%

Table 3.24 Lifting in pre-fabricated structures

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
Manufacturer's data	Self propelled modular trailer	89	2	80%
C.4.87	Diesel generator	93	4	80%
C.4.38	Wheeled mobile telescopic crane	106	1	40%
C.4.54	Telescopic handler	107	1	25%

Table 3.25 Landscaping

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.2.19	Tracked excavator	105	1	30%
C.4.1	Articulated dump truck	109	1	25%

Table 3.26 Central reserve hardening

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.5.11	Wheeled excavator	101	1	45%
C.2.34	Lorry (4-axle wagon)	108	1	30%
C.4.72	Hand-held circular saw	107	1	10%
C.2.41	Vibratory plate - petrol	108	1	25%
C.5.19	Road roller	108	1	45%

Table 3.27 Retaining walls piling

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.3.21	Crawler mounted rig	107	1	40%
C.3.20	Mini tracked excavator	96	1	30%
C.4.28	Concrete mixer truck (discharging) & pump	103	1	35%
C.2.16	Tracked excavator	103	1	30%
C.4.4	Dumper	104	1	25%
C.2.34	Lorry (4-axle wagon)	108	1	25%

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
Measured data	Jetwash unit	96	1	10%

Table 3.28 Retaining walls installation

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.4.77	Diesel generator	88	1	50%
C.4.70	Petrol hand-held circular saw	119	1	5%
C.4.21	Large lorry concrete mixer	105	1	35%
C.4.28	Concrete mixer truck (discharging) & pump	103	1	35%
C.3.30	Wheeled mobile crane	98	1	25%
C.4.54	Telescopic handler	107	1	25%
C.4.57	Lifting platform	95	2	25%
Measured data	Jetwash unit	96	1	20%

Table 3.29 Batching plant

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
Measured data	Concrete batching plant	103.6	1	45%
C.9.27	Wheeled loader	105	1	30%
C.4.20	Concrete mixer truck	108	2	30%
C.6.21	Road lorry (full)	108	1	10%

Table 3.30 Asphalt plant

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
Measured data	Asphalt plant	104	1	45%
C.9.27	Wheeled loader	105	1	30%
C.2.34	Lorry (4-axle wagon)	108	2	25%
C.6.21	Road lorry (full)	108	1	15%

Table 3.31 Bridge joints

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.2.34	Lorry (4-axle wagon)	108	1	10%
C.5.5	Compressor	93	1	35%
Manufacturer's data	Cauldron for heating material	96	1	35%
C.1.18	Gas cutter	107	1	20%
C.1.6	Hand held breaker	111	1	20%
C.4.70	Petrol hand-held circular saw	119	1	5%

Table 3.32 Beam installation

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.4.38	Wheeled mobile telescopic crane	106	1	35%
C.4.57	Lifting platform	95	2	30%
C.11.4	Lorry	111	1	30%
C.4.77	Diesel generator	88	1	50%

Table 3.33 Planing surface joints

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
Manufacturer's data	Planer	118	1	40%
Manufacturer's data	Shotblast	115	1	10%
Manufacturer's data	Scabber	97	1	20%
C.5.5	Compressor	93	1	25%
C.2.34	Lorry (4-axle wagon)	108	1	20%

Table 3.34 Structure waterproofing

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.2.34	Lorry (4-axle wagon)	108	1	20%

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.5.5	Compressor	93	1	25%
C.2.45	Water pump	93	1	20%
C.1.18	Gas cutter	107	1	20%
Manufacturer's data	Scabber	97	1	20%
C.5.5	Compressor	93	1	25%

Table 3.35 Duct laying

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.4.4	Dumper	104	1	20%
C.2.17	Tracked excavator	104	1	25%
C.2.34	Lorry (4-axle wagon)	108	1	20%
C.2.41	Vibratory plate - petrol	108	1	10%
C.5.22	Vibratory roller	109	1	20%

Table 3.36 Building demolition

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.2.16	Tracked excavator	103	1	40%
C.1.3	Pulveriser on excavator	108	1	30%
C.1.9	Breaker on excavator	118	1	10%
C.2.34	Lorry (4-axle wagon)	108	1	10%
C.6.38	Tractor (towing water bowser)	111	1	15%

Table 3.37 Hydro demolition

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
Measured data	High pressure water jet	111	1	50%
Measured data	Suction pump	108	1	50%
Measured data	Suction tanker	96	1	50%
Measured data	Submersible pump	88	1	50%

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.4.90	Road Sweeper	104	1	25%

Table 3.38 Vehicle restraint systems

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.4.70	Petrol hand-held circular saw	119	1	5%
C.3.17	Mini piling rig	104	1	30%
C.4.21	Large lorry concrete mixer	105	1	35%
Measured data	Impact wrench	110	1	5%
C.5.5	Compressor	93	1	40%
C.4.77	Diesel generator	88	1	50%

Table 3.39 Parapet demolition

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.4.77	Diesel generator	88	1	50%
C.4.72	Hand-held circular saw	107	1	10%
Measured data	Hammer drill	101	1	15%
C.2.34	Lorry (4-axle wagon)	108	1	25%

Table 3.40 Parapet installation

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
Measured data	Cauldron for heating jointing material	96	2	35%
C.4.72	Hand-held circular saw	107	1	10%
Measured data	Nail gun	120	1	15%
C.4.24	Concrete pump & cement mixer	95	1	45%
C.2.16	Tracked excavator	103	1	35%
C.2.34	Lorry	108	1	25%
C.4.39	Mobile telescopic crane	105	1	25%
C.4.33	Poker vibrator	106	2	20%

Table 3.41 Micro piling

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.3.17	Mini piling rig	104	1	40%
C.3.19	Compressor for mini piling rig	103	1	45%
C.4.24	Concrete pump + mixer truck	95	1	25%
C.2.7	14t Tracked Excavator	98	1	30%

Table 3.42 Roundabout works on existing A12

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.2.14	Tracked excavator	107	1	30%
C.8.16	Dump truck	109	1	25%
C.2.34	Lorry	108	1	10%
C.5.31	Asphalt paver	105	1	35%
C.5.19	Road roller	108	1	30%
Manufacturers data	Road marking vehicles	111	1	10%

Table 3.43 Borrow pit (de-watering)

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.4.76	Diesel generator	89	1	50%
C.11.3	Electric water pump	97	1	50%

Table 3.44 Traffic management

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.4.55	Telescopic handler	98	1	20%
C.2.34	Lorry (4-axle wagon)	108	1	10%
C.2.28	Wheeled loader	104	1	20%

Table 3.45 Footbridge foundations

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.4.18	Cement mixer truck (discharging)	103	1	15%
C.4.25	Concrete pump + mixer truck	110	1	40%
C.4.33	Poker vibrator	106	2	30%
C.4.7	Dumper	106	2	20%
C.2.35	Telescopic handler	99	1	10%
C.2.41	Vibratory plate - Petrol	108	2	20%
C.4.72	Hand-held circular saw (petrol-cutting concrete blocks)	107	1	5%

Table 3.46 Footbridge piling

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.6.19	Road lorry (empty)	104	2	10%
C.3.1	Hydraulic hammer rig	117	2	10%
C.4.52	Tracked mobile crane	103	1	30%
C.2.34	Lorry (4-axle wagon)	108	2	25%
C.4.25	Concrete pump + mixer truck	110	1	40%
C.2.1	Dozer	103	2	25%
C.2.38	Roller	101	2	20%
C.2.5	Tracked excavator	104	2	20%
C.4.7	Dumper	106	2	20%

