Gatwick Airport Northern Runway Project

Environmental Statement
Appendix 14.9.1: Construction Noise Modelling

Book 5

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1 Introduction

1.1 General

1.1.1 This document forms Appendix 14.9.1 of the Environmental Statement (ES) prepared on behalf of Gatwick Airport Limited (GAL). The ES presents the findings of the Environmental Impact Assessment (EIA) process for the proposal to make best use of Gatwick Airport's existing runways and infrastructure (referred to within this report as 'the Project'). The Project proposes alterations to the existing northern runway which, together with the lifting of the current restrictions on its use, would enable dual runway operations. The Project includes the development of a range of infrastructure and facilities which, with the alterations to the northern runway, would enable the airport passenger and aircraft operations to increase. Further details regarding the components of the Project can be found in **ES Chapter 5: Project Description** (Doc Ref 5.1).

1.1.2 This document describes the construction works which were included in the noise modelling for the Project, the reasonable worst case and mitigated modelling results.

2 Construction Works in Noise Model

2.1 Construction Works

2.1.1 Table 2.1.1 and Table 2.1.2 show the main construction works included in the construction noise model. This includes works on the airfield and on the highways, as well as the assumed hours over which they could be undertaken, based on construction design information as discussed in the E**S Chapter 5: Project Description** (Doc Ref. 5.1).

Table 2.1.1: Construction Works Airfield

Group	Name	Description	Working Times
1	Alterations to the Existing Northern Runway	The existing northern runway would be adjusted to reposition the centreline 12 metres further north to ensure a separation distance of 210 metres between it and the main runway.	Day, Evening, Night
2	Taxiway Juliet	The western part of Taxiway Juliet (Taxiway Juliet West) would be realigned approximately 27 metres to the north to allow for the movement of large (Code F) aircraft.	Day, Evening, Night
3		The eastern part of Taxiway Juliet (Taxiway Juliet East Code E) would be realigned approximately 19.5 metres to the north between Taxiways Uniform and Sierra.	Day, Evening, Night
4		The eastern part of Taxiway Juliet between Taxiways Sierra and Papa (Taxiway Juliet East Code C) would be realigned by approximately 5 metres northwards	Night
5		In addition, a new spur (known as the Taxiway Juliet West Spur) would be provided to the north of the taxiway	Day, Evening, Night
6	Aircraft Holding Area	Clearance for Charlie Taxiway	Day, Evening, Night
7		Reconfiguration of an existing apron area to the north of Taxiway Juliet is proposed.	Day, Evening, Night
8	Taxiways Lima and Tango	Taxiway Lima would require an extension westward, towards the existing Taxiway Uniform, providing a route suitable for larger Code E and Code F aircraft. The extension would be 23 metres in width and approximately 300 metres in length	Day, Evening, Night
9		An extension to Taxiway Tango would provide a cut-through northwards to meet the extended Taxiway Lima, creating a taxiway for Code E aircraft. The cut-through would be 23 metres in width and approximately 85 metres in length.	Day, Evening, Night
10	Taxiways Whiskey, Victor and Zulu	This would largely be located within the area occupied by the existing taxiways but would require an additional area to the north of Taxiway Zulu to accommodate wider body aircraft.	Night
11	Exit Taxiways	Four additional new runway exits would be provided between the northern runway and Taxiway Juliet.	Day, Evening, Night
12		A further eight new exit taxiways from the main runway would be required as part of the Project in order to allow arriving aircraft to hold before crossing the northern runway.	Day, Evening, Night
13	End Around Taxiways	End around taxiway west: a new end around taxiway linking into the existing Taxiway Juliet.	Day, Evening, Night
14		End around taxiway east (Yankee): a new exit taxiway would link into the existing Taxiway Yankee to form the end around taxiway east (Yankee).	Night

Group	Name	Description	Working Times
15	Pier and Stand Amendments	As part of the Project, a new Pier 7 is proposed to the north west of Pier 6, adjacent to the existing cargo facility.	Day
16		Provision of a new area of remote stands to the south of Hangar 7 (easyJet hangar) and south of Pier 7, in the existing Cuckoo area to the north of Taxiway Juliet.	Day
17		Reconfiguration of existing areas of remote stands (stands 150-152, removing stand 152 and shortening stands 150 and 151) to allow for the reconfigured Taxiway Lima while retaining stands suitable for Code C aircraft	Day
18	Central Airfield Maintenance and Recycling (CARE) Facilities	The CARE facility is proposed to be relocated in the north western part of the airport.	Day
19	Motor Transport Facilities	The existing Motor Transport (MT) maintenance facilities are also located to the north of Taxiway Juliet and are proposed to be relocated to the north western part of the airport.	Day
20	Grounds Maintenance Facilities	The existing grounds maintenance facilities would also be relocated out of the Cuckoo area to an area of hardstanding in the south eastern part of the airport.	Day
21	Airfield Surface Transport Facilities	The existing Surface Transport (ST) facility would be relocated out of the existing Cuckoo area to an area of hardstanding in the south eastern part of the airport.	Day
22		Due to the reconfiguration of the Cuckoo area, the existing Rendezvous Point North would require relocation in order that it remains accessible to external emergency services.	Day
23	Fire Training Ground	It is proposed that the fire training ground be re-provided to the north of its existing location, occupying a consolidated area of approximately 12,000 m^2.	Day
24	Satellite Airport Fire Service Provision	Dependent on safety case requirements, the Project may require a satellite Airport Fire Service (AFS) facility to the south of the main runway.	Day
25	Hangars	One additional hangar would be required for Code E aircraft as part of the Project. This is also proposed to be located in the north western part of the airport, to the north of Larkins Road.	Day
26		Existing pavement on the northern side of the Virgin hangar would need to be re-provided on the southern side.	Day
27	Perimeter Boundary Treatments to Mitigate Noise	The Project would remove an existing noise bund in the western end of the airfield.	Day
28		The functionality of the bund would be re-provided in the proposed design, potentially in the form of a new bund and barrier in this area.	Day
29	Internal Access Routes	The existing Larkins Road within the airport boundary would require realignment to accommodate the extension to Taxiway Lima.	Day
30		A new east-west access track is proposed between the main runway and the altered northern runways.	Night
31	North Terminal	Extensions to the existing North Terminal.	Day
32	South Terminal	Extensions to the existing South Terminal.	Day
33	Forecourts	The forecourts and approaches to both existing terminals would be enhanced, with routes providing access to the terminal frontage, multi-storey and long stay car parks, hotels and pick-up and drop-off areas for different transport modes.	Day
34	Hotel and Commercial Facilities	One new South Terminal hotel (up to 400 bedrooms) in the location of existing car park H.	Day
35		One new North Terminal hotel (up to 400 bedrooms) in the location of existing car park Y.	Day
36		One new hotel at the current car rental location (200 bedrooms).	Day
37		Up to three new office blocks to serve internal airport uses. These would be up to approximately 27 metres high. This is likely to be provided within the existing car park H.	Day
38	Car Parking	Pentagon Field (surface parking).	Day
39		Car park J multi-storey.	Day
40		Car park H.	Day
41		Car park Y.	Day
42		North Terminal long stay car park.	Day
43		In addition to the above, an area in the western part of Crawter's Field may be required to replace the existing 'Purple Parking' (operated by a third party).	Day

