



Subject	Eastly Alternation
Description	Enabling works to allow implementation of full runway alternation during easterly operations
Location	Heathrow Airport, Hillingdon
Reference	41573/APP/2024/2838

1. Introduction to the Review
- 1.1.

The following represents a review of the Noise impacts of the planning application for the works to enable full runway alternation when operating easterly departures.
- 1.2.

The review has been predominantly informed by work completed by Temple noise consultants.
- 1.3.

A summary list of questions, recommendations and clarifications is provided at the end of this document.

General

2. LOAEL and SOAEL
- 2.1.

The national policy statement for England (NPSE) sets out the appraisal framework for Local Planning Authorities. This sets out a hierarchy of considerations.

• avoid significant adverse impacts on health and quality of life;

• mitigate and minimise adverse impacts on health and quality of life; and

• where possible, contribute to the improvement of health and quality of life.
- 2.2.

The policy then introduced the following levels to allow for the appropriate assessment of impacts:

- NOEL – No Observed Effect Level
- LOAEL – Lowest Observed Adverse Effect Level
- SOAEL – Significant Observed Adverse Effect Level

2.3. The NPSE doesn't specify what the corresponding noise levels noting that these will vary depending on the type of project or source. However, defining these levels is extremely important to determining the impacts of a proposal given the associated policy requirements in relation to mitigation and avoidance of harm.

2.4. The table below identifies the recent positions in relation to Gatwick and Luton, by the applicants and the Examining Authority (ExA) in the case of Gatwick.

	LOAEL	SOAEL	LOAEL (night)	SOAEL (night)
Luton Applicant	51	63	45	55
Gatwick Applicant	51	63	45	55
Gatwick ExA	45	54	40	48

2.5. The Secretary of State has been minded to support the position of the Gatwick ExA although also reached a decision on Luton that conflicts.

2.6. As a consequence, and given the significance of the matter, we have taken the decision to seek clarification from the SoS. This has a bearing on our current consideration of this application, noting the position of the Applicant is the same as that for the Applicants, and the SoS decision on Luton expansion.

2.7. The below commentary is therefore without prejudice to the outcome of those considerations.

Review of Noise & Vibration Chapter

3. Baseline Conditions (Section 7.4)

Introduction

3.1. It is noted that for construction noise, baseline conditions for the period Summer 2025 to Summer 2027 are proposed to align with the currently identified period for construction works. This is considered appropriate.

3.2. For operational noise sources, adoption of a baseline year of 2019 (i.e. pre-COVID) is considered appropriate, as does an assessment year of a proposed commencement of operations in 2028. The operational modelling of 480,000 annual movements to align with the limit imposed by the Terminal 5 planning permission is appropriate.

- 3.3. Clarification regarding the fleet mix and how the future baseline is calculated is set out below.

Method of baseline data collection

- 3.4. This element has been split into a desk study, and surveys and modelling.
- 3.5. For the surveys and modelling, a baseline noise measurement survey was carried out at three locations over a one-week period in May 2024 which is considered appropriate for receptors in Longford during the construction period. It is noted that the measurement locations were in the car parks so are slightly closer to the airport than the receptors, but this is not considered to be significant.

Study Areas

- 3.6. Construction Phase: Construction Noise: The proposed construction noise study area is considered appropriate although **it is recommended that this be extended until no significant effects are reported.**
- 3.7. Operational Phase: Aircraft Air Noise: The proposed area is considered appropriate although **it is recommended this be extended until no significant effects are reported.**
- 3.8. Operational Phase: Aircraft Ground Noise: Given that the proposed study area includes the noise sensitive receptors likely to be exposed to ground noise effects above proposed LOAEL, this is considered appropriate. However, this is subject to further consideration of LOAEL and SOAEL as set out above.
- 3.9. Operational Phase: Noise Induced Vibration: Focusing on receptors in Longford Village is considered appropriate.

Current Baseline

- 3.10. Current construction baseline: The approach taken to determine the construction baseline noise levels is considered appropriate and agreed.
- 3.11. Current aircraft 'air' noise baseline: The use of a reference year of 2019 (i.e. pre-COVID) is considered acceptable and agreed.
- 3.12. Current aircraft 'ground' noise baseline: The expectation that future ground noise baseline conditions will be lower than the reference year of 2019 is accepted, however the degree of change needs to be reviewed in light of the commentary below relating to assumptions in fleet transition.

Future Baseline

- 3.13. Future Aircraft Air Noise Baseline: The proposed methodology to assess the future aircraft air noise baseline and use of the 480,000 aircraft movement cap is considered appropriate and agreed.
- 3.14. However, there are concerns over the future baseline of 2028 and how it has been

calculated in relation to the current 2019 baseline. 7.4.32 of the Noise Chapter states:

Table 7.8 demonstrates a reduction in the area, population and households exposed to aircraft noise for both the summer daytime and summer night-time periods in 2028 without the Proposed Development, compared with conditions in 2019, despite aircraft operations at the airport trending towards larger aircraft types.

