Homes England

The Housing and Regeneration Agency

West of Ifield, Crawley
Environmental Statement: Volume 1: Main Report

CHAPTER 12: NOISE AND VIBRATION
Version 1 - Planning submission

July 2025

12 NOISE AND VIBRATION

12.1 Introduction

12.1.1 This chapter of the ES reports on the identification and assessment of likely significant noise and vibration effects to arise from the demolition and construction stage and operational stage of the Proposed Development.

12.1.2 The chapter describes the noise and vibration legislation, policy and guidance framework; the methods used to assess the potential impacts and likely effects; the baseline conditions at the Site and within the study area; the likely noise and vibration effects and the setting out of proposed mitigation measures, where feasible, in respect of any identified likely significant effects; proposed additional mitigation and any enhancement measures where applicable; the significance of residual effects; and inter-project cumulative effects.

12.1.3 A detailed description of the Proposed Development is provided in ES Volume 1 Chapter 4: Proposed Development Description. The Proposed Development comprises the construction and operation of a mixed-use development. For this reason, the Proposed Development has the potential to result in significant effects due to noise and vibration arising during the demolition and construction stages, and noise arising during the completed development stage.

12.1.4 The chapter is supported by the following technical appendices in ES Volume 2:

- ES Technical Appendix 12.1: Acoustic Terminology;
- ES Technical Appendix 12.2: Policy, Guidance and Legislation;
- ES Technical Appendix 12.3: Baseline Noise Survey;
- ES Technical Appendix 12.4: Demolition and Construction Noise Calculations;
- ES Technical Appendix 12.5: Site Suitability for Residential Development; and
- ES Technical Appendix 12.6: Road Traffic Data and Calculation of Road Traffic Noise.

12.2 Policy Context and Guidance

12.2.1 The Planning Statement which accompanies the hybrid planning application (HPA) outlines the local policy which relates to the Proposed Development. For the noise assessment described in this ES Chapter, where applicable given the Site's proximity to Crawley Borough and solely in relation to specific noise criteria, reference has been made to Crawley Borough Council's adopted local policy. This is explained in further detail within section 12.6 (Assessment Method).

12.2.2 The assessment has been informed by the following legislation, policies and published guidance:

- National Legislation and Policy:
  - National Planning Policy Framework (NPPF) (2024)[1];
  - Noise Policy Statement for England (NPSE) (2010)[2];
  - Planning Practice Guidance: Noise (PPG) (2019)[3];
  - The Control of Pollution Act (1974)[4];

[1] Ministry of Housing, Communities and Local Government, 2024, with a minor revision in 2025.National Planning Policy Framework. London. HMSO.
[2] Department of Environment, Food and Rural Affairs, 2010. Noise Policy Statement for England.
[3] Department for Levelling Up, Housing and Communities and Ministry of Housing Communities and Local Government, 2019. Planning Practice Guidance: Noise.
[4] Secretary of State, 1974. Control of Pollution Act, HMSO.

  - Building Regulations Approved Document E: Resistance to the passage of sound (ADE) (2015)[5];
  - Building Regulations Approved Document O: Overheating (ADO) (2022)[6].
- Regional Guidance:
  - Planning Noise Advice Document: Sussex (PNAD) (2023)[7];
- Local Policy:
  - Horsham District Planning Framework (HDPF) (2015)[8], in particular Policy 24;
  - Crawley Borough Local Plan 2023 – 2040 (2024)[9];
  - Rusper Neighbourhood Plan 2018-2031[10]. Although there is no specific policy on noise and vibration, *Policy RUS3: Design* notes that proposals should satisfactorily consider the achievement of current noise insultation standards. The Plan further includes that any noise emissions should be in accordance with the HDPF.
- National guidance and industry standards:
  - BS 5228:2009+A1:2014 – Code of practice for noise and vibration control on construction and open sites[11];
  - BS 7385-2:1993 – Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration[12];
  - BS 7445-1:2003 – Description and measurement of environmental noise – guide to quantities and procedures[13];
  - BS 8233:2014 – Guidance on sound insulation and noise reduction for buildings[14];
  - ISO 9613-2: 2024 – Acoustics – Attenuation of sound during propagation outdoors. Part 2: Engineering method for the prediction of sound pressure levels outdoors15;
  - BS 4142:2014+A1:2019 – Method for rating and assessing industrial and commercial sound[16];
  - BS EN 1793-2:2018 Road traffic noise reducing devices – Test method for determining the acoustic performance[17];
  - Calculation of Road Traffic Noise ('CRTN') (1988)[18];
  - The Design Manual for Roads and Bridges ('DMRB') LA111 Noise and Vibration (2020)[19];
  - The Design Manual for Roads and Bridges ('DMRB') LD 119 Roadside Environmental mitigation and enhancement (2020) [20];

5 Ministry of Housing, Communities and Local Government, 2015. The Building Regulations, 2010. Approved Document E: Resistance to the passage of sound. HMSO.

6 Department for Levelling Up, Housing and Communities, 2022. The Building Regulations, 2010. Approved Document O: Overheating. HMSO.

7 Horsham District Council et. al., 2023. Planning Noise Advice Document: Sussex.

8 Horsham District Council, 2015. Horsham District Planning Framework (excluding South Downs National Park).

9 Crawley Borough Council, 2024. Crawley Borough Council Local Plan 2023 – 2040.

10 Rusper Neighbourhood Plan 2018-2031

11 British Standards Institute, 2014. BS 5228:2009+A1:2014: Code of practice for noise and vibration control on construction and open sites.

12 British Standards Institute, 1993. BS 7385-2:1993: Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration.

13 British Standards Institute, 2003. BS 7445-1:2003: Description and measurement of environmental noise – guide to quantities and procedures.

14 British Standards Institute, 2014. BS 8233:2014: Guidance on sound insulation and noise reduction for buildings.

15 International Organization for Standardization, 2024. ISO 9613-2: Acoustics – Attenuation of sound during propagation outdoors. Part 2: Engineering method for the prediction of sound pressure levels outdoors.

16 British Standards Institute, 2019. BS 4142:2014+A1:2019. Method for rating and assessing industrial and commercial sound.

17 British Standards Institute, 2018. BS EN 1793-2:2018. Road traffic noise reducing devices – Test method for determining the acoustic performance

18 Department of Transport and the Welsh Office, 1988. Calculation of Road Traffic Noise.

19 Highways England (now National Highways), 2020. Design Manual for Roads and Bridges. LA111: Noise and Vibration (Version 2).

20 Highways England (now National Highways), 2020. Design Manual for Roads and Bridges. LD119: Roadside Environmental Mitigation and Enhancement (Revision 0).

- Institute of Environmental Management and Assessment Guidelines for Environmental Noise Impact Assessment ('IEMA Guidelines') (2014)[21];
- World Health Organization ('WHO'): Guidelines for Community Noise (1999)[22];
- World Health Organization ('WHO'): Night noise guidelines for Europe (2009)[23]
- ProPG: Planning and Noise: Professional Practice Guidance on Planning and Noise (2017)[24];
- Association of Noise Consultants ('ANC'): Acoustics, Ventilation and Overheating (AVO) (2020)[25] and
- Consultation Response on UK Airspace Policy: A framework for balanced decisions on the design and use of airspace (2017)[26].

12.3 Consultation

12.3.1 Horsham District Council (HDC) originally adopted a scoping opinion for a potential, outline planning application in November 2020 (HDC ref. EIA/19/0004). A revised scoping opinion request was submitted to HDC for a proposed HPA on 19 October 2023. On 27 November HDC issued a revised scoping opinion (HDC ref. EIA/23/0007). An updated scoping opinion request was submitted to HDC to take account of changes to development proposals on 21 May 2024. A formal ES Scoping Opinion for the updated proposed HPA was issued in July 2024 (HDC ref. EIA/24/0003).

12.3.2 Table 12.1 summarises the key ES Scoping Opinion responses and separate consultations that have been undertaken with respect to the noise and vibration assessment.

Table 12.1: Summary of Consultation

Consultee and Form/ Date of Consultation	Summary of Comments	Where in this Chapter Comments are addressed
Horsham District Council Scoping Opinion, dated 30 November 2020	• Minimise the need for piling works. • Construction not usually permitted during night-time periods. • Significance criteria banding too wide. • Plant noise limits should be set at 5 dB below background.	• Piling has been considered for non-residential development in the construction noise and vibration assessment. The requirement for piling would need to be reviewed and associated impacts assessed once further details of the development are known, at reserved matters stage. • It is expected that permission for any construction night-time works would be sought via Section 61 agreements with the Local Authorities. Night-time working would not be built into typical construction hours. • Significance criteria adjusted in the 'Assessment Criteria' section of this chapter. • Plant noise limits aimed to be set at 5 dB below representative background noise

[21] Institute of Environmental Management and Assessment, 2014. Guidelines for Environmental Noise Impact Assessment.
[22] World Health Organisation, 1999. Guidelines for Community Noise.
[23] World Health Organisation, 2009. Night noise guidelines for Europe.
[24] Association of Noise Consultants (ANC), Institute of Acoustics (IoA), Chartered Institute of Environmental Health, 2017. Professional Practice Guidance on Planning and Noise (ProPG): New Residential Development.
[25] Association of Noise Consultants (ANC), 2020. Acoustics, Ventilation and Overheating (AVO).
[26] Department for Transport. Consultation Response on UK Airspace Policy: A framework for balanced decisions on the design and use of airspace. October 2017.

Table 12.1: Summary of Consultation		
		levels in the 'Assessment of Effects' section of this chapter.
Crawley Borough Council Scoping Opinion, dated 27 October 2020	• General agreement with scoping report. • Expected that the noise rating level should not exceed the background L_{A90} and to prevent background creep in mixed commercial residential areas the L_{A90} should be 10dB below the L_{Aeq}. • Internal noise levels quoted in BS 8233:2014 relate to steady external noise sources (i.e. the distant hum of traffic) and not noise made up on intermittent events like aircraft and passing traffic in close proximity.	• Plant noise limits set at 5dB below background noise levels to be consistent with requirements of Horsham District Council. • The 45 dB L_{AFmax} recommendation of the WHO Guidelines for Community Noise (1999) and the more recent requirements of Building Regulations Approved Document O are considered to assess the internal noise levels during overheating conditions. This is considered in the 'Assessment of Effects' section of this chapter and the Site Suitability for Residential Development appendix. These assessments consider intermittent events such as aircraft.
London Gatwick Airport Response to Scoping Opinion, dated 28 October 2020	• Support the use of the future wide-spaced runway noise contours for the year 2040 in the assessment. • The assessment of significance should take into account latest government advice that the 54dBA L_{eq} contour represents the threshold for the onset of significant aircraft noise in the daytime and 48 dBA L_{eq} at night (SOAEL). • The opinion does however state: "*To be clear this does not mean that noise development should not be allowed where noise levels exceed 54dBAL_{eq} day / 48dBAL_{eq} night, but it is important that the impacts on noise sensitive development is properly assessed and mitigation is planned accordingly to protect against significant adverse effects on such development.*"	• LOAELs set at 51 dBA L_{eq} and 45 dBA L_{eq} for daytime and night-time periods, respectively, in accordance with the *Government's Consultation Response on UK Aviation Policy: A framework for balanced decisions on the design and use of airspace*, October 2017. This document does not state that the SOAELs should be set at 54 dBA L_{eq} and 48 dBA L_{eq}, as suggested in the Gatwick Airport Scoping Opinion Response. See the 'Assessment Criteria' section of this chapter. • Mitigation would be offered to protect internal residential amenity where the internal noise levels guidelines of BS 8233:2014 and requirements of Building Regulations Approved Document O would be expected to be exceeded due to aircraft movements in the Second Runway 2040 scenario.
Principal Environmental Health Officer, Crawley Borough Council email of 10 June 2022	• No objection to baseline noise monitoring proposals.	• Baseline noise survey methodology and results are detailed in this chapter and supporting appendix.
Planning Manager – Consents and Policy, Gatwick Airport Limited email of 23 January 2023 to Planning and Enabling Manager of Homes England	• GAL's advice is to use the 2040 summer day contours in any noise assessment".	• The assessment has considered the 2040 day and night aircraft noise contours throughout the operational assessments contained in this chapter.
Horsham District Council	• The adoption of the construction noise thresholds quoted in Annex E	• The Planning Noise Advice Document: Sussex (2023) states that when setting