Table 3.47 Footbridge erection

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.6.19	Road lorry (empty)	104	1	10%
C.4.38	Wheeled mobile telescopic crane	106	1	25%
Manufacturer's data	Impact wrench	112	2	10%
C.4.59	Diesel scissor lift	106	2	30%

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.2.35	Telescopic handler	99	1	10%

Table 3.48 Noise barrier removal

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.2.5	Tracked excavator	104	1	30%
C.2.34	Lorry (4-axle wagon)	108	1	20%
C.1.1	Breaker on wheeled backhoe	120	1	30%
C.4.7	Dumper	106	1	20%

Table 3.49 Cadent gas main diversion

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.2.11	Dozer	107	1	25%
C.4.65	Tracked excavator	99	1	30%
C.4.6	Dumper	107	1	25%
C.2.39	Vibratory roller	102	1	20%
C.2.35	Telescopic handler	99	1	15%

Table 3.50 Pile mat construction/ removal

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.2.34	Lorry (4-axle wagon)	108	2	25%
C.4.65	Tracked excavator	99	1	30%
C.2.38	18T Vibratory roller	101	1	20%

Table 3.51 Removal of street furniture

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.4.66	Wheeled backhoe loader 8t	97	1	30%
C.4.72	Hand-held circular saw	107	1	15%
C.5.5	Compressor	93	1	25%
C.1.6	Hand held pneumatic breaker	111	1	25%

Table 3.52 Construction compound (near River Ter)

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.2.8	Wheeled backhoe loader	96	1	40%
C.2.20	Tracked excavator	96	2	40%
C.4.1	Articulated dump truck	109	2	25%
C.2.37	Roller (rolling fill)	107	1	35%
C.2.34	Lorry (4-axle wagon)	108	2	30%
C.4.53	Lorry with lifting boom	105	1	40%
C.4.39	Mobile telescopic crane	105	1	15%

Table 3.53 Temporary access road construction

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.2.19	Tracked excavator 25t	105	1	35%
C.4.4	Dumper 9t	104	1	30%
C.2.34	Lorry (4-axle wagon)	108	1	25%
C.5.21	Vibratory roller 12t	108	1	20%
C.5.31	Asphalt paver (+ lorry) 18t	105	1	30%
C.4.72	Hand-held circular saw	107	1	5%

Table 3.54 Gantry decommissioning

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.4.39	Wheeled mobile crane	105	1	40
C.4.57	Lifting platform	95	2	20
C.5.5	Compressor for hand-held pneumatic breaker	93	1	30
C.1.6	Hand held pneumatic breaker	111	1	25
Measured data	Impact wrench	110	2	40
C.1.9	Breaker on excavator 15t	118	1	20
C.2.19	Tracked excavator 25t	105	1	25

Table 3.55 Bridge bearing replacement

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.4.24	Concrete pump + cement mixer truck	95	1	40%
C.4.77	Diesel generator	88	1	50%
C.2.34	Lorry (4-axle wagon)	108	1	20%
C.4.39	Mobile telescopic crane	105	1	25%
Manufacturer's Data	Hammer Drill Under Load	101	1	20%
C.4.57	Lifting platform 8t	98	2	25%

Table 3.56 Temporary bridge construction

BS5228 Ref	Plant Description	Single Plant L _w dB	Quantity	Acoustic On-Time
C.4.38	Wheeled mobile telescopic crane	106	1	20%
Manufacturer's Data	Impact Wrench	113	2	10%
C.6.21	Road lorry (full) 39t	108	1	10%
C.2.34	Lorry (4-axle wagon)	108	1	25%
C.2.1	Dozer	103	1	25%
C.2.38	Roller 18t	101	1	20%
C.2.5	Tracked excavator 16t	104	1	20%

4 Construction baseline

4.1.1 Forty-four receptors have been selected to represent the closest groups of noise sensitive receptors to different construction activities, and these receptors are indicated on Figure 12.3 [TR010060/APP/6.2] of the Environmental Statement. Table 4.1 shows the location of each of receptor, with R1 referring to receptor 1 etc. Receptor R31 was initially assigned to a building that is now to be demolished and is therefore no longer included as a receptor.

Table 4.1 Construction assessment locations

Receptor ID	Location	Receptor ID	Location	Receptor ID	Location
R1	Little Generals Main Road	R16	Natgragle Hodges	R32	Prested Hall
R2	Boreham - Fitzwalter Road	R17	44 Market Street	R33	Prested Hall Cottages
R3	Boreham – Main Road	R18	Little Braxted Mill	R34	Easthorpe Green
R4	Meadow Bank	R19	Burghey Brook Cottages	R35	Little Birch Holt Farm
R5	10 Swan Close	R20	Fair Rest Caravan Site	R36	Wishingwell Farm
R6	Crofton, Station Road	R21	15 Foxmead	R37	283 A12 London Road
R7	Bennett Way	R22	The Firs	R38	Doggetts
R8	22 Rookery Close	R23	Essex County fire and Rescue service	R39	Elders Garden
R9	Lawrence Court	R24	Hole Farm	R40	York Lodge
R10	Rock Cottages	R25	Davey House	R41	Marks Tey Hall
R11	Kingsford Cottage	R26	Ewell Hall	R42	121 London Road
R12	Latneys Kennels	R27	14 Lapwing Drive	R43	1 London Road
R13	Dengie Farmhouse	R28	Inworth Hall Lodge	R44	Millfields
R14	72 Baker Way	R29	Park Farm	R45	Boleyn Way
R15	132 Maltings Lane	R30	Belmont		

4.1.2 Table 4.2 shows the most representative measured baseline noise level, together with the associated lowest observed adverse effect level (LOAEL) and significant observed adverse effect level (SOAEL) levels for the daytime. The

respective night-time levels are shown in Table 4.3. All levels presented are free-field, being 3.5m away from any façades. The values for LOAEL and SOAEL have been determined in accordance with the instructions within DMRB LA 111 (Highways England, 2020).

Table 4.2 Daytime baseline at construction assessment locations

Receptor ID	Location	Representative baseline survey location	Daytime measured $L_{Aeq,T}$	LOAEL	SOAEL
R1	Little Generals Main Road	L18	58.1	58	65
R2	Boreham – Fitzwalter Road	L5	57.1	57	65
R3	Boreham – Main Road	L2	62.7	63	70
R4	Meadow Bank	L2	62.7	63	70
R5	10 Swan Close	L2	62.7	63	70
R6	Crofton, Station Road	L2	62.7	63	70
R7	Bennett Way	L5	57.1	57	65
R8	22 Rookery Close	L2	62.7	63	70
R9	Lawrence Court	L2	62.7	63	70
R10	The Vineyards	L5	57.1	57	65
R11	Kingsford Cottage	L15	54.8	55	65
R12	Latneys Kennels	L15	54.8	55	65
R13	Dengie Farmhouse	L11	66.2	66	70
R14	72 Baker Way	L15	54.8	55	65
R15	132 Maltings Lane	L5	57.1	57	65
R16	Natgragle Hodges	L3	67.3	67	70
R17	44 Market Street	L3	67.3	67	70
R18	Little Braxted Mill	L4	59.4	59	65
R19	Burghey Brook Cottages	L12	60.5	61	65
R20	Fair Rest Caravan Site	L13	55.9	56	65
R21	15 Foxmead	L5	57.1	57	65

