

November 2023

# London Luton Airport Expansion

Planning Inspectorate Scheme Ref: TR020001

Volume 8 Additional Submissions (Examination)

**8.92 Applicant's response to Issue Specific Hearing 3**

**Action 1: Assessment of night-time construction noise**

Infrastructure Planning (Examination Procedure) Rules 2010

Application Document Ref: TR020001/APP/8.92

**The Planning Act 2008**

**The Infrastructure Planning (Examination Procedure) Rules 2010**

**London Luton Airport Expansion Development Consent  
Order 202x**

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**8.92 APPLICANT'S RESPONSE TO ISSUE SPECIFIC HEARING  
3 ACTION 1: ASSESSMENT OF NIGHT-TIME CONSTRUCTION  
NOISE**

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<b>Deadline:</b>	Deadline 4
<b>Planning Inspectorate Scheme Reference:</b>	TR020001
<b>Document Reference:</b>	TR020001/APP/8.92
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<b>Version</b>	<b>Date</b>	<b>Status of Version</b>
Issue 1	November 2023	Additional Submission - Deadline 4

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## 1 INTRODUCTION

1.1.1 This paper provides supplementary information in response to the Examining Authority Action 1 from Issue Specific Hearing 3 [EV8-008]:

**Provide a quantitative assessment of night-time construction noise impacts based on the proposed night-time works.**

1.1.2 This document provides identification of potential night-time construction activities, a quantitative assessment of night-time works and a summary of actions taken to reduce construction noise impacts at night. In addition, to the assessment of night-time construction activities, this document includes an assessment of noise of any works outside of the core working hours, but not night-time, i.e. evening and daytime weekend working. Furthermore, vibration generated due to potential works outside of the core working hours is also considered.

## 2 OUT OF CORE HOURS CONSTRUCTION WORKS

2.1.1 Section 5 of the **Code of Construction Practice (CoCP)** [TR020001/APP/5.02], updated at Deadline 4, notes the following with regards to work outside of the core hours of 08:00 to 18:00 on weekdays (excluding bank holidays) and from 08:00 to 13:00 on Saturdays:

*“To ensure the safe operation of the airport, construction personnel safety, or for reasons of engineering practicability, some activities will need to be conducted outside of the core working hours defined above. In some situations, this may result in a need to undertake works on a 24 hour/seven days per week basis.*

*When planning for the need of additional working hours, the following hierarchy of time periods, in order of preference, shall be considered:*

- a. Weekday evenings 18:00 – 22:00 and weekday morning 07:00 – 08:00;*
- b. Saturday afternoons 13:00 – 18:00;*
- c. Sunday daytime 10:00 – 18:00;*
- d. Saturday / Sunday evenings 18:00 – 23:00; and*
- e. Night-time works 23:00 – 07:00.”*

2.1.2 Taking the above into consideration, a summary of works that may be required outside of core working hours and which have the potential to result in noise impacts are presented in **Table 2-1**. In some cases construction activities commencing during core working hours may extend into evening and night-time hours for reasons of engineering practicability or because they involve activities that cannot be safely stopped once started. Such activities may include but are not limited to major concrete pours. As there is limited information on these potential activities, it is not feasible to undertake a quantitative assessment. However, as noted in paragraph 14.2.10 of the CoCP, there is a requirement to agree with the relevant local authority the approach to Section 61 consents

where activities that were originally planned for core hours have to be extended into additional hours.

Table 2-1: Works that are likely to be required outside of core working hours

Assessment Phase	Works	Reason for Extended Work Hours
Phase 1	M1 Junction 10 works	Construction personnel safety
	Terminal 1 enhancements	Safe operation of the airport and construction personnel safety
	Terminal 1 pier	Safe operation of the airport and construction personnel safety
	New taxiways	Safe operation of the airport and construction personnel safety
	Earthworks	Engineering practicability/ safe operation of the airport and construction personnel safety
Phase 2a	Luton DART extension	Safe operation of the airport and construction personnel safety
	New taxiways	Safe operation of the airport and construction personnel safety
	Earthworks	Engineering practicability/ safe operation of the airport and construction personnel safety
	Service installation and drainage	Safe operation of the airport and construction personnel safety
	M1 Junction 10 works	Construction personnel safety
Phase 2b	New taxiways and fire training ground access roads	Safe operation of the airport and construction personnel safety
	Earthworks	Engineering practicability/ safe operation of the airport and construction personnel safety
	M1 Junction 10 works	Construction personnel safety

### 3 DESCRIPTION OF WORKS

3.1.1 Annotated figures showing the locations of runway, taxiway and terminal infrastructure works that are likely to be required at night due to the proximity to operational aprons or the runway are presented in **Appendix A**.