Table 12.1: Summary of Consultation

Scoping Opinion, dated 27 November 2023	to BS 5228-1 as LOAELs and SOAELs is questioned. • The applicant should illustrate the potential magnitude of the construction noise impacts by comparing the predicted construction noise levels to the existing ambient noise levels at each receptor location. • The assessment for aviation noise should consider additional metrics beyond annualised $L_{Aeq,T}$. These should include consideration of single-mode noise impacts to ensure worst-case effects are fully captured. • The insulation scheme should include an overheating assessment and provision of mechanical ventilation.	appropriate thresholds refer to Annex E for BS5228 -1 2009 + A1:2014 Noise across all construction sites. • Effects have been considered using Annex E of BS5228-1 and particularly the thresholds of significant effects. • During a meeting of 1 February 2024, the Environmental Health Officer (EHO) agreed that BS 5228:2009+A1:2014 Annex E is the correct methodology to use for the construction noise assessment. However, the EHO was concerned about potential temporary construction noise effects to the nearest noise sensitive receptors to the Site. It was requested that additional mitigation to Best Practicable Means (BPM) be considered to reduce potential temporary construction noise effects to the nearest noise sensitive receptors to the Site. However, much of the scheme and assessment is based on outline parameters, only. Additional specific mitigation would need to be derived once the extent of the detailed development is known at the Reserved Matters stage. • In terms of aviation Noise, HDC suggested that the proposed assessment would adopt annualised metrics which do not account for worst-case single mode operations at the airport. • The Applicant's consultant completed measurements of maximum noise levels on Site and suggested assessment against the 2040 N60 contours which present the number of exceedances of 60 dB L_{max} during a night-time period. The noise assessment considers the maximum noise levels at the proposed sensitive receptors. Therefore, the noise assessment is robust and has not only been considered against annualised average metrics. • The EHO agreed with the proposed methodology. • HDC suggested that annualised metrics are unlikely to capture the full impact of aviation noise, particularly for overflight, and additional metrics should be employed. This should include consideration of single-mode noise

Table 12.1: Summary of Consultation		
		impacts to ensure worst-case effects are fully captured. This has been considered as part of the assessment. • The EHO requested assessment of the 2038 N65 daytime contours associated with the proposed operation of the northern runway. It was agreed to do this within the assessment of cumulative effects. The EHO stated that 20 events, as indicated on the N65 daytime noise contours, would be the SOAEL, which has been included in the assessment • HDC suggested that implementation of sound insulation measures is likely to significantly increase the risk of overheating in affected dwellings and therefore insulation schemes should also include an overheating assessment and provision of mechanical ventilation. • The results of the on-Site noise measurements and the 2040 N60 contours have been used to determine areas of the Site where the external noise level requirements of Building Regulations Approved Document O are likely to be exceeded, and therefore, additional mitigation will be required to achieve suitable internal noise levels during overheating conditions. A detailed overheating assessment would be undertaken at detailed design stage once residential proposals are finalised. All mitigation would be subject to detailed design at a later stage to be secured via appropriate planning condition.
Horsham District Council Scoping Opinion, dated 15 July 2024	• BS 5228-1 and Annex E standards may not sufficiently protect noise-sensitive receptors in rural areas, where background noise is low, and significant adverse effects could occur below the 65 dB $L_{Aeq,T}$ threshold. • Construction noise assessments should include receptor identification and consideration of topography, extending beyond BS 5228-1 Annex E, as part of the development consent process to ensure thorough understanding and mitigation of impacts.	• BS 5228-1 Annex E has been used for assessment of construction noise impacts, as agreed with the HDC EHO during a meeting of 1 February 2024. • CadnaA noise prediction models of the construction noise levels have been completed that take account of topography between the source and the receiver. • The assessment has considered the 2038 N65 aviation noise contour for the daytime (associated with the proposed operation of the Gatwick northern runway), within the cumulative effects section of the report. • The 2040 N60 contour has been considered for the night-time

Table 12.1: Summary of Consultation		
	• Support of the use of the N65 aviation noise contour alongside the annualised $L_{Aeq,T}$. • Support of the commitment to identify buildings at risk of overheating due to the external noise environment.	assessment of maximum noise levels at the proposed residential receptors. • Outline mitigation measures are provided to achieve the internal maximum noise level criteria of Building Regulations Approved Document O during overheating conditions. However, all mitigation would be subject to detailed design at a later stage to be secured via appropriate planning condition.
Meeting with Horsham District Council and Applicants on 3 May 2024	• Ramboll explained the baseline noise monitoring that was completed and the noise prediction modelling of road traffic noise levels from the Crawley Western Multi Modal Corridor ("CWMMC"). • Ramboll explained the optioneering for road noise traffic noise mitigation from the CWMMC and why the proposed noise bund was the preferred solution to reduce potential noise effects at the nearest existing noise sensitive receptors. • HDC stated that they did not necessarily see a need for a noise bund. • HDC requested additional data from the baseline noise surveys to further inform their response to the noise bund proposal. Ramboll issued the noise survey report to the Applicant to forward onto HDC. • HDC responded to the Applicant via email on 4 June 2024 to request a non-standard assessment methodology (not in accordance with LA 111) to determine whether a noise bund would be required. • Ramboll responded to the Applicant and detailed why a non-standard assessment would not be appropriate • HDC responded to the Applicant to re-iterate that they did not necessarily see a need for a noise bund and further requested a potentially non-standard assessment. • Ramboll responded to the Applicant to further advocate the use of LA 111 to determine road traffic noise effects and appropriate mitigation requirements.	• The proposed noise bund and barriers are detailed in the Completed Development Effects Embedded Mitigation section of this ES chapter, commensurate with the requirements of LA 111 as a proposed 'non-standard' assessment methodology suggested by HDC was not considered appropriate.

12.4 Assessment Scope

12.4.1 The assessment has been undertaken in accordance with relevant noise and vibration guidance and aligns with the methodology outlined in ES Volume 1 Chapter 2: EIA Process and ES Methodology, and included in the 2024 Scoping Report (ES Volume 2 Technical Appendix 2.1). The assessment has taken account of all applicable legislation, national, regional and local policy, guidance and the ES Scoping Opinions.

12.4.2 Noise and vibration originating from the demolition, construction or operation of the Proposed Development are impacts on the local environment. These environmental impacts can result in potentially significant effects at adjacent receptors such as a change in behaviour or adverse health effects, sleep disturbance, annoyance.

12.4.3 The point at which a noise or vibration impact results in a significant effect varies depending upon factors including:

- The type of effect that could occur;
- The magnitude of the impact (i.e. the noise level, the vibration level, or the magnitude of the change in noise level);
- The type of noise or vibration source;
- The time of day in which the impact occurs;
- The existing conditions at the receptor; and
- The sensitivity of the receptor.

Technical Scope

12.4.4 In-line with best practice, applicable guidance, the Scoping Opinion and direct consultation with HDC, the technical scope of the demolition and construction assessment has considered the following:

- Demolition and construction works - the resulting demolition and construction plant noise and vibration impacts and the associated effects to the nearest, existing off-Site noise-sensitive receptors (NSRs);
- Demolition and construction plant noise and vibration of the later phases of the demolition and construction works on the new on-Site NSRs introduced from the completion and occupation of the earlier phases of the Proposed Development; and
- The resulting demolition and construction traffic and associated noise and vibration effects to the nearest on-Site and off-Site NSRs.

12.4.5 In-line with best practice, applicable guidance, Scoping Opinion and direct consultation with HDC, the technical scope for the completed development stage has considered the following:

- Noise effects on existing local residents as a result of traffic directly and indirectly generated by the Proposed Development;
- Noise effects from aircraft noise on the future on-Site NSRs of the Proposed Development;
- Noise effects from aircraft noise on the future on-Site NSRs of the Proposed Development with external amenity areas; and
- Building services plant noise effects associated with the operation of the Proposed Development upon existing and proposed NSRs.

12.4.6 In addition, an assessment of the Site suitability for residential use, from a noise and vibration perspective, for the Proposed Development has been carried out and presented in ES Volume 2 Technical Appendix 12.5. This assessment includes consideration of:

- Noise effects due to the potential impact of road traffic noise and aircraft noise on the future on-Site occupants of the Proposed Development.

12.4.7 The Site suitability for residential use assessment has been used to develop outline mitigation measures for the Proposed Development to inform the future detailed design stages. The Site suitability includes an outline assessment of internal noise levels during overheating conditions, as requested by HDC in the Scoping Opinion and subsequent consultations.

12.4.8 The assessment has been based on the following:

- Demolition and construction works for the Proposed Development and specific activities, presented in ES Volume 1 Chapter 5: Demolition and Construction Description of this Volume and the Outline Construction Environmental Management Plan (OCEMP) included as ES Volume 2 Technical Appendix 5.1;
- Completed development as presented in ES Chapter 4: Proposed Development Description of this Volume; and
- Completed development traffic as presented in ES Volume 2 Technical Appendix 12.6.

Spatial Scope

12.4.9 The study area for the demolition and construction noise assessment includes existing off-Site NSRs up to 300 m from the Site boundary, in accordance with BS 5228-1:2009+A1:2014. Assessment to this British Standard is considered to be best practice and this approach was agreed upon with HDC as part of the Scoping Opinions. BS 5228-1:2009+A1:2014 states that calculations beyond 300 m should be treated with caution. Demolition and construction vibration has been considered for receptors up to 100 m from the boundaries of potential plots that may include piling works. Piling is assumed to potentially occur for development in non-residential or mixed-use development plots. Based on data presented in BS 5228-2:2009+A1:2014, vibration would not be expected to be perceivable beyond 100m from the works.

12.4.10 The study area incorporates new and existing NSRs as detailed in Table 12.13.

12.4.11 The study area for the completed development road traffic noise assessment covers an area of up to 15km from the Site boundary. This area includes the full road traffic data set provided by the Applicant's traffic consultant, Steer. The road traffic noise modelling considers road links adjacent to the Site boundary or through the Site, as road links at distance from the Site would not significantly influence average noise levels on the Site.

Temporal Scope

12.4.12 The assessment has considered impacts arising during the demolition and construction stage which would be expected to be temporary and short to long term (5-15 years) in nature and from the completed development stage which would be expected to be permanent and long-term in nature (i.e., more than 10 years).

12.4.13 Demolition and construction noise and vibration effects have been assessed between 2025 and 2041.

12.4.14 The following scenarios have been assessed for the demolition and construction stage:

- Scenario 1: Existing Baseline (2025);
- Scenario 2: Future Baseline (2029); and
- Scenario 3: Future Baseline + Completed Development (2029 – 2041).

12.4.15 The following scenarios have been assessed for the completed development stage:

- Scenario 1: Existing Baseline (2025[27]);

[27] Based on road traffic flow data provided by the Applicant's Transport Consultant. Refer to ES Chapter 15: Transport for details of the selection of 2025 as the baseline year.

- Scenario 2: Future Baseline (2029) + Committed Developments;
- Scenario 3: Future Baseline (2029) + Committed Developments + Proposed Development;
- Scenario 4: Future Baseline (2041) + Committed Developments; and
- Scenario 5: Future Baseline (2041) + Committed Developments + Proposed Development.

12.4.16 The 2029 Scenario has been selected as being the 'Opening Year' as this constitutes the first year of the residential year build-out, and represents the occupation of 25 residential dwellings and the operations from 6FE secondary school.

12.4.17 The assessment has been undertaken considering the existing baseline noise levels measured in 2022 and the baseline road traffic flow data provided by the Applicant's transport consultant. The baseline noise survey data is still deemed to be valid as the primary purpose of the survey was to measure maximum noise levels from aircraft across the Site. Whilst the frequency of maximum noise level events may have changed since 2022 (as aircraft movements were returning to normal after the Covid-19 pandemic), the absolute maximum noise levels from aircraft are not expected to have changed. The assessment of effects on proposed sensitive receptors on the Site are based on the future baseline road traffic noise levels (2029 and 2041), along with:

- The Gatwick Airport Second Runway 2040 Option 3 (Wide Spaced Mixed Mode) No EATs 2040 L_{eq} 54-72 dB(A) Contours; and
- the Gatwick Airport Second Runway 2040 Option 3 (Wide Spaced Mixed Mode) No EATs 2040 Summer Night N60 Contours.