- 3.15. The Table then shows a sizeable difference between the noise exposure from 2019 to 2028. With 7.4.32 providing an explanation of why this change would be realised:

The reductions between 2019 and 2028 are predominantly driven by changes in aircraft fleet mix at Heathrow Airport. For example, British Airways retired their Boeing 747-400 aircraft earlier than planned in 2020 due to the impact of the COVID-19 pandemic. Boeing 747-400 aircraft have been replaced with more modern aircraft such as the Boeing 787 Dreamliner and Airbus A350 types which are quieter both on arrival and departure compared to the Boeing 747-400.

- 3.16. The Chapter then links the expected improvements to a report by the International Civil Aviation Organisation (ICAO) (2019) titled 'Independent Expert Integrated Technology Goals'

- 3.17. The matter of fleet transition was discussed at length during the recent Gatwick Development Consent Order (DCO) examination. Gatwick Airport Limited (GAL) produced an ES Addendum ([Updated Central Case - Aircraft Fleet](#)) in May 2024 which stated:

The Covid-19 pandemic caused major disruption to the aviation industry globally and those effects are still being felt. The case forecast undertaken in 2021 (2.1.1)

- 3.18. It included the following diagram to illustrate the impacts on the difference between expectation and reality of fleet progression:

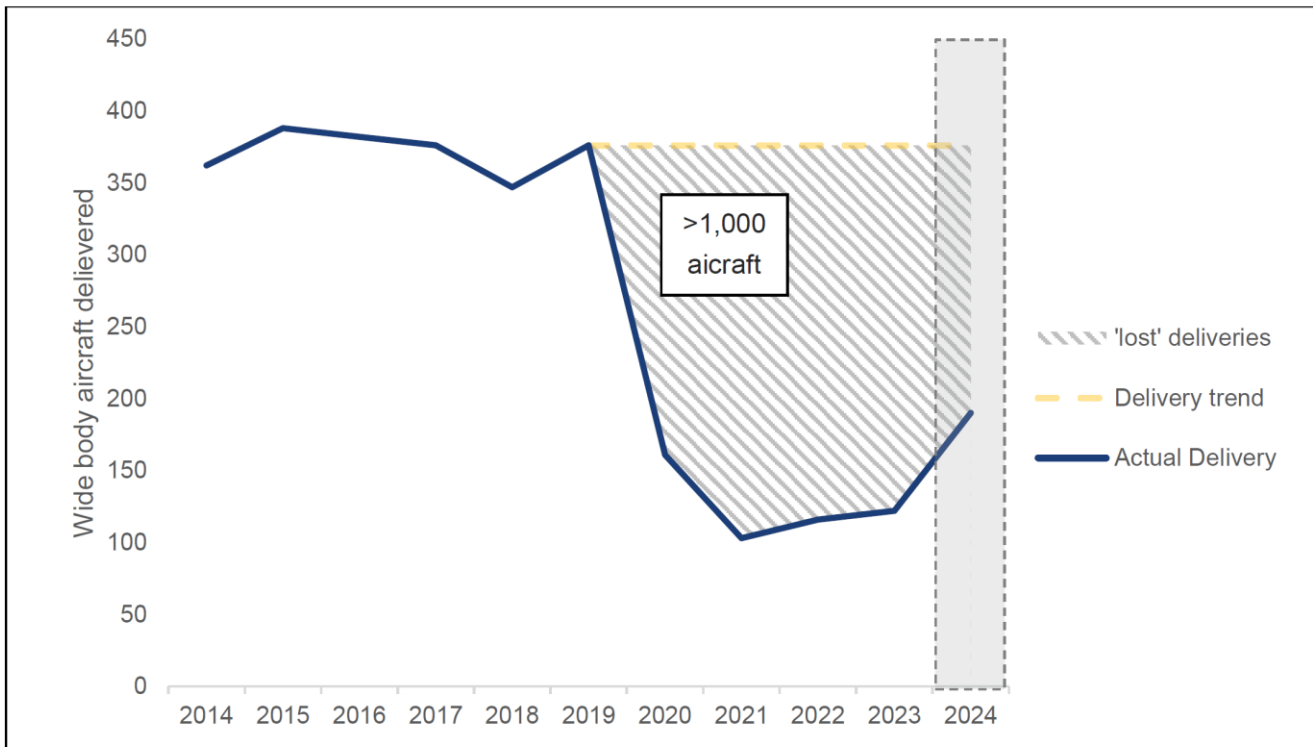


Diagram 2.2 Loss of production of wide body aircraft due to Covid (Aircraft produced by year) Source: Airbus/Boeing

3.19. As a consequence, the noise assessment was updated to reveal that noise contours would not reduce as much as per the original ‘central case’:

Table 2.2: Summary next generation fleet shares assumed (%of annual ATMs)

	Base (Updated Central)				Northern Runway (Updated Central)			
	2029	2032	2038	2047	2029	2032	2038	2047
DCO Central Case	59%	80%	100%	100%	59%	82%	100%	100%
DCO Slow Fleet Transition Case	40%	50%	82%	100%	40%	53%	83%	100%
Updated Central Case	45%	68%	94%	100%	45%	70%	93%	100%

2.2.3 The Updated Central Case fleet forecast shows that by 2029 the share of next generation aircraft could increase to 45% (14% points below the Central Case forecast) before reaching 68% in 2032 and 94% in 2038.

