Heathrow

EASTERLY ALTERNATION INFRASTRUCTURE PROJECT

Environmental Impact Assessment
Environmental Statement, Volume III
Appendix 7.4: Construction Noise and Vibration

Document Reference: 19309-XX-EC-XXX-000037

October 2024

Heathrow

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1. Introduction

1.1 Overview

1.1.1 This Appendix supports the construction noise assessment presented in **Chapter 7: Noise and Vibration, Volume II** of the Environmental Statement.

1.1.2 This Appendix provides:

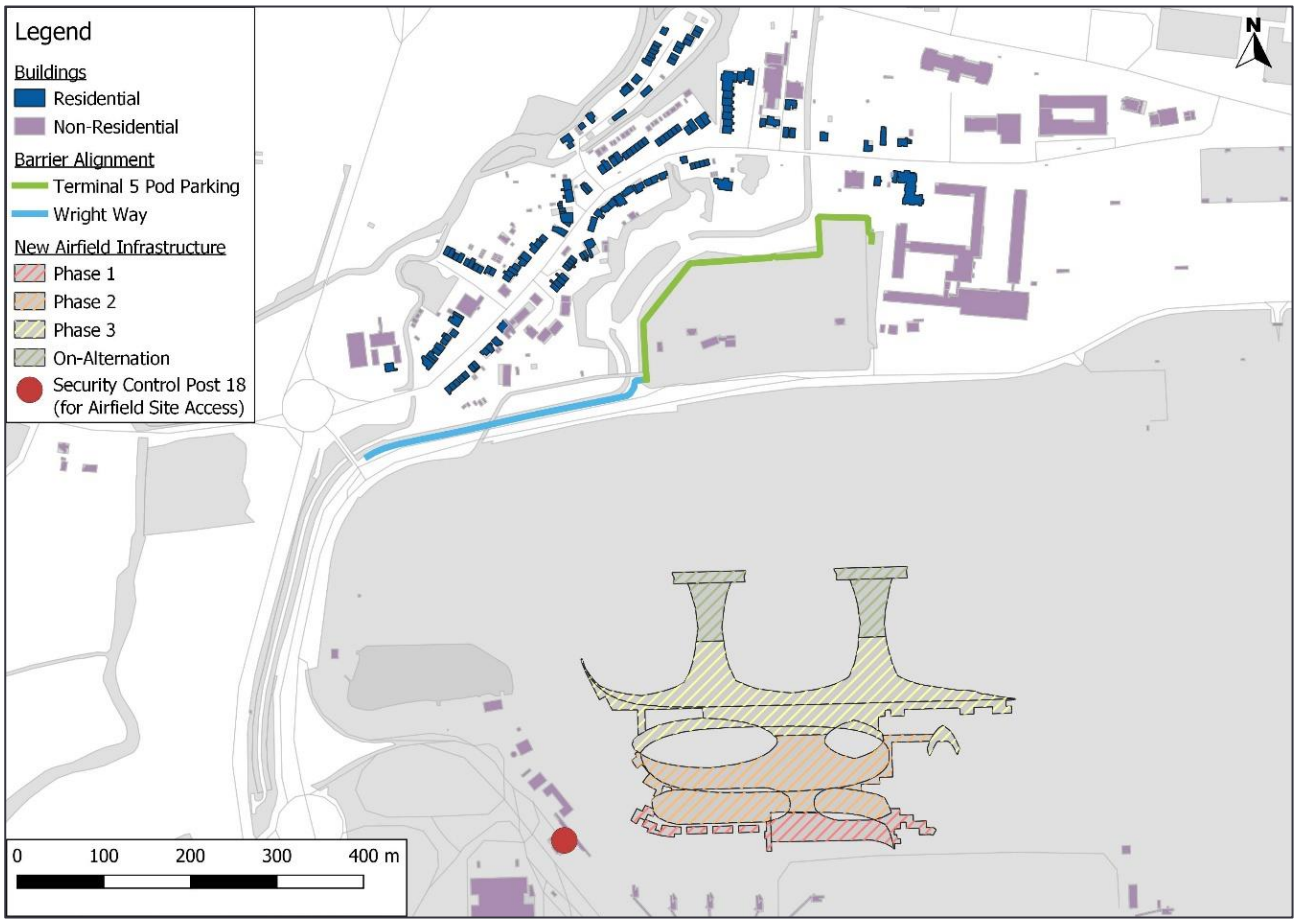
- Detailed justification for the scoped-out elements of the construction noise and vibration assessment, including construction vibration and construction traffic noise;
- An overview of the construction proposals, study area and noise sensitive receptors (NSRs); and
- Construction noise modelling methodology including plant lists, assumptions and model parameters.

1.1.3 The Proposed Development is described in detail in **Chapter 3: Description of the Proposed Development, Volume II** of the Environmental Statement and in summary comprises ground-based infrastructure (such as new taxiways) required to allow regular and scheduled departures on the northern runway in an easterly direction.