12.5 Baseline Characterisation Method

Desk Study

12.5.1 A desk study was not carried out to establish baseline noise levels in the study area.

12.5.2 A desk study of maps and satellite imagery was undertaken to identify the nearest existing off-Site NSRs to the Proposed Development.

12.5.3 Traffic data was obtained from the Applicant's transport consultant, Steer. See ES Volume 1 Chapter 15: Transport for further information on the trip generation and modelling approach adopted.

12.5.4 No modelling was carried out to characterise the existing baseline noise climate for completed development Scenario 1. This is because noise measurements were complete on Site to determine existing baseline noise levels. The assessment of effects of the completed development is based on predictions of future road traffic and aircraft noise levels. The existing and future noise sources were accounted for in the noise prediction model of completed development Scenario 5 to assess the potential effects of noise from these sources, with the completed development in place.

Field Study

12.5.5 The existing noise environment was characterised by Ramboll using a baseline noise survey completed between 28 June and 7 July 2022 and undertaken in accordance with BS 7445-1:2003. The survey was completed in and around the Site to quantify the typical prevailing ambient, background and maximum noise levels during daytime and night-time periods.

12.5.6 The survey was designed to measure all noise sources affecting the Site, as far as possible. Noise sources include road and air traffic noise, and users of Ifield Golf Course which is in the south of the Site.

12.5.7 The baseline noise survey comprised a combination of unattended and attended measurements as detailed in ES Volume 2 Appendix 12.2: Baseline Noise Survey. The survey

results have been used to inform the assessment criteria and mitigation requirements for demolition and construction noise effects, Site suitability for residential amenity, and plant noise emissions.

12.5.8 A vibration survey was not completed as significant sources of vibration are not present on or around the Site.

12.6 Assessment Method

Methodology

12.6.1 The demolition and construction stage has been based on the development phasing and works as described in ES Volume 1 Chapter 5: Demolition and Construction Description, the OCEMP (ES Volume 2 Technical Appendix 5.1), and the Phase 1 OCEMP (10051123-ARC-XXX-ZZ-TR-CM-00001) prepared by Arcadis. Both the OCEMP (for outline component) and Phase 1 OCEMP (for detailed component) will be submitted with the HPA.

12.6.2 The completed development stage assessment has been based on the parameter plans and development specification documents, as described in ES Volume 1 Chapter 4: Proposed Development Description.

12.6.3 Traffic data has been provided by the Applicant's transport consultant, Steer, and are presented in the Transport Assessment (WOI-HPA-DOC-TA-01).

12.6.4 A noise model of the Proposed Development and the study area was developed using CadnaA® version 2025, a proprietary noise modelling software. The software implements the calculation methodology of BS 5228:2009+A1:2014 for demolition and construction noise predictions, and the standard noise prediction methodology detailed in ISO 9613 Part 2:2024, for the completed development assessments.

12.6.5 The model was used to assess the likely effects of noise sources within the study area. The software utilises standard acoustic principles in conjunction with approved prediction methodologies and is a tried and tested method for accurately predicting and assessing the impact of noise from a variety of sources.

12.6.6 Existing topography was obtained from open-source LiDAR data. The building massing was based on the maximum development zone height and massing as shown in the parameter plans.

12.6.7 The noise model was used to predict impacts during the demolition and construction and completed development stages.

12.6.8 Modelling of the demolition and construction works was undertaken by reference to construction phases (as provided in ES Volume 1 Chapter 5: Demolition and Construction Description).

12.6.9 Demolition and construction noise impacts have been predicted based on the use of typical plant and methodologies, and by assigning the noise emissions for typical demolition and construction activities to areas of the Site, in accordance with the proposed demolition and construction stage phasing.

12.6.10 The completed development stage model used for assessing the suitability of the Site for the Proposed Development, from a noise perspective, accounts for the cumulative road traffic flow data provided for 2041 with the completed development and cumulative schemes in place (i.e. completed development Scenario 5).

Demolition and Construction Stage

12.6.11 Demolition and construction plant noise was assessed against the existing measured baseline (2022) in line with the ABC Method presented in BS 5228-1:2009+A1:2014. Details of the demolition and construction calculations and assumptions are presented in ES Volume 2 Technical Appendix 12.4.

12.6.12 Demolition and construction plant vibration has been assessed against the Peak Particle Velocity (PPV) significance criteria in BS 5228-2:2009+A1:2014.

12.6.13 For residential receptors, a cause of concern in relation to construction vibration relates to building damage. However, the magnitudes of vibration that are associated with cosmetic damage to buildings are much greater than the magnitudes of vibration that the human body can perceive. Therefore, the most likely effects due to vibration from construction of the Proposed Development are associated with perceptibility (i.e. adverse comments from occupants of adjacent buildings).

12.6.14 For this chapter the potential effects of construction vibration have been for two activities most likely to result in the highest levels of ground-borne vibration. These activities are vibratory compaction for new or altered highways and earthworks, and piling for the structures works.

12.6.15 Demolition and construction traffic has been assessed against the road traffic baseline (2025) in-line with the short-term impact criteria in CRTN and DMRB LA111.

Completed Development Stage

Site Suitability for Residential Development

12.6.16 The Site suitability for the residential development assessment for the completed development considers future cumulative road traffic noise and aircraft noise from Gatwick Airport, located approximately 1km to the north of the Site.

12.6.17 The Site suitability of the completed development for residential development has been assessed using completed development Scenario 5[12.4.15] to predict internal and external noise levels. Mitigation measures have been proposed where noise levels are predicted to give rise to adverse impacts on habitable rooms, as per the requirement of the Planning Noise Advice Document: Sussex. The proposed mitigation would adequately control internal ambient noise levels to equal to or below the recommended levels specified in Table 4 of BS 8233:2014. This includes taking into consideration regular nighttime noise events, such as scheduled aircraft, in line with the standards outlined in Building Regulations ADO (2021).

12.6.18 The anticipated noise levels within the proposed external amenity areas of the completed development have been evaluated according to the guidelines set forth in ProPG Noise, BS 8233:2014, the Planning Noise Advice Document: Sussex and the Crawley Local Plan. The Crawley Local Plan has been used to determine significance criteria for aircraft noise, as the criteria within the Crawley Local Plan are deemed to provide a worst-case assessment.

Site Suitability for Non-Residential Development

12.6.19 The Site suitability for non-residential development assessment for the completed development considers future cumulative road traffic noise and aircraft noise from Gatwick Airport.

12.6.20 The Site suitability of the completed development for non-residential development has been assessed using completed development Scenario 5 (refer to section 12.4 for details) to predict internal and external noise levels.

12.6.21 The Site suitability for education and school use has been assessed against the guideline internal ambient noise level criteria provided in Building Bulletin 93 (BB93): Acoustic design of schools – performance standards.

12.6.22 The Site suitability for commercial use has been assessed against the guideline for internal ambient noise level criteria provided in BS 8233:2014 Guidance on sound insulation and noise reduction for buildings.

12.6.23 All proposed non-residential buildings will be subject to detailed design at a later stage and suitable mitigation measures would be secured by appropriately worded planning conditions following a reserved matters planning application.

Changes in Road Traffic Noise

12.6.24 Potential effects arising due to the change in road traffic noise that is expected to occur with the Proposed Development, have been assessed in line with the methodologies in CRTN and DMRB LA111.

12.6.25 The basic noise level (BNL) at a nominal position 10 m from the kerb of each link has been calculated following the methodology provided in CRTN (see ES Technical Appendix 12.6: Road Traffic Data and Calculation of Road Traffic Noise).

12.6.26 The total change in road traffic noise level (dB $L_{A10,18hr}$) from all road links at each identified receptor has been calculated using proprietary noise modelling software, CadnaA.

12.6.27 The change in road traffic noise level road link has then been determined for the following scenarios in line with DMRB LA111:

- Comparison 1: Scenario 3 versus Scenario 2 (i.e., the effect of the Proposed Development when compared to the future baseline 2029);
- Comparison 2: Scenario 5 versus Scenario 2 (i.e., the cumulative effect of the Proposed Development and the cumulative schemes when compared to the future baseline); and
- Comparison 3: Scenario 4 versus Scenario 2 (i.e., the non-project noise change).

12.6.28 The potential for significant effects has been evaluated using the DMRB LA111 methodology which includes consideration of short-term change, long-term change, absolute road traffic noise levels, context and sensitivity of receptors.

Fixed Plant Installations

12.6.29 Operational plant noise has been assessed using the BS 4142:2014+A1:2019 methodology, as required by the Planning Advice Document: Sussex. This assessment accounts for baseline conditions via reference to the measured representative background sound levels obtained from the baseline noise survey.

Cumulative Stage

12.6.30 A cumulative assessment has been undertaken of the schemes identified within ES Volume 1 Chapter 2: EIA Process and ES Methodology in combination with the Proposed Development.

12.6.31 Within this Chapter, a construction stage cumulative assessment has been undertaken of the cumulative schemes within 300 m of the Site boundary as this encompasses the receptors that are likely to be affected for noise.

12.6.32 The cumulative stage for construction effects has been undertaken based on a qualitative approach informed by professional judgment and experience, because complete construction information for cumulative schemes (programme, CEMP, phasing, traffic flows) are not available within the public domain.

12.6.33 The assessment of operational road traffic effects, Scenario 3 and Scenario 5 has been undertaken using the road traffic flow data, as provided by the Applicant's transport consultant (refer to section 12.4 of this ES chapter). Accordingly, a separate cumulative assessment has not been undertaken for the completed development stage.

12.6.34 Following consultation with and specific request from HDC, the assessment of cumulative aircraft noise assessments has been undertaken using the 2038 N65 daytime noise contours from the Gatwick Airport Northern Runway Development Consent Order ("DCO").

12.7 Assessment Criteria

12.7.1 The general criteria used to assess if an effect is significant or not, is set out in ES Volume 1 Chapter 2, with further details specific to noise and vibration provided herein. This is determined by consideration of the sensitivity of the receptor, magnitude of impact and scale of the effect. In considering the significance of an effect, consideration has been given to the duration of the effect, the geographical extent of the effect and the application of professional judgement.

Receptor Sensitivity/Value Criteria

12.7.2 The sensitivity of receptors has been classified as low, medium or high, in accordance with the criteria set out in Table 12.2.

Table 12.2: Receptor Sensitivity Criteria

Sensitivity	Criteria
Low	Industrial, commercial and retail premises.
Medium	Places of worship, community facilities, offices.
High	Residential properties, educational buildings, hotels.

Impact Magnitude Criteria

12.7.3 Impacts have been assessed on the basis of the value/sensitivity of receptors against the magnitude of impact to determine the scale of effect as presented in Table 12.12.

12.7.4 The effect levels are based on the Government Guidance PPG: Noise and are defined as:

- No Observed Adverse Effect Level (NOAEL);
- Lowest Observed Adverse Effect Level (LOAEL): noise that can be heard and can cause small changes to behaviour and/or attitudes; and
- Significant Observed Adverse Effect Level (SOAEL): noise that can cause a significant change in behaviour and/or attitude.

12.7.5 Full details of the NPSE and PPG: Noise are provided in ES Volume 2 ES Technical Appendix 12.2.

Demolition and Construction Noise

12.7.6 To determine the likely effect of noise levels during the demolition and construction stage, noise level predictions have been completed to BS 5228-1:2009+A1:2014, taking full account of Best Practicable Means (BPM) to be adopted (see ES Volume 1 Chapter 5: Demolition and Construction Description and OCEMP (ES Volume 2 Technical Appendix 5.1).

12.7.7 Demolition and construction stage noise thresholds have been set for the NSRs closest to the Site boundary. For high and medium sensitivity receptors, these thresholds have been set in accordance with the 'ABC Method' detailed in Annex E of BS 5228-1:2009+A1:2014. No assessment has been undertaken for low sensitivity receptors.

12.7.8 Based on the results of the baseline noise survey presented in ES Volume 2 Technical Appendix 12.2, the daytime demolition and construction noise threshold for high sensitivity receptors has been set at 65 dB $L_{Aeq,T}$ during typical working hours. Above this threshold, there is potential for significant effects to occur due to daytime demolition and construction noise.