- 3.20. In relation to air noise contours, table 3.1 of the Updated Central Case shows that the 2019 baseline resulted in a 54dB Laeq 16hr contour of 74km², with the original Central Case showing a reduction to 66.8dB Laeq 16hr. However, the Updated Central Case reflecting updated assumptions regarding fleet transition identifies a more modest 71.8dB Laeq 16hr.
- 3.21. **The information provided in the Noise Chapter (Easterly Alternation) needs to be considered in light of the above. We would look to the Applicant to provide more robust evidence to support their assumptions about the future operating fleet.**
- 3.22. **Future Aircraft Ground Baseline: Given the above, commentary on the Future Aircraft Ground Baseline will need to be reviewed as they are inherently linked.**

4. Assessment Methodology

Construction: Construction Noise

- 4.1. Noise Metrics: The use of $L_{Aeq,T}$ is considered appropriate. It is noted that the time periods proposed for the $L_{Aeq,T}$ assessments do not align with the BS 5228-1 time periods so it is recommended that this is amended (e.g. $L_{Aeq,5.5hr}$ for night-time should be replaced by $L_{Aeq,1hr}$). **This is included as a question/clarification (1).**
- 4.2. Assessment Methodology: Paragraph 7.5.23 infers that the “number of receptors affected” could alter the significance of the effect which requires clarification as to why. **This is included as a question/clarification (2).**

Operational: Aircraft ‘Air’ Noise

- 4.3. Residential Receptors – Likely Significant Effects: The use of a 1 dB increase (adverse) above the proposed SOAEL is agreed to be conservative approach and is therefore considered acceptable. It is, however, unclear as to what the justification is for the use a 1 dB decrease (beneficial) being significant. **This is included as a question/clarification (3).**
- 4.4. While population size (under paragraph 7.5.86) is useful for context, beneficial effects to a large number of people should not be seen to offset adverse effects to others.
- 4.5. Non-Residential Noise Sensitive Receptors: Where uses include night-time operation (e.g. Hospices, Nursing Homes, Hotels, etc), it is essential that night-time criteria as well as daytime criteria be considered. It is unclear why “commercial non-residential receptors, namely hotels and offices” are considered differently to some other commercial uses e.g. sound recording and broadcast studios so it is recommended that this be discussed. In the case of hotels, it would be appropriate to consider night-time criteria which does not appear to be covered by the current proposals. The values presented in Table 7.23

(Non-residential noise-sensitive receptor types, and absolute 'lower' assessment thresholds) require justification as to the internal noise levels that the external noise criteria are aiming to achieve and hence the assumed sound level difference from external to internal for consideration. In the case of "Places of meeting for religious worship", the "Assumed Ventilation and Cooling Strategy" is stated as "Closed windows". Since closed windows would not provide ventilation or cooling, further explanation of this approach is required. **This is included as a question/clarification (4).**

- 4.6. Parks and Open Spaces – Noise and Amenity: In Table 7.24 Stepped Assessment Methodology for Parks and Open Spaces, under "Impact of Proposed Development" it is recommended that the description of "Intermediate" be revised to "between 25% and 50% of the receptor area". Under "Assessment", it is unclear how a "change of 3-5 dB" being considered a likely significant effect differs from "a change of greater than 5 dB" being considered a likely significant effect. **This is included as a question/clarification (5).**
- 4.7. Assumptions and Limitations: The stated assumptions are broadly reasonable although further clarification is required in relation to the fleet mix as set out above.

Operational: Aircraft 'Ground' Noise

- 4.8. Modelling Methodology: It should be noted that ISO 9613-2 has recently been updated from the 1996 version referenced to a 2024 version which was published on 30 January 2024. While it is acknowledged that modelling work may have commenced prior to this change, it is recommended that, as a minimum, some comparative modelling be undertaken to compare the results from the two versions of the standard. **This is included as a question/clarification (6).**

Operational: Aircraft Noise Induced Vibration

- 4.9. Concerns have been raised through the consultation about the assessment of noise induced vibration within Longford receptors. Residents have reported impacts with the existing operations on the infrequent occasions the northern runway has been used for easterly departures.
- 4.10. We would like to understand the role of monitoring/modelling in determining baseline conditions and then how this informs the assessment. Reference to the investigations and measurements previously carried out by Heathrow Airport in a conservatory at the far end of Myrtle Avenue have been outlined but this needs to be explained in more context. **This is included as a question/clarification (7).**