Receptor ID	Location	Representative baseline survey location	Daytime measured $L_{Aeq,T}$	LOAEL	SOAEL
R22	The Firs	L6	54.0	54	65
R23	Essex County Fire and Rescue service	L5	57.1	57	65
R24	Hole Farm	L11	66.2	66	70
R25	Davey House	L15	54.8	55	65
R26	Ewell Hall	L7	58.0	58	65
R27	14 Lapwing Drive	L10	52.8	53	65
R28	Inworth Hall Lodge	L1	51.7	52	65
R29	Park Farm	L1	51.7	52	65
R30	Belmont	L3	67.3	67	70
R32	Prested Hall	L9	59.5	60	65
R33	Prested Hall Cottages	L10	52.8	53	65
R34	Easthorpe Green	L10	52.8	53	65
R35	Little Birch Holt Farm	L8	45.8	46	65
R36	Wishingwell Farm	L17	46.9	47	65
R37	283 A12 London Road	L17	46.9	47	65
R38	Doggetts	L16	57.7	58	65
R39	Elders Garden	L11	66.2	66	70
R40	York Lodge	L17	46.9	47	65
R41	Marks Tey Hall	L11	66.2	66	70
R42	121 London Road	L5	57.1	57	65
R43	1 London Road	L15	54.8	55	65
R44	Millfields	LT18	58.1	58	65
R45	Boleyn Way	LT2	62.7	63	70

Table 4.3 Night-time baseline at construction assessment locations

Receptor ID	Location	Representative baseline survey location	Night-time measured $L_{Aeq,T}$	LOAEL	SOAEL
R1	Little Generals Main Road	L18	53.2	53	55
R2	Boreham – Fitzwalter Road	L5	50.2	50	55
R3	Boreham – Main Road	L2	57.2	57	57
R4	Meadow Bank	L2	57.2	57	57
R5	10 Swan Close	L2	57.2	57	57
R6	Crofton, Station Road	L2	57.2	57	57
R7	Bennett Way	L5	50.2	50	55
R8	22 Rookery Close	L2	57.2	57	57
R9	Lawrence Court	L2	57.2	57	57
R10	The Vineyards	L5	50.2	50	55
R11	Kingsford Cottage	L15	49.7	50	55
R12	Latneys Kennels	L15	49.7	50	55
R13	Dengie Farmhouse	L11	61.4	61	61
R14	72 Baker Way	L15	49.7	50	55
R15	132 Maltings Lane	L5	50.2	50	55
R16	Natgragle Hodges	L3	61.8	62	62
R17	44 Market Street	L3	61.8	62	62
R18	Little Braxted Mill	L4	54.9	55	55
R19	Burghey Brook Cottages	L12	56.4	56	56
R20	Fair Rest Caravan Site	L13	51.3	51	55
R21	15 Foxmead	L5	50.2	50	55
R22	The Firs	L6	49.7	50	55
R23	Essex County Fire & Rescue	L5	50.2	50	55

Receptor ID	Location	Representative baseline survey location	Night-time measured $L_{Aeq,T}$	LOAEL	SOAEL
R24	Hole Farm	L11	61.4	61	61
R25	Davey House	L15	49.7	50	55
R26	Ewell Hall	L7	53.8	54	55
R27	14 Lapwing Drive	L10	50.4	50	55
R28	Inworth Hall Lodge	L1	48.2	48	55
R29	Park Farm	L1	48.2	48	55
R30	Belmont	L3	61.8	62	62
R32	Prested Hall	L9	54.9	55	55
R33	Prested Hall Cottages	L10	50.4	50	55
R34	Easthorpe Green	L10	50.4	50	55
R35	Little Birch Holt Farm	L8	40.5	41	45
R36	Wishingwell Farm	L17	44.9	45	50
R37	283 A12 London Road	L17	44.9	45	50
R38	Doggetts	L16	54.1	54	55
R39	Elders Garden	L11	61.4	61	61
R40	York Lodge	L17	44.9	45	50
R41	Marks Tey Hall	L11	61.4	61	61
R42	121 London Road	L5	50.2	50	55
R43	1 London Road	L15	49.7	50	55
R44	Millfields	LT18	53.2	53	55
R45	Boleyn Way	LT2	57.2	57	57

4.1.3 Table 4.4 lists individual receptors or areas (if any) that are nearby to the chosen assessment receptors which are expected to experience similar noise levels. A location not listed indicates that there is not expected to be any impacts from construction activities in that area.

Table 4.4 Individual receptors or areas representative of chosen assessment receptors

Receptor ID	Location	Representative of which other receptors
R1	Little Generals Main Road	Premier Inn (Boreham), Grange public house.
R2	Boreham – Fitzwalter Road	Boreham – away from Main Road or the A12.
R3	Boreham – Main Road	Receptors alongside Main Road in Boreham.
R4	Meadow Bank	Receptors in the vicinity of Bury Lane Bridge, Hatfield Peverel.
R5	10 Swan Close	Receptors along The Street, Hatfield Peverel.
R6	Crofton, Station Road	Receptors in the vicinity of Station Road Bridge, Hatfield Peverel.
R7	Bennett Way	Hatfield Peverel away from The Street or those alongside the A12.
R8	22 Rookery Close	Receptors directly alongside the A12 at Hatfield Peverel.
R9	Lawrence Court	Receptors near Wellington Road Bridge, Hatfield Peverel.
R10	The Vineyards	No other representative receptors
R11	Kingsford Cottage	No other representative receptors
R12	Latneys Kennels	No other representative receptors
R13	Dengie Farmhouse	No other representative receptors
R14	72 Baker Way	Receptors closest to the A12 within Witham (e.g. Gershwin Boulevard, Hawkes Road, Olivers Drive, Halfacres).
R15	132 Maltings Lane	Central Witham.
R16	Natgragle Hodges	Receptors closest to Olivers Bridge (Maldon Road underbridge), including Pantile Close, Hodges Holt, Benton Close.
R17	44 Market Street	Receptors along Market Lane facing the A12.
R18	Little Braxted Mill	Receptors in Little Braxted.
R19	Burghey Brook Cottages	No other representative receptors
R20	Fair Rest Caravan Site	Including The Cottage and Rose Cottage.

Receptor ID	Location	Representative of which other receptors
R21	15 Foxmead	Receptors within Rivenhall End to the north of the existing A12.
R22	The Firs	Receptors along The Drive, Rivenhall End.
R23	Essex County Fire & Rescue	No other representative receptors
R24	Hole Farm	No other representative receptors
R25	Davey House	Closest receptors to the A12 along Cranes Lane and those on London Road into Kelvedon.
R26	Ewell Hall	Receptors along Ewell Hall Chase and those closest to the A12 on Highfields Lane.
R27	14 Lapwing Drive	Receptors within Kelvedon.
R28	Inworth Hall Lodge	Receptors directly fronting Inworth Road from the proposed new junction 24 to Inworth village.
R29	Park Farm	Receptors in the vicinity of the proposed new roundabout on Inworth Road.
R30	Belmont	Receptors of Tugela, Emmanuelle and Columbyne Cottage.
R32	Prested Hall	Including nearby dwellings
R33	Prested Hall Cottages	Receptors to the south of the existing A12.
R34	Easthorpe Green	1 and 2 The Lodge.
R35	Little Birch Holt Farm	Receptors within Easthorpe.
R36	Wishingwell Farm	No other representative receptors
R37	283 A12 London Road	Receptors to the south on the existing A12 on the approach to Marks Tey.
R38	Doggetts	No other representative receptors
R39	Elders Garden	Receptors within the west of Marks Tey (e.g. Long Green, Jays Lane).
R40	York Lodge	Receptors along Old London Road.
R41	Marks Tey Hall	No other representative receptors
R42	121 London Road	Receptors along London road near to the existing junction 25.
R43	1 London Road	Receptors within the east of Marks Tey along London Road.