12.7.9 The daytime demolition and construction stage noise threshold for medium sensitivity receptors has also been set at 65 dB $L_{Aeq,T}$ during typical working hours, in accordance with the guidance of the '5dB Change Method' presented in BS 5228-1:2009+A1:2014.

12.7.10 The demolition and construction stage noise threshold criteria are detailed in Table 12.3. The LOAEL for daytime demolition and construction noise has been informed by the measured baseline noise levels and has been set at 50 dB $L_{Aeq,10hr}$.

Table 12.3: Demolition and Construction Noise Criteria for Noise Sensitive Receptors		
Daytime Demolition and Construction Noise Level	**Adverse Effect Level**	**Magnitude of Impact**
≥ 70 dB $L_{Aeq,10,hr}$	Above or equal to SOAEL + 5 dB	High
65 – 69 dB $L_{Aeq,10,hr}$	Above or equal to SOAEL and below SOAEL + 5 dB	Medium
SOAEL		
50 – 65 dB $L_{Aeq,10,hr}$	Above or equal to LOAEL and below SOAEL	Low
LOAEL		
< 50 dB $L_{Aeq,10,hr}$	Below LOAEL	Negligible

12.7.11 Typical plant equipment and percentage on-times have been used to predict the expected noise levels for each activity during the demolition and construction stage. This has been carried out in accordance with BS 5228-1:2009+A1:2014, which accounts for the following variables:

- Sound power levels for each item of equipment;
- Distance attenuation between source and receiver;
- Percentage operating time of the noise source;
- Any relevant barrier attenuation effects;
- Ground absorption; and
- Façade corrections.

Demolition and Construction Vibration

12.7.12 BS 5228-2 states that for the majority of people, vibration levels between 0.14 and 0.3 mm/s PPV are just perceptible. A vibration level of 1.0 mm/s is sufficient to cause complaint, but tolerable with prior warning, whereas a level of 10 mm/s is intolerable for anything more than a very brief exposure.

12.7.13 Vibration levels due to demolition or construction exceeding 15 mm/s PPV has the potential to result in minor cosmetic damage in light/unreinforced buildings. This magnitude of vibration is not considered likely as a result of the proposed demolition and construction activities being undertaken, and therefore an assessment of potential building damage due to vibration has not been undertaken.

12.7.14 Table 12.4: Demolition and Construction Vibration Criteria presents the magnitude of impact for levels of demolition and construction vibration.

Table 12.4: Demolition and Construction Vibration Criteria		
Vibration Level Peak Particle Velocity (PPV)	**Adverse Effect Level**	**Magnitude of Impact**
≥ 10 mm/s	Above SOAEL	High
1.0 mm/s to 9.9 mm/s	Above SOAEL	Medium
LOAEL		
0.3 mm/s to 0.9 mm/s	LOAEL to SOAEL	Low
SOAEL		
≤0.29 mm/s	Below LOAEL	Negligible

Construction Road Traffic Noise

12.7.15 It is understood that during Phase 1 detailed works, construction traffic would access the Site via Rusper Road only.

12.7.16 It is understood that following the completion of the Phase 1 detailed works and the CWMMC is complete (i.e. Phase 2 onwards), construction traffic would access the Site via the CWMMC. Access to the Site from the wider road network would be via 4 defined routes. The roads included on these routes would be Ifield Avenue, the A2011, London Road, the A23 Crawley Avenue and Horsham Road.

12.7.17 The potential change in road traffic flows for these road links have been assessed against the existing baseline road traffic flows.

12.7.18 An increase in road traffic flow of ≥20% would indicate a potential increase in road traffic noise level of 1 dB. To the short-term impact magnitude criteria of DMRB LA 111, as presented in Table 12-5, this would indicate a low magnitude of impact.

12.7.19 The traffic flows for roads used construction vehicles have been assessed to determine whether a change in road traffic flow of ≥20% would be expected.

Road Traffic Noise

12.7.20 DMRB LA111 requires that road traffic noise levels are predicted and assessed for four scenarios, as follows:

- Do-Minimum in the opening year, 2029 (DMOY);
- Do-Minimum in the future year, 2041 (DMFY);
- Do-Something in the opening year, 2029 (DSOY); and
- Do-Something in the future year, 2041 (DSFY).

12.7.21 The 2029 Scenario has been selected as being the 'Opening Year' as this constitutes the first year of the residential year build-out, and represents the occupation of 25 residential dwellings and the operations from 6FE secondary school.

12.7.22 Predicted road traffic noise changes have then been evaluated for the following comparisons:

- Long-term noise change without the Proposed Development (DMFY minus DMOY);
- Short-term noise change with the Proposed Development (DSOY minus DMOY); and
- Long-term noise change with the Proposed Scheme (DSFY minus DMOY).

12.7.23 For the assessment, these comparisons have been carried out for the daytime (dB $L_{A10,18hr}$ index) and night-time (dB L_{night} index in accordance with TRL Method 2).

12.7.24 The assessment of predicted daytime and night-time noise levels has been undertaken at the receptor façade (i.e. building evaluation) and floor (i.e. ground floor, first floor, etc.) which experiences the greatest magnitude of noise change. Where two or more façade points have equal change, the point with the highest Do-Something traffic noise level is selected in accordance with DMRB LA111 methodology.

12.7.25 DMRB sets out impact magnitudes and effect levels for operational noise.

12.7.26 Operational noise effect levels relate to level of road traffic noise expected at a receptor with the Proposed Development in place and are shown in Table 12.5.

Table 12.5: Operational Road Traffic Noise LOAELs and SOAELs For All Receptors

Time Period	LOAEL	SOAEL
Day (06:00 – 24:00)	55dB $L_{A10,18hr}$ façade	68dB $L_{A10,18hr}$ façade
Night (24:00 – 06:00)	40dB $L_{night,outside}$ (free-field)	55dB $L_{night,outside}$ (free-field)

12.7.27 Impact magnitude are evaluated in terms of the change in road traffic noise at the receptor position for the short-term (upon opening of the Proposed Development in 2029) and over the long-term with the Proposed Development (Do-Something 2041 versus Do-Minimum 2029) with reference to Table 12.6 and Table 12.7.

Table 12.6: Short-Term Road Traffic Noise Impact Magnitude Criteria

Change in Basic Noise Level $L_{A10,18hr}$ or L_{night} dB	Magnitude of Impact
< 1	Negligible
1.0 to 2.9	Low
3.0 to 4.9	Medium
≥ 5	High

Table 12.7: Long-Term Road Traffic Noise Impact Magnitude Criteria

Change in Basic Noise Level $L_{A10,18hr}$ or L_{night} dB	Magnitude of Impact
< 3	Negligible
3.0 to 4.9	Low
5.0 to 9.9	Medium
≥ 10	High

12.7.28 For consistency within the wider ES, the DMRB Magnitude of Impact terminology has been changed from Negligible, Minor, Moderate and Major to Negligible, Low, Medium and High respectively.

Aircraft Noise

12.7.29 The Horsham District Council Planning Policies[28] and the Sussex Planning Noise Advice Document[29] do not provide any quantitative metrics for the assessment of aircraft noise.

12.7.30 Daytime and night-time LOAELs are provided in the Consultation Response on UK Airspace Policy: A Framework for Balanced Decisions on the Design and Use of Airspace[30]. These metrics have also been suggested for use by Gatwick Airport in their response to a Scoping Opinion, dated 28 October 2020.

12.7.31 In accordance with Government's expectations for compensation and noise insulation schemes outlined in the Aviation Policy Framework (2013)[31], the daytime and night-time SOAELs would be set at 63 dB(A) $L_{eq,\ 16\ hour}$ and 55 dB(A) $L_{eq,\ 8\ hour,}$ respectively.

12.7.32 However, the Crawley Borough Council Planning Policies and Supplementary Documents provide extensive and well-defined guidance on the metrics and assessment of aircraft noise. Although the Site does not fall within the jurisdiction of Crawley Borough Council, their guidance on aircraft noise has been adopted for this ES Chapter. This is because their criteria are more onerous than those outlined in the Government and UK Airspace Policy, thereby offering a worst-case assessment.

12.7.33 These criteria also align with Gatwick Airport's advice that the 54dB(A) $L_{eq,16hour}$ and 48 dB(A) $L_{eq,8hour}$ contours represent the thresholds for the onset of significant effects, respectively.

[28] Horsham District Council, 2015. Horsham District Planning Framework (excluding South Downs National Park).

[29] Horsham District Council et. al., 2023. Planning Noise Advice Document: Sussex.

[30] Department for Transport. Consultation Response on UK Airspace Policy: A framework for balanced decisions on the design and use of airspace. October 2017.

[31] Department for Transport (2013) Aviation Policy Framework, March 2013. [Online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/153776/aviation-policy-framework.pdf

Table 12.8: Aircraft Noise LOAELs and SOAELs For All Receptors		
Time Period	**LOAEL**	**SOAEL**
Day (07:00 – 23:00)	51 dB $L_{Aeq,16hour}$	54 dB $L_{Aeq,16hour}$
Night (23:00 – 07:00)	45 dB $L_{Aeq,8hour}$	48 dB $L_{Aeq,8hour}$

12.7.34 Table 12-8 defines the magnitude of impacts and adverse effect levels for the Proposed Development.

Table 12.9: Aircraft Noise Impact Magnitude Criteria		
Time Period	**Noise level**	**Magnitude of Impact**
Day (07:00 – 23:00)	<51 dB $L_{Aeq,16hour}$	Negligible
	51 - 53 dB $L_{Aeq,16hour}$	Low
	54 - 56 dB $L_{Aeq,16hour}$	Medium
	≥57 dB $L_{Aeq,16hour}$	High
Night (23:00 – 07:00)	<45 dB $L_{Aeq,8hour}$	Negligible
	45 – 47 dB $L_{Aeq,8hour}$	Low
	48 – 50 dB $L_{Aeq,8hour}$	Medium
	51 dB $L_{Aeq,8hour}$	High

12.7.35 It should be noted that the Crawley Local Plan sets night-time criteria in terms of $L_{Aeq,8hour,}$ i.e. the 8-hour average night-time noise level between 23:00-07:00. The Gatwick Airport contours show night-time noise levels in terms of L_{night}, i.e. the equivalent sound level of aircraft noise in dBA for the 8-hour annual average night (23:00-07:00). For the purpose of assessment and to determine significance of effects against the Gatwick Airport night-time contours, these parameters are deemed to be the same.

12.7.36 The Crawley Local Plan states that night-time maximum noise levels of >60 dB L_{AFmax} could give rise to a LOAEL and that maximum noise levels of 60-80 dB L_{AFmax} could give rise to a SOAEL.

External Amenity Noise Levels

12.7.37 BS 8233:2014 states "For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces but should not be prohibited".

12.7.38 The noise levels in external amenity areas are expected to be dictated by aircraft noise from Gatwick Airport. As such, the magnitude of impact criteria has been adapted to suit the Gatwick Airport noise contours for ease of comparison. For example, 55 dB $L_{Aeq,16hour}$ could be deemed to be the onset of a Medium Magnitude of Impact to BS 8233:2014 whereas 54 dB $L_{Aeq,16hour}$ has been set as the onset of a Medium Magnitude of Impact, so that these areas of the development can be easily identified from the Gatwick Airport contours.

12.7.39 The criteria are deemed to be compliant with the Crawley Local Plan aircraft noise criteria, and broadly follow the guidance of BS 8233:2014.

12.7.40 The assessment outlines the magnitude of impact associated with the expected external noise levels at the completed development stage of the Proposed Development. These are summarised in Table 12.10.

Table 12.10: External Amenity Effect Level and Magnitude of Impact Criteria	
External Noise Level $L_{Aeq,16hr}$ dB	**Magnitude of Impact**
> 57	High
SOAEL	
54 to 57	Medium
51 to 53	Low
LOAEL	
≤ 50	Negligible

12.7.41 The Crawley Local Plan states that noise levels >60 dB $L_{Aeq,16hour}$ from aviation noise sources would indicate an Unacceptable Adverse Effect.

Fixed Plant Installations

12.7.42 The type, quantity and location of fixed mechanical and electrical plant associated with the Proposed Development has not been finalised at this stage in the design and hence it is not possible to fully quantify the building services plant noise impact at the nearest NSRs.