5. Environmental Measures (Section 7.7)

- 5.1. Quieter Neighbourhood Support (QNS) Sound Insulation Schemes: Under paragraph 7.7.12, clarification as to whether only one or all three conditions must be met to qualify is required. Under paragraph 7.7.14 it is noted that the scheme

boundary will be reviewed at “approximately five-year intervals”; it would be useful if Heathrow could commit to an exact timeframe for these reviews. The full contribution up to a maximum of £34,000 per dwellings requires some further information e.g. what £34,000 currently covers (particularly because it is used as a mitigation to avoid significant effects), whether this value increases over time in line with inflation, and what the scheme covers in terms of replacement of noise insulation measures and regularity. **This is included as a question/clarification (8).**

- 5.2. Home Relocation Assistance Scheme (HRAS): As above, further information is required on what £20,000 currently covers, and whether this value increases over time in line with inflation. **This is included as a question/clarification (9).**

Embedded Noise Management Measures

- 5.3. Construction Phase: Regarding paragraph 7.7.23, consideration of short-term temporary rehousing may be appropriate depending on the predicted construction phase noise levels, so it should not be discounted. **This is included as a question/clarification (10).**

Additional Noise Mitigation Measures

- 5.4. The financial contributions towards noise insulation described in Table 7.31 should include details of the level of works that £3,000 and up to £12,000 are likely to provide to a recipient for context. **This is included as a question/clarification (11).**
- 5.5. Similarly, details of what the “bespoke insulation and ventilation” for schools is likely to include for the cap of £2.5m should be provided for context. **This is included as a question/clarification (11).**
- 5.6. Regarding Easterly Alternation Noise Mitigation Package for Noise Induced Vibration, examples of the level of works that £10,000 are likely to provide to a recipient should be included for context. **This is included as a question/clarification (11).**
- 5.7. Regarding Easterly Alternation Noise Mitigation Package for Parks and Gardens, it is unclear what the financial contribution of up to £250,000 will mean in terms of “enhancement” and hence additional details should be provided. **This is included as a question/clarification (11).**

6. Assessment of Potential Effects (Section 7.8)

Construction Phase: Construction Noise – Noise Barrier Construction Works – Wright Way (Night-time)

- 6.1. Table 7.32 “Calculated night-time construction noise levels for Wright Way noise barrier construction works” references façade noise levels in terms of $L_{Aeq,5.5hr}$. In line with BS 5228, it is recommended that the time period of L_{Aeq} be referenced to

1hr for night-time works. **This is included as a question/clarification (12).**

- 6.2. Given that UAEL is predicted to be exceeded at Receptor 5 for four nights, consideration of an offer of short-term temporary rehousing (i.e. hotel accommodation) should be given in these instances. **This is included as a question/clarification (13).**

Construction Phase: Construction Noise – 09L Airfield Infrastructure Works, Phases 1-3 and ‘On-Alternation’ (Night-time)

- 6.3. Table 7.34 “Predicted night-time noise levels for Phases 1, 2 and 3 new airfield infrastructure construction works” references façade noise levels in terms of $L_{Aeq,5.5hr}$. In line with BS 5228, it is recommended that the time period of L_{Aeq} be referenced to 1hr for night-time works. **This is included as a question/clarification (14).**
- 6.4. It is noted that the affected properties have or will be offered sound insulation packages under the QNS scheme. This, and the adoption of Best Practicable Means (BPM) to minimise construction noise are considered appropriate.
- 6.5. Further construction noise matters will be expected to be dealt with through Section 61 of the Control of Noise Pollution Act.

Construction Phase: Construction Noise – 09R/27L Redundant Pavement Removal (Night-time)

- 6.6. As noted above, it is recommended that the time period of L_{Aeq} be referenced to 1hr for night-time works. **This is included as a question/clarification (15).**

Summary of Construction Phase Noise Assessment

- 6.7. The summary should also include that there are exceedances of the UAEL at Receptor 5 for four nights. **This is included as a question/clarification (16).**

Operational Phase: Aircraft Air Noise – Residential Receptors

- 6.8. Assessment in Accordance with the Noise Policy Statement for England: Table 7.39 indicates there will be an additional 1,100 people exposed to a level above proposed SOAEL (63 dB $L_{Aeq,16hr}$) because of the development, with 500 over these being above the 69 dB $L_{Aeq,16hr}$ threshold for the Home Relocation Assistance Scheme (HRAS). There are also another 1,400 additional people in the 60-63 dB band just below the proposed SOAEL.
- 6.9. Assessment in Accordance with NPSE – Daytime Exposure: Details of what £34,000 would cover for the QNS in 2024 terms should be sought, along with a commitment for an annual inflationary increase. Regarding paragraphs 7.8.93 and 7.8.94, it is unclear whether reducing noise levels for some people while increasing noise levels for others meets the spirit of the second aim of the NPSE of mitigation and minimising the adverse impacts on health and quality of life between the proposed LOAEL and the proposed SOAEL. In addition, some of the

net decrease in this band is due to some people moving to the band above the proposed SOAEL. Some justification around this approach should be provided.