Group	Name	Description	Working Times
44	Museum Field	The Museum Field would be lowered to a depth of up to approximately 3.5 metres below ground level.	Day
45	River Mole Corridor and Flood Compensation Area	The works to Taxiway Juliet require the relocation of Pond A to a location north of its existing position, through which the River Mole currently flows. It is proposed to provide a diversion of the River Mole to the north of its current course.	Day
46		In addition, a new flood compensation area is proposed between the River Mole diversion and Museum Field. This would require lowering of ground levels by up to approximately 1.8 metres.	Day, Evening, Night
47	Car Park X	The existing Car Park X would be lowered by a depth of up to 2.5 metres.	Day
48	Foul Water	A new pumping station (Pumping Station 7a) would be provided near the existing Pumping Station 7, to accommodate flows from the extended North Terminal.	Day
49		A second new pumping station would be provided to decouple the existing sewerage network east of the railway.	Day
50		A third new pumping station (Pumping Station 2a) is proposed to allow for flows from the existing Pumping Station 3 (affected by Taxiway Juliet) and flows from Pier 6.	Day
51	Power Strategy	Substation J, a priority substation, forming part of the airfield ring.	Day
52		Substation BK.	Day
53		Substations BP and BR.	Day, Evening, Night
54		Substation A.	Day
55		A new substation to be located to the east of the railway in an area known as the Pentagon Field.	Day
56		Flood mitigation for substation L.	Day
57	MA1 Compound	Compound operation.	Day
58	Satellite Compound	Compound operation.	Day
59	Reigate Compound + South Terminal Roundabout Contractor Compound	Compound operation. 1/3 slope for the noise bund at north/east side of the compound. Around 1.5 m height.	Day
60	North Terminal Compound (Car Park Y) Main airfield	Compound operation for mainfield support.	Day
61	North Terminal Compound (Car Park Y) Surface Access	Compound operation for surface access support.	Day
62	Water Management, Foul Water and Substations	Dog Kennel Pond.	Day
63	Internal Access	North Terminal autonomous vehicle station.	Day
64	Internal Access	South Terminal autonomous vehicle station.	Day
65	Internal Access	Autonomous vehicle connection to Pier 7.	Day
66	Terminal Extensions	North Terminal baggage hall extension.	Day
67	Main runway works	Main Runway bellmouths existing utility diversions.	Night
68	Oscar Stand	Construction of Oscar stands.	Day
69	Lima Stand	Construction of Lima stands.	Day
70	40s Stands	Reconfiguring 40s stands.	Day
71	Stand - Northeast Area of VAA	Construction of Code C stand in Towergate area.	Day
72	Segro Contiguous Land Swap	Reprovision of land in order to construct Pier 7.	Day
73	Cargo Triangle	Reprovision of land in order to extend Taxiway Lima.	Day
74	RVP North	Relocation of RVP North.	Day
75	TCR Building	Demolition of old TCR building.	Day

Group	Name	Description	Working Times
76	Perimeter security access North	Expansion of security access gates.	Night
77	Autonomous Vehicle Maintenance Building	New autonomous vehicle facility building.	Day
78	North Terminal Baggage Reclaim	The required increase in capacity requires North Terminal reclaim building to be reconfigured.	Day
79	Additional South Terminal Coaching Gates	Additional coaching gates will be constructed to facilitated additional fully serviced stands in lieu of Pier 7 building.	Day
80	South terminal foul water	A connection is required of a new underground pumping station and pipeline to pump effluent to Crawley Sewage Treatment Works.	Day
81	Rising Main Upgrade	The revised sewage network design requires a new 100 mm diameter rising main to be installed on the outlet side of PS40.	Day
82	Open Space replacement for the Constrained North Terminal Roundabout	The current Constrained North Terminal Roundabout scheme will require constructing an area of open space in the Riverside Garden Park.	Day
83	Pedestrian link Car Park B	A pedestrian route linking Car Park B (north side) to Riverside Garden Park will be constructed.	Day
84	Larkins Road Utilities Relocation	As part of Phase 1 of the Larkins Road Relocation works Larkins Road will be relocated to allow for the extension of Taxiway Lima.	Day
85	Pond M	Pond M and River Mole reconfiguration.	Day

Table 2.1.2: Construction Works Highways

Group	Name	Description	Working Times
1	Longbridge Roundabout Utility Works During Works - Diversion off Existing River Mole	Utility Diversions	Day
2	Longbridge Roundabout General	Attenuation Pond 2	Day
3	A23 Brighton Road Bridge	Utility Diversions	Day, Night
4		New Bridge South Half East Abutment	Day, Night
5		New Bridge South Half West Abutment	Day, Night
6		New Bridge South Half Deck	Day
7		New Bridge North Half East Abutment	Day
8		New Bridge North Half West Abutment	Day
9		New Bridge North Half Deck	Day
10	A23 London Road Bridge	Utility Diversions South Side	Day
11		Utility Diversions North Side	Day
12		South Half Reconstruction	Day, Night
13		North Half Reconstruction	Day
14	Stilt Structure and Associated Works	Stilt Structure	Day
15	Longbridge Roundabout and Approaches	North Quadrant	Day
16		South Quadrant	Day
17		West Quadrant	Day
18		Brighton Road Southbound Verge	Day
19		East Quadrant	Day
20		Central Island	Day
21		New Traffic Islands	Day
22	North Terminal Junction General	Attenuation Pond 1 – 1700 m^3	Day