3.1.2 Figures showing earthworks locations are presented in the **Construction Method Statement and Programme Report [AS-082]** as follows:

- a. Inset 4.6 – Phase 1 cut areas.

- b. Inset 4.7 – Phase 1 fill areas.
- c. Inset 5.3 – Phase 2a cut areas.
- d. Inset 4.7 – Phase 2a fill areas.
- e. Inset 4.6 – Phase 2b cut areas.
- f. Inset 4.7 – Phase 2b fill areas.

3.1.3 The assessment of construction noise in **Chapter 16** of the **Environmental Statement (ES) [REP1-003]** assumed that works were taking place at the closest location to sensitive receptors as a reasonable worst-case. To provide a more realistic prediction of night-time earthworks noise, it has been assumed that earthworks at night would be undertaken in less sensitive areas, as would be expected to be applied in the Section 61 consent, and a commitment has been made in section 5 of the **CoCP [TR020001/APP/5.02]** to secure this assumption. The area where earthworks can occur at night is illustrated in Appendix A of the **CoCP [TR020001/APP/5.02]**.

3.1.4 M1 Junction 10 works are described in the **Construction Method Statement and Programme Report [AS-082]** as follows:

- a. Phase 1 – the existing Junction 10 is to be upgraded with widening of the northbound offslip to provide a third lane. The widening is accommodated in the existing verge. Works also include the widening of the western circulatory carriageway to provide four circulating lanes. The exit from the roundabout on to the A1081 is also amended to allow for a third lane, the works being accommodated within the existing verge.
- b. Phase 2a - the existing Junction 10 is to be upgraded with widening of the junction and its connection to the A1081 westbound carriageway and the southbound slip road.
- c. Phase 2b – the works in assessment Phase 2b include the widening of the western circulatory carriageway to provide five lanes. The realignment of the A1081 exit to enable three lanes to exit roundabout onto A1081, with the segregated left turn lane removed and junction of southbound off-slip signalised.

## 4 CONSTRUCTION ASSESSMENT CRITERIA

4.1.1 Criteria for assessing construction noise are presented in **Table 4-1**. These criteria are reproduced from **Table 16.11 of Chapter 16 [REP1-003]**. Criteria are defined in terms of the:

- a. Lowest Observed Adverse Effect Level (LOAEL);
- b. Significant Observed Adverse Effect Level (SOAEL); and
- c. Unacceptable Observed Adverse Effect Level (UAEL).

4.1.2 Whilst noise during core work periods is assessed based on noise emissions over the entire period, more sensitive periods are assessed using shortened assessment periods of 4 hours for Saturday afternoons and 1 hour for Sundays and night-time). Consequently, 'T' has been defined for each time period.

Table 4-1: Thresholds of potential effects of construction noise at residential buildings

Time Period	Threshold Value ( $L_{Aeq,T}$ dB) (façade)		
	LOAEL	SOAEL	UAEL
Day (07:00 – 19:00, T=12hr) Saturday (07:00 – 13:00, T=6hr)	65	75	85
Evening (19.00 – 23.00, T=4hr) Weekends (13.00–23.00 Saturdays, T=4hr, and 07.00–23.00 Sundays, T=1h)	55	65	75
Night (23.00 – 07.00, T=1h)	45	55	65

4.1.3 Although a significant effect due to construction activities may be determined through an assessment based on exceedances of the defined SOAELs for construction noise, consideration of the significance of the effect for temporary construction activities exceeding the LOAEL is undertaken through qualitative consideration of the following:

- a. duration of activities;
- b. frequency of events;
- c. number of receptors; and
- d. sensitivity of receptors.

## 5 ADDITIONAL WORKING HOURS ASSUMPTIONS

5.1.1 Given the increased sensitivity of night-time works, the controls in the CoCP [TR020001/APP/5.02], and the shortened assessment period (as defined in paragraph 4.1.2), assumptions representing a reasonable worst-case approach for evening, weekend daytime and night-time assessment would be different to those used for a core working hours assessment.

5.1.2 Assumptions that were applied in additional hours noise predictions are as follows:

- a. Construction plant lists in Table 5.3 of **Appendix 16.1 of the ES [AS-096]** have been reviewed and amended where it is clear that types of plant would not be used simultaneously e.g. for earthworks, soil stabilisers and rollers would not be used at the same time and area as excavators and bulldozers.
- b. 'Percentage on times' have been reviewed to provide a more reasonable assumption e.g. dump truck and HGV activity have been reduced to avoid double counting of heavy spoil moving vehicles that are accounted for in the noise model on internal haul routes.
- c. Deliveries of construction support equipment have been limited to daytime only.

- d. Generators have been included to power lighting that would be required for night-time works.