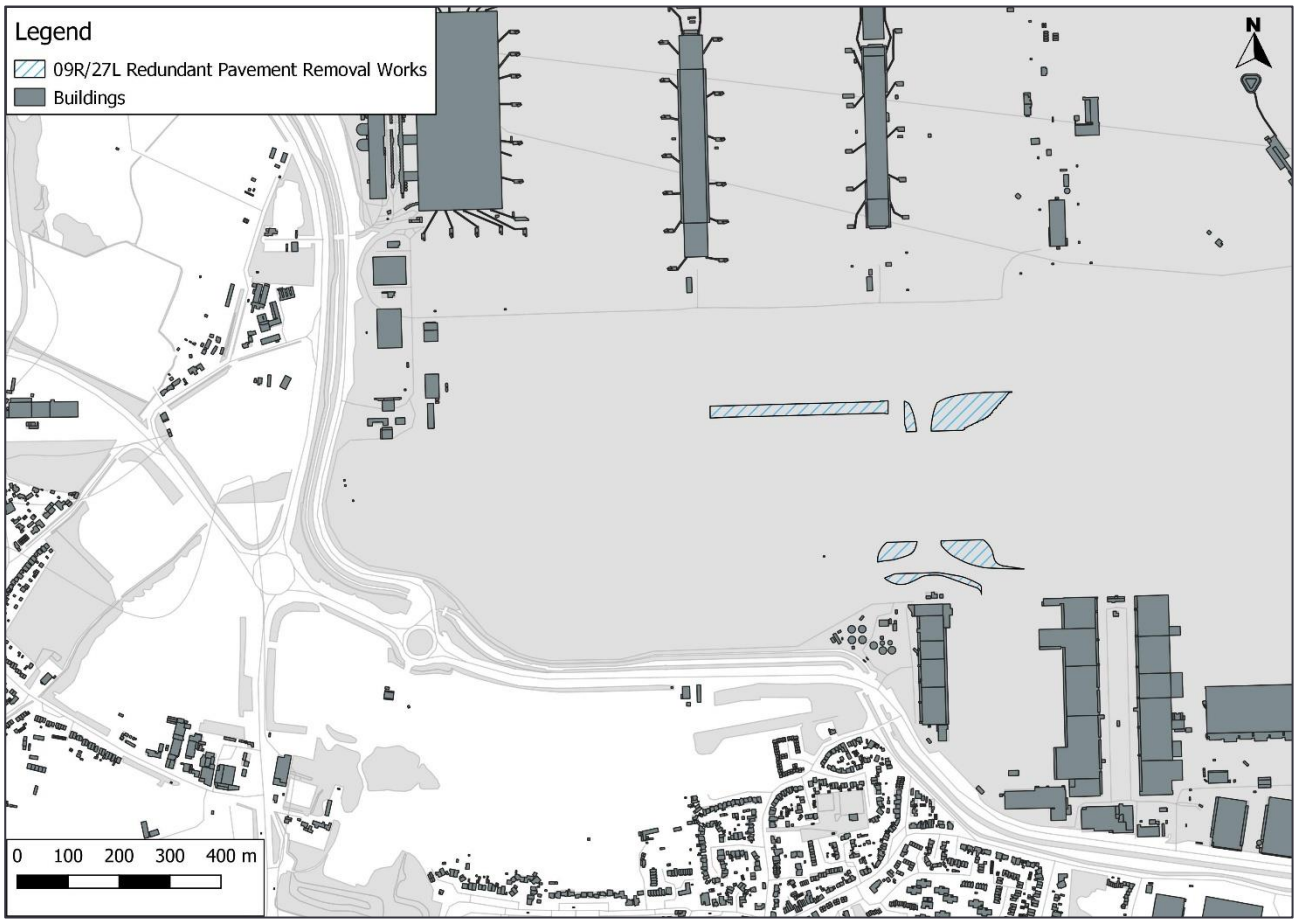
1.1.4 In respect of construction noise, the most pertinent components of the Proposed Development are the noise barrier, and the 09L airfield infrastructure works as shown in **Graphic A7.4.1** and **Figure 7.4.1** (**Volume IV** of the Environmental Statement).

1.1.5 To off-set the additional areas of pavement required for the 09L airfield infrastructure works, some redundant areas of pavement will be removed either side of runway 09R/27L to the south of the airfield. This area is shown in **Graphic A7.4.2**.

Graphic A7.4.1 Noise barrier and 09L airfield infrastructure construction works



Graphic A7.4.2: 09R/27L redundant pavement removal construction works



1.1.6 The construction of the noise barrier is primarily intended to provide enhanced mitigation to noise sensitive receptors (NSRs) in respect of ground noise, as discussed in **Appendix 7.6: Ground Noise, Volume III** of the Environmental Statement. The works are also anticipated to provide enhanced mitigation in respect of aircraft 'air' noise as discussed in **Appendix 7.5: Air Noise, Volume III** of the Environmental Statement. The 09L airfield infrastructure works are intended to facilitate the efficient operation of departures in an easterly direction from the northern runway.

1.1.7 The construction noise impact assessment has been carried out having regard to the methodologies and approaches set out in British Standard (BS) *5228-1:2009 +A1:2014 Code of practice for noise and vibration control on construction and open sites: Part 1 – Noise*[1] (BS 5228-1).

1.2 Detailed proposals

1.2.1 The assumptions set out in this Appendix are based on a well progressed but indicative construction programme, methodologies (including plant selections and on-times) and phasing assumptions provided by the construction planner. The assumptions are subject to

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

change upon award of the construction contract; however, it is anticipated that higher impact construction activities will be controlled through a Section 61 process. This approach allows for some flexibility and would allow the London Borough of Hillingdon to scrutinise the proposed construction methodology and mitigation to ensure noise is being kept as low as practically possible.

1.2.2 The noise barrier works comprise the provision of an enhanced acoustic barrier to the north of Wright Way / The Western Perimeter Road and the Heathrow Terminal 5 Pod Parking. The works entail the replacement of the existing barrier in some areas with a taller more effective acoustic barrier. In some areas, entirely new sections of noise barrier will be provided.

1.2.3 The enhanced noise barrier is intended to provide mitigation to NSRs in Longford Village, primarily in respect of aircraft 'ground' noise, but might also be expected to provide some benefit in respect of start of roll noise (aircraft 'air' noise). It will also provide additional benefits in respect of road traffic / vehicle noise from Wright Way, the Western Perimeter Road and the Terminal 5 Pod Parking.

1.2.4 It is proposed that the noise barrier works be conducted first, to capitalise on its function to provide noise mitigation for the 09L airfield infrastructure construction works, which would follow upon completion of the noise barrier works.

1.2.5 The 09L airfield infrastructure construction works comprise the construction of new taxiway infrastructure at the western end of the northern runway (runway 09L) including runway access taxiways (RATs) linking to the main runway. In some areas, existing hardstanding will become grassed areas (airfield grassland).

1.2.6 The construction works are anticipated to commence in Summer 2025 and require a 100-week (approximately) construction period. Consequently, the year of opening for the Proposed Development is anticipated to be 2028.

1.2.7 The noise barrier construction works are anticipated to commence in Summer 2025 and be carried out over two phases:

- Along Wright Way: approximately 9 weeks, night-time works only, weekdays only, with a final week to reinstate the road safety barrier along Wright Way[2]; and
- Around the perimeter of Terminal 5 Pod Parking: approximately 10 weeks, daytime works only, weekdays only.

1.2.8 The 09L airfield infrastructure construction works are anticipated to commence in Autumn 2025 and be carried out over three phases:

- Phase 1: approximately 21 weeks, night-time works only, weekdays only;
- Phase 2: approximately 31 weeks, night-time works only, weekdays only;

[2] The reinstatement of the road safety barrier will take place on the airport side of the 'noise barrier' which will screen activity noise from receptors. Consequently, these activities are not considered to result in significant noise effects and have not been assessed.

- Phase 3: approximately 28 weeks, mix of daytime and night-time works, weekdays only; and
- On-alternation works: approximately 60 weeks, over the same period as Phases 1 -3, at night-time, only on weekends during alternation (two weekends working, two weekends not working, for a total of approximately 30 weekends working).

1.2.9 Additionally, redundant pavement will be removed and reinstated as airfield grassland adjacent to runway 09R/27L. This will be night-time works carried out on weekdays only for approximately 20 weeks. It is likely that this will overlap with the 09L airfield infrastructure and occur when the relevant plant can be redeployed during other 09L airfield infrastructure construction activities.

1.2.10 Additionally, high level consideration has been given to construction traffic, particularly traffic resulting from off-site soil disposal during the 09L airfield infrastructure works (**Section 1.4**).

1.3 Construction vibration

1.3.1 Notably, ground-borne noise and vibration impacts, due to high energy construction activities such as piling works and vibratory compaction; has been scoped out of the assessment because the distances to nearby sensitive receptors means that the likelihood of significant effects is negligible.