Group	Name	Description	Working Times
23		Attenuation Pond 2 - 500 m^3	Day
24		Geocell Tank	Day
25	North Terminal Flyover Bridge	North Abutment	Day
26		South Abutment	Day
27		Deck	Day
28	Network Rail Bridge	East Abutment	Day, Night
29		West Abutment	Day, Night
30		Deck	Day, Night
31	A23 London Road Northbound	Verge Works - Centre and South	Day, Night
32		Verge Works - North	Day
33	Roundabout to A23 Northbound Link	Highway Works	Day
34	A23 Northbound to Roundabout Link	Highway Works	Day
35	A23 London Road Eastbound Link / Airport Way Eastbound	Offside Verge New and road surfacing including A23 Southbound Verge	Day
36		Nearside Verge surfacing including A23 Southbound Verge	Day
37	Airport Way Westbound and over Flyover	Extend Gatwick Stream Culvert	Day
38		Extend Underpass	Day
39		Embankment Widening Between London Road Bridge and NR Bridge	Day
40		Highway Widening Between London Road Bridge and NR Bridge	Day
41		Flyover North Embankment	Day
42		Flyover South Embankment	Day
43		Highway Works over Flyover	Day
44		Highway Works Old Airport Way Eastbound / Tie in to Flyover	Day, Night
45	Airport Way Westbound Roundabout Approach	Embankment Widening	Day
46		New Highway	Day
47	North Terminal Roundabout and Approaches	Roundabout and Approaches Widening	Day, Night
48		Central Island Widening	Day
49	Gatwick Way / Perimeter Road N / Northgate Rd Junction	Gatwick Way Southbound Verge / Gatwick Way North Verge	Day
50		Gatwick Way Island and Gatwick Way / Northgate Road South Verge	Day
51	South Terminal Junction General	Utilities diversion	Day
52		Attenuation Pond 1	Day
53	Balcombe Road M23 Westbound off Slip Bridge	East Abutment	Day
54		West Abutment	Day
55		Centre	Day, Night
56	Balcombe Road M23 Eastbound on Slip Bridge	East Abutment	Day
57		West Abutment	Day
58		Deck	Day, Night
59	South Terminal Airport Way Eastbound off Slip	Embankment Widening	Day
60		Highway Works	Day
61	South Terminal Airport Way Westbound on Slip	Embankment Widening (up to NR Bridge 111)	Day
62		Highway Works	Day

Group	Name	Description	Working Times
63	South Terminal M23 Eastbound on Slip	Embankment Widening Between railway and Balcombe Road	Day
64		Embankment Widening East of Balcombe Road	Day
65		Highway Works	Day
66	South Terminal M23 Westbound off Slip	Embankment Widening Between R/A and Balcombe Road	Day
67		Embankment Widening East of Balcombe Road	Day
68		Highway Works	Day
69	M23 Eastbound Spur	Embankment Widening	Day, Night
70		Highway Works	Day
71	Balcombe Road M23 Mainline Bridge	East Abutment	Day
72		West Abutment	Day
73		Deck	Day, Night
74	South Terminal Flyover Bridge	West Abutment	Day
75		Pier 1	Day
76		Pier 2	Day
77		East Abutment	Day
78		Deck	Day
79	Mainline Over Flyover Bridge - CWA-49	West Side Embankment	Day
80		East Side Embankment West of Balcombe Road	Day
81		East Side Embankment East of Balcombe Road	Day
82		Highway Works	Day
83	South Terminal Roundabout and Approaches	Modify Nearside Verges	Day
84		Modify Offside Areas including Central Island	Day

2.2 Construction Plant Teams

2.2.1 Table 2.2.1 provides the construction plant teams used to model the various works activities.

Table 2.2.1: Construction Plant Teams

Plant ID	Plant Name	Quantity	% on time	BS5228 Reference	Plant Item Sound Power Level, SWL, dB(A)
T1	**Earthworks**				**116**
T1-1	Tracked excavators ranging from 3T to 30T	2	50	C.2.3	106
T1-2	25, 35 and 40 tonnes articulated dump trucks	1	50	C.6.26	104
T1-3	Bulldozers	2	50	C.2.11	107
T1-4	Tractors and trailers	2	75	C.4.75	109
T1-5	Compaction plant	2	50	C.2.42	106
T1-6	6 or 8 wheeled tipper lorries	1	50	C.4.2	103
T1-7	Water bowsers	4	10	C.6.37	105
T1-8	Tractor crane	1	50	C.4.41	96

Plant ID	Plant Name	Quantity	% on time	BS5228 Reference	Plant Item Sound Power Level, SWL, dB(A)
T1-9	Grader	1	50	C.6.31	111
T2	**Utilities Diversion**				**110**
T2-1	Tracked excavator (small)	1	50	C.2.7	95
T2-2	Concrete mixer truck	1	30	C.4.20	103
T2-3	Trench compactor	1	50	C.5.28	101
T2-4	Dewatering pump	1	100	C.4.89	107
T3	**Major Foundation Piling Works (driving sheet piling)**				**115**
T3-1	Steel sheet driven piling (spectrum reference from vibratory piling C.3.8)	1	50	C.3.8	113
T3-2	Flatbed truck	1	50	C.6.21	106
T3-3	Front end loader	1	25	C.2.8	90
T3-4	Back-end loader	1	25	C.2.5	98
T3-5	Mobile crane	2	50	C.4.38	105
T3-6	Tipper dump trucks (non all terrain)	2	50	C.4.2	106
T4	**Bored CFA piling**				**115**
T4-1	Piling rig (bored piling)	2	50	C.3.15	111
T4-2	Concrete mixer trucks	2	25	C.4.20	105
T4-3	Mobile crane	2	50	C.4.38	105
T4-4	Concrete pump	2	50	C.3.25	106
T4-5	Tracked excavators ranging from 3T to 30T	2	50	C.2.3	106
T4-6	All terrain tipper trucks	1	25	C.6.25	108
T5	**Bridge Install - Lifting**				**110**
T5-1	Tracked excavator 16T	1	30	C.2.5	99
T5-2	Dumper 8T	1	30	D.9.38 - C.4.4 Spectrum	98
T5-3	Road lorry (full) 39T	2	10	C.6.21	102
T5-4	Crawler crane	2	40	Used C.4.38 spectrum	104
T5-5	Large lorry concrete mixer	1	20	C.4.21	98
T5-6	Truck mounter concrete pump	1	30	Used C.4.28 spectrum	93
T5-7	Large mobile crane	2	50	Used C.4.38 spectrum	105
T6	**Paving (Highways)**				**109**
T6-1	Planer 17T	1	20	C.5.7	103
T6-2	Paver	1	30	C.5.31	99
T6-3	Vibratory compactor (asphalt)	2	30	C.2.42	103
T6-4	Roller large	1	15	C.5.19	99
T6-5	Road lorry 39T	2	20	C.6.21	105
T6-6	Road marking vehicle	1	20	C.5.9	88
T6-7	Lance	1	20	C.5.5	87
T6-8	Task lighting - generators (if at night)	2	10	C.4.79	85