5.1.3 Details of construction plant for each identified activity are presented in **Appendix B**.

## **6 ASSESSMENT PHASE 1 EXTENDED CONSTRUCTION WORKS**

6.1.1 Results of predictions of extended working activities during assessment Phase 1 are presented in Table 6-1.



Table 6-1: Assessment Phase 1 Extended Construction Work Hours Assessment per Activity

Activity	Highest Predicted Noise Level $L_{Aeq,T}$ dB	Evening (19.00 – 23.00) Weekends (13.00–23.00 Saturdays and 07.00– 23.00 Sundays)		Night (23.00 – 07.00)	
		Number of Properties Between LOAEL and SOAEL	Number of Properties Exceeding SOAEL	Number of Properties Between LOAEL and SOAEL	Number of Properties Exceeding SOAEL
Terminal 1 enhancements	46	0	0	1	0
Terminal 1 pier	46	0	0	2	0
New taxiways	45	0	0	1	0
Earthworks – cut	46	0	0	4	0
Earthworks – fill	45	0	0	2	0
M1 Junction 10 works	52	0	0	54	0

6.1.2 All assessment Phase 1 works that may extend into the evening and weekend periods are predicted to result in noise levels below the LOAEL at all sensitive receptors. For all proposed night-time works the noise levels are less than SOAEL at all receptors.

6.1.3 For potential night-time works on Terminal 1 enhancements, Terminal 1 pier and new taxiways; four receptors are predicted to experience noise levels exceeding the night-time LOAEL. One receptor is located in the Someries area to the south of the airport and three receptors are located in the Eaton Green Road area to the north of the airport. For earthworks activities, it is predicted that a maximum of four receptors in the Eaton Green Road area to the north of the airport would experience noise levels exceeding the night-time LOAEL. For M1 Junction 10 works, it is predicted that 54 receptors would experience noise levels exceeding the night-time LOAEL. These receptors are located to the west of the M1 Junction 10 works. Further details on the predicted construction noise levels and the current ambient noise levels are presented in **Table 6-2**.

Table 6-2: Phase 1 Receptor Night-time Construction Noise Effects

Receptor area	Number of receptors affected	Baseline noise level, $dBL_{Aeq,8h}$ [A]	Predicted night-time construction noise level [B]	Difference dB	
				[B] – LOAEL	[B] – [A]
Someries	1	55 <sup>1</sup>	46 (terminal 1 works)	1	- 9
Eaton Green Road	3	60 <sup>2</sup>	46 (terminal 1 works)	1	-14
Eaton Green Road	4	60 <sup>3</sup>	46 (Earthworks)	1	-14
Junction 10 M1	54	60-65 <sup>4</sup>	52 (roadworks)	7	-8

6.1.4 At the Someries and Eaton Green Road affected receptors, considering that the construction and earthworks noise levels are less than the current baseline ambient noise levels, the small exceedance of the night-time LOAEL, and the small number of receptors affected, no likely significant effects are identified from these works.

6.1.5 At the receptors near the M1 Junction 10 works, considering that the construction noise levels are more than 8dB below the predicted current baseline road traffic noise levels, no likely significant effects are identified from these works.

## 7 ASSESSMENT PHASE 2A EXTENDED CONSTRUCTION WORKS

7.1.1 Results of predictions of extended working activities during assessment Phase 2a are presented in Table 7-1.

<sup>1</sup> Table 4.5 of **Appendix 16.1 of the ES [AS-096]** provides  $L_{Aeq,8h}$  of 55 dB  $L_{Aeq,8h}$  at ML1, which is considered representative of receptors to the south of the airport.

<sup>2</sup> Table 4.5 of **Appendix 16.1 of the ES [AS-096]** provides  $L_{Aeq,8h}$  of 60 dB  $L_{Aeq,8h}$  at ML15, which is considered representative of receptors to the north of the airport.

<sup>3</sup> Table 4.5 of **Appendix 16.1 of the ES [AS-096]** provides  $L_{Aeq,8h}$  of 60 dB  $L_{Aeq,8h}$  at ML15, which is considered representative of receptors to the north of the airport.

<sup>4</sup> From Figure 16.12 of the **ES [AS-105]**.

Table 7-1: Assessment Phase 2a Extended Construction Work Hours Assessment per Activity

Activity	Highest Predicted Noise Level $L_{Aeq,T}$ dB	Evening (19.00 – 23.00) Weekends (13.00–23.00 Saturdays and 07.00–23.00 Sundays)		Night (23.00 – 07.00)	
		Number of Properties Between LOAEL and SOAEL	Number of Properties Exceeding SOAEL	Number of Properties Between LOAEL and SOAEL	Number of Properties Exceeding SOAEL
Luton DART extension	46	0	0	18	0
New taxiways	46	0	0	1	0
Earthworks – cut	51	0	0	61	0
Earthworks – fill	51	0	0	43	0
Service installation and drainage	40	0	0	0	0
M1 Junction 10	45	0	0	0	0

7.1.2 All assessment Phase 2a works that may extend into the evening and weekend periods are predicted to result in noise levels below the LOAEL at all sensitive receptors. For all proposed night-time works the noise levels are less than SOAEL at all receptors.