12.7.43 As per standard good practice, the design of suitable noise mitigation measures for each individual plant item would be carried out during the detailed design stage. Noise emissions from plant associated with the Proposed Development would, therefore, be controlled via a suitably worded planning condition resulting from each reserved matters planning application.

12.7.44 For the purposes of this assessment, the magnitude of impact is classified in accordance with BS 4142, as outlined in Table 12.11.

Table 12.11: Operational Plant Noise Impact Magnitude Criteria		
Excess of rating level over representative background level	**Adverse Effect Level**	**Magnitude of Impact**
≤ 0 dB	Below LOAEL	Negligible
0 to 5 dB	LOAEL to SOAEL	Low
5 to 9 dB	Potentially above SOAEL depending on context	Medium
≥ 10 dB	Likely above SOAEL	High

12.7.45 As requested by Horsham District Council in the ES Scoping Opinion (ref: EIA/19/0004 dated 30 November 2020), the rating level for all plant associated with the Proposed Development will be set as at least 5 dB below the representative background noise level at the NSRs.

12.7.46 Note that this is more onerous than the limit in the PNAD of equal to or less than representative background noise levels.

12.7.47 Providing that the plant noise rating level limits are met, no significant effects are predicted.

Scale of Effect Criteria

12.7.48 Impacts have been assessed on the basis of the value/sensitivity of receptors against the magnitude of impact to determine the scale of effect as presented in Table 12.12.

Table 12.12: Scale of Effect Criteria			
Magnitude of Impact	**Sensitivity of Receptors**		
	Low	**Medium**	**High**

Table 12.12: Scale of Effect Criteria			
Negligible	Negligible	Negligible	Negligible
Low	Negligible	Negligible - Minor	Minor
Medium	Negligible - Minor	Minor	Moderate
High	Minor	Moderate	Major

12.7.49 In accordance with ES Volume 1 Chapter 2: EIA Process and ES Methodology, moderate and major effects are considered significant in EIA terms (shown in grey).

12.7.50 In determining the significance of reported effects, consideration has been given to the type of effect i.e., direct, indirect or secondary, the geographical extent of the effect and permeance of the effect i.e. temporary or permanent.

12.7.51 Duration of effect has been described as short, medium or long-term, in accordance with the criteria set out in ES Volume 1 Chapter 2: EIA Process and ES Methodology.

Nature of Effect Criteria

12.7.52 The nature of the effect has been described as either adverse, neutral or beneficial as follows:

- Beneficial – An advantageous effect to a receptor;
- Neutral – An effect that on balance, is neither beneficial nor adverse to a receptor or equally beneficial and adverse; or
- Adverse – A detrimental effect to a receptor.

12.8 Assumptions and Limitations

12.8.1 All reasonable measures have been undertaken to reduce uncertainty in the baseline noise survey data and the calculations used with the assessments presented within this Chapter.

12.8.2 Uncertainty in baseline noise levels has been minimised by completing unattended measurements over daytime, evening, weekend, and night-time periods. Attended measurements were completed to support the unattended measurements and supplemented with observations of the type of sound source audible at each location. The noise survey was undertaken in a period of weather suitable for environmental noise measurement.

12.8.3 The model implements the calculation method of ISO 9613-2:2024 (for completed development assessments) which provides noise level predictions accounting for a moderate downwind condition between source and receiver (i.e. reasonable worse-case sound propagation assumptions).

12.8.4 The noise prediction model accounts for topography and existing building massing.

12.8.5 The ground profile for the Site and surrounding NSRs in the baseline scenario has been determined from open-source LiDAR data for the area surrounding the Site.

12.8.6 The assessments and calculations undertaken in this report are based on data and parameter plans of the Proposed Development provided by the Applicant and project team. Should any of this change, the results of the assessments may not be valid and would need to be updated.

12.8.7 The demolition and construction noise assessments include corrections to account for the implementation of BPM and façade reflections.

12.8.8 The current piling vibration assessment accounts for driven precast piles as a worst-case scenario. If low vibration piling techniques and methods (e.g., continuous flight auger (CFA) piling) are employed, then the current predicted effects would be reduced.

12.8.9 Operational road traffic noise predictions account for the transport data provided by the Applicant's transport consultant, Steer. Speeds on each road link have been assumed from posted speed limits and the design speed limit for the proposed Crawley Western Multi-Modal Corridor (CWMMC) (40 mph) based on information provided by the Applicant's Transport Consultant.

12.8.10 The assessment of operational road traffic noise is based on the methodology of CRTN. The traffic data for each road link has been included within a noise model to calculate the cumulative road traffic noise level from all roads at each receptor.

12.8.11 Details of plant selections are not known at this time. It is proposed that noise emissions may not exceed 40 dB $L_{Aeq,T}$ at any residential façades that form part of the Proposed Development. This would allow internal ambient noise levels to be limited to around 30 dB $L_{Aeq,T}$ at night should natural ventilation be a suitable ventilation strategy. The above noise emission limits would apply to the cumulative noise levels of all plant items associated with the Proposed Development. It is assumed that further assessment of noise from plant and the effect on existing receptors would be secured through an appropriately worded planning condition.

12.9 Baseline Conditions

Existing Baseline

12.9.1 The existing baseline noise climate is characterised by road and air traffic noise. During daytime periods steady road traffic noise dominates the noise climate towards the eastern side of the Site. The main noise source towards the western side of the Site is regular air traffic. Distant road traffic is audible at these locations. During the start of night-time periods the background noise level across the Site is caused by distant road traffic noise with air traffic dominating during regular take-off and landing events. Regular air traffic events also dominate towards the end of the night-time periods.

12.9.2 The existing baseline noise conditions were characterised through a baseline noise survey completed between Tuesday 28 June and Thursday 7 July 2022. Details of the survey methodology and results are presented in ES Volume 2 Technical Appendix 12.3: Baseline Noise Survey.

Future Baseline

12.9.3 The future baseline noise climate would be expected to be dictated by aircraft noise from Gatwick Airport and road traffic from the existing and proposed road network. Activity from proposed residential, schools and mixed-use areas would also contribute to the noise climate.

12.9.4 The Site suitability for residential and non-residential development assessment considers:

- the 2041 Future Baseline with Committed Developments and Proposed Development (with the road traffic noise assessment); and
- the Gatwick Airport Second Runway 2040 Option 3 (Wide Spaced Mixed Mode) No EATs 2040 L_{eq} 54-72 dB(A) Contours and the 2040 Second Runway Option 3 (Wide Spaced Mixed Mode) No EATs 2040 Summer Night N_{60} Contours.

12.9.5 Outline mitigation has been proposed based on the future predicted noise levels at the completed development with the Proposed Development and cumulative schemes.

Sensitive Receptors

12.9.6 The receptors identified as sensitive to the Proposed Development, and which have been 'scoped-in' to the assessment are summarised in Table 12.13 and Figure 12.1.

Table 12.13: Summary of Sensitive Receptors	
Receptor	**Sensitivity**
Existing Off-Site Receptors	
R1. Bonnets Lane / Ifield Green dwellings	High
R2. Trivelles Gatwick Hotel	High
R3. The Druids, Ifield Wood	High
R4. Crawley Gurdwara	Medium
R5. Tweed Lane dwellings	High
R6. Bonwycks Place dwellings, Ifield Wood	High
R7. Rectory Lane dwellings	High
R8. Pound Cottages and Strathaven, Rusper Road	High
R9. Rusper Road dwellings (Whitehall Drive to Furlong Farm)	High
R10. Rhodes Drive dwellings	High
R11. The Hyde, Rusper Road	High
R12. Dwellings west and south of Ifield Golf Club	High
Future On-Site Receptors	
NC1. Parameter plan plot NC1 - Substation	Low
NC2. Parameter plan plot NC2	High
NC3. Parameter plan plot NC3	High
NC4. Parameter plan plot NC4	High
NC5. Parameter plan plot NC5	High
NC6. Parameter plan plot NC6	High
NC7. Parameter plan plot NC7	High
NC8. Parameter plan plot NC8	High
NC9. Parameter plan plot NC9	High
NC10. Parameter plan plot N10 - School	High
NC11. Parameter plan plot NC11 - School	High
RV1. Parameter plan plot RV1	High
RV2. Parameter plan plot RV2	High
RV3. Parameter plan plot RV3	Medium
M1. Parameter plan plot M1	High
M2. Parameter plan plot M2	High
M3. Parameter plan plot M3	High
M4. Parameter plan plot M4	High
M5. Parameter plan plot M5	High
M6. Parameter plan plot M6	High
M7. Parameter plan plot M7	High

Table 12.13: Summary of Sensitive Receptors	
M8. Parameter plan plot M8	High
HW1. Parameter plan plot HW1	High
HW2. Parameter plan plot HW2	High
HW3. Parameter plan plot HW3	High
HW4. Parameter plan plot HW4	High
HW5. Parameter plan plot HW5	High
HW6. Parameter plan plot HW6	High
HW7. Parameter plan plot HW7	High

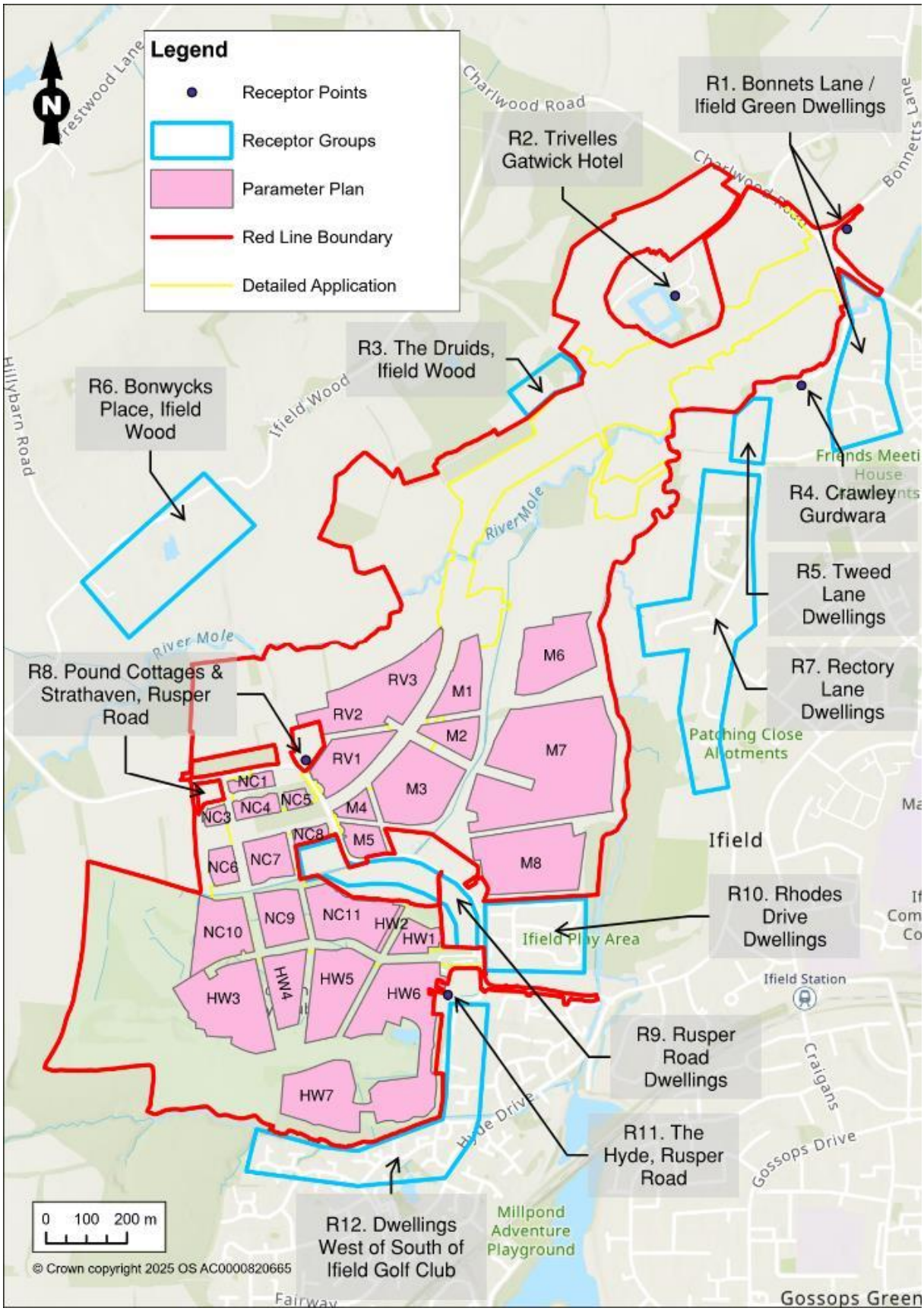

Figure 12.1: Identified noise-sensitive receptors

12.10 Assessment of Effects

Demolition and Construction Effects

Demolition and Construction Noise

12.10.1 Account has been taken of the best practice measures that would be adopted and implemented by the Applicant, as described in ES Volume 1 Chapter 5: Demolition and Construction Description, including the implementation of BPM as outlined in the OCEMP (ES Volume 2 Technical Appendix 5.1) and Phase 1 OCEMP (10051123-ARC-XXX-ZZ-TR-CM-00001). This constitutes embedded mitigation accounted for in this assessment.