Plant ID	Plant Name	Quantity	% on time	BS5228 Reference	Plant Item Sound Power Level, SWL, dB(A)
T7	**Demolition Works**				**117**
T7-1	15T 360 deg excavator	2	50	C.2.25	97
T7-2	Lorry delivery	2	25	Average C.6.21 & 23	106
T7-3	30T tracked excavator with pneumatic breaker	2	20	C.1.1	116
T7-4	40T dumper	2	25	C.6.26	104
T7-5	170t tractor crane	1	50	C.4.41	96
T8	**Road Breaking**				**115**
T8-1	15T 360 deg excavator	2	50	C.2.25	97
T8-2	Lorry delivery	2	25	Average C.6.21 & 23	106
T8-3	30T tracked excavator with pneumatic breaker	1	20	C.1.1	113
T8-4	40T dumper	1	25	C.6.26	101
T9	**Bridge Install FRC**				**116**
T9-1	Tracked excavator 16T	1	30	C.2.5	99
T9-2	Dumper 8T	1	30	D.9.38 - C.4.4 Spectrum	98
T9-3	Road lorry (full) 39T	2	10	C.6.21	102
T9-4	Floor saw	1	30	C.4.73	106
T9-5	Crawler crane	1	40	Used C.4.38 spectrum	101
T9-6	Backhoe mounted hydraulic breaker	1	20	C.1.1	113
T9-7	Twin drum roller	1	20	C.5.19	101
T9-8	Rotary piling rig	1	20	C.3.14	105
T9-9	Large lorry concrete mixer	1	20	C.4.21	98
T9-10	Truck mounter concrete pump	1	20	Used C.4.28 spectrum	91
T9-11	Large mobile crane	1	40	Used C.4.38 spectrum	101
T10	**Small Earthworks**				**112**
T10-1	Tracked excavators ranging from 3T to 30T	1	75	C.2.3	105
T10-2	25, 35 and 40 tonnes articulated dump trucks	1	50	C.6.26	104
T10-3	Bulldozers	1	50	C.2.11	104
T10-4	Tractors and trailers	1	25	C.4.75	101
T10-5	Compaction plant	1	50	C.2.42	103
T10-6	6 or 8 wheeled tipper lorries	1	50	C.4.2	103
T10-7	Water bowsers	2	10	C.6.37	102
T11	**Paving Works (Footpaths, kerbs)**				**112**
T11-1	All terrain tipper trucks	1	50	C.6.25	111
T11-2	Dumper	1	50	C.6.26	104
T11-3	Tracked excavator (small)	1	75	C.2.7	96
T11-4	Combination loader backhoes	1	50	C.2.8	93
T12	**Concrete Paving (Mainfield only)**				**117**

Plant ID	Plant Name	Quantity	% on time	BS5228 Reference	Plant Item Sound Power Level, SWL, dB(A)
T12-1	Asphalt paver	2	75	C.5.31	106
T12-2	20T tipper lorries	2	75	-	110
T12-3	Compaction plant of various sizes with edge cutter	2	50	C.2.42	106
T12-4	Asphalt planner	2	50	C.5.7	110
T12-5	Pneumatic or hydraulic breakers	2	10	C.5.1	110
T12-6	Concrete mixer trucks	1	75	C.4.20	107
T12-7	Bond coat lorry	2	50	Average C.6.21 & 23	109
T13	**Concrete Breaking**				**117**
T13-1	Concrete saw cutter	1	25	C.4.70	113
T13-2	Hydraulic arm excavators with hydraulic breaking hammer	1	25	C.1.1	114
T13-3	Tractors and trailers	2	75	C.4.75	109
T14	**Vegetation Clearance**				**118**
T14-1	Chipper	1	10	Suppliers Data	113
T14-2	Chain saw	2	20	D.2.14 (C.4.71 spectrum)	110
T14-3	Tractor and trailer	1	20	C.4.75	100
T14-4	Tipper lorries - 20T	2	10	-	102
T14-5	Strimmer	1	30	C.4.70	113
T14-6	Excavator 25T	1	75	C.2.3	105
T15	**Attenuation Culverts / Retaining Wall**				**114**
T15-1	Tracked excavator 16T	1	30	C.2.5	99
T15-2	Hydraulic hammer rig (sheet piling)	1	50	C.3.1	114
T15-3	Twin drum roller	1	40	C.5.19	104
T15-4	Crane less than 100T	1	10	C.4.39	95
T16	**Stilt Structure Reconstruction**				**113**
T16-1	Excavator 25T	1	40	C.2.3	102
T16-2	Tracked excavator 16T	1	30	C.2.5	99
T16-3	Dumper 8T	1	30	D.9.38 - C.4.4 Spectrum	98
T16-4	Road lorry (full) 39T	2	10	C.6.21	102
T16-5	Trench compactor	1	50	C.5.28	101
T16-6	Floor saw	1	30	C.4.72	102
T16-7	Crawler crane	1	40	Used C.4.38 spectrum	101
T16-8	Rotary piling rig	1	60	C.3.14	109
T16-9	Large lorry concrete mixer	1	20	C.4.21	98
T16-10	Truck mounter concrete pump	1	30	Used C.4.28 spectrum	93
T17	**Paving Works Preparation**				**116**
T17-1	All terrain tipper trucks	1	50	C.6.25	111
T17-2	Bulldozers	2	50	C.2.11	107