Receptor ID	Location	Representative of which other receptors
R44	Millfields	Receptors near the River Ter, just west of Hatfield Peverel.
R45	Boleyn Way	Receptors directly alongside the A12 at Boreham, and those on Main Road between Boreham and Hatfield Peverel.

5 Construction calculation results

5.1.1 The predicted construction noise levels for receptors in the vicinity of each construction activity are presented in this section in Table 5.1 to Table 5.27. Where the activity is too distant from the receptor to result in any change to baseline noise levels then this has not been included in the tables. Locations where the SOAEL is predicted to be exceeded are shown in **bold** text within shaded cells in Table 5.1 to Table 5.27.

Table 5.1 Predicted daytime construction noise level at receptors in the vicinity of A12 junction 19 (Boreham interchange)

Activity	Predicted daytime $L_{Aeq,T}$ dB at receptor IDs (LOAEL/SOAEL)		
	R1 (58/65)	R2 (57/65)	R3 (63/70)
Culverts	60	49	50
Archaeological/Ecology works	40	-	-
Service diversion	52	-	-
Fencing	62	29	40
Drainage	43	30	40
Kerb laying	53	-	-
De-vegetation	62	39	47
Bridge widening work - hydro demolition	57	28	28
Footbridge foundation	52	24	25
Footbridge piling	52	24	25
Footbridge erection	50	38	39
Structures piling (including temporary sheet piling)	66	32	35
Structures formwork reinforcing and concreting	64	33	36
Structures backfill	55	24	27
Structures waterproofing	56	29	30
Beam installation	34	-	-
Bridge joints	40	-	-
Lifting pre-fabricated structures	37	-	-
Parapet installation	62	31	34

Activity	Predicted daytime $L_{Aeq,T}$ dB at receptor IDs (LOAEL/SOAEL)		
	R1 (58/65)	R2 (57/65)	R3 (63/70)
Installation / removal of VRS	46	33	45
Earthworks	43	30	42

Table 5.2 Predicted night-time construction noise level at receptors in the vicinity of A12 junction 19 (Boreham interchange)

Activity	Predicted night-time $L_{Aeq,T}$ dB at receptor IDs (LOAEL/SOAEL)		
	R1 (53/55)	R2 (50/55)	R3 (57/57)
Surface planing	44	34	44
Road Surfacing	45	35	47
De-vegetation	62	39	47
Bridge widening work - hydro demolition	57	28	28
Footbridge erection	50	38	39
Structures piling (including temporary sheet piling)	66	32	35
Structures formwork reinforcing and concreting	64	33	36
Beam installation	34	-	-
Bridge joints	40	-	-
Lifting pre-fabricated structures	37	-	-
Parapet installation	62	31	34
Installation / removal of VRS	46	33	45

Table 5.3 Predicted daytime construction noise level at receptors at Boreham

Activity	Predicted daytime $L_{Aeq,T}$ dB at receptor IDs (LOAEL/SOAEL)		
	R2 (57/65)	R3 (63/70)	R45 (63/70)
Service diversions	36	64	31
Road surfacing	31	43	73

Table 5.4 Predicted night-time construction noise level at receptors at Boreham

Activity	Predicted night-time $L_{Aeq,T}$ dB at receptor IDs (LOAEL/SOAEL)		
	R2 (50/55)	R3 (57/57)	R45 (57/57)
Road surfacing	31	43	73

Table 5.5 Predicted daytime construction noise level at receptors at Hatfield Peverel

Activity	Predicted daytime $L_{Aeq,T}$ dB at receptor IDs (LOAEL/SOAEL)							
	R4 (63/70)	R5 (63/70)	R6 (63/70)	R7 (57/65)	R8 (63/70)	R9 (63/70)	R10 (57/65)	R44 (58/65)
Service diversion	45	64	38	37	36	57	32	-
Culverts	63	36	63	32	62	64	66	43
Archaeological / Ecological work	40	28	24	21	25	-	20	43
Fencing	59	40	65	30	60	62	64	62
Drainage	59	33	65	32	62	57	66	50
Structures demolition	70	41	72	39	60	68	49	69
Structures demolition (BE05)	39	29	31	24	25	24	22	60
Surface planing	65	36	65	34	64	66	69	63
Road surfacing (temp carriageway construction and road surfacing)	65	37	65	36	63	65	68	62
Kerb laying	53	24	52	21	51	50	56	51
Structures piling (including temporary sheet piling)	84	37	74	41	55	71	68	72
Structure formwork reinforcement and concreting	83	39	74	42	54	72	68	70
Structures backfill	65	44	73	38	51	65	60	50
Structure waterproofing	71	26	62	31	43	60	56	58
Retaining walls piling	58	31	64	26	44	59	56	57
Retaining walls installation	63	35	68	30	49	64	61	63

Activity	Predicted daytime L _{Aeq,T} dB at receptor IDs (LOAEL/SOAEL)							
	R4 (63/70)	R5 (63/70)	R6 (63/70)	R7 (57/65)	R8 (63/70)	R9 (63/70)	R10 (57/65)	R44 (58/65)
Bridge joints	68	32	71	31	52	64	58	50
Installation/removal of VRS	68	61	65	33	61	68	56	62
Removal of street furniture	62	55	59	26	51	64	50	56
Construction compound (west of River Ter)	40	33	34	32	32	29	29	54
Slipform of central reserve	63	53	59	31	52	66	50	57
Access Track	-	33	33	24	31	49	44	-

Table 5.6 Predicted night-time construction noise level at receptors at Hatfield Peverel

Activity	Predicted night-time L _{Aeq,T} dB at receptor IDs (LOAEL/SOAEL)							
	R4 (57/57)	R5 (57/57)	R6 (57/57)	R7 (50/55)	R8 (57/57)	R9 (57/57)	R10 (50/55)	R44 (53/55)
De-vegetation	67	59	70	38	70	71	68	62
Structures demolition	39	29	31	24	25	24	22	60
Road stud removal	59	31	56	34	57	58	47	54
Surface Planing	65	36	65	34	64	66	69	63
Road surfacing (temp carriageway construction and road surfacing)	65	37	65	36	63	65	68	62
Structures piling (including temporary sheet piling)	84	37	73	41	55	71	68	72
Structure formwork reinforcement and concreting	83	39	74	42	54	72	68	70
Lifting pre-fabricated structures	71	43	61	29	42	59	56	55
Central reserve hardening	43	33	64	34	56	45	50	57