This is included as a question/clarification (17).

- 6.10. Assessment in Accordance with NPSE – Night-time Exposure: As above re: QNS and questioning whether reducing noise levels for some people while increasing noise levels for others meets the spirit of the second aim of the NPSE. Table 7.41 appears to be incorrectly formatted with levels of “55-57” shown as being between (proposed) “LOAEL to SOAEL” and therefore requires correction. **This is included as a question/clarification (18).**
- 6.11. The table indicates that an additional 1,700 people will be exposed to levels above proposed SOAEL (55 dB $L_{Aeq,8hr}$) as a result of the development, with 400 of these exposed to level in excess of 63 dB $L_{Aeq,8hr}$ (the provisional UAEL for night-time).
- 6.12. Assessment in Accordance with the NPSE – Conclusion: The above elements are not covered in the conclusion and it is recommended that they should be. Bullet point 3 states that “Although the number of people exposed to air noise above the daytime and night-time proposed SOAEL is forecast to increase due to the Proposed Development in 2028, the increase is much smaller and most of these receptors are already eligible or will become eligible for a funded scheme of insulation under Heathrow’s QNS RIS“. It is recommended that some context be added to this e.g. what is the increase much smaller than. Additionally, demonstrated that the sound insulation scheme will avoid the significant effect in all cases is required. **This is included as a question/clarification (19).**
- 6.13. Likely Significant Effects – Daytime: Under Table 7.44, LSE-D07 includes a “very high” number of the population (15,500) who will experience “Exposure between proposed LOAEL and SOAEL and a ‘moderate’ 3 dB – 5.9 dB increase” but will have limited availability to noise insulation funding or, in the case of 12,100, will have no availability to noise insulation funding. Regarding paragraph 7.8.155, there is potential that on some days there will be a need for “*having to keep windows closed most of the time*”. As such, additional sound insulation provision should be considered for this area. **This is included as a question/clarification (20).**

Operational Phase: Annoyance, Sleep Disturbance and Monetised Outcomes

- 6.14. Annoyance: The number of people ‘highly annoyed’ is predicted to be lower with development than without, i.e. is beneficial, which is obviously positive. However, it would be useful to understand the number of people who will become ‘highly annoyed’ as a result of the proposed development. **This is included as a question/clarification (21).**
- 6.15. Sleep Disturbance: Again, the reduction in the number of people ‘highly sleep disturbed’ is positive but it would be useful to understand the number of people who will become ‘highly sleep disturbed’ as a result of the proposed development. **This is included as a question/clarification (22).**

- 6.16. Monetised Outcomes: The TAG analysis effectively assumes ‘symmetry’ so a 1dB beneficial decrease exactly offsets a 1dB adverse increase. It is unclear whether there is evidence for this, particularly in the short to medium term. **This is included as a question/clarification (23).**

Operational Phase: Aircraft Air Noise – Non-Residential Noise Sensitive Receptors

- 6.17. As noted above, the justification for excluding hotels and offices on the basis that they are commercial enterprises does not make sense when compared with other receptor types such as Theatres, Cinemas, and Sound recording and broadcast studios which would also be commercial enterprises. As such, it is recommended that hotels and offices be included within the assessment. **This is included as a question/clarification (24).**
- 6.18. Place of Meeting for Religious Worship: Holy Angels Anglican Church and St Christopher Roman Catholic Church are forecast to experience a ‘moderate’ adverse impact (significant) but no mitigation appears to be being offered to minimise this impact. As noted previously, the assumed ventilation strategy and cooling strategy for these spaces is “Closed Windows” which does not provide ventilation or cooling. **This is included as a question/clarification (25).**
- 6.19. Hospitals, Nursing Homes and Hospices: No adverse likely significant effects are reported and hence no comments other than that these should also be assessed for night-time noise as well as daytime. **This is included as a question/clarification (26).**
- 6.20. Schools including Registered Nurseries: It is noted that a number of schools will experience levels of up to 60-61 dB $L_{Aeq,8hr}$ (alternation period) but will not be eligible for sound insulation. Paragraph 7.8.233 states that “*At such levels, internal noise conditions are likely to be below 40 dB $L_{Aeq,30min}$ assuming standard façade and roof construction, and a closed window. In other words, no bespoke acoustic insulation measures would be necessary to achieve suitable internal noise conditions for classrooms.*” The reference to 40 dB $L_{Aeq,30min}$ relates to the Building Bulletin 93 (BB93) “‘upper limit’ for indoor ambient noise levels in nursery, primary and secondary school rooms class and teaching rooms for refurbished schools.” It is unclear why the more relaxed refurbishment criterion has been assumed as opposed to the standard criterion for new schools of 35 dB $L_{Aeq,30min}$. Additionally, it is inappropriate to compare L_{Aeq} levels averaged over 8 hours with a criterion averaged over 30 minutes since the $L_{Aeq,30min}$ criteria stated in BB93 should assume a worst case 30-minute period over that day. On this basis, further work/justification is required for schools and registered nurseries to demonstrate that appropriate mitigation measures will be adopted. The assumption that windows would be closed requires further consideration; unless a mechanical ventilation system is proposed for schools, windows would need to be opened for both ventilation and cooling. External areas in schools should also be considered. Guidance states “For new schools, 60 dB $L_{Aeq,30min}$ should be regarded as an upper