Plant ID	Plant Name	Quantity	% on time	BS5228 Reference	Plant Item Sound Power Level, SWL, dB(A)
T17-3	Excavator	2	75	C.2.5	106
T17-4	Combination loader backhoes	2	50	C.2.8	96
T17-5	Grader	1	75	C.6.31	113
TM	**Compound Plant MA1**				**116**
TM-1	Batching plant (360 m^3/day)	1	75	D.6.11	107
TM-2	Batching plant (360 m^3/day)	1	75	D.6.11	107
TM-3	Batching plant (360 m^3/day)	1	75	D.6.11	107
TM-4	Backhoe excavator	1	75	C.2.5	103
TM-5	Front load excavator	1	75	C.2.5	103
TM-6	All terrain tipper trucks (close to batching plants)	1	50	C.6.25	111
TM-7	Concrete mixer trucks	1	50	C.4.20	105
TM-8	Concrete mixer trucks	1	50	C.4.20	105
TM-9	10 cars moving around the car park	10	100	-	91
TM-10	Asphalt/cement tank	1	75	C.4.15	103
TY	**Compound Plant Car Park Y**				**112**
TY-1	Batching plant small (19 m^3/hr)	1	75	D.6.9	103
TY-2	Backhoe excavator	1	75	C.2.5	103
TY-3	Backhoe excavator	1	75	C.2.5	103
TY-4	Normal tipper trucks (close to batching plants)	1	50	C.4.2	103
TY-5	Concrete mixer trucks	1	75	C.4.20	107
TY-6	Concrete mixer trucks	1	75	C.4.20	107
TY-7	10 cars moving around the car park	10	100	-	91
TR	**Compound Plant Reigate Field**				**113**
TR-1	Batching plant large 360 m^3/day	1	75	D.6.11	107
TR-2	Front load excavator	1	75	C.2.5	103
TR-3	Backhoe excavator	1	75	C.2.5	103
TR-4	Normal tipper trucks (close to batching plants)	1	50	C.4.2	103
TR-5	Concrete mixer trucks	1	75	C.4.20	107
TR-6	Concrete mixer trucks	1	75	C.4.20	107
TS	**Compound Plant Satellite Compound**				**115**
TS-1	Batching plant large 360 m^3/day	1	75	D.6.11	107
TS-2	Front load excavator	1	75	C.2.5	103
TS-3	Backhoe excavator	1	75	C.2.5	103
TS-4	All terrain tipper trucks (close to batching plants)	1	50	C.6.25	111
TS-5	Concrete mixer trucks	1	75	C.4.20	107
TS-6	Concrete mixer trucks	1	75	C.4.20	107
TS-7	10 cars moving around the car park	10	100	-	91

Plant ID	Plant Name	Quantity	% on time	BS5228 Reference	Plant Item Sound Power Level, SWL, dB(A)
TL	**Compound Plant Longbridge Roundabout**				**95**
TL-1	Generator (silenced)	2	100	C.4.79	95

3 Construction Noise Model Results

3.1 Model Results

3.1.1 Construction noise has been modelled based on a series of worst case assumptions as reported in Section 14.5 of **ES Chapter 14: Noise and Vibration** (Doc Ref. 5.1). The 170 main works modelled are listed above with their currently expected hours of working: day; evening; or night. The programme of works has allowed the main airfield construction works areas to be grouped into 13 periods: the 12 individual years between 2024 and 2035; and the period 2036 to 2038 when there will be less construction activity. For the five periods when airfield works will be occurring spread across the airfield, 'busy' (B) and 'typical' (T) cases has been modelled to illustrate both a set of works expected to occur typically of the whole year and a set of works expected for a shorter busy period within that year, in order to help give an indication of the duration of the associated impacts. For the highways works, because some noisy works are shorter in duration, various periods within each year have been modelled; 2 in 2028, 6 in 2029, 4 in 2030 and 3 in 2031. This gave an additional 11 periods to model, giving 29 periods across the 15 year construction period from 2024 to 2038.

Noise Modelling Results Without Further Mitigation

3.1.2 In order to not under-estimate the possible cumulative effect of concurrent works, all works likely to occur within any of these periods have been modelled concurrently, resulting in 29 noise models. The reasonable worst case (without mitigation) results of noise modelling levels at representative receptors in each of 12 Receptors Areas and are provided in **ES Chapter 14: Noise and Vibration** (Doc Ref. 5.1). The results of modelling noise at all receptor buildings in each receptor area are summarised in Table 3.1.1, Table 3.1.2 and Table 3.1.3. For each noise model, these provide the total number of residential properties above LOAEL and above SOAEL, for the day and night periods. The LOAEL and SOAEL for night-time are the same, as discussed in **ES Chapter 14: Noise and Vibration**. Non-residential receptors are discussed individually in **ES Chapter 14: Noise and Vibration**.

Table 3.1.1: LOAEL Daytime Residential Property Count

Community	Outer Charlwood (1)	Charlwood (2)	Charlwood Road (3)	Farmfield (4)	Povey Cross (5)	Longbridge Road, Horley (6)	Riverside, Horley (7)	Bonnetts Lane (8)	Lowfield Heath (9)	Rowley Farm (10)	Balcombe Road (11)	Tinsley Green (12)
2024	0	0	0	0	0	0	0	0	0	0	0	0
2025 T	0	0	0	0	0	0	0	0	0	0	0	0
2025 B	0	0	0	0	0	0	0	0	0	0	0	0
2026 T	0	0	0	0	0	0	0	0	0	0	0	0
2026 B	0	0	0	0	0	0	0	0	0	0	0	0
2027 T	0	0	0	0	0	0	0	0	0	0	0	0
2027 B	0	0	0	0	0	0	0	0	0	0	0	0
2028-06 T	0	0	0	0	0	5	0	0	0	0	0	0
2028-06 B	0	0	0	0	0	5	0	0	0	0	0	0
2028-07 T	0	0	0	0	0	3	0	0	0	0	0	0
2028-07 B	0	0	0	0	0	3	0	0	0	0	0	0
2029-02	0	0	0	0	0	33	32	0	0	0	2	0
2029-03	0	0	0	0	0	35	3	0	0	0	2	0
2029-05	0	0	0	0	1	45	28	0	0	0	1	0
2029-07	0	0	0	0	0	41	20	0	0	0	3	0
2029-10	0	0	0	0	0	26	0	0	0	0	0	0