Activity	Predicted night-time $L_{Aeq,T}$ dB at receptor IDs (LOAEL/SOAEL)							
	R4 (57/57)	R5 (57/57)	R6 (57/57)	R7 (50/55)	R8 (57/57)	R9 (57/57)	R10 (50/55)	R44 (53/55)
Retaining walls installation	62	34	67	29	48	64	60	62
Beam installation	65	32	68	31	49	61	56	58
Installation/removal of VRS	68	61	65	33	61	68	56	62
Removal of street furniture	62	55	59	26	51	64	50	56
Slipform of central reserve	63	53	59	31	52	66	50	57
Access Track	-	33	33	24	31	49	44	-

Table 5.7 Predicted daytime construction noise level at receptors at the new A12 junction 21

Activity	Predicted daytime L _{Aeq,T} dB at receptor IDs (LOAEL/SOAEL)					
	R4 (63/70)	R5 (63/70)	R6 (63/70)	R7 (57/65)	R8 (63/70)	R9 (63/70)
De-vegetation	32	37	45	35	31	64
Culverts	25	27	40	30	24	52
Archaeological / Ecological work	-	21	34	24	-	46
Gantry / light column foundations	-	29	37	27	21	40
Duct laying	25	26	44	29	29	54
Gantry construction	-	29	36	27	21	38
Lighting construction	-	-	-	-	-	25
Fencing	26	31	40	29	25	59
Earthworks	40	28	24	21	25	-
Drainage	25	28	40	30	24	52
Surface planing	26	34	50	32	32	55
Road surfacing	27	35	49	33	33	54
Kerb laying	-	20	38	22	22	48
Structures piling (including temporary sheet piling)	35	32	36	38	34	44
Structure formwork reinforcement and concreting	36	33	37	39	35	45
Structures backfill	27	24	28	30	26	36
Structure waterproofing	-	-	22	21	-	36
Landscaping	23	25	41	27	28	52
Bridge joints	-	22	24	24	-	37
Installation/removal of VRS	27	25	38	28	39	58
Removal of street furniture	21	-	32	22	33	53
Access road	-	-	-	-	-	21

Table 5.8 Predicted daytime construction noise level at receptors at the new A12 junction 21

Activity	Predicted daytime L _{Aeq,T} dB at receptor IDs (LOAEL/SOAEL)				
	R10 (57/65)	R11 (55/65)	R12 (55/65)	R13 (66/70)	R14 (55/65)
De-vegetation	61	54	51	35	38
Culverts	51	51	47	37	34
Archaeological / Ecological work	45	43	41	24	28
Gantry / light column foundations	41	47	43	25	24
Duct laying	53	49	46	30	33
Gantry construction	37	46	41	24	28
Lighting construction	27	40	37	20	21
Fencing	56	55	46	36	33
Earthworks	20	61	61	41	37
Drainage	52	47	46	30	34
Surface planing	58	51	51	35	38
Road surfacing	57	51	51	35	38
Kerb laying	44	40	40	23	26
Structures piling (including temporary sheet piling)	43	47	45	34	33
Structure formwork reinforcement and concreting	44	48	46	35	34
Structures backfill	35	39	37	26	25
Structure waterproofing	36	40	38	-	26
Landscaping	52	50	45	34	32
Bridge joints	30	35	31	21	20
Installation/removal of VRS	49	27	25	-	-
Removal of street furniture	43	21	-	-	-
Service diversion	-	36	45	22	-
Access road	21	37	41	21	-

Table 5.9 Predicted night-time construction noise level at receptors at the new A12 junction 21

Activity	Predicted night-time L _{Aeq,T} dB at receptor IDs (LOAEL/SOAEL)					
	R4 (57/57)	R5 (57/57)	R6 (57/57)	R7 (50/55)	R8 (57/57)	R9 (57/57)
Road stud removal	31	35	42	35	39	47
Surface planing	26	34	50	32	32	55
Road surfacing	27	35	49	33	33	54
Structures piling (including temporary sheet piling)	-	-	20	22	-	27
Structure formwork reinforcement and concreting	-	-	21	23	-	29
Lifting pre-fabricated structures	-	-	21	21	-	39
Beam installation	20	22	24	25	-	36
Installation/removal of VRS	27	25	38	28	39	58
Removal of street furniture	21	20	32	22	33	53
Gantry decommissioning	-	35	33	33	31	42
Slipform of central reserve	-	-	-	-	-	23

Table 5.10 Predicted night-time construction noise level at receptors at the new A12 junction 21

Activity	Predicted night-time L _{Aeq,T} dB at receptor IDs (LOAEL/SOAEL)				
	R10 (50/55)	R11 (50/55)	R12 (50/55)	R13 (61/61)	R14 (50/55)
Road stud removal	49	53	50	42	41
Surface planing	58	51	51	35	38
Road surfacing	57	51	51	35	38
Structures piling (including temporary sheet piling)	27	31	29	-	-
Structure formwork reinforcement and concreting	28	32	30	-	-
Lifting pre-fabricated structures	42	41	38	-	27
Beam installation	30	34	31	21	20

Activity	Predicted night-time $L_{Aeq,T}$ dB at receptor IDs (LOAEL/SOAEL)				
	R10 (50/55)	R11 (50/55)	R12 (50/55)	R13 (61/61)	R14 (50/55)
Installation/removal of VRS	49	27	25	-	-
Removal of street furniture	43	21	-	-	-
Gantry decommissioning	40	40	37	28	27
Slipform of central reserve	22	30	35	22	-
Service diversion	-	36	45	22	-

Table 5.11 Predicted daytime construction noise level at receptors at the Witham bypass widening, including the new A12 junction 22

Activity	Predicted daytime $L_{Aeq,T}$ dB at receptor IDs (LOAEL/SOAEL)				
	R12 (55/65)	R13 (66/70)	R14 (55/65)	R15 (57/65)	R16 (67/70)
De-vegetation	42	72	65	32	82
Culverts	37	65	60	28	73
Archaeological / Ecological work	20	58	41	22	61
Duct laying	25	62	44	27	70
Fencing	37	70	61	27	79
Earthworks	42	74	54	33	70
Drainage	37	63	44	28	76
Hydro demolition of Olivers Bridge (BE10)	33	40	43	46	74
Hydro demolition of Benton Bridge (BE11)	34	39	42	45	61
Structure demolition (Brain Bridge, BE12)	-	36	32	39	47
Surface planing	43	66	45	32	78
Road surfacing	42	64	46	33	77
Installing noise barrier	29	27	28	28	62
Kerb laying	30	55	34	22	67
Retaining wall piling	42	82	55	32	51

Activity	Predicted daytime L _{Aeq,T} dB at receptor IDs (LOAEL/SOAEL)				
	R12 (55/65)	R13 (66/70)	R14 (55/65)	R15 (57/65)	R16 (67/70)
Retaining wall installation	32	79	50	25	50
Barrier removal	31	33	27	33	58
Footbridge foundations (Gershwin Boulevard, FB03)	34	43	45	35	35
Footbridge piling (Gershwin Boulevard, FB03)	36	46	41	38	38
New footbridge erection (Gershwin Boulevard, FB03)	29	39	33	31	30
Installation / removal of VRS	30	63	45	33	72
Removal of street furniture	25	58	40	28	67
Micro piling (Oliver's Bridge)	-	-	-	21	56
Bridge bearing replacement	-	20	-	24	62
Slipform of central reserve	-	23	20	27	64