1.3.2 During the noise barrier construction works, the worst-case activity is likely to be auger piling. This activity has been assumed to be equivalent to continuous flight auger (CFA) piling as described by Hiller[3] (2003). This results in a peak particle velocity (PPV) of less than 0.3mm/s at distances of 20 metres and more.

1.3.3 BS 5228-2:2009 +A1:2014 *Code of practice for noise and vibration control on construction and open sites: Part 2 – Vibration*[4] (BS 5228-2), advises that for a PPV of 0.3mm/s "*vibration might be just perceptible in residential environments*". All adjacent residential receptors are at least 32m away from any potential piling works therefore, the potential worst-case vibration levels will be well below the threshold of 0.3 mm/s for human exposure. Adherence to appropriate mitigation measures set out in the **Construction Environmental Management Plan** is required to ensure that the type of piling is appropriate for the proximity of the works to the nearest key vibration sensitive receptors.

1.3.4 During the 09L airfield infrastructure works, construction activities are in excess of 300m from NSRs, therefore the likelihood of significant effects is negligible.

1.3.5 During the 09R/27L redundant pavement removal works, construction activities are in excess of 300m from NSRs, therefore the likelihood of significant effects is negligible.

1.3.6 On the basis of the above, a detailed assessment of construction vibration effects has been scoped out.

[3] Hiller, D. M. (2003), 'A comparison of noise and vibration from percussive and bored piling', *Proc Underground Construction 2003*, pp.213-224.
[4] British Standards Institution (2014). *BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open site: Part 2 – Vibration.* London: BSI.

1.4 Construction traffic

1.4.1 Construction traffic movements, particularly at night-time, have the potential to result in adverse noise effects at NSRs. The methodology in Calculation of Road Traffic Noise (CRTN)[5] enables the calculation of Basic Noise Levels (BNL) from road traffic movements based on the volume, speed and percentage of Heavy Goods Vehicles (HGVs). In general, an increase in traffic volume of 25% is required to result in a 1 dB(A) noise increase.

1.4.2 For the noise barrier construction works, the number of vehicles required during a shift is low (refer to the plant lists in **Section 2.2**) and most vehicles will only arrive at the start of the shift and depart at the end of the shift (a total of one two-way movement per vehicle). The exception will be concrete mixer deliveries for approximately two to four weeks, however, the number of movements generated will be dependent on the volume of concrete required in a specific shift. Importantly, concrete deliveries will be staggered throughout the shift equating to approximately one to two deliveries per hour. As a result, the likelihood of significant effects from construction traffic noise during the noise barrier construction works is negligible.

1.4.3 During the 09L airfield infrastructure construction works, any vehicle movements across the airfield have been included within the construction noise assessment as vehicle movements on defined construction site haul routes (refer to the plant lists in **Section 2.2**). Most vehicles, which will be travelling on and off site via the security checkpoints adjacent to Terminal 5 during a shift, will only travel a relatively short distance to the site compound or concrete batching plant which will be located nearby. There are few NSRs along the anticipated routes (A-roads) and the noise climate during the night-time, in the absence of aircraft 'air' noise, is dominated by road traffic movements on the nearby M25. Therefore, the likelihood of significant effects from construction traffic noise during the 09L airfield infrastructure construction works in the immediately vicinity of the airfield is negligible.

1.4.4 The delivery of aggregates from the supplier to the concrete batching plant will be carried out during the daytime only. The route between the aggregate supplier compound and concrete batching plant is also predominantly A-roads or airport perimeter roads with few NSRs along the anticipated route. The noise climate during the daytime is dominated by aircraft 'air' noise and localised road traffic noise, and roads will likely be much busier than during the night-time. Therefore, the likelihood of significant effects from construction traffic noise between the aggregates supplier and concrete batching plant is not likely to be significant.

1.4.5 However, as a result of the 09L airfield infrastructure construction works, there will be a quantity of materials which will need to be disposed of off-site. A number of candidate off-site disposal locations have been identified in the Slough and Uxbridge areas. For the majority of the route to the disposal sites, wagons will be on the strategic road network (predominantly motorways and A-roads) therefore noise impacts will result in a negligible change at any relevant NSRs. However, for some of the candidate disposal sites, the final part of the journey would pass along quieter roads in built up areas which could result in adverse noise effects. Off-site disposal site(s) will be selected once the construction

[5] Department for Transport Welsh Office (1988), *Calculation of Road Traffic Noise*. London: Her Majesty's Stationery Office.

contract has been awarded. As part of the design and selection process, a noise assessment will be conducted and where calculated noise impacts are appreciable (more than a 1dB(A) increase and with an end state above the relevant lowest observed adverse effect level (LOAEL) at NSRs) alternative approaches will be adopted. An example approach could include acquiring a temporary site for stockpiling materials at night, for subsequent delivery to a disposal site during the day. The requirement for a construction traffic noise assessment will be captured in the **Construction Environmental Management Plan** and addressed once the disposal sites and methodology have been selected.

1.4.6 For reference, in respect of off-site construction traffic movements for material disposal only (refer to **paragraph 1.4.5**), **Table A7.4.1** summarises the peak projected number of HGVs required per shift to remove excavated material for each phase of the 09L airfield infrastructure works. This information has been provided by the construction planner.