Community	Outer Charlwood (1)	Charlwood (2)	Charlwood Road (3)	Farmfield (4)	Povey Cross (5)	Longbridge Road, Horley (6)	Riverside, Horley (7)	Bonnetts Lane (8)	Lowfield Heath (9)	Rowley Farm (10)	Balcombe Road (11)	Tinsley Green (12)
2029-11	0	0	0	0	0	21	0	0	0	0	0	0
2030-03	0	0	0	0	2	25	8	0	0	0	1	0
2030-04	0	0	0	0	0	22	8	0	0	0	1	0
2030-08	0	0	0	0	2	23	5	0	0	0	1	0
2030-12	0	0	0	0	0	20	5	0	0	0	1	0
2031-02	0	0	0	0	0	21	26	0	0	0	1	0
2031-05	0	0	0	0	0	14	16	0	0	0	0	0
2031-08	0	0	0	0	0	14	5	0	0	0	1	0
2032	0	0	0	0	0	12	2	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	5	0	0	0	0	0	0
2035	0	0	0	0	0	5	0	0	0	0	0	0
2036-2038	0	0	0	0	0	0	0	0	0	0	0	0
Total Individual Property Count T	0	0	0	0	2	52	39	0	0	0	4	0
Total Individual Property Count B	0	0	0	0	2	52	39	0	0	0	4	0

Table 3.1.2: SOAEL Daytime Residential Property Count

Community	Outer Charlwood (1)	Charlwood (2)	Charlwood Road (3)	Farmfield (4)	Povey Cross (5)	Longbridge Road, Horley (6)	Riverside, Horley (7)	Bonnetts Lane (8)	Lowfield Heath (9)	Rowley Farm (10)	Balcombe Road (11)	Tinsley Green (12)
2024	0	0	0	0	0	0	0	0	0	0	0	0
2025 T	0	0	0	0	0	0	0	0	0	0	0	0
2025 B	0	0	0	0	0	0	0	0	0	0	0	0
2026 T	0	0	0	0	0	0	0	0	0	0	0	0
2026 B	0	0	0	0	0	0	0	0	0	0	0	0
2027 T	0	0	0	0	0	0	0	0	0	0	0	0
2027 B	0	0	0	0	0	0	0	0	0	0	0	0
2028-06 T	0	0	0	0	0	1	0	0	0	0	0	0
2028-06 B	0	0	0	0	0	1	0	0	0	0	0	0
2028-07 T	0	0	0	0	0	1	0	0	0	0	0	0
2028-07 B	0	0	0	0	0	1	0	0	0	0	0	0
2029-02	0	0	0	0	0	1	0	0	0	0	0	0
2029-03	0	0	0	0	0	1	0	0	0	0	0	0
2029-05	0	0	0	0	0	4	0	0	0	0	1	0

Community	Outer Charlwood (1)	Charlwood (2)	Charlwood Road (3)	Farmfield (4)	Povey Cross (5)	Longbridge Road, Horley (6)	Riverside, Horley (7)	Bonnetts Lane (8)	Lowfield Heath (9)	Rowley Farm (10)	Balcombe Road (11)	Tinsley Green (12)
2029-07	0	0	0	0	0	1	0	0	0	0	1	0
2029-10	0	0	0	0	0	0	0	0	0	0	0	0
2029-11	0	0	0	0	0	3	0	0	0	0	0	0
2030-03	0	0	0	0	0	2	0	0	0	0	0	0
2030-04	0	0	0	0	0	6	0	0	0	0	1	0
2030-08	0	0	0	0	0	4	0	0	0	0	0	0
2030-12	0	0	0	0	0	4	0	0	0	0	0	0
2031-02	0	0	0	0	0	0	0	0	0	0	0	0
2031-05	0	0	0	0	0	0	0	0	0	0	0	0
2031-08	0	0	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0	0	0
2036-2038	0	0	0	0	0	0	0	0	0	0	0	0
Total Individual Property Count T	0	0	0	0	0	7	0	0	0	0	1	0
Total Individual Property Count B	0	0	0	0	0	7	0	0	0	0	1	0

Table 3.1.3: SOAEL Night-time Residential Property Count

Community	Outer Charlwood (1)	Charlwood (2)	Charlwood Road (3)	Farmfield (4)	Povey Cross (5)	Longbridge Road, Horley (6)	Riverside, Horley (7)	Bonnetts Lane (8)	Lowfield Heath (9)	Rowley Farm (10)	Balcombe Road (11)	Tinsley Green (12)
2024	0	0	0	0	0	0	0	0	0	0	0	0
2025 T	0	0	0	0	0	0	0	0	0	0	0	0
2025 B	0	0	3	0	0	0	0	0	0	0	0	0
2026 T	0	0	2	0	0	0	0	0	0	0	0	0
2026 B	0	1	7	0	0	0	0	3	2	0	0	0
2027 T	0	1	0	0	0	0	0	0	2	0	0	0
2027 B	0	6	0	0	0	0	0	7	4	0	0	0
2028-06 T	0	1	0	0	0	0	0	3	3	0	0	0
2028-06 B	0	1	0	0	0	0	0	6	3	0	0	0

Community	Outer Charlwood (1)	Charlwood (2)	Charlwood Road (3)	Farmfield (4)	Povey Cross (5)	Longbridge Road, Horley (6)	Riverside, Horley (7)	Bonnetts Lane (8)	Lowfield Heath (9)	Rowley Farm (10)	Balcombe Road (11)	Tinsley Green (12)
2028-07 T	0	1	0	0	0	0	0	0	2	0	0	0
2028-07 B	0	1	0	0	0	0	0	2	3	0	0	0
2029-02	0	0	0	0	0	8	21	0	0	0	0	0
2029-03	0	0	0	0	0	5	53	0	0	0	7	0
2029-05	0	0	0	0	0	0	60	0	0	0	1	0
2029-07	0	0	0	0	10	39	0	0	0	0	1	0
2029-10	0	0	0	0	0	3	31	0	0	0	0	0
2029-11	0	0	0	0	0	0	30	0	0	0	0	0
2030-03	0	0	0	0	0	0	0	0	0	0	0	0
2030-04	0	0	0	0	0	0	0	0	0	0	0	0
2030-08	0	0	0	0	0	0	0	0	0	0	9	0
2030-12	0	0	0	0	0	0	0	0	0	0	0	0
2031-02	0	0	0	0	0	0	0	0	0	0	0	0
2031-05	0	0	0	0	0	0	0	0	0	0	0	0
2031-08	0	0	0	0	0	0	27	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0	0	0
2036-2038	0	0	0	0	0	0	0	0	0	0	0	0
Total Individual Property Count T	0	1	2	0	10	47	109	3	4	0	16	0
Total Individual Property Count B	0	6	7	0	10	47	109	7	4	0	16	0