Table 5.12 Predicted daytime construction noise level at receptors at the Witham bypass widening, including the new A12 junction 22

Activity	Predicted daytime L _{Aeq,T} dB at receptor IDs (LOAEL/SOAEL)				
	R17 (67/70)	R18 (59/65)	R19 (61/65)	R20 (56/65)	R21 (57/65)
De-vegetation	77	52	66	39	33
Culverts	66	47	62	34	28
Archaeological / Ecological work	56	26	49	21	-
Duct laying	61	36	52	25	21
Gantry construction	-	32	54	35	37
Lighting construction	-	28	28	-	-
Service diversion	-	27	34	22	-
Fencing	71	28	64	35	26
Earthworks	58	31	61	36	33
Drainage	69	48	58	35	27

Activity	Predicted daytime L _{Aeq,T} dB at receptor IDs (LOAEL/SOAEL)				
	R17 (67/70)	R18 (59/65)	R19 (61/65)	R20 (56/65)	R21 (57/65)
Hydro demolition of Olivers Bridge (BE10)	47	34	-	-	-
Hydro demolition of Benton Bridge (BE11)	52	34	-	-	-
Structure demolition (Brain Bridge, BE12)	53	38	-	-	-
Structure demolition (Colemans Bridge, BE14)	-	39	50	37	38
Surface planing	71	34	62	38	29
Road surfacing	70	32	61	38	30
Installing noise barriers	38	27	-	-	-
Kerb laying	58	20	50	27	-
Structures piling (including temporary sheet piling)	-	38	56	41	44
Structure formwork reinforcement and concreting	-	39	57	42	44
Structures backfill	-	30	48	33	35
Retaining walls piling	69	36	-	-	-
Retaining walls installation	47	33	54	30	30
Bridge joints	-	28	49	24	28
Barrier removal	72	37	36	32	25
New footbridge (Little Braxted, FB04) (foundations)	20	34	30	23	22
New footbridge (Little Braxted, FB04) (piling)	24	37	33	26	25
New footbridge (Little Braxted, FB04) (erection)	-	30	26	-	-
Installation / removal of VRS	56	49	52	28	28
Removal of street furniture	51	44	47	23	23

Table 5.13 Predicted night-time construction noise level at receptors at the Witham bypass widening, including the new A12 junction 22

Activity	Predicted night-time $L_{Aeq,T}$ dB at receptor IDs (LOAEL/SOAEL)				
	R12 (50/55)	R13 (61/61)	R14 (50/55)	R15 (50/55)	R16 (62/62)
De-vegetation	42	72	65	32	82
Road stud removal	52	61	53	38	65
Hydro demolition of Olivers Bridge (BE10)	33	40	43	46	74
Hydro demolition of Benton Bridge (BE11)	34	39	42	45	61
Structure demolition (Brain Bridge, BE12)	-	36	32	39	47
Road surfacing	42	64	46	33	77
Central reserve hardening	28	64	43	31	70
Retaining walls piling	42	82	55	32	51
Footbridge erection (Gershwin Boulevard, FB03)	29	39	33	31	30
Installation/removal of VRS	30	63	45	33	72
Removal of street furniture	25	58	40	28	67
Bridge bearing replacement	-	20	-	24	62
Slipform of central reserve	-	23	20	27	64

Table 5.14 Predicted night-time construction noise level at receptors at the Witham bypass widening, including the new A12 junction 22

Activity	Predicted night-time $L_{Aeq,T}$ dB at receptor IDs (LOAEL/SOAEL)				
	R17 (62/62)	R18 (55/55)	R19 (56/56)	R20 (51/55)	R21 (50/55)
De-vegetation	77	52	66	39	33
Road stud removal	63	45	27	22	-
Gantry construction	-	32	54	35	37
Hydro demolition of Olivers Bridge (BE10)	47	34	-	-	-

Activity	Predicted night-time L _{Aeq,T} dB at receptor IDs (LOAEL/SOAEL)				
	R17 (62/62)	R18 (55/55)	R19 (56/56)	R20 (51/55)	R21 (50/55)
Hydro demolition of Benton Bridge (BE11)	52	34	-	-	-
Structure demolition (Brain Bridge, BE12)	53	38	-	-	-
Structure demolition (Colemans Bridge, BE14)	-	39	50	37	38
Road surfacing	70	32	61	38	30
Structures piling (including temporary sheet piling)	-	38	56	41	43
Central reserve hardening	55	47	50	26	27
Retaining walls piling	69	28	48	26	26
Beam installation	-	27	46	24	27
Installation/removal of VRS	56	49	52	28	-
Removal of street furniture	51	44	47	23	23

Table 5.15 Predicted daytime construction noise level at receptors at Rivenhall End

Activity	Predicted daytime L _{Aeq,T} dB at receptor IDs (LOAEL/SOAEL)					
	R19 (61/65)	R20 (56/65)	R21 (57/65)	R22 (54/65)	R23 (57/65)	R24 (66/70)
De-vegetation	39	74	42	60	63	65
Culverts	35	67	37	54	59	63
Archaeological / Ecological work	32	42	25	-	23	-
Gantry / light column foundations	43	42	33	25	31	27
Duct laying	33	64	36	44	58	59
Gantry construction	41	41	39	25	29	26
Lighting construction	29	39	33	28	21	-
Service diversion	35	42	37	25	-	-
Fencing	34	66	33	41	32	34
Building demolition	28	36	40	39	58	44

Activity	Predicted daytime L _{Aeq,T} dB at receptor IDs (LOAEL/SOAEL)					
	R19 (61/65)	R20 (56/65)	R21 (57/65)	R22 (54/65)	R23 (57/65)	R24 (66/70)
Earthworks	39	75	42	62	63	67
Drainage	35	70	34	48	57	57
Road surfacing	38	68	41	52	53	55
Installation of noise barriers	40	75	34	45	36	27
Kerb laying	26	59	26	43	40	53
Structures piling (including temporary sheet piling)	46	52	48	44	37	34
Structure formwork reinforcement and concreting	47	53	49	45	38	35
Structures backfill	38	44	40	36	29	25
Landscaping	-	-	-	21	-	20
New footbridge (Foundations)	29	31	32	30	53	57
New footbridge (Piling)	29	31	32	30	53	56
New footbridge (Erection)	25	27	27	25	48	54
Installation/removal of VRS	58	65	35	51	52	46
Removal of street furniture	54	60	30	46	48	41
Temporary bridge construction	20	35	30	42	41	35
Slipform central reserve	55	61	31	47	49	42

Table 5.16 Predicted night-time construction noise level at receptors at Rivenhall End

Activity	Predicted night-time L _{Aeq,T} dB at receptor IDs (LOAEL/SOAEL)					
	R19 (56/56)	R20 (51/55)	R21 (50/55)	R22 (50/55)	R23 (50/55)	R24 (61/61)
Road stud removal	34	64	42	50	53	55
Installation/removal of VRS	58	65	35	51	52	46
Structures piling (including temporary sheet piling)	46	52	48	44	37	34
Removal of street furniture	54	60	30	46	48	41
Temporary bridge construction	20	35	30	42	41	35

Activity	Predicted night-time L _{Aeq,T} dB at receptor IDs (LOAEL/SOAEL)					
	R19 (56/56)	R20 (51/55)	R21 (50/55)	R22 (50/55)	R23 (50/55)	R24 (61/61)
Slipform central reserve	55	61	31	47	49	42