Table A7.4.1: Projected peak off-site HGV movements for material disposal only

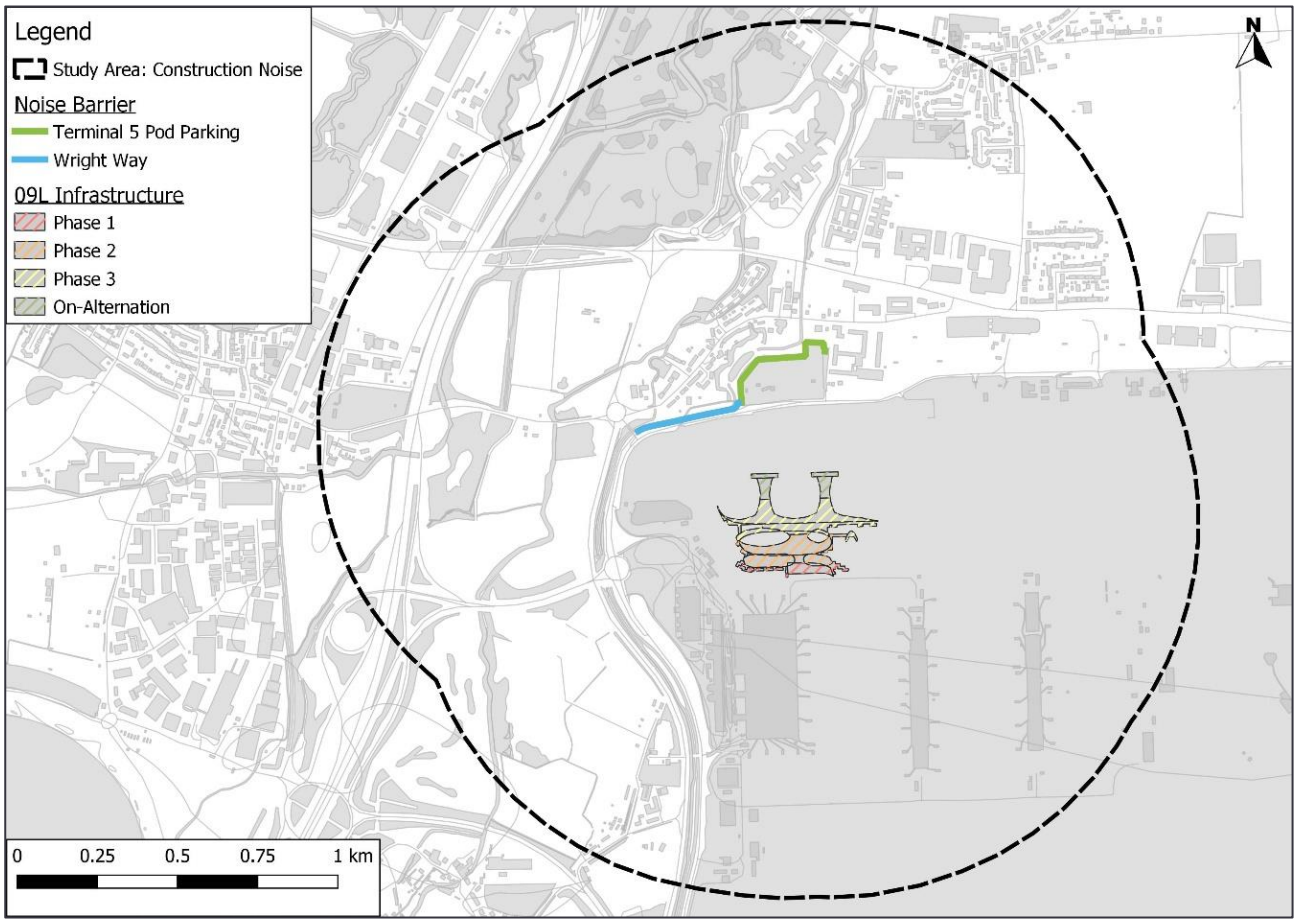
Phase	Daytime HGVs per Shift	Night-time HGVs per Shift
Phase 1	0	44
Phase 2	0	42
Phase 3	70	44
On-Alternation Works – RAT E	0	75
On-Alternation Works – RAT W	0	75

1.4.7 On the basis of the above review of construction traffic movements, an assessment of construction traffic noise has been scoped out of the construction assessment. However, a construction traffic noise assessment will be captured in the **Construction Environmental Management Plan**, subject to the selected material disposal site, or selection of an alternative material disposal management procedure.

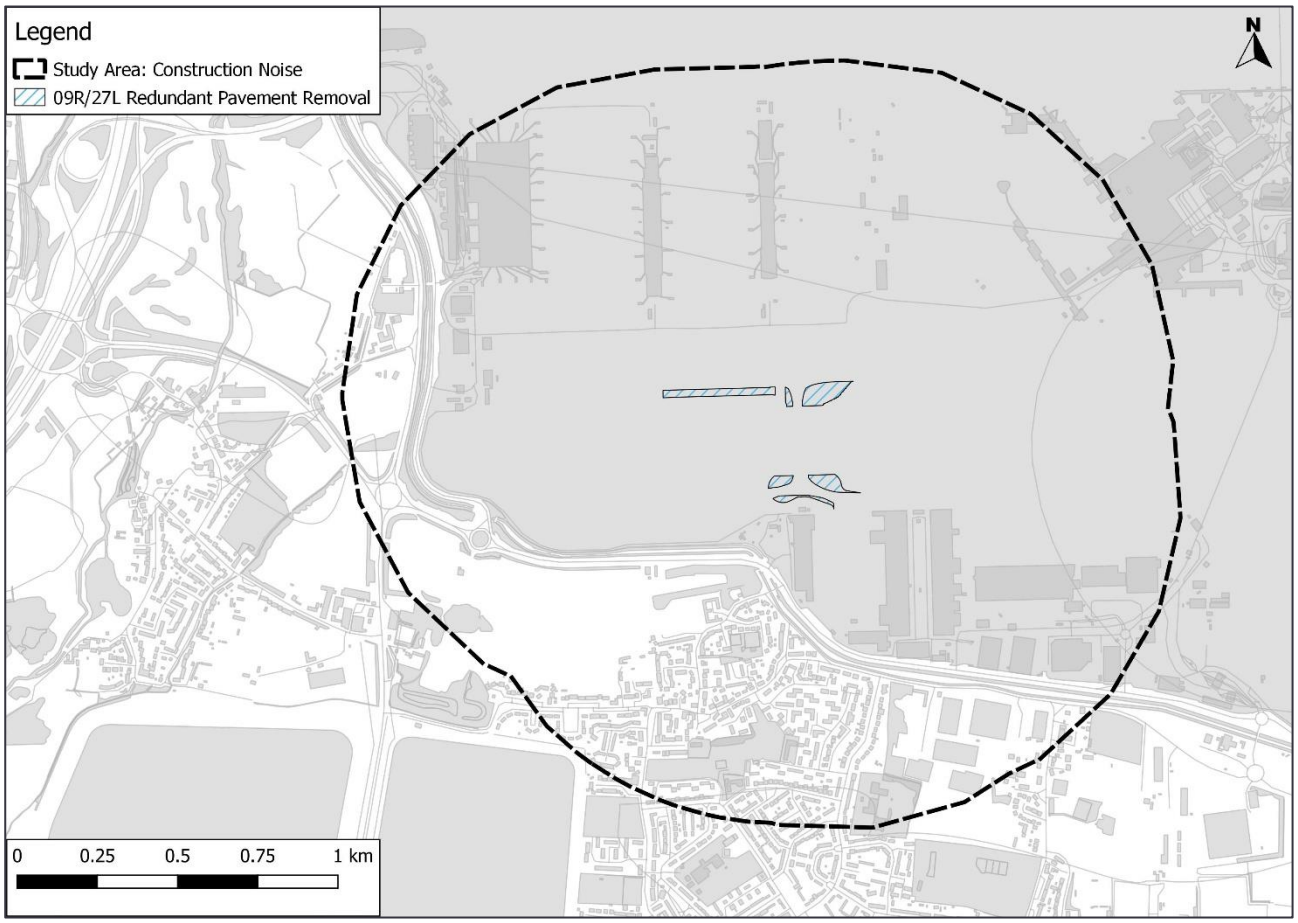
1.5 Study area

1.5.1 As described in the Scoping Report (**Appendix 1.5: Scoping Report**), the construction noise study area covers a distance of approximately 1 km from the airfield, however, in practice, the worst-affected receptors will be those which are closest to the construction activities. The study area for the construction noise assessment has therefore been amended to 1km from the construction worksites. The study area for noise barrier and 09L airfield infrastructure works is presented in **Graphic A7.4.3** and **Figure 7.3.1** (**Volume IV** of the Environmental Statement). The study area for 09R/27L “redundant pavement removal works” is presented in **Graphic A7.4.4** and **Figure 7.3.1** (**Volume IV** of the Environmental Statement).