3.2 Noise Modelling Results With Further Mitigation

3.2.1 Section 14.9 of **ES Chapter 14: Noise and Vibration** (Doc Ref. 5.1) describes the locations in which site perimeter noise barriers have been modelled and the assumed reductions in noise emissions using Best Practicable Means. The results of modelling noise with this level of mitigation at all receptor buildings in each receptor area are summarised in Table 3.2.1, Table 3.2.2 and Table 3.2.3 by providing for each noise model; the total number of residential properties above LOAEL and above SOAEL, for the day and night periods. The LOAEL and SOAEL for night-time are the same, as discussed in **ES Chapter 14: Noise and Vibration**. Non-residential receptors are discussed individually in **ES Chapter 14: Noise and Vibration**.

Table 3.2.1: LOAEL Daytime Residential Property Count, with Further Noise Mitigation

Community	Outer Charlwood (1)	Charlwood (2)	Charlwood Road (3)	Farmfield (4)	Povey Cross (5)	Longbridge Road, Horley (6)	Riverside, Horley (7)	Bonnetts Lane (8)	Lowfield Heath (9)	Rowley Farm (10)	Balcombe Road (11)	Tinsley Green (12)
2024	0	0	0	0	0	0	0	0	0	0	0	0
2025 T	0	0	0	0	0	0	0	0	0	0	0	0
2025 B	0	0	0	0	0	0	0	0	0	0	0	0
2026 T	0	0	0	0	0	0	0	0	0	0	0	0
2026 B	0	0	0	0	0	0	0	0	0	0	0	0
2027 T	0	0	0	0	0	0	0	0	0	0	0	0
2027 B	0	0	0	0	0	0	0	0	0	0	0	0
2028-06 T	0	0	0	0	0	3	0	0	0	0	0	0
2028-06 B	0	0	0	0	0	3	0	0	0	0	0	0
2028-07 T	0	0	0	0	0	1	0	0	0	0	0	0
2028-07 B	0	0	0	0	0	1	0	0	0	0	0	0
2029-02	0	0	0	0	0	4	13	0	0	0	0	0
2029-03	0	0	0	0	0	9	0	0	0	0	0	0
2029-05	0	0	0	0	0	21	5	0	0	0	1	0
2029-07	0	0	0	0	0	9	0	0	0	0	1	0
2029-10	0	0	0	0	0	10	0	0	0	0	0	0
2029-11	0	0	0	0	0	12	0	0	0	0	0	0
2030-03	0	0	0	0	0	11	0	0	0	0	0	0
2030-04	0	0	0	0	0	11	0	0	0	0	1	0
2030-08	0	0	0	0	0	11	0	0	0	0	0	0
2030-12	0	0	0	0	0	7	0	0	0	0	0	0
2031-02	0	0	0	0	0	0	0	0	0	0	0	0
2031-05	0	0	0	0	0	0	0	0	0	0	0	0
2031-08	0	0	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0	0	0
2036-2038	0	0	0	0	0	0	0	0	0	0	0	0
Total Individual Property Count T	0	0	0	0	0	23	13	0	0	0	1	0
Total Individual Property Count B	0	0	0	0	0	23	13	0	0	0	1	0

Table 3.2.2: SOAEL Daytime Residential Property Count, with Further Noise Mitigation

Community	Outer Charlwood (1)	Charlwood (2)	Charlwood Road (3)	Farmfield (4)	Povey Cross (5)	Longbridge Road, Horley (6)	Riverside, Horley (7)	Bonnetts Lane (8)	Lowfield Heath (9)	Rowley Farm (10)	Balcombe Road (11)	Tinsley Green (12)
2024	0	0	0	0	0	0	0	0	0	0	0	0
2025 T	0	0	0	0	0	0	0	0	0	0	0	0
2025 B	0	0	0	0	0	0	0	0	0	0	0	0
2026 T	0	0	0	0	0	0	0	0	0	0	0	0
2026 B	0	0	0	0	0	0	0	0	0	0	0	0
2027 T	0	0	0	0	0	0	0	0	0	0	0	0
2027 B	0	0	0	0	0	0	0	0	0	0	0	0
2028-06 T	0	0	0	0	0	0	0	0	0	0	0	0
2028-06 B	0	0	0	0	0	0	0	0	0	0	0	0
2028-07 T	0	0	0	0	0	0	0	0	0	0	0	0
2028-07 B	0	0	0	0	0	0	0	0	0	0	0	0
2029-02	0	0	0	0	0	0	0	0	0	0	0	0
2029-03	0	0	0	0	0	0	0	0	0	0	0	0
2029-05	0	0	0	0	0	0	0	0	0	0	0	0
2029-07	0	0	0	0	0	0	0	0	0	0	0	0
2029-10	0	0	0	0	0	0	0	0	0	0	0	0
2029-11	0	0	0	0	0	0	0	0	0	0	0	0
2030-03	0	0	0	0	0	0	0	0	0	0	0	0
2030-04	0	0	0	0	0	0	0	0	0	0	0	0
2030-08	0	0	0	0	0	0	0	0	0	0	0	0
2030-12	0	0	0	0	0	0	0	0	0	0	0	0
2031-02	0	0	0	0	0	0	0	0	0	0	0	0
2031-05	0	0	0	0	0	0	0	0	0	0	0	0
2031-08	0	0	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0	0	0
2036-2038	0	0	0	0	0	0	0	0	0	0	0	0
Total Individual Property Count T	0	0	0	0	0	0	0	0	0	0	0	0
Total Individual Property Count B	0	0	0	0	0	0	0	0	0	0	0	0