7.1.3 For potential night-time works on new taxiways, service installation and drainage and M1 Junction 10 works; one receptor in the Someries area to the south of the airport is predicted to experience noise levels exceeding the night-time LOAEL. For the Luton DART extension works, 18 receptors in the Eaton Green Road area to the north of the works are predicted to experience noise levels exceed the LOAEL. For earthworks activities, it is predicted that up to 61 receptors would experience noise levels exceeding the night-time LOAEL. These receptors are located in the Eaton Green Road area to the north of the works. Five receptors at the corner of Eaton Green Road and Colwell Rise are predicted to experience noise levels exceeding the LOAEL during both earthworks and DART extension works.

7.1.4 For earthworks activities, it is predicted that up to 61 receptors would experience noise levels exceeding the night-time LOAEL. These receptors are located in the Eaton Green Road area to the north of the works. Further details on the predicted construction noise levels and the current ambient noise levels are presented in Table 7-2.

Table 7-2: Phase 2a Receptor Night-time Construction Noise Effects

Receptor area	Number of receptors affected	Baseline noise level, $L_{Aeq,8h}$ [A]	Predicted night-time construction noise level [B]	Difference dB	
				[B] – LOAEL	[B] – [A]
Someries	1	55 <sup>5</sup>	46 (Taxiways)	1	-9
Eaton Green Road	74	60 <sup>6</sup>	46 (DART extension)	1	-14
			51 (Earthworks)	6	-9

7.1.5 At the Someries affected receptor, considering that the construction noise levels are less than the current baseline ambient noise levels, the small exceedance of the night-time LOAEL, and the small number of receptors affected, no likely significant effects are identified from these works.

7.1.6 At the Eaton Green Road affected receptors, considering that the construction noise levels are at least 9dB below the predicted current baseline ambient noise levels, no likely significant effects are identified from these works.

## 8 ASSESSMENT PHASE 2B EXTENDED CONSTRUCTION WORKS

8.1.1 Results of predictions of extended working activities during Phase 2a are presented in Table 8-1.

<sup>5</sup> Table 4.5 of **Appendix 16.1 of the ES [AS-096]** provides  $L_{Aeq,8h}$  of 55 dB  $L_{Aeq,8h}$  at ML1, which is considered representative of receptors to the south of the airport.

<sup>6</sup> Table 4.5 of **Appendix 16.1 of the ES [AS-096]** provides  $L_{Aeq,8h}$  of 60 dB  $L_{Aeq,8h}$  at ML15, which is considered representative of receptors to the north of the airport.

Table 8-1: Assessment Phase 2b Extended Construction Work Hours Assessment per Activity

Activity	Highest Predicted Noise Level $L_{Aeq,T}$ dB	Evening (19.00 – 23.00) Weekends (13.00–23.00 Saturdays and 07.00–23.00 Sundays)		Night (23.00 – 07.00)	
		Number of Properties Between LOAEL and SOAEL	Number of Properties Exceeding SOAEL	Number of Properties Between LOAEL and SOAEL	Number of Properties Exceeding SOAEL
New taxiways and fire training ground access roads	49	0	0	3	0
Earthworks – cut	52	0	0	55	1
Earthworks – fill	52	0	0	48	1
M1 Junction 10	51	0	0	54	0

8.1.2 All assessment Phase 2b works that may extend into the evening and weekend periods are predicted to result in noise levels below the LOAEL at all sensitive receptors. For all proposed night-time works the noise levels are less than SOAEL at all receptors.

8.1.3 For potential night-time works on new taxiways and fire training ground access roads, three receptors are predicted to experience noise levels exceeding the night-time LOAEL. Two receptors are located at Dane street to the south of the airport and one at Winch Hill to the east. For earthworks activities, it is predicted that up to 55 receptors would experience noise levels exceeding the night-time LOAEL. These receptors are located in the Eaton Green Road area to the north of the works with one receptor located to the east of works at Winch Hill. The same receptor at Winch Hill is predicted to experience noise levels exceeding the LOAEL during taxiway works and earthworks. For M1 Junction 10 works, it is predicted that 54 receptors would experience noise levels exceeding the night-time LOAEL. These receptors are located to the west of the M1 Junction 10 works.

8.1.4 Further details on the predicted construction noise levels and the current ambient noise levels are presented in Table 8-2.