Table 5.17 Predicted daytime construction noise level at receptors at Kelvedon bypass widening, including the new junction 24 works

Activity	Predicted daytime L _{Aeq,T} dB at receptor IDs (LOAEL/SOAEL)							
	R25 (55/65)	R26 (58/65)	R27 (53/65)	R28 (53/65)	R29 (52/65)	R30 (67/70)	R32 (60/65)	R33 (53/65)
Culverts	53	59	36	34	46	67	31	28
Archaeological / Ecological work	30	31	34	33	49	30	21	-
Gantry / light column foundations	20	40	41	26	37	35	30	29
Duct laying	29	56	37	35	46	69	29	27
Gantry construction	29	38	39	32	44	34	29	27
Lighting construction	28	28	28	35	44	22	-	-
Service diversion	-	55	25	24	33	20	-	-
Fencing	29	58	35	-	23	68	30	27
Earthworks	-	61	33	-	-	64	37	33
Drainage	29	58	31	32	44	68	32	29
Surface planning	31	52	33	34	47	68	32	29
Structures demolition	48	54	40	23	30	31	-	-
Hydro demolition of Cranes Bridge	50	32	26	-	-	-	-	-
Hydro demolition of Ashmans Bridge	29	29	27	35	47	-	-	-
Road surfacing	32	52	38	39	52	70	35	32
Kerb laying	31	40	30	38	52	60	24	20
Structures piling (including temporary sheet piling)	-	30	30	27	32	33	-	-

Activity	Predicted daytime $L_{Aeq,T}$ dB at receptor IDs (LOAEL/SOAEL)							
	R25 (55/65)	R26 (58/65)	R27 (53/65)	R28 (53/65)	R29 (52/65)	R30 (67/70)	R32 (60/65)	R33 (53/65)
Structure formwork reinforcement and concreting	32	47	47	44	49	47	35	32
Structures backfill	23	38	38	35	40	41	26	23
Central reserve	42	50	28	40	52	55	32	28
Retaining walls piling	32	31	32	23	29	34	40	34
Retaining walls installation	-	34	36	32	39	39	46	39
Bridge joints	22	38	39	34	38	34	46	33
Installation/removal of VRS	43	49	29	35	53	53	34	30
Removal of street furniture	38	44	34	31	48	48	29	26
Slipform central reserve	39	45	25	32	49	49	30	27

Table 5.18 Predicted night-time construction noise level at receptors at Kelvedon bypass widening, including the new junction 24 works

Activity	Predicted night-time $L_{Aeq,T}$ dB at receptor IDs							
	R25 (50/55)	R26 (54/55)	R27 (50/55)	R28 (48/55)	R29 (48/55)	R30 (62/62)	R32 (55/55)	R33 (50/55)
De-vegetation	67	61	31	72	69	72	35	32
Road stud removal	43	50	35	34	47	54	29	25
Gantry construction	29	38	39	32	44	34	29	27
Structures piling (including temporary sheet piling)	-	30	30	27	32	33	-	-
Structures demolition	48	54	40	23	30	31	-	-
Hydro demolition of Cranes Bridge	50	32	26	-	-	-	-	-
Hydro demolition of Ashmans Bridge	29	29	27	35	47	-	-	-
Road surfacing	32	52	38	39	52	70	35	32

Activity	Predicted night-time L _{Aeq,T} dB at receptor IDs							
	R25 (50/55)	R26 (54/55)	R27 (50/55)	R28 (48/55)	R29 (48/55)	R30 (62/62)	R32 (55/55)	R33 (50/55)
Central reserve	42	50	28	40	52	55	32	28
Beam installation	-	37	38	34	42	33	43	32
Installation/removal of VRS	43	49	29	35	53	53	34	40
Removal of street furniture	38	44	24	31	48	48	29	26
Slipform of central reserve	39	45	25	32	49	49	30	27

Table 5.19 Predicted daytime construction noise level at receptors at offline section between junction 24 and junction 25

Activity	Predicted daytime L _{Aeq,T} dB at receptor IDs (LOAEL/SOAEL)			
	R29 (52/65)	R30 (67/70)	R32 (60/65)	R33 (53/65)
De-vegetation	51	65	52	53
Culverts	47	56	48	50
Gantry / light column foundations	-	-	33	34
Duct laying	46	55	46	47
Gantry construction	-	-	28	29
Service diversion	-	-	20	28
Fencing	48	65	47	37
Earthworks	36	35	53	60
Drainage	51	63	48	39
Surface planning	51	63	51	55
Road surfacing	50	63	50	54
Kerb laying	39	50	39	43
Structures piling (including temporary sheet piling)	37	36	54	45
Structure formwork reinforcement and concreting	40	38	56	47
Structures backfill	-	-	22	24

Activity	Predicted daytime L _{Aeq,T} dB at receptor IDs (LOAEL/SOAEL)			
	R29 (52/65)	R30 (67/70)	R32 (60/65)	R33 (53/65)
Structure waterproofing	27	25	-	-
Installation/removal of VRS	28	27	29	46
Removal of street furniture	23	22	24	41

Table 5.20 Predicted daytime construction noise level at receptors at offline section between junction 24 and junction 25

Activity	Predicted daytime L _{Aeq,T} dB at receptor IDs (LOAEL/SOAEL)				
	R34 (53/65)	R35 (46/65)	R36 (47/65)	R37 (47/65)	R38 (58/65)
De-vegetation	63	43	61	51	57
Culverts	56	39	58	48	53
Duct laying	57	38	46	46	51
Earthworks	65	43	71	51	76
Surface planing	61	41	60	51	56
Road surfacing	60	42	60	50	57
Kerb laying	49	31	48	39	45
Structures piling (including temporary sheet piling)	56	39	48	45	44
Structure formwork reinforcement and concreting	57	41	50	48	46
Structures backfill	23	-	-	-	-
Structure waterproofing	45	-	39	-	-
Lifting pre-fabricated structures	44	-	38	35	34
Parapet installation	40	42	47	48	55
New footbridge (foundations)	39	42	35	47	50
New footbridge (piling)	39	42	35	47	49
New footbridge (erection)	35	37	31	43	45
Installation/removal of VRS	54	32	37	34	33
Removal of street furniture	49	27	32	29	28
Beam installation	23	37	33	42	46

Activity	Predicted daytime L _{Aeq,T} dB at receptor IDs (LOAEL/SOAEL)				
	R34 (53/65)	R35 (46/65)	R36 (47/65)	R37 (47/65)	R38 (58/65)
Bride joints	25	39	35	44	48
Roundabout works at existing A12	21	24	27	31	38

Table 5.21 Predicted night-time construction noise level at receptors at offline section between junction 24 and junction 25

Activity	Predicted night-time L _{Aeq,T} dB at receptor IDs (LOAEL/SOAEL)					
	R33 (50/55)	R34 (50/55)	R35 (41/45)	R36 (45/50)	R37 (45/50)	R38 (54/55)
Road stud removal	49	51	34	48	44	55
Installation/removal of VRS	46	54	32	37	34	33
Removal of street furniture	41	49	27	32	29	28
Lifting pre-fabricated structures	-	44	-	38	35	34
Structures piling (including temporary sheet piling)	45	56	39	48	45	44