Graphic A7.4.3 Construction noise study area (Longford)



Graphic A7.4.4 Construction noise study area (Stanwell)



1.5.2 The primary area considered incorporates noise and vibration sensitive receptors in the village of Longford which is closest to both the noise barrier construction works and the 09L airfield infrastructure construction works. Twelve specific receptor locations have been used in the construction noise model predictions and represent the key receptor groups which are most exposed to construction noise.

1.5.3 The specific NSR locations and groups are identified in **Graphic A7.4.5** and **Table A7.4.2**. The receptor group numbering has been devised in conjunction with the aircraft 'ground' noise assessment which considers a study area of 1 km from the edge of the airfield; however, in respect of construction noise, only NSR groups 4 to 15 are expected to experience likely significant effects.

Graphic A7.4.5 Noise sensitive receptor locations

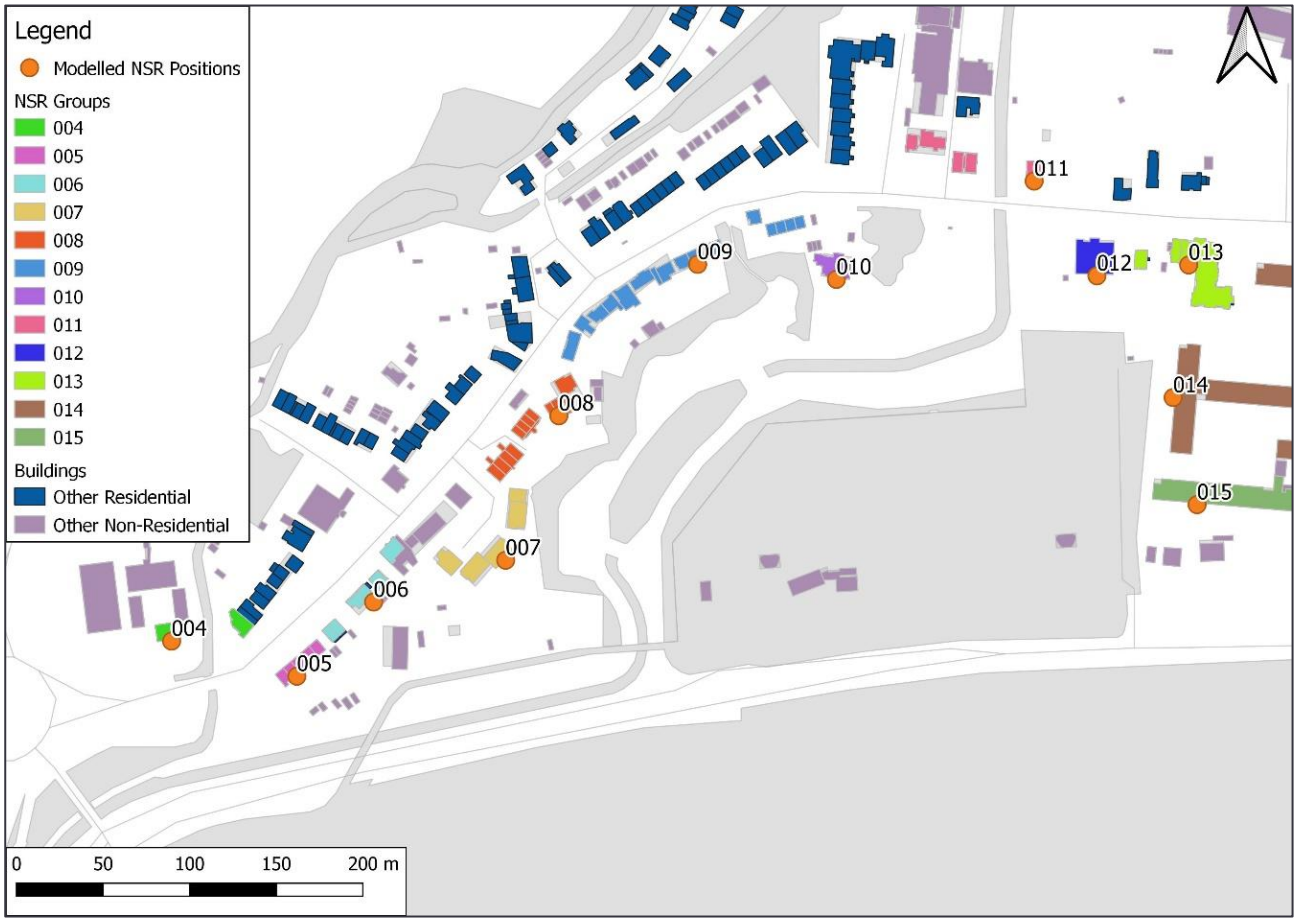


Table A7.4.2 Noise sensitive receptor groups

Receptor	Area	Primary Use	Notes
4	Longford	Residential	Representative of: Spelthorne Farm, Bath Road including Heathrow Special Needs Centre (Equestrian) 576 Bath Road
5	Longford	Residential	Representative of: 609 to 617 Bath Road
6	Longford	Residential	Representative of: The Kings Arms, 593 Bath Road 599 to 603 Bath Road
7	Longford	Offices (non-residential)	Representative of: Knightsbridge House, 581 Bath Road Highbridge House, 579A Bath Road Moorbridge House, 579 Bath Road Stonebridge House, 577A Bath Road Middlebridge House, 577 Bath Road
8	Longford	Residential	Representative of: Kings Court, 575 Bath Road Blacksmiths Court, 567 Bath Road 563 Bath Road
9	Longford	Residential	Representative of: 535 to 561 Bath Road
10	Longford	Residential	Representative of: 533 Bath Road
11	Longford	Residential	Representative of: 470 to 476 Bath Road
12	Longford	Nursery (non-residential)	Representative of: Littlebrook Nursery, 501 Bath Road
13	Longford	Residential	Representative of: 493 Bath Road Margaret Cassidy House, 485 Bath Road
14	Longford	Hotel (non-residential)	Representative of: Thistle London Heathrow Terminal 5 (west façade)
15	Longford	Hotel (non-residential)	Representative of: Thistle London Heathrow Terminal 5 (south façade)

1.5.4 Residential receptors 134 to 143 (refer to **Appendix 7.6: Ground Noise**) have been considered in the assessment of 09R/27L “redundant pavement removal works”.