12.10.2 The reduction in noise levels provided through the implementation of BPM would vary depending on the nature of the works. For the purpose of assessment, a reduction of -5 dB has been allowed for the implementation of BPM.

12.10.3 As part of future reserved matters applications, a Detailed CEMP would be prepared in advance of each phase of demolition and construction which would define all mitigation measures to be adopted to minimise noise and vibration emissions at surrounding NSRs. This would incorporate specific measures within all works where noise and vibration may give rise to disturbance. It is expected that the Detailed CEMP would be secured by means of an appropriately worded planning condition.

12.10.4 The predicted façade noise levels at each of the identified NSRs are presented in ES Volume 2 Technical Appendix 12.4.

12.10.5 Table 12.14 summarises the predicted adverse effects of demolition and construction activities for existing off-Site NSRs. The effect of noise from demolition and construction activities on receptors not listed in Table 12.14 would be **Negligible Adverse**, and **not significant** in EIA terms.

12.10.6 The construction phases were determined from the indicative phasing strategy provided in the Design and Access Statement (WOI-HPA-DOC-DAS-01).

Table 12.14: Adverse Effects of Demolition and Construction Noise Summary for Existing Off-Site NSRs

Phase / Activity	Scale of Adverse Effect	Adverse Effect Level	Off-Site Receptor(s)
Demolition	High	Above or equal to SOAEL + 5 dB	R8 and R11
	Medium	Above or equal to SOAEL and below SOAEL + 5 dB	R10
	Low	Above or equal to LOAEL and below SOAEL	R6, R7, R9, R12
Phase 1 and CWMMC Site Clearance	Medium	Above or equal to SOAEL and below SOAEL + 5 dB	R8 and R10
	Low	Above or equal to LOAEL and below SOAEL	R1 - R7, R9, R11 and R12
Phase 1 and CWMMC / Substructure works	Medium	Above or equal to SOAEL and below SOAEL + 5 dB	R8 and R10
	Low	Above or equal to LOAEL and below SOAEL	R1 - R7, R9, R11 and R12
Phase 1 and CWMMC / Superstructure works	Medium	Above or equal to SOAEL and below SOAEL + 5 dB	R8 and R10
	Low	Above or equal to LOAEL and below SOAEL	R1 - R7, R9, R11 and R12

Table 12.14: Adverse Effects of Demolition and Construction Noise Summary for Existing Off-Site NSRs			
Phase 1 and CWMMC / External Landscaping	Medium	Above or equal to SOAEL and below SOAEL + 5 dB	R8 and R10
	Low	Above or equal to LOAEL and below SOAEL	R1 - R7, R9, R11 and R12
Phase 2 / Site Clearance	High	Above or equal to SOAEL + 5 dB	R9
	Medium	Above or equal to SOAEL and below SOAEL + 5 dB	R8, R10 and R11
	Low	Above or equal to LOAEL and below SOAEL	R1 – R7 and R12
Phase 2 / Substructure works	High	Above or equal to SOAEL + 5 dB	R8 – R10
	Medium	Above or equal to SOAEL and below SOAEL + 5 dB	R11 and R12
	Low	Above or equal to LOAEL and below SOAEL	R1 – R7
Phase 2 / Superstructure works	High	Above or equal to SOAEL + 5 dB	R8 and R9
	Medium	Above or equal to SOAEL and below SOAEL + 5 dB	R10 and R11
	Low	Above or equal to LOAEL and below SOAEL	R1 – R3, R5 – R7 and R12
Phase 2 / External Landscaping	High	Above or equal to SOAEL + 5 dB	R9
	Medium	Above or equal to SOAEL and below SOAEL + 5 dB	R8, R10 and R11
	Low	Above or equal to LOAEL and below SOAEL	R2, R3, R5 – R7 and R12
Phase 3 / Site Clearance	Medium	Above or equal to SOAEL and below SOAEL + 5 dB	R11
	Low	Above or equal to LOAEL and below SOAEL	R3, R6 – R10 and R12
Phase 3 / Substructure works	Medium	Above or equal to SOAEL and below SOAEL + 5 dB	R8 and R11
	Low	Above or equal to LOAEL and below SOAEL	R2, R3, R5 – R7, R9, R10 and R12
Phase 3 / Superstructure	Medium	Above or equal to SOAEL and below SOAEL + 5 dB	R8 and R11
	Low	Above or equal to LOAEL and below SOAEL	R2, R3, R6, R7, R9, R10 and R12
Phase 3 / External Landscaping	Medium	Above or equal to SOAEL and below SOAEL + 5 dB	R11
	Low	Above or equal to LOAEL and below SOAEL	R3, R6 – R10, R12
Phase 4 / Site Clearance	High	Above or equal to SOAEL + 5 dB	R8
	Low	Above or equal to LOAEL and below SOAEL	R2, R3, R6 and R7
	High	Above or equal to SOAEL + 5 dB	R8

Table 12.14: Adverse Effects of Demolition and Construction Noise Summary for Existing Off-Site NSRs			
Phase 4 / Substructure works	Low	Above or equal to LOAEL and below SOAEL	R1 – R3, R5 – R7 and R9
Phase 4 / Superstructure works	High	Above or equal to SOAEL + 5 dB	R8
	Low	Above or equal to LOAEL and below SOAEL	R2, R3, R5 – R7 and R9
Phase 4 / External Landscaping	Major	Above or equal to SOAEL + 5 dB	R8
	Low	Above or equal to LOAEL and below SOAEL	R2, R3, R6 and R7
Phase 5 / Site Clearance	Low	Above or equal to LOAEL and below SOAEL	R2, R3, R5 and R7
Phase 5 / Substructure works	Medium	Above or equal to SOAEL and below SOAEL + 5 dB	R7
	Low	Above or equal to LOAEL and below SOAEL	R1 – R3, R5 and R6
Phase 5 / Superstructure works	Medium	Above or equal to SOAEL and below SOAEL + 5 dB	R7
	Low	Above or equal to LOAEL and below SOAEL	R1 – R3, R5 and R6
Phase 5 / External Landscaping	Low	Above or equal to LOAEL and below SOAEL	R2, R3, R5 and R7

12.10.7 The effects from Table 12.14 are summarised in the following paragraphs. Only the highest impact has been presented for each receptor across all phases to represent a worst-case scenario. These effects will be short-term and not necessarily carried over the entire construction period.

12.10.8 The effect of noise from demolition and construction works on residential off-Site receptors R8, R9 and R10 over the construction phase have the potential to result in direct, temporary, short-term, **Major Adverse** effects and would therefore be **significant.**

12.10.9 The effect of noise from demolition and construction works on residential off-Site receptors R7, R11 and R12 over the construction phase have the potential to result in direct, temporary, short-term, **Moderate Adverse** effects and would therefore be **significant.**

12.10.10 The effect of noise from demolition and construction works on residential off-Site receptors R1, R2, R3, R5, R6 and R7 over the construction phase have the potential to result in direct, temporary, short-term, **Minor Adverse** effects and would therefore be **not significant.**

12.10.11 The effect of noise from demolition and construction works on non-residential off-Site receptor R4 over the construction phase have the potential to result in direct, temporary, short-term, **Minor Adverse** effects and would therefore be **not significant**.

12.10.12 Table 12.15 summarises the predicted adverse effects of demolition and construction activities for future on-Site NSRs. The effect of works on receptors not listed in Table 12.15 would be **Negligible Adverse**, and **not significant**.

Table 12.15: Adverse Effects of Demolition and Construction Noise Summary for Future On-Site NSRs			
Phase / Activity	**Magnitude of Impact**	**Adverse Effect Level**	**On-Site Receptor(s)**
Phase 2 Site Clearance	High	Above or equal to SOAEL + 5 dB	NC10
Phase 2 Substructure works	High	Above or equal to SOAEL + 5 dB	NC10
Phase 2 Superstructure works	High	Above or equal to SOAEL + 5 dB	NC10
Phase 2 External Landscaping	High	Above or equal to SOAEL + 5 dB	NC10
Phase 3 / Site Clearance	Medium	Above or equal to SOAEL and below SOAEL + 5 dB	M3, HW1, HW5
	Low	Above or equal to LOAEL and below SOAEL	NC6 – NC9, NC11, M4, M5, HW2 – HW4
Phase 3 / Substructure works	High	Above or equal to SOAEL + 5 dB	M3, HW5
	Medium	Above or equal to SOAEL and below SOAEL + 5 dB	NC11, M4, M5, HW1, HW2
	Low	Above or equal to LOAEL and below SOAEL	NC6 – NC10, Hw3, HW4
Phase 3 / Superstructure works	High	Above or equal to SOAEL + 5 dB	M3
	Medium	Above or equal to SOAEL and below SOAEL + 5 dB	HW1, HW2, HW5
	Low	Above or equal to LOAEL and below SOAEL	NC6 – NC9, NC11, M4, M5, HW3, HW4
Phase 3 / External Landscaping	Medium	Above or equal to SOAEL and below SOAEL + 5 dB	M3, HW1, HW5
	Low	Above or equal to LOAEL and below SOAEL	NC6 – NC9, NC11, M4, M5, HW2 – HW4
Phase 4 / Site Clearance works	High	Above or equal to SOAEL + 5 dB	NC1, NC6 – NC8, M3 – M7, RV3
	Low	Above or equal to LOAEL and below SOAEL	NC9 – NC11, HW3 – HW5 and M8
Phase 4 / Substructure works	High	Above or equal to SOAEL + 5 dB	NC1, NC6 – NC8, M3 – M7, RV3
	Low	Above or equal to LOAEL and below SOAEL	NC9 – NC11, HW1 – HW6 and M8
Phase 4 / Superstructure works	High	Above or equal to SOAEL + 5 dB	NC1, NC6 – NC8, M3 – M7, RV3
	Low	Above or equal to LOAEL and below SOAEL	NC9 – NC11, HW1 – HW5 and M8
Phase 4 / External Landscaping works	High	Above or equal to SOAEL + 5 dB	NC1, NC6 – NC8, M3 – M7, RV3
	Low	Above or equal to LOAEL and below SOAEL	NC9 – NC11, HW3 – HW5 and M8

Table 12.15: Adverse Effects of Demolition and Construction Noise Summary for Future On-Site NSRs			
Phase 5 / Site Clearance works	High	Above or equal to SOAEL + 5 dB	M2 and RV3
	Medium	Above or equal to SOAEL and below SOAEL + 5 dB	M7
	Low	Above or equal to LOAEL and below SOAEL	M3, M4, RV1, NC8
Phase 5 / Substructure works	High	Above or equal to SOAEL + 5 dB	M2, M7 and RV3
	Medium	Above or equal to SOAEL and below SOAEL + 5 dB	RV1
	Low	Above or equal to LOAEL and below SOAEL	NC11, HW2, M3, M4,
Phase 5 / Superstructure works	High	Above or equal to SOAEL + 5 dB	M2, M7 and RV3
	Medium	Above or equal to SOAEL and below SOAEL + 5 dB	RV1
	Low	Above or equal to LOAEL and below SOAEL	M3, M4, NC8
Phase 5 / External Landscaping works	High	Above or equal to SOAEL + 5 dB	M2 and RV3
	Medium	Above or equal to SOAEL and below SOAEL + 5 dB	M7
	Low	Above or equal to LOAEL and below SOAEL	M3, M4, RV1 and NC8

12.10.13 The effects from Table 12.15 are summarised in the following paragraphs. Only the highest impact has been presented for each receptor across all phases to represent a worst-case scenario. These effects will be short-term and not necessarily carried over the entire construction period.