limit for external noise at the boundary of external areas used for formal and informal outdoor teaching and recreation “ and “Noise levels in unoccupied playgrounds, playing fields and other outdoor areas should not exceed 55 dB $L_{Aeq,30min}$ and there should be at least one area suitable for outdoor teaching activities where noise levels are below 50 dB $L_{Aeq,30min}$ “. **This is included as a question/clarification (27).**

- 6.21. Summary of Non-Residential Noise Sensitive Receptor Assessment: As noted above, it is recommended that further consideration be given to mitigation (likely to be in the form of noise insulation) to the places of religious worship and schools and registered nurseries where significant adverse effects are predicted but where currently no provision for mitigation is proposed.

Operational Phase: Aircraft Air Noise – Parks and Open Spaces – Noise and Amenity

- 6.22. The approach taken to the assessment of this issue is considered appropriate. 3 parks have been concluded as experiencing potentially significant adverse effects on noise and amenity due to the Proposed Development. The mitigation package of £250k is proposed “towards enhancing these parks in other ways”. It is unclear how this could be used and is unlikely to help mitigate the increased noise levels in these parks. **This is included as a question/clarification (28).**

Operational Phase: Aircraft Ground Noise

- 6.23. Southwest Quadrant Receptors – Daytime Effects: Paragraph 7.8.301 states “All residential receptors which fall between the daytime proposed LOAEL and SOAEL are forecast to experience a ‘moderate’ increase in daytime ground noise exposure due to the Proposed Development. Clarification as to why this is not reported as a significant effect is required. **This is included as a question/clarification (29).**

Operational Phase Noise Induced Vibration

- 6.24. It is noted that adverse likely significant effects are concluded for dwellings within 500m of aircraft start of roll but that these dwellings fall within the Heathrow QNS eligibility boundary and would also be eligible for additional funding of up to £10,000 under the Easterly Alternation Noise Mitigation Package for assistance towards the costs of mitigating potential effects (e.g. through reinforcing lightweight floors).
- 6.25. It is unclear, however, as to whether Littlebrook Nursery, also within 500m of aircraft start of roll, will be eligible for any noise mitigation package. This should be confirmed. **This is included as a question/clarification (30).**

Questions/Clarifications

1. Construction: Construction Noise: Noise Metrics: It is noted that the time periods proposed for the $L_{Aeq,T}$ assessments do not align with the BS 5228-1 time periods so it is recommended that this is amended (e.g. $L_{Aeq,5.5hr}$ for night-time should be replaced by $L_{Aeq,1hr}$).
2. Construction: Construction Noise: Assessment Methodology: Paragraph 7.5.23 infers that the “number of receptors affected” could alter the significance of the effect which requires clarification as to why.
3. Residential Receptors – Likely Significant Effects: The use of a 1 dB increase (adverse) above the proposed SOAEL is agreed to be conservative approach and is therefore considered acceptable. It is, however, unclear as to what the justification is for the use a 1 dB decrease (beneficial) being significant.
4. Non-Residential Noise Sensitive Receptors: Where uses include night-time operation (e.g. Hospices, Nursing Homes, Hotels, etc), it is essential that night-time criteria as well as daytime criteria be considered. It is unclear why “commercial non-residential receptors, namely hotels and offices” are considered differently to some other commercial uses e.g. sound recording and broadcast studios so it is recommended that this be discussed. In the case of hotels, it would be appropriate to consider night-time criteria which does not appear to be covered by the current proposals. The values presented in Table 7.23 (Non-residential noise-sensitive receptor types, and absolute ‘lower’ assessment thresholds) require justification as to the internal noise levels that the external noise criteria are aiming to achieve and hence the assumed sound level difference from external to internal for consideration. In the case of “Places of meeting for religious worship”, the “Assumed Ventilation and Cooling Strategy” is stated as “Closed windows”. Since closed windows would not provide ventilation or cooling, further explanation of this approach is required.
5. Parks and Open Spaces – Noise and Amenity: In Table 7.24 Stepped Assessment Methodology for Parks and Open Spaces, under “Impact of Proposed Development” it is recommended that the description of “Intermediate” be revised to “between 25% and 50% of the receptor area”. Under “Assessment”, it is unclear how a “change of 3-5 dB” being considered a likely significant effect differs from “a change of greater than 5 dB” being considered a likely significant effect.
6. Modelling Methodology: It should be noted that ISO 9613-2 has recently been updated from the 1996 version referenced to a 2024 version which was published on 30 January 2024. While it is acknowledged that modelling work may have commenced prior to this change, it is recommended that, as a minimum, some

comparative modelling be undertaken to compare the results from the two versions of the standard.