2. Construction noise modelling methodology

2.1 Noise modelling software

2.1.1 The Softnoise Predictor/LimA® noise modelling software has been used to calculate noise levels generated by the construction phase. The software implements the calculation methodologies set out in BS 5228-1[1] for point (static and quasi-static) and line (moving) noise sources.

2.1.2 **Section 2.2** describes the inputs to the construction noise model.

2.2 Model inputs

2.2.1 Construction methodologies including inventories of plant / equipment, their location and their percentage on-times have been determined through discussions with the construction planner for the Proposed Development.

2.2.2 This information has been used to determine activity noise levels for different construction activities with reference to source sound level data using the data tables set out in Annex C of BS 5228-1. The information has then been further considered having regards to the project programme and construction working hours to develop a thorough understanding of likely construction noise levels throughout the duration of the works.

2.2.3 The programme for the two distinct elements of the construction works is described in **Table A7.4.3.**

Table A7.4.3 Construction programme and activities

Construction Phase	Period	Approximate Duration (weeks)
Noise barrier construction along Wright Way	Night-time only	9
Noise barrier construction around Terminal 5 Pod Parking	Daytime only	10
09L airfield infrastructure Phase 1	Night-time only	21
09L airfield infrastructure Phase 2	Night-time only	31
09L airfield infrastructure Phase 3	Daytime and Night-time	28
09L airfield infrastructure On-Alternation	Night-time only, two weekends on, two weekends off coinciding with night-time runway alternation	60
09R/27L redundant pavement removal	Night-time only	20

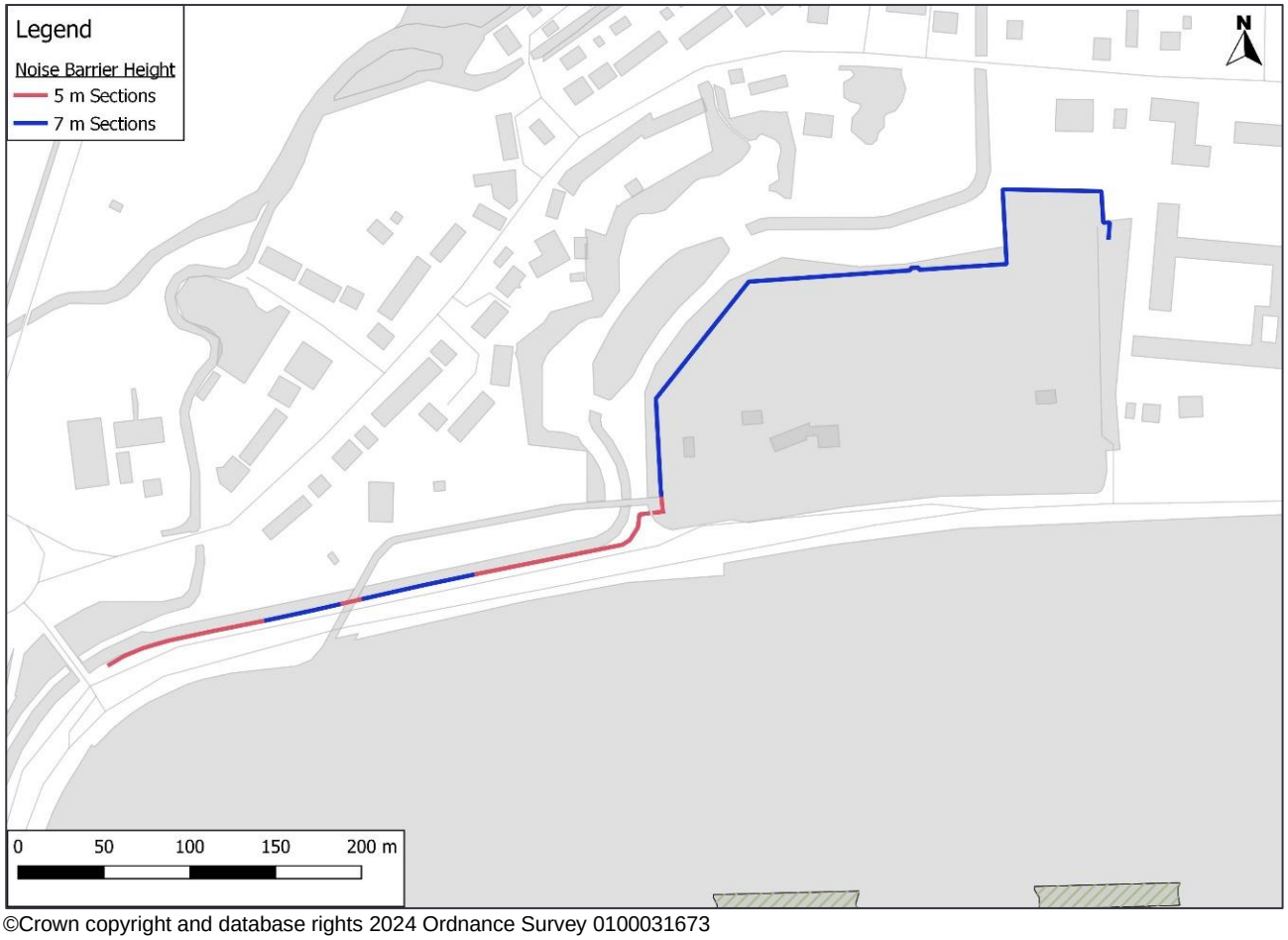
2.2.4 All construction works, except for works on-alternation, will occur sequentially with the noise barrier being completed in advance of the 09L airfield infrastructure construction works commencing. On-alternation works will occur throughout Phases 1 to 3 but will occur on weekends, whereas Phases 1 to 3 are weekday.

2.2.5 Daytime activities will occur between 07:30 and 17:30 (10 hours) and night-time activities will occur between 23:00 and 04:30 (5.5 hours).

Noise barrier construction works

2.2.6 The noise barrier construction works will be carried out in two parts: the section along Wright Way and the section around the Terminal 5 Pod Parking as shown in **Graphic A7.4.1**. The noise barrier, including proposed heights is shown in **Graphic A7.4.6**.

Graphic A7.4.6 Noise barrier alignment and heights



2.2.7 Wright Way noise barrier activities will be carried out at night-time only due to the requirement for lane closures and traffic management on Wright Way. Once the Wright Way construction works are fully completed, the Pod Parking noise barrier activities will then be carried out during the daytime.

2.2.8 During each shift, a section which is approximately 30 m in length will be worked. The construction activities have been modelled as point sources at 3 m centres along the noise

barrier alignment. Therefore, each group of 10 point sources represents one shift. The total sound power level for the relevant activity has been divided equally between the 10 points.

2.2.9 Based on the proposed construction methodology the assessment assumes three activities which will be completed in successive passes along the relevant extent of the noise barrier:

- Activity 1: Removal of old barrier structures and site clearance;
- Activity 2: 'Noise barrier' foundations and installation of steelwork; and
- Activity 3: Installation of noise barrier panels.