Table 3.2.3: SOAEL Night-time Residential Property Count, with Further Noise Mitigation

Community	Outer Charlwood (1)	Charlwood (2)	Charlwood Road (3)	Farmfield (4)	Povey Cross (5)	Longbridge Road, Horley (6)	Riverside, Horley (7)	Bonnetts Lane (8)	Lowfield Heath (9)	Rowley Farm (10)	Balcombe Road (11)	Tinsley Green (12)
2024	0	0	0	0	0	0	0	0	0	0	0	0
2025 T	0	0	0	0	0	0	0	0	0	0	0	0
2025 B	0	0	0	0	0	0	0	0	0	0	0	0
2026 T	0	0	0	0	0	0	0	0	0	0	0	0
2026 B	0	0	0	0	0	0	0	0	0	0	0	0
2027 T	0	0	0	0	0	0	0	0	0	0	0	0
2027 B	0	1	0	0	0	0	0	0	0	0	0	0
2028-06 T	0	0	0	0	0	0	0	0	0	0	0	0
2028-06 B	0	0	0	0	0	0	0	0	0	0	0	0
2028-07 T	0	0	0	0	0	0	0	0	0	0	0	0
2028-07 B	0	0	0	0	0	0	0	0	0	0	0	0
2029-02	0	0	0	0	0	1 [(1)]	0	0	0	0	0	0
2029-03	0	0	0	0	0	0	0	0	0	0	0	0
2029-05	0	0	0	0	0	0	0	0	0	0	0	0
2029-07	0	0	0	0	5 [(2)]	7 [(2)]	0	0	0	0	0	0
2029-10	0	0	0	0	0	0	0	0	0	0	0	0
2029-11	0	0	0	0	0	0	0	0	0	0	0	0
2030-03	0	0	0	0	0	0	0	0	0	0	0	0
2030-04	0	0	0	0	0	0	0	0	0	0	0	0
2030-08	0	0	0	0	0	0	0	0	0	0	1	0
2030-12	0	0	0	0	0	0	0	0	0	0	0	0
2031-02	0	0	0	0	0	0	0	0	0	0	0	0
2031-05	0	0	0	0	0	0	0	0	0	0	0	0
2031-08	0	0	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0	0	0
2036-2038	0	0	0	0	0	0	0	0	0	0	0	0
Total Individual Property Count T	0	1	0	0	5	8	0	0	0	0	1	0
Total Individual Property Count B	0	1	0	0	5	8	0	0	0	0	1	0

1) Single building comprising 8 flats, see main text.

2) Short durations, see Chapter 14 for discussion on significance of effect.

4 Construction Vibration Assessment

4.1 Vibration Sources and Levels

4.1.1 Bored piling will be used during construction of various foundations to structures and buildings within the airfield. Measurements from bored piling operations suggest that vibration levels will not exceed 1 mm/s beyond about 10 m from the pile during normal piling conditions. Piling is not expected to be carried out within 10 m of occupied sensitive receiver buildings, so significant vibration impacts are not expected.

4.1.2 Vibration from demolition works, and other occasional activities that take place on construction sites may be perceptible within occupied sensitive buildings on occasions, but not at levels that would give rise to concern or risk damage to building structures.

4.1.3 Sheet piling will be required at various locations within the airfield and the highways works. The closest of these to sensitive receptors are summarised in Table 4.1.1.

Table 4.1.1: Sheet Piling Locations

Sheet Piling Location	Program Duration (approx.)	Distance to Nearest Receptor
A23 Brighton Road Bridge abutments	2 weeks	50 m
Longbridge Roundabout stilt structures	3 weeks	60 m
Network Rail Bridge	2 weeks	150 m
South Terminal Roundabout eastbound slip road	6 weeks	60 m
South Terminal Roundabout westbound slip road	3 weeks	20 m
Balcombe Road Bridge	4 weeks	60 m

4.1.4 The closest areas of piling to residential noise sensitive receptors are on the A23 Brighton Road Bridge approximately 50 m from properties on Longbridge Road, and on the South Terminal Roundabout eastbound slip road approximately 60 m from the nearest office building and dwelling to the north. Sheet piling for the South Terminal westbound slip road will be approximately 20 m from the KFC building that is not as sensitive to disturbance as residential or office buildings. It is anticipated that sheet piling will be carried out by vibratory techniques, rather than methods requiring piles being impacted.

4.1.5 Vibration from sheet piling has been assessed based on the information provided in BS5228 Part 2, 2009. This standard provides measured vibration levels from various construction activities including vibratory sheet piling. Whilst the exact form of piling will be determined by the contractor there are several entries for vibratory pile driving that give an indication of the levels to be expected, including those in the following table.

Table 4.1.2: Examples of Vibratory Piling in BS5228-2

Ref	Location	Soil Condition	Pile Dimensions	Mode	Measurement Distance (m)	Peak Particle Velocity (mm/s)
C44	Bridlington (Humberside)	4 m to 5 m soft saturated sand over soft to firm clay	Sheet piling, dimensions N/R	Driving or extracting	6	2.6
C44	Bridlington (Humberside)	4 m to 5 m soft saturated sand over soft to firm clay	Sheet piling, dimensions N/R	Driving or extracting	8	2.2
C45	Glasgow Cowcaddens (Strathclyde)	3 m fill, blaes, clay and boulders over 8 m soft to firm silty clay over sandstone	450 mm diameter casings, depth not recorded	Driving casings	13	1.4

N/R - Not Recorded

4.1.6 These two examples give an indication of the levels from similar forms of vibratory piling to that expected in this case. Vibration levels will drop with distance from the piling activity as the vibration energy loses intensity through spreading and frictional losses in the ground. The nearest residential receptors are 50 to 60 m from the sheet piling that will be required to form the A23 Brighton Road bridge abutments and the retaining walls near the south terminal roundabout and Balcombe Road Bridge. At this distance vibration levels are likely to be above the LOAEL of 0.3 mm/s Peak Particle Velocity (PPV) on occasions, but not at levels above the SOAEL of 1 mm/s when adverse comments become possible or probable. Also, vibration is likely to be intermittent and may not arise for periods of more than 10 days in any 15 consecutive days, or more than a total of 40 days in any consecutive 6 months. Hence minor but not significant impacts are expected.