7. Operational: Aircraft Noise Induced Vibration: The approach proposed is considered appropriate. It would however be useful to include a reference to the investigations and measurements previously carried out by Heathrow Airport in a conservatory at the far end of Myrtle Avenue.
8. Quieter Neighbourhood Support (QNS) Sound Insulation Schemes: The full contribution up to a maximum of £34,000 per dwellings requires some further information e.g. what £34,000 currently covers (particularly because it is used as a mitigation to avoid significant effects), whether this value increases over time in line with inflations, and what the scheme covers in terms of replacement of noise insulation measures and regularity.
9. Home Relocation Assistance Scheme (HRAS): As above, further information is required on what £20,000 currently covers, and whether this value increases over time in line with inflation.
10. Construction Phase: Regarding paragraph 7.7.23, consideration of short-term temporary rehousing may be appropriate depending on the predicted construction phase noise levels so it is recommended that it not be discounted.
11. Additional Mitigation Measures: The financial contributions towards noise insulation described in Table 7.31 should include details of the level of works that £3,000 and up to £12,000 are likely to provide to a recipient for context. Similarly, details of what the “bespoke insulation and ventilation” for schools is likely to include for the cap of £2.5m should be provided for context. Regarding Easterly Alternation Noise Mitigation Package for Noise Induced Vibration, examples of the level of works that £10,000 are likely to provide to a recipient should be included for context. Regarding Easterly Alternation Noise Mitigation Package for Parks and Gardens, it is unclear what the financial contribution of up to £250,000 will mean in terms of “enhancement” and hence additional details should be provided.
12. Table 7.32 “Calculated night-time construction noise levels for Wright Way noise barrier construction works” references façade noise levels in terms of $L_{Aeq,5.5hr}$. In line with BS 5228, it is recommended that the time period of L_{Aeq} be referenced to 1hr for night-time works.
13. Given that UAEL is predicted to be exceeded at Receptor 5 for four nights, consideration of an offer of short-term temporary rehousing (i.e. hotel accommodation) should be given in these instances.
14. Table 7.34 “Predicted night-time noise levels for Phases 1, 2 and 3 new airfield infrastructure construction works” references façade noise levels in terms of $L_{Aeq,5.5hr}$.

In line with BS 5228, it is recommended that the time period of L_{Aeq} be referenced to 1hr for night-time works.

15. Construction Phase: Construction Noise – 09R/27L Redundant Pavement Removal (Night-time): As noted above, it is recommended that the time period of L_{Aeq} be referenced to 1hr for night-time works.
16. Summary of Construction Phase Noise Assessment: The summary should also include that there are exceedances of the UAEL at Receptor for four nights.
17. Assessment in Accordance with NPSE – Daytime Exposure: Details of what £34,000 would cover for the QNS in 2024 terms should be sought, along with a commitment for an annual inflationary increase. Regarding paragraphs 7.8.93 and 7.8.94, it is unclear whether reducing noise levels for some people while increasing noise levels for others meets the spirit of the second aim of the NPSE of mitigation and minimising the adverse impacts on health and quality of life between the LOAEL and the SOAEL. In addition, some of the net decrease in this band is due to some people moving to the above SOAEL band. Some justification around this approach should be provided.
18. Assessment in Accordance with NPSE – Night-time Exposure: As above re: QNS and questioning whether reducing noise levels for some people while increasing noise levels for others meets the spirit of the second aim of the NPSE. Table 7.41 appears to be incorrectly formatted with levels of “55-57” shown as being between “LOAEL to SOAEL” and therefore requires correction.
19. Assessment in Accordance with the NPSE – Conclusion: The above elements are not covered in the conclusion and it is recommended that they should be. Bullet point 3 states that “Although the number of people exposed to air noise above the daytime and night-time SOAEL is forecast to increase due to the Proposed Development in 2028, the increase is much smaller and most of these receptors are already eligible or will become eligible for a funded scheme of insulation under Heathrow’s QNS RIS“. It is recommended that some context be added to this e.g. what is the increase much smaller than. Additionally, demonstrated that the sound insulation scheme will avoid the significant effect in all cases is required.
20. Likely Significant Effects – Daytime: Under Table 7.44, LSE-D07 includes a “very high” number of the population (15,500) who will experience “Exposure between proposed LOAEL and SOAEL and a ‘moderate’ 3 dB – 5.9 dB increase” but will have limited availability to noise insulation funding or, in the case of 12,100, will have no availability to noise insulation funding. Regarding paragraph 7.8.155, there is potential that on some days there will be a need for “*having to keep windows closed most of the time*”. As such, additional sound insulation provision should be considered for this area.
21. Operational Phase: Annoyance, Sleep Disturbance and Monetised Outcomes:
Annoyance: The number of people ‘highly annoyed’ is predicted to be lower with

development than without, i.e. is beneficial, which is obviously positive. However, it would be useful to understand the number of people who will become 'highly annoyed' as a result of the proposed development.