12.10.14 The effect of noise from demolition and construction works on residential and education on-Site receptors NC1, NC6, NC7, NC8, NC10, M2, M3, M4, M5, M6, M7, HW5 over the construction phase have the potential to result in direct, temporary, short-term, **Major Adverse** effects and would therefore be **significant.**

12.10.15 The effect of noise from demolition and construction works on residential, educational and commercial on-Site receptors HW1, HW2, HW3, NC11, RV1 and RV3 over the construction phase have the potential to result in direct, temporary, short-term, **Moderate Adverse** effects and would therefore be **significant.**

12.10.16 The effect of noise from demolition and construction works on residential on-Site receptors HW4, HW6, NC9 and M8 over the construction phase have the potential to result in direct, temporary, short-term, **Minor Adverse** effects and would therefore be not significant.

Demolition and Construction Vibration - Compaction

12.10.17 The highest levels of vibration associated with the construction of the Proposed Development would be from piling or compaction works.

12.10.18 The ground would be subject to compaction via vibratory compactors, which can introduce high levels of vibration into the ground.

12.10.19 BS 5228-2 provides source data for various vibratory construction activities as well as empirical predictors for ground-borne vibration due to construction works. Annex E, Table E.1 of BS 5228-2 sets out these empirical calculations for each type of construction activity.

12.10.20 To understand the potential impact of vibration from a single drum vibratory compactor, the following inputs have been used based on a Bomag 211 PD40:

- Drum width: 2130 mm; and
- Maximum amplitude: 1.7 mm.

12.10.21 Due to their proximity to the Site, residential receptors R1, R3, R10, R11 and R12 are the most likely to be affected by construction vibration during the construction of the CWMMC. This would include the formation and compaction of the road. All other receptors are over 100 m from proposed vibratory compaction and fall outside the scope of this assessment.

12.10.22 Note that only existing receptors have been considered in the construction vibration assessment. It is understood that construction activities associated with the CWMMC that could produce significant vibration effects will be completed prior to any future residential receptors taking occupation of the Proposed Development.

12.10.23 Construction vibration assessments of minor internal roads of the Proposed Development on future NSRs would need to be completed at a later design stage as part of a reserved matters planning application.

12.10.24 Table 12.16 identifies the predicted vibration levels from vibratory compaction in a steady state at the nearest possible point to each receptor. All levels are based on a scaling factor of 143 (33.3%). Any predicted levels exceeding the LOAEL are presented in bold and any levels that exceed the SOAEL are highlighted in grey.

Table 12.16: Predicted vibration levels from vibratory compaction

Receptor ID	Distance to nearest possible Crawley Western Multi-Modal Corridor vibratory compaction	Predicted level of vibration, PPV mm/s
R1	15	4.5
R3	70	0.5
R10	25	2.2
R11	80	0.4
R12	80	0.4

12.10.25 Predicted vibration levels at the nearest vibration sensitive receptors (with the exception of R1 and R10) are all less than 1.0mm/s PPV which is considered a low magnitude of impact and falls between the LOAEL and the SOAEL.

12.10.26 Receptors R3, R11 and R12 are all high sensitivity, residential dwellings. Therefore, construction vibration effects on these receptors are short-term, temporary, and **Minor Adverse.** Therefore, vibration from vibratory compaction is considered **not significant** for these receptors.

12.10.27 Predicted vibration levels at receptors R1 and R10 are greater than 1.0mm/s PPV which is considered a medium magnitude of impact and falls between above the SOAEL. On this high sensitivity receptor, a medium magnitude of impact would normally be considered significant (Moderate effect). However, this is a calculation of vibratory compaction at its nearest point to the receptor and considered a worst-case scenario. Once the vibratory compactor has moved 20m along the respective section of the road, the predicted PPV level will drop below the SOAEL and would not be considered significant.

12.10.28 Additionally, BS 5228-2 states that a PPV of 1.0mm/s could be tolerated in residential homes if prior warning and explanation has been given to residents. Therefore, with adequate community liaison in place, the effect of construction vibratory compaction on receptor R10 would be short-term, temporary, **Moderate Adverse**. Although this has been assessed as a moderate adverse effect, it is only representative of the effect experienced when the vibratory compactor is at its very nearest point to the receptor. It is not representative of the general level that will be experienced over the entire construction period and is therefore considered to be **not significant**.

Demolition and Construction Vibration – Foundation Piling

12.10.29 Percussive foundation piling involves the rapid acceleration and or deceleration of tools in contact with the ground, which can produce high levels of vibration.

12.10.30 Percussive piling techniques can produce PPV levels above the SOAEL (1.0mm/s) up to 100m away. Therefore, any percussive piling within 100m of a receptor has the potential to be significant.

12.10.31 The receptors within 100m of any potential piling activities (i.e. piling activities are only expected to take place in areas identified as schools or commercial land uses within the parameter plan) are R8, R9, R10 and R11.

12.10.32 In order to avoid significant effects at these receptors, alternate low-vibration piling techniques (e.g. continuous flight auger (CFA) piling) methods would need to be adopted. CFA piling would only typically produce PPV levels above the SOAEL within 30m, at which distance all identified receptors would be beyond. Therefore, with the adoption of this piling technique, no significant effects are predicted with regard to construction piling vibration.

12.10.33 Alternative low-vibration piling techniques would need to be developed though a detailed construction vibration assessment as part of a reserved matters planning application.

Construction Road Traffic Noise

12.10.34 During the Phase 1 detailed works, the greatest increase in two-way construction traffic flows is expected in year 6 (2031) of construction, with a total of 1095 vehicles (including 68 HGVs) during an 18-hour period per day.

12.10.35 In the baseline year (2025), the total two-way traffic flow on Rusper Road was 11,128 18-hr AAWT with 81 (1%) HGVs. The predicted total construction road traffic flow is not expected to cause a 20% increase in road traffic flows on Rusper Road during the Phase 1 detailed works.

12.10.36 The greatest increase in two-way construction traffic flows following the completion of the CWMMC (Phase 2 onwards) is expected in year 8 (2033) of construction, with a total of 1295 vehicles (including 95 HGVs) during an 18-hour period per day.

12.10.37 In the baseline year (2025), the total two-way traffic flows on the roads included on the proposed construction traffic routes from Phase 2 onwards are provided below:

- Ifield Avenue – 10,592 18-hr AAWT with 199 (2%) HGVs;
- A2011 – 51,116 18-hr AAWT with 1829 (4%) HGVs;
- London Road – 24,520 18-hr AAWT with 360 (1%) HGVs;
- A23 Crawley Avenue – 40,856 18-hr AAWT with 1382 (3%) HGVs; and
- A2220 Horsham Road – 47,073 18-hr AAWT with 1153 (2%) HGVs.

12.10.38 The predicted total construction road traffic flow is not expected to cause a 20% increase in road traffic flows on Ifield Avenue and Charlwood Road. As such, effects across all construction phases are expected to be direct, temporary, short-term and **Negligible Adverse (not significant).**

Completed Development Effects

Embedded Mitigation

12.10.39 Noise barriers and bunds have been embedded into the design of the Proposed Development, specifically regarding the CWMMC. The locations of which are described in Table 12.17 and as presented in Figure 12.2. The proposed noise barriers and bunds have been incorporated into the Embedded Mitigation to reduce potential road traffic noise effects on existing noise sensitive receptors.

12.10.40 The requirement for the noise bund and the design of the noise bund was discussed with HDC during a meeting of 3 May 2024 with HDC. A report was issued to HDC to detail the optioneering and design evolution for the bund (see Table 12.1 for details of the consultations undertaken with HDC).

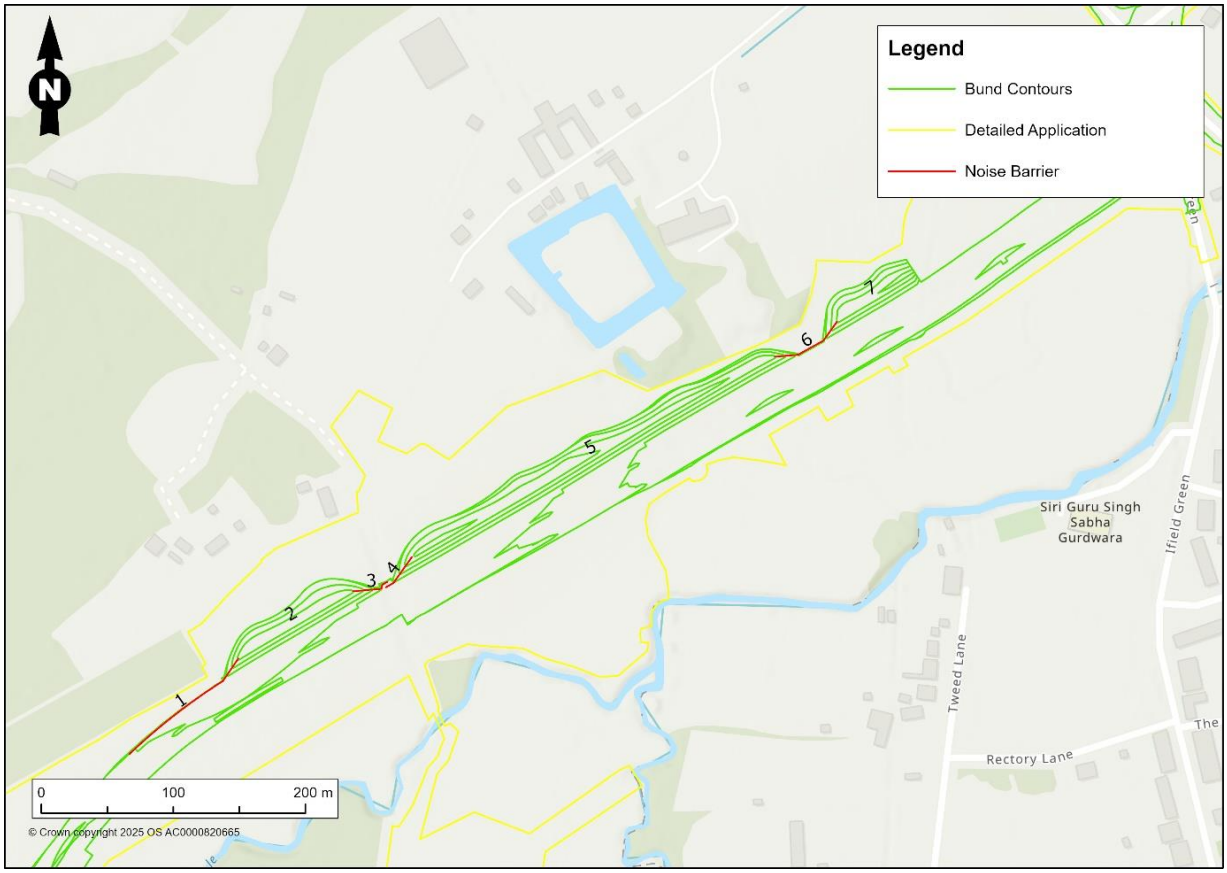

Figure 12.2: Location of noise bund and barrier (based on Drawing No. 10051123-ARC-070-1B-M3-HE-00001 Contour Plan 1m Interval as provided by the Project Civil Engineer)

12.10.41 The required noise barrier and bund specification is presented below in Table 12.17 and have been determined in accordance with DMRB LD 119. The required category of airborne sound insulation for the barrier is specified as per BS EN 1793-2 in accordance with the stated requirements within DMRB LA111.

Table 12.17: Permanent Acoustic Screening Requirements

Noise Screen ID	Location	Screening Item	Height*	Approx. Length	Type	Insertion loss (IL), dB requirement	Sound Insulation Category**
1	North of CWMMC	Barrier	3m	110m	Reflective	5	B2
2		Bund	3m	125m	N/A	N/A	N/A
3		Barrier	3m	30m	Reflective	5	B2
4		Barrier	3m	30m	Reflective	5	B2
5		Bund	3m	350m	N/A	N/A	N/A
6		Barrier	3m	60m	Reflective	5	B2
7		Bund	3m	95m	N/A	N/A	N/A

*Heights are specified relative to the local carriageway height.

**DMRB LD119 (2020) refers to the Sound Insulation Category for airborne noise insulation within BS EN 1793-2 (2012). This standard has since been superseded by BS EN 1793-2 (2018) in which such categories have been removed.

12.10.42 The calculations carried out to determine the insertion loss (IL) and height requirements for the bunds and barriers were based on drawings provided by the Project Civil Engineer. It is assumed that the bunds and barriers will be designed and built in accordance with Sections 3 and 5 of DMRB LD 119 respectively.

12.10.43 The specification as set out in Table 12.17 is expected to be secured by an appropriately worded planning condition.

Operational Road Traffic Noise

12.10.44 Table 12.18 to Table 12.19 present the predicted noise level change at all dwellings and sensitive receptors within the operational study area.

12.10.45 The short-term noise change (Do-Something Opening Year versus Do-Minimum Opening Year) has been used to determine where initial significant effects due to operational road traffic noise could occur, in accordance with DMRB LA111.s

12.10.46 Noise Changes in the Short-Term with the Proposed Development

12.10.47 Table 12.18 provides summary of the comparison of the road traffic noise levels at receptors within the study area between the Do-Something Opening Year (2029) scenario and the Do-Minimum Opening Year (2029) scenario.

12.10.48 The change in road traffic noise levels have been calculated using the annual average weekday traffic (AAWT) 18-hour data for the 2029 Do-Minimum Opening Year (DMOY) traffic flows compared to the 2029 Do-Something Opening Year (DSOY) flows.

12.10.49 The total change in noise level from all road links at each receptor has been calculated. Table 12.18 below presents the change in noise level at the façade with the greatest magnitude of noise change at each receptor.

12.10.50 The changes within Table 12.18 include the effect of the embedded mitigation measured of the Proposed Development as described in Table 12.17.

Table 12.18: Change in Road Traffic Noise Levels – Short-Term				
Change in Noise Level, dB(A)		Magnitude of Impact	Receptors	
			Daytime, dB $L_{A10,18hr\ -facade}$	Night-time, dB $L_{night\ –\ free\text{-}field}$
Increase in noise level	> 5.0	High	R5, R11	R11
	3.0 to 4.9	Medium	R3	R5
	1.0 – 2.9	Low	R2, R7	R2, R3, R7
	< 1.0	Negligible	R6	R6
No change	0.0	Negligible	-	-
Decrease in noise level	< 1.0	Negligible	-	-
	1.0 – 2.9	Low	R1, R4, R8, R12	R1, R4, R10, R12
	3.0 – 4.9	Medium	-	-
	> 5.0	High	R9, R10	R8, R9

12.10.51 Table 12.18 demonstrates that during the daytime, the Proposed Development is expected to result in permanent medium or high adverse changes in road traffic noise at R3, R5 and R11, and permanent high beneficial changes in road traffic noise at R9 and R10.

12.10.52 Table 12.18 also demonstrates that during the night-time, the Proposed Development is expected to result in permanent medium or high adverse changes in road traffic noise at R5 and R11, and permanent high beneficial changes in road traffic noise at R8 and R9.

12.10.53 The opening year road traffic noise changes as a result of the Proposed Development (the short-term noise impacts) are described below.

Adverse Impacts in the Short-Term with the Proposed Development

12.10.54 Adverse impacts are predicted in the short-term due to:

- Changes in traffic volumes, compositions or speeds on the parts of the existing road network, due to the redistribution of traffic; and
- The introduction of the CWMMC, and the Primary Road that will serve the southern half of the Proposed Development.

12.10.55 Residential receptors R2 and R7 are predicted to experience a permanent low adverse impact as a result of the Proposed Development. This is due to the road traffic noise from the CWMMC.

12.10.56 Residential receptor R3 is predicted to experience a permanent medium adverse impact due to the Proposed Development. This receptor lies to the north of the CWMMC. The predicted absolute noise level at this receptor with the Proposed Development is below the LOAEL.

12.10.57 Residential receptors R5 and R11 are predicted to experience a permanent high adverse impact due to the Proposed Development. The predicted absolute noise level at both receptors with the Proposed Development is below the LOAEL.

Beneficial Impacts in the Short-Term with the Proposed Development

12.10.58 Beneficial impacts are predicted in the short-term due to:

- Changes traffic volumes, compositions or speeds on parts of the existing road network, due to the redistribution of traffic; and
- The introduction of the CWMMC, and the Primary Road that will serve the southern half of the Proposed Development.

12.10.59 Residential receptors R1, R8 and R12 and non-residential receptor R4 are predicted to experience a permanent low beneficial impact due to the redistributed traffic impacts of the Proposed Development.

12.10.60 Receptors R9 and R10 are predicted to experience a permanent high beneficial impact due to the redistributed traffic impacts of the Proposed Development.

Noise Changes over the Long-Term with the Proposed Development

12.10.61 Table 12.19 provides summary of the comparison of the road traffic noise levels at receptors within the study area between the Do-Minimum Opening Year scenario (2029) and the Do-Something Future Year (2041) scenario.

12.10.62 The change in road traffic noise levels have been calculated using the annual average weekday traffic (AAWT) 18-hour data for the 2029 Do-Minimum Opening Year (DMOY) traffic flows compared to the 2041 Do-Something Future Year (DSFY) flows.

12.10.63 The total change in noise level from all road links at each receptor has been calculated. Table 12.19 below presents the change in noise level at the façade with the greatest magnitude of noise change at each receptor.

12.10.64 The changes within Table 12.19 include the effect of the embedded mitigation measures of the Proposed Development as described in Table 12.17.

Table 12.19: Change in Road Traffic Noise Levels – Long-Term

Change in Noise Level, dB(A)		Magnitude of Impact	Receptors	
			Daytime, dB $L_{A10,18hr\ -facade}$	Night-time, dB $L_{night\ –\ free\text{-}field}$
Increase in noise level	> 10.0	High	R5	
	5.0 to 9.9	Medium	R2, R3	R2, R3, R5
	3.0 – 4.9	Low	R7	R7
	< 3.0	Negligible	R1, R4, R6	R6,
No change	0.0	Negligible	R10	R10
Decrease in noise level	< 3.0	Negligible	R11, R12	R1, R4, R11, R12
	3.0 – 4.9	Low	-	-
	5.0 – 9.9	Medium	-	-
	> 10.0	High	R8, R9	R8, R9

12.10.65 Table 12.19 demonstrates that during the daytime, the Proposed Development is expected to result in permanent medium or high adverse changes in road traffic noise at R2, R3 and R5, and permanent high beneficial changes in road traffic noise at R8 and R9.

12.10.66 Table 12.19 also demonstrates that during the night-time, the Proposed Development is expected to result in permanent medium or high adverse changes in road traffic noise at R2, R3 and R5, and permanent high beneficial changes in road traffic noise at R8 and R9.

12.10.67 The future year (2041) road traffic noise changes as a result of the Proposed Development (the long-term noise impacts) are described below.

Adverse Impacts in the Long-Term with the Proposed Development

12.10.68 Adverse impacts are predicted in the long-term of the Proposed Development due to:

- Changes in traffic volumes, compositions or speeds on the parts of the existing road network, due to the redistribution of traffic; and
- The introduction of the CWMMC, and the Primary Road that will serve the southern half of the Proposed Development.

12.10.69 Residential receptor R7 is predicted to experience a permanent low adverse impact due to the Proposed Development.

12.10.70 Residential receptors R2 and R3 are predicted to experience a permanent medium adverse impact due to the Proposed Development over the long-term. These receptors lie to the north of the CWMMC. The predicted absolute noise level at these receptors with the Proposed Development is below the LOAEL.

12.10.71 Residential receptor R5 is predicted to experience a permanent high adverse impact due to the Proposed Development over the long-term. However, the predicted absolute noise level at this receptor with the Proposed Development is below the LOAEL (55 dB $L_{A10,18hr}$ façade) during the daytime. The impacts at this receptor have the potential to be significant. Final significance of effect for each receptor is determined and discussed in the following section of this ES chapter.

Beneficial Impacts in the Long-Term with the Proposed Development

12.10.72 Beneficial impacts are predicted in the long-term of the Proposed Development due to the redistribution of traffic.

12.10.73 Receptors R8 and R9 are predicted to experience a permanent high beneficial impact due to the Proposed Development over the long-term.

Potential Significance of Effects due to Operational Road Traffic Noise

12.10.74 The above sections have set out likely operational noise impacts from the Proposed Development in terms of change in road traffic noise level. The impacts have the potential to result in significant effects at receptors within the operational study area.

12.10.75 DMRB LA1111 provides a method of reviewing the potential for likely significant effects due to operational noise. The approach allows for consideration of contextual factors, such as the expected level of road traffic noise in each scenario, and professional judgement.

12.10.76 Firstly, an initial estimate of potential significant effects is determined from the impacts (noise level changes) that are of moderate or major magnitude upon scheme opening. This initial estimate can then be modified to account to the contextual factors listed within Table 3.60 of LA111 Revision 2. This table has been replicated below for reference.

Table 12.20: Determining final operational significance on noise sensitive buildings – DMRB LA111 Table 3.60

Local circumstance	Influence on significance judgement
Noise level change (is the magnitude of change Close to the minor/ moderate boundary?)	1) Noise level changes within 1dB of the top of the 'minor' range can indicate that it is more appropriate to determine a likely significant effect. Noise level changes within 1dB of the bottom of a 'moderate' range can indicate that it is more appropriate to consider a change is not a likely significant effect.
Differing magnitude of impact in the long term to magnitude of impact in the short term	1) Where the long term impact is predicted to be greater than the short term impact, it can be appropriate to conclude that a minor change in the short term is a likely significant effect. Where the long term impact is predicted to be less than the short term it can be appropriate to conclude that a moderate or major change in the short term is not significant. 2) A similar change in the long term and non-project noise change can indicate that the change is not due to the project and not an indication of a likely significant effect.
Absolute noise level with reference to LOAEL and SOAEL	1) A noise change where all do-something absolute noise levels are below SOAEL requires no modification of the initial assessment.

Table 12.20: Determining final operational significance on noise sensitive buildings – DMRB LA111 Table 3.60	
(by design this includes sensitivity of receptor)	2) Where any do-something absolute noise levels are above the SOAEL, a noise change in the short term of 1.0dB or over results in a likely significant effect.
Location of noise sensitive parts of a receptor	1) If the sensitive parts of a receptor are protected from the noise source, it can be appropriate to conclude a moderate or major magnitude change in the short term and/or long term is not a likely significant effect. 2) Conversely, if the sensitive parts of the receptor are exposed to the noise source, it can be more appropriate to conclude a minor change in the short term and/or long term is a likely significant effect. 3) It is only necessary to look in detail at individual receptors in terms of this circumstance where the decision on whether the noise change gives rise to a significant environmental effect is marginal.
Acoustic Context	1) If a project changes the acoustic character of an area, it can be appropriate to conclude a minor magnitude of change in the short term and/or long term is a likely significant effect.
Likely perception of change by residents	1) If the project results in obvious changes to the landscape or setting of a receptor, it is likely that noise level changes will be more acutely perceived by the noise sensitive receptors. In these cases it can be appropriate to conclude that a minor change in the short term and/or long term is a likely significant effect. 2) Conversely, if the project results in no obvious changes for the landscape, particularly if the road is not visible from the receptor, it can be appropriate to conclude that a moderate change in the short term and/or long term is not a likely significant effect.

12.10.77 Based on Table 12.18, the initial estimate indicates the potential for significant adverse effects at R3, R5 and R11, and the potential for significant beneficial effects at R8, R9 and R10. This demonstrates the potential for both significant adverse and beneficial impacts resulting from the Proposed Development and further consideration is therefore required.

12.10.78 The outcomes of the operational noise modelling have been considered in detail to assess the contextual factors for each potentially significant effect, and for receptors subject to a low change that could be considered significant given the context.

12.10.79 Given the relatively quiet nature of parts of the Proposed Development, existing absolute noise levels in rural locations are relatively low. The NPSE defines the LOAEL as "*the level above which adverse effects on health and quality of life can be detected*", and DMRB LA1111 defines values for this effect level, as set out within Table 12.5. It is considered that a road traffic noise level at or below the LOAEL will be unlikely to result in any adverse effects on health or quality of life, or any change to resident behaviour.

12.10.80 Through application of the DMRB LA1111 methodology, Table 12.