2.2.10 It has been assumed in this assessment that the noise barrier works will progress from west to east along the proposed alignment for all activities on both sections.

2.2.11 **Table A7.4.4** sets out the plant list and the activities for which they will be required.

Table A7.4.4 Plant list for noise barrier construction works

Plant Item	Activity		
	1	2	3
Transit tipper[6]	✓	✓	✓
Small vans[6]	✓	✓	✓
Low loader[6]	✓	✓	✓
Traffic management lorry (7.5t)[6]	✓	✓	✓
Traffic management transit van[6]	✓	✓	✓
Tower lights[7]	✓	✓	✓
7.5t HIAB lorry	✓	✓	✓
14t rubber tracked 360 excavator	-	✓	-
3t rubber tracked 360 excavator	✓	-	✓
Auger rig to suit excavator	-	✓	-
9t articulated dump truck	✓	✓	✓
Leibherr 8m^3 concrete truck mixer	-	✓	-
Poker vibrator	-	✓	-
Handtools	✓	✓	✓
Mobile Elevating Work Platform (MEWP)	✓	-	✓

[6] Vehicle typically only required at start/end of shift or phase of works. As the vehicle will predominantly operate on the public highway, activity noise associated with these vehicles has not been included in the noise model.
[7] Tower lights are only required for night-time shifts during Wright Way construction works. Tower lights will be electric and are therefore a negligible source of noise which have not been included in the noise model.

2.2.12 **Table A7.4.5** sets out the sound power levels for each activity including number, on-time of plant and source of data from BS 5228-1 Annex C.

Table A7.4.5 Activity sound power levels for noise barrier works

Plant Item	BS 5228-1 Table Ref.	No. of Plant	% On-time in Shift	Sound Power Level L_{WA} (dB)
Activity 1 – Removal of old barrier and site clearance				**105**
7.5t HIAB lorry	C.4.53	1	10%	95
3t rubber tracked 360 excavator	C.3.20	1	75%	94
9t articulated dump truck	C.4.4	1	50%	101
Handtools	C.4.95	1	75%	100
MEWP	C.4.57	1	75%	94
Activity 2 – Noise barrier foundations and installation of steelwork				**109**
7.5t HIAB lorry	C.4.53	1	10%	95
14t rubber tracked 360 excavator	C.2.7	1	50%	95
Auger rig to suit excavator	C.3.17	1	50%	101
9t articulated dump truck	C.4.4	1	50%	101
Leibherr 8m^3 concrete truck mixer	C.4.21	1	50%	102
Poker vibrator	C.4.34	1	50%	94
Handtools	C.4.95	1	50%	98
Activity 3 – Install noise barrier panels				**105**
7.5t HIAB lorry	C.4.53	1	10%	95
3t rubber tracked 360 excavator	C.3.20	1	75%	94
9t articulated dump truck	C.4.4	1	50%	101
Handtools	C.4.95	1	75%	100
MEWP	C.4.57	1	75%	94

09L airfield infrastructure construction works

2.2.13 The 09L airfield infrastructure construction works will be carried out in three phases in addition to on-alternation works which straddle all three phases to varying degrees. The Phase 1 works are located in proximity to Terminal 5, in excess of 600 metres to the south of NSRs in Longford. Phase 2 and 3 works move progressively closer to Longford with on-alternation works being the closest to Longford, albeit still in excess of 300 metres from NSRs.

2.2.14 Each phase will last for a number of weeks; however, only relatively small (approximately 50 m^2) areas will be worked per shift. Therefore, to obtain noise levels which are representative of the phase as a whole, 10 point sources have been modelled across the extent of each phase. The total sound power level for the relevant activity has been divided equally between the 10 points.

2.2.15 During the 09L airfield infrastructure construction works, a number of vehicles will need to travel back and forth across the airfield moving materials around and removing any spoil. Sound power levels per linear metre (L_W/m) have been calculated assuming a single vehicle moving between the worksite and the airfield access adjacent to Terminal 5. The sound power levels have then been corrected assuming that each vehicle will spend 10 minutes at each end their journey between the worksite and the site compound / security control post 18. Finally, the sound power level per linear metre has been corrected for the number of vehicles and a further on-time correction as specified within the plant lists below.

2.2.16 The construction methodology assumes seven key activity groups:

- Activity A: Breakout of existing surface/groundworks;
- Activity B: Cabling, drainage, etc. works;
- Activity C: Laying hardcore;
- Activity D: Concreting;
- Activity E: Asphalt surfacing (on alternation works only);
- Activity F: Installing lighting, finishing concrete; and
- Activity G: Line marking.

2.2.17 During many shifts, particularly during the first half of each phase, two or more activities will occur simultaneously. For example, Activity B (cabling) would occur at a location on the night immediately following Activity A (groundworks) whilst Activity A is occurring in the next location, and whilst Activity A is occurring in one location, spoil is being moved to an earlier location to backfill trenches as part of Activity C.

2.2.18 **Table A7.4.6** sets out the plant list and the activities for which they will be required.

Table A7.4.6 Plant list for 09L airfield infrastructure construction works

Plant Item	Activity						
	A	B	C	D	E	F	G
Transit tipper[8]	✓	✓	✓	✓	✓	✓	✓
Small vans[8]	✓	✓	✓	✓	✓	✓	✓
Long wheelbase transit vans[8]	✓	-	-	-	-	✓	-
20t 8-wheeled lorries[9]	✓	✓	✓	✓	✓	-	-
Line marking lorry[9]	-	-	-	-	-	-	✓
Cable drum trailer[10]	-	✓	-	-	-	-	-
Cable pulling winch trailer[10]	-	✓	-	-	-	-	-
Tower lights[11]	✓	✓	✓	✓	✓	✓	✓
Bomag 120 roller	-	-	✓	✓	✓	-	-
20t tracked excavator	✓	✓	✓	✓	✓	-	-
Hydraulic breakers to suit excavators	✓	-	-	-	-	-	-
Bomag 14t single drum roller	-	-	-	✓	✓	-	-
9t articulated dump truck	✓	✓	✓	-	-	-	-
900 mm road saw	✓	-	-	-	-	✓	-
Trailer mounted diamond coring rig	✓	-	-	-	-	✓	-
Volumetric concrete mixer truck	-	✓	-	✓	-	-	-
Leibherr 8m^3 concrete truck mixer	-	-	-	✓	✓	-	-
Vogele super 1700 paving machine	-	-	-	✓	✓	-	-
Gomaco Commander 3 slip form paver	-	-	-	✓	-	-	-
14t wheeled excavator	✓	✓	✓	✓	✓	-	-

[8] Vehicles typically only required at start/end of shift or phase of works. Where vehicles travel across the airfield, these have been included in the noise model as moving point sources. Vehicle movements on public roads have not been modelled.
[9] Vehicle will travel across the airfield and has been included in the noise model as a moving point source. Vehicle movements on public roads have not been modelled.
[10] Plant item generates negligible amounts of noise and has been excluded from the noise modelling.
[11] Tower lights are only required for night-time shifts. Tower lights will be electric and are therefore a negligible source of noise which have not been included in the noise model.

2.2.19 **Table A7.4.7** sets out the sound power levels for each activity including number, on-time of plant and source of data from BS 5228-1 Annex C.

Table A7.4.7 Activity sound power levels for 09L airfield infrastructure construction works

Plant Item	BS 5228-1 Table Ref.	No. of Plant	% On-time in Shift	Sound Power Level L_{WA} (dB)	Sound Power Level per Meter L_{WA}/m (dB)
Activity A – Breakout of existing surface/groundworks				**121**	**77**
20t tracked excavator	C.2.3	1	75%	105	-
Hydraulic breakers to suit excavators	C.1.2	1	50%	117	-
9t articulated dump truck	C.4.4	2	25%	104	-
900 mm road saw	C.5.36	2	25%	112	-
Trailer mounted diamond coring rig	C.4.69	2	25%	110	-
14t wheeled excavator	C.4.56	1	50%	108	-
Transit tipper	C.8.20	1	10%	-	60
Small vans	C.8.20	5	10%	-	67
Long wheelbase transit vans	C.8.20	2	10%	-	63
20t 8-wheeled lorries	Av. C.11.4-C.11.20	2	100%	-	77
Activity B – Cabling, Drainage, etc. Works				**112**	**75**
20t tracked excavator	C.2.3	1	75%	105	-
9t articulated dump truck	C.4.4	2	25%	101	-
Volumetric concrete mixer truck	C.4.20	1	100%	108	-
14t wheeled excavator	C.4.56	1	50%	108	-
Transit tipper	C.8.20	1	20%	-	63
Small vans	C.8.20	5	10%	-	67
20t 8-wheeled lorries	Av. C.11.4-C.11.20	2	50%	-	74
Activity C – Laying hardcore				**111**	**77**
Bomag 120 roller	C.2.40	2	75%	103	-
20t tracked excavator	C.2.3	1	75%	105	-
9t articulated dump truck	C.4.4	2	25%	101	-
14t wheeled excavator	C.4.56	1	50%	108	-
Transit tipper	C.8.20	1	10%	-	60

Plant Item	BS 5228-1 Table Ref.	No. of Plant	% On-time in Shift	Sound Power Level L_{WA} (dB)	Sound Power Level per Meter L_{WA}/m (dB)
Small vans	C.8.20	5	10%	-	67
20t 8-wheeled lorries	Av. C.11.4-C.11.20	2	100%	-	77
Activity D – Concreting				**116**	**79**
Bomag 120 roller	C.2.40	2	50%	101	-
20t tracked excavator	C.2.3	1	75%	105	-
Bomag 14t single drum roller	C.2.37	1	50%	105	-
Volumetric concrete mixer truck	C.4.20	1	100%	108	-
Leibherr 8m^3 concrete truck mixer	C.4.21	4	100%	111	-
Vogele super 1700 paving machine	C.5.31	1	50%	102	-
Gomaco Commander 3 slip form paver	C.5.30	1	50%	101	-
14t wheeled excavator	C.4.56	1	50%	108	-
Transit tipper	C.8.20	2	10%	-	63
Small vans	C.8.20	5	10%	-	67
20t 8-wheeled lorries	Av. C.11.4-C.11.20	3	100%	-	78
Activity E – Surfacing				**115**	**79**
Bomag 120 roller	C.2.40	2	50%	101	-
20t tracked excavator	C.2.3	1	75%	105	-
Bomag 14t single drum roller	C.2.37	1	50%	105	-
Leibherr 8m^3 concrete truck mixer	C.4.21	4	100%	111	-
Vogele super 1700 paving machine	C.5.31	1	50%	102	-
14t wheeled excavator	C.4.56	1	50%	108	-
Transit tipper	C.8.20	2	10%	-	63
Small vans	C.8.20	5	10%	-	67
20t 8-wheeled lorries	Av. C.11.4-C.11.20	3	100%	-	78

Plant Item	BS 5228-1 Table Ref.	No. of Plant	% On-time in Shift	Sound Power Level L_{WA} (dB)	Sound Power Level per Meter L_{WA}/m (dB)
Activity F – Lighting Installation and Concrete Finishing				**117**	**66**
900 mm road saw	C.5.36	2	50%	115	-
Trailer mounted diamond coring rig	C.4.69	2	50%	113	-
Transit tipper	C.8.20	1	10%	-	60
Small vans	C.8.20	1	10%	-	60
Long wheelbase transit vans	C.8.20	2	10%	-	63
Activity G – Line Marking				**-**	**74**
Transit tipper	C.8.20	1	10%	-	60
Small vans	C.8.20	1	10%	-	60
Line marking lorry	Av. C.11.4-C.11.20	1	100%	-	74

09R/27L redundant pavement removal construction works

2.2.20 For the 09R/27L redundant pavement removal works, only Activity A has been considered. Pavement will be broken out, removed and the area reinstated as airfield grassland.

Noise model parameters

2.2.21 **Table A7.4.8** sets out the parameters used for the noise modelling of construction noise.

Table A7.4.8 Noise model parameters

Modelling parameter	Input parameter
Calculation Methodology	BS 5228-1:2009 +A1:2014 Code of practice for noise and vibration control on construction and open sites: Part 1 – Noise
Topography	Obtained from Environment Agency's National LiDAR Programme
Order of reflections	n/a
Ground Absorption, G	0 – hard ground assumed throughout
Temperature / Humidity	n/a
Adverse propagation conditions	n/a
Heights of existing buildings and structures	OS features draped onto LiDAR
Noise Barrier (existing)	n/a
Noise Barrier (proposed)	The noise barrier alignment has been taken from Jacobs drawing – TEMP-XX-GA-200-000001 v1.4 Proposed Noise Barrier General Arrangement dated 21 May 2024 as presented in **Graphic A7.4.6**.
Sources Heights	All point sources are modelled at 1.5 m above ground level. All line sources are modelled at 0.75 m above ground level.
Noise Sensitive Receivers	For NSRs 4 to 12, 14 to 15 and 134 to 143, receivers are modelled at 4.0 m (first floor, typically representing bedrooms in traditional two storey dwellings). At NSR 13, the receivers are modelled at: • 1.5 m (13_A: ground floor flats) • 4.0 m (13_B: first floor flats) • 6.5 m (13_C: second floor flats) All receivers are modelled at 1 m from the relevant building façade.

2.3 Model output

2.3.1 Noise modelling outputs have been provided as façade noise levels at the NSR points, including those shown in **Graphic A7.4.5**, for the daytime construction period (07:30 to 17:30) and night-time construction period (23:00 to 04:30) where applicable.