22. Operational Phase: Annoyance, Sleep Disturbance and Monetised Outcomes: Sleep Disturbance: Again, the reduction in the number of people 'highly sleep disturbed' is positive but it would be useful to understand the number of people who will become 'highly sleep disturbed' as a result of the proposed development.
23. Operational Phase: Annoyance, Sleep Disturbance and Monetised Outcomes: Monetised Outcomes: The TAG analysis effectively assumes 'symmetry' so a 1dB beneficial decrease exactly offsets a 1dB adverse increase. It is unclear whether there is evidence for this, particularly in the short to medium term.
24. Operational Phase: Aircraft Air Noise – Non-Residential Noise Sensitive Receptors: As noted above, the justification for excluding hotels and offices on the basis that they are commercial enterprises does not make sense when compared with other receptor types such as Theatres, Cinemas, and Sound recording and broadcast studios which would also be commercial enterprises. As such, it is recommended that hotels and offices be included within the assessment.
25. Operational Phase: Aircraft Air Noise – Non-Residential Noise Sensitive Receptors: Place of Meeting for Religious Worship: Holy Angels Anglican Church and St Christopher Roman Catholic Church are forecast to experience a 'moderate' adverse impact (significant) but no mitigation appears to be being offered to minimise this impact. As noted previously, the assumed ventilation strategy and cooling strategy for these spaces is "Closed Windows" which does not provide ventilation or cooling.
26. Operational Phase: Aircraft Air Noise – Non-Residential Noise Sensitive Receptors: Hospitals, Nursing Homes and Hospices: No adverse likely significant effects are reported and hence no comments other than that these should also be assessed for night-time noise as well as daytime.
27. Operational Phase: Aircraft Air Noise – Non-Residential Noise Sensitive Receptors: Schools including Registered Nurseries: It is noted that a number of schools will experience levels of up to 60-61 dB $L_{Aeq,8hr}$ (alternation period) but will not be eligible for sound insulation. Paragraph 7.8.233 states that "*At such levels, internal noise conditions are likely to be below 40 dB $L_{Aeq,30min}$ assuming standard façade and roof construction, and a closed window. In other words, no bespoke acoustic insulation measures would be necessary to achieve suitable internal noise conditions for classrooms.*" The reference to 40 dB $L_{Aeq,30min}$ relates to the Building Bulletin 93 (BB93) "'upper limit' for indoor ambient noise levels in nursery, primary and secondary school rooms class and teaching rooms for refurbished schools." It is unclear why the more relaxed refurbishment criterion has been assumed as opposed to the standard criterion for new schools of 35 dB $L_{Aeq,30min}$. Additionally, it is inappropriate to compare L_{Aeq} levels averaged over 8 hours with a criterion averaged over 30 minutes since the $L_{Aeq,30min}$ criteria stated in BB93 should assume a worst

case 30-minute period over that day. On this basis, further work/justification is required for schools and registered nurseries to demonstrate that appropriate mitigation measures will be adopted. The assumption that windows would be closed windows also requires further consideration as unless a mechanical ventilation system is proposed for schools, windows would need to be opened for both ventilation and cooling. External areas in schools should also be considered. Guidance states “For new schools, 60 dB $L_{Aeq,30min}$ should be regarded as an upper limit for external noise at the boundary of external areas used for formal and informal outdoor teaching and recreation “ and “Noise levels in unoccupied playgrounds, playing fields and other outdoor areas should not exceed 55 dB $L_{Aeq,30min}$ and there should be at least one area suitable for outdoor teaching activities where noise levels are below 50 dB $L_{Aeq,30min}$ “.

28. Operational Phase: Aircraft Air Noise – Parks and Open Spaces – Noise and Amenity: The mitigation package of £250k is proposed “towards enhancing these parks in other ways”. It is unclear how this could be used and is unlikely to help mitigate the increased noise levels in these parks.
29. Operational Phase: Aircraft Ground Noise: Southwest Quadrant Receptors – Daytime Effects: Paragraph 7.8.301 states “All residential receptors which fall between the daytime LOAEL and SOAEL are forecast to experience a ‘moderate’ increase in daytime ground noise exposure due to the Proposed Development.” It is questioned whether this should be considered as a significant effect.
30. Operational Phase Noise Induced Vibration: It is unclear whether Littlebrook Nursery, within 500m of aircraft start of roll, will be eligible for any noise mitigation package. This should be confirmed.
31. Clarification around Fleet mix and transition is required with evidence to be produced to demonstrate the current assumptions are accurate.