Table 8-2: Phase 2b Receptor Night-time Construction Noise Effects

Receptor area	Number of receptors affected	Baseline noise level, dBLAeq,8h [A]	Predicted night-time construction noise level [B]	Difference dB	
				[B] – LOAEL	[B] – [A]
Dane Street	2	55 <sup>7</sup>	49 (Taxiway)	4	-6
Winch Hill	1	61 <sup>8</sup>	49 (Taxiway)	4	-12
			52 (Earthworks)	7	-9
Eaton Green Road	55	60 <sup>9</sup>	52 (Earthworks)	7	-8
Junction 10 M1	54	60-65 <sup>10</sup>	51	6	-9

- 8.1.5 At the Dane Street affected receptors, considering that the construction noise levels are less than the current baseline ambient noise levels, and the small number of receptors affected, no likely significant effects are identified from these works.
- 8.1.6 At the Winch Hill affected receptors, considering that the construction noise levels are less than the current baseline ambient noise levels, and the small number of receptors affected, no likely significant effects are identified from these works.
- 8.1.7 At the Eaton Green Road affected receptors, considering that the construction noise levels are at least 9dB below the predicted current baseline ambient noise levels, no likely significant effects are identified from these works.
- 8.1.8 At the receptors near the M1 Junction 10 works, considering that the construction noise levels are more than 9dB below the predicted current baseline road traffic noise levels, no likely significant effects are identified from these works.

## 9 CONSTRUCTION VIBRATION

- 9.1.1 As the human response to vibration is not dependent on day or night periods, construction vibration criteria for night-time are unchanged from those presented in Table 16.12 of **Chapter 16 of the ES [REP1-003]**. No significant effects are identified in the assessment of construction vibration presented in **Chapter 16 of the ES [REP1-003]** and this conclusion can be applied to night-time activities.

<sup>7</sup> Table 4.5 of **Appendix 16.1 of the ES [AS-096]** provides an L<sub>Aeq,8h</sub> of 55 dB at ML1, which is considered representative of receptors to the south of the airport.

<sup>8</sup> Table 4.5 of **Appendix 16.1 of the ES [AS-096]** provides L<sub>Aeq,8h</sub> of 61 dB L<sub>Aeq,8h</sub> at ML2, which is considered representative of receptors to the east of the airport.

<sup>9</sup> Table 4.5 of **Appendix 16.1 of the ES [AS-096]** provides L<sub>Aeq,8h</sub> of 60 dB L<sub>Aeq,8h</sub> at ML1, which is considered representative of receptors to the north of the airport.

<sup>10</sup> From **Figure 16.12 of the ES [AS-105]**

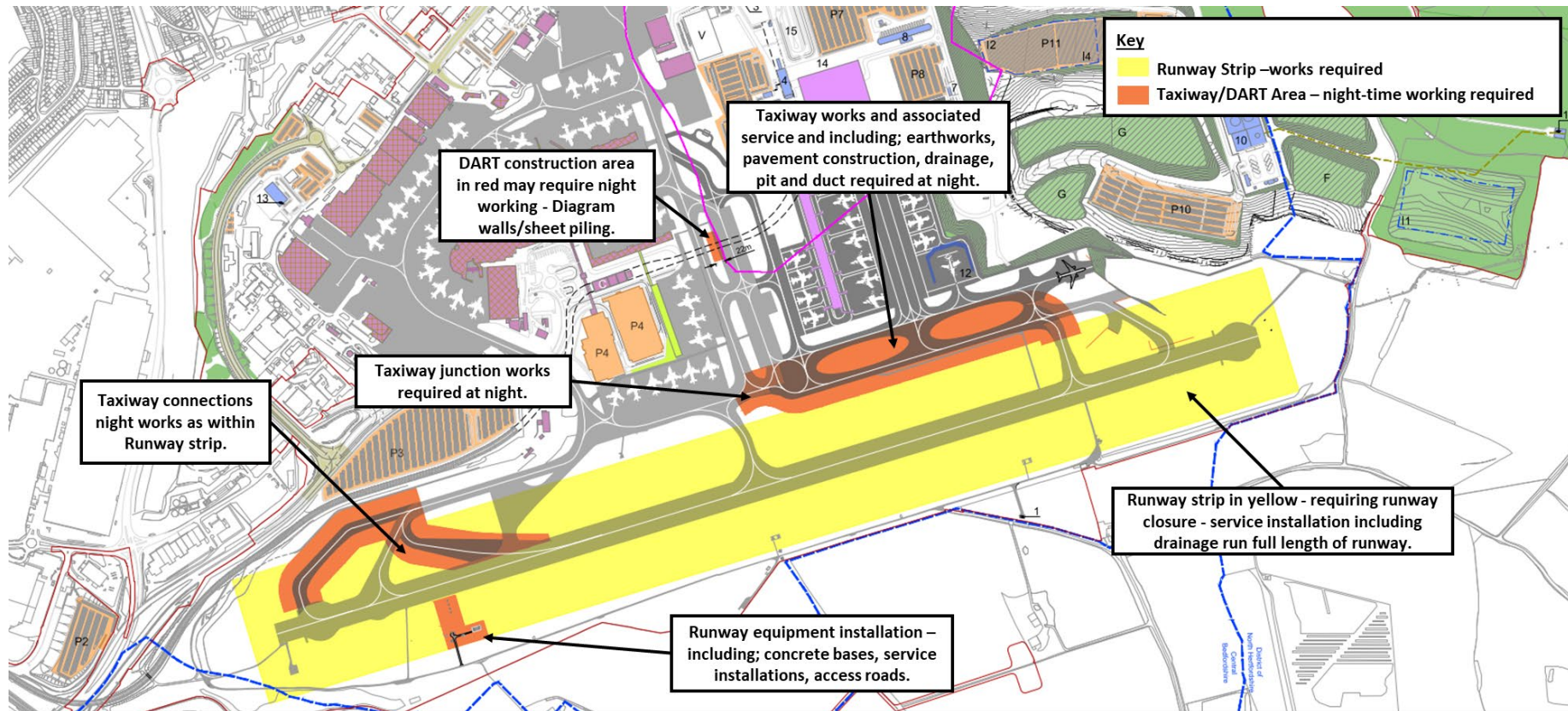
## 10 SUMMARY

- 10.1.1 A quantitative assessment of noise effects due to potential night-time construction activities has been undertaken. No significant effects have been identified due to activities required to be undertaken outside of core work periods. Consideration has also been given to night-time construction vibration and no significant effects are identified.

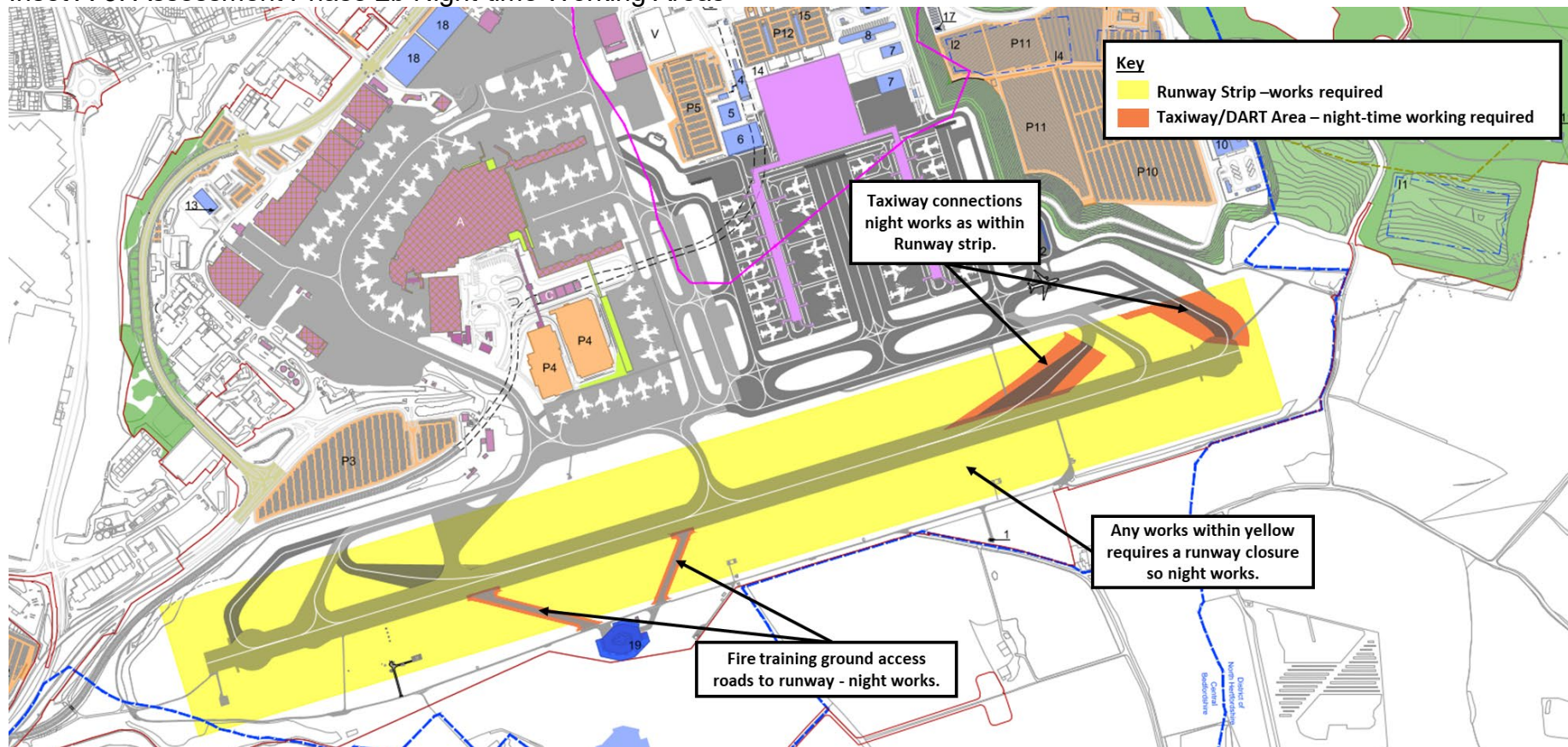




### Inset A-2: Assessment Phase 2a Night-time Working Areas



### Inset A-3: Assessment Phase 2b Night-time Working Areas



## APPENDIX B – EXTENDED WORKING HOURS PLANT

Table B-1: Extended Working Hours Plant List

Activity	Plant	No.	% on-time	Unweighted Octave Band Sound Power Level [LwdB]								Overall Sound Power Level [LwAdB]	Reference
				63	125	250	500	1k	2k	4k	8k		
Earthworks/ Landfill	360-hydraulic excavators (20T)	2	75	113	106	105	105	101	99	96	91	107	BS 5228 (Ref 1): Tab C.2 #14
	360-hydraulic excavators (40T)	2	75	105	114	108	104	100	98	94	91	107	Overall A-weighted sound power level from manufacturer. Spectrum from BS 5228: Tab C.2 #2
	Rigid Heavy Goods Vehicles (HGV)	4	10	101	106	106	106	102	101	96	94	108	BS 5228: Tab C.2 #34
	All terrain articulated dumper (40T)	10	10	113	115	105	103	104	101	97	90	109	BS 5228: Tab C.2 #33
	Generators	4	100	105	100	92	88	87	85	82	70	93	BS 5228: Tab C.4 #87
	GPS Bulldozer	4	75	111	109	104	105	110	98	93	86	111	BS 5228: Tab C.5 #15
Airfield extension	360-hydraulic excavators (20T)	2	75	113	106	105	105	101	99	96	91	107	BS 5228: Tab C.2 #14
	Rigid Heavy Goods Vehicles (HGV)	4	10	101	106	106	106	102	101	96	94	108	BS 5228: Tab C.2 #34
	All terrain articulated dumper (40T)	4	10	113	115	105	103	104	101	97	90	109	BS 5228: Tab C.2 #33
	Roller	1	75	110	106	95	99	95	92	88	85	101	BS 5228: Tab C.2 #40
	Compressors	2	75	112	101	92	87	85	83	86	75	93	BS 5228: Tab C.5 #5
	Concrete Paving Machine	1	75	100	105	102	100	99	98	95	88	105	BS 5228: Tab C.5 #31
	Telehandler Forklift	2	75	113	107	97	95	92	90	84	75	99	BS 5228: Tab C.2 #35
	Concrete mixer truck	4	75	108	97	94	98	99	97	92	86	103	BS 5228: Tab C.4 #18
	Generators	2	100	105	100	92	88	87	85	82	70	93	BS 5228: Tab C.4 #87
General waste skips	2	75	116	110	102	102	102	101	98	95	107	BS 5228: Tab C.8 #20	
Road Works	All terrain articulated dumper (40T)	5	10	113	115	105	103	104	101	97	90	109	BS 5228: Tab C.2 #33
	GPS Bulldozer	1	75	111	109	104	105	110	98	93	86	111	BS 5228: Tab C.5 #15
	Roller	1	75	110	106	95	99	95	92	88	85	101	BS 5228: Tab C.2 #40
	Compressors	4	75	112	101	92	87	85	83	86	75	93	BS 5228: Tab C.5 #5

Activity	Plant	No.	% on-time	Unweighted Octave Band Sound Power Level [LwdB]								Overall Sound Power Level [LwAdB]	Reference
				63	125	250	500	1k	2k	4k	8k		
	Asphalt paving machine	1	75	100	105	102	100	99	98	95	88	105	BS 5228: Tab C.5 #31
	Generators	2	100	105	100	92	88	87	85	82	70	93	BS 5228: Tab C.4 #87
	Concrete mixer truck	4	75	108	97	94	98	99	97	92	86	103	BS 5228: Tab C.4 #18
Landside Buildings	360-hydraulic excavators (20T)	2	75	113	106	105	105	101	99	96	91	107	BS 5228: Tab C.2 #14
	Rigid Heavy Goods Vehicles (HGV)	8	10	101	106	106	106	102	101	96	94	108	BS 5228: Tab C.2 #34
	Dumper (9T)	2	10	113	115	105	103	104	101	97	90	109	BS 5228: Tab C.2 #33
	Telehandler Forklift	2	75	113	107	97	95	92	90	84	75	99	BS 5228: Tab C.2 #35
	Tower Cranes	2	75	110	105	108	104	94	94	84	78	104	BS 5228: Tab C.4 #48
	Mobile Truck Mounted concrete pump	4	75	111	109	106	107	105	102	99	94	110	BS 5228: Tab C.4 #25
	Concrete mixer truck	4	75	108	97	94	98	99	97	92	86	103	BS 5228: Tab C.4 #18
	Mobile Cranes (100T)	2	75	110	105	108	104	94	94	84	78	104	BS 5228: Tab C.4 #48
	General waste skips	10	10	116	110	102	102	102	101	98	95	107	BS 5228: Tab C.8 #20
	Generators	2	100	105	100	92	88	87	85	82	70	93	BS 5228: Tab C.4 #87
Access equipment (cherry pickers / MEWPs)	10	75	113	107	97	95	92	90	84	75	99	BS 5228: Tab C.2 #35	
DART Extension	13T Excavator	1	30	108	103	97	103	99	95	89	86	104	BS 5228: Tab C.4 #90
	Dumper	1	30	104	101	90	94	90	87	82	77	96	BS 5228: Tab C.3 #20
	Delivery lorry	2	10	105	99	93	93	94	94	88	79	99	BS 5228: Tab C.4 #19
	Generators	1	100	105	100	92	88	87	85	82	70	93	BS 5228: Tab C.4 #87
	ABI TM22 Piling Rig	1	60	98	90	90	85	81	80	76	69	88	BS 5228: Tab C.4 #77
	LTR1060	1	50	111	110	107	110	112	110	105	95	116	BS 5228: Tab C.3 #8
	MEWP	1	5	94	93	94	91	93	94	99	99	104	Overall A-weighted sound power level from manufacturer. Spectrum from BS 5228: Tab C.4 #69
	20T Excavator	1	15	111	102	94	97	98	106	88	83	108	BS 5228: Tab C.4 #20
Dumper	1	15	111	107	106	104	102	99	93	88	107	BS 5228: Tab C.6 #10	

Activity	Plant	No.	% on-time	Unweighted Octave Band Sound Power Level [LwdB]								Overall Sound Power Level [LwAdB]	Reference
				63	125	250	500	1k	2k	4k	8k		
	Generators	2	100	105	100	92	88	87	85	82	70	93	BS 5228: Tab C.4 #87
	Hand tools	4	25	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4
Service Installation and Drainage	360-hydraulic excavators (20T)	2	75	113	106	105	105	101	99	96	91	107	BS 5228: Tab C.2 #14
	Rigid Heavy Goods Vehicles (HGV)	4	10	101	106	106	106	102	101	96	94	108	BS 5228: Tab C.2 #34
	All terrain articulated dumper (40T)	4	10	113	115	105	103	104	101	97	90	109	BS 5228: Tab C.2 #33
	Compressors	4	75	112	101	92	87	85	83	86	75	93	BS 5228: Tab C.5 #5
	Telehandler Forklift	2	75	113	107	97	95	92	90	84	75	99	BS 5228: Tab C.2 #35
	Concrete mixer truck	2	75	108	97	94	98	99	97	92	86	103	BS 5228: Tab C.4 #18
	Mobile Cranes (100T)	1	75	110	105	108	104	94	94	84	78	104	BS 5228: Tab C.4 #48
	Generators	2	100	105	100	92	88	87	85	82	70	93	BS 5228: Tab C.4 #87
	General waste skips	2	75	116	110	102	102	102	101	98	95	107	BS 5228: Tab C.8 #20

## GLOSSARY AND ABBREVIATIONS

<b>Term</b>	<b>Definition</b>
CoCP	Code of Construction Practice
Luton DART	Luton Direct Air-Rail Transit
ERUB	Engine Run-Up Bay
HGV	Heavy Goods Vehicle
LOAEL	Lowest Observed Adverse Effects Level
MEWP	Mobile Elevated Work Platform
PAX	Passengers
SOAEL	Significant Observed Adverse Effect Level
UAEL	Unacceptable Adverse Effect Level

## REFERENCES

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Ref 1 British Standards Institute (2014), BS 5228-1:2009+A1:2014 – Code of practice for noise and vibration control on construction and open sites. Part 1: Noise. BSi, London.