Table 5.22 Predicted daytime construction noise level at receptors at Marks Tey

Activity	Predicted daytime $L_{Aeq,T}$ dB at receptor IDs						
	R37 (47/65)	R38 (58/65)	R39 (66/70)	R40 (47/65)	R41 (66/70)	R42 (57/65)	R43 (55/65)
De-vegetation	49	60	38	64	38	69	53
Culverts	31	42	31	61	42	71	48
Archaeological / Ecological work	27	36	28	56	38	64	43
Gantry / light column foundations	37	46	34	66	43	73	53
Duct laying	32	41	32	61	39	69	48
Gantry construction	35	45	36	64	42	73	51
Lighting construction	25	34	23	54	33	64	21
Fencing	31	41	32	60	43	69	47
Earthworks	37	47	39	66	47	76	35
Drainage	33	43	34	62	41	71	50
Surface planing	36	47	35	65	49	76	53
Road surfacing	35	46	36	65	48	75	52
Kerb laying	25	34	26	54	32	62	41
Retaining walls piling	24	31	29	38	31	58	23
Retaining walls installation	27	35	32	42	34	64	26
Structures piling (including temporary sheet piling)	36	42	39	49	41	65	34
Structures formwork reinforcement and concreting	39	36	40	48	47	66	42
Structures backfill	30	27	31	39	38	57	33
Installation/removal of VRS	35	47	31	63	30	74	28
Removal of street furniture	30	42	26	58	25	69	23
New footbridge (foundations)	27	26	28	36	33	59	30
New footbridge (piling)	28	26	29	36	33	63	30
New footbridge (erection)	25	23	26	33	30	58	27

Activity	Predicted daytime $L_{Aeq,T}$ dB at receptor IDs						
	R37 (47/65)	R38 (58/65)	R39 (66/70)	R40 (47/65)	R41 (66/70)	R42 (57/65)	R43 (55/65)
Slipform of central reserve	34	44	34	63	47	74	51

Table 5.23 Predicted night-time construction noise level at receptors at Marks Tey

Activity	Predicted night-time $L_{Aeq,T}$ dB at receptor IDs						
	R37 (45/50)	R38 (54/55)	R39 (61/61)	R40 (45/50)	R41 (61/61)	R42 (50/55)	R43 (50/55)
Road stud removal	45	57	37	57	42	68	31
Surface planing	36	47	35	65	49	76	53
De-vegetation	49	60	38	64	38	69	53
Structures piling (including temporary sheet piling)	36	42	39	49	41	65	34
Installation/removal of VRS	35	47	31	63	30	74	28
Removal of street furniture	30	42	26	58	25	69	23
Slipform of central reserve	34	44	34	63	47	74	51
New footbridge (erection)	25	23	26	33	30	58	27

Table 5.24 Predicted daytime construction noise level at receptors at the two main construction compounds

Activity	Predicted daytime L _{Aeq,T} dB at receptor IDs								
	R1 (58/65)	R9 (63/70)	R10 (57/65)	R19 (61/65)	R20 (56/65)	R38 (58/65)	R40 (47/65)	R41 (66/70)	R42 (57/65)
De-vegetation	49	56	63	55	42	41	49	60	45
Archaeology	39	44	59	48	29	34	42	44	44
Service diversion	42	49	56	48	35	34	42	53	37
Earthworks	50	56	64	56	42	42	50	60	45
Fencing	43	50	58	50	36	36	43	54	38
Compound construction (buildings)	49	55	63	55	41	40	49	54	44
Concrete batching plant	-	40	40	-	-	-	-	-	-
Asphalt plant (only at compound J20b)	-	51	59	-	-	-	-	-	-
Surfacing	48	55	62	54	41	40	48	59	44
Drainage	45	46	62	-	-	38	46	57	41

Table 5.25 Predicted night-time construction noise level at receptors at the two main construction compounds

Activity	Predicted night-time $L_{Aeq,T}$ dB at receptor IDs	
	R9 (57/57)	R10 (50/55)
Concrete batching plant	40	40
Asphalt plant (only at compound J20b)	51	59

Table 5.26 Predicted daytime construction noise level at receptors close to the traffic management compound

Activity	Predicted night-time $L_{Aeq,T}$ dB at receptor IDs (LOAEL/SOAEL)					
	R11 (55/65)	R12 (55/65)	R13 (66/70)	R14 (55/65)	R15 (57/65)	R16 (67/70)
Traffic management compound	26	31	51	53	34	28

Table 5.27 Predicted daytime construction noise level at receptors at borrow pits

Activity	Predicted daytime $L_{Aeq,T}$ dB at receptor IDs						
	R9 (63/70)	R10 (57/65)	R11 (55/65)	R12 (55/65)	R13 (66/70)	R14 (55/65)	R21 (57/65)
De-vegetation	44	46	53	66	62	52	43
Fencing	38	40	47	59	56	46	37
Earthworks	45	46	53	66	62	53	43
Borrow pit operation	47	48	50	50	46	42	51
Material processing	45	47	54	66	63	53	44
De-watering (assuming the use of a generator)	28	29	36	49	45	36	26

Table 5.28 Predicted daytime construction noise level at receptors at borrow pits

Activity	Predicted daytime $L_{Aeq,T}$ dB at receptor IDs						
	R22 (54/65)	R23 (57/65)	R24 (66/70)	R26 (58/65)	R27 (53/65)	R28 (53/65)	R29 (52/65)
De-vegetation	41	54	40	54	41	36	45
Fencing	35	48	34	48	35	30	39
Earthworks	42	54	40	54	41	36	45
Borrow pit operation	49	56	48	56	49	43	42
Material processing	42	55	41	55	42	36	46
De-watering (assuming the use of a generator)	25	37	23	37	24	-	28
Construction of access (surfacing and planing)	51	49	53	56	37	36	51
Construction of haul routes	51	49	53	56	37	36	51

5.1.2 The assessment of the construction of the Cadent gas main diversion considers three receptors along the route of the diversion corridor. Table 5.28 shows the most representative measured baseline noise level for each receptor, together with the associated LOAEL and SOAEL levels.

Table 5.29 Daytime baseline at construction assessment locations

Receptor ID	Location	Representative baseline survey location	Daytime measured $L_{Aeq,T}$	LOAEL	SOAEL
Cadent 1	Closest dwelling on Pantile Close	L3	62.7	63	70
Cadent 2	Blue Mills	L4	59.4	59	65
Cadent 3	Glen Acres, Ishams Chase	L4	59.4	59	65

5.1.3 The predicted construction noise levels from the construction of the Cadent gas main diversion are indicated in Table 5.29. Any locations where the SOAEL is predicted to be exceeded are shown in bold text within the table. It is assumed that all works will be undertaken during the daytime.

Table 5.30 Predicted daytime construction noise level at receptors in the vicinity of the Cadent gas main diversion construction

Predicted daytime $L_{Aeq,T}$ dB at receptor (LOAEL/SOAEL)		
Cadent 1 (63/70)	Cadent 2 (59/65)	Cadent 3 (59/65)
65	36	46

References

British Standards Institution (2014). BS 5228-1:2009+A1:2014: Code of practice for noise and vibration control on construction and open sites. Noise.

Highways England (2020). Design Manual for Roads and Bridges, LA 111 Revision 2, Noise and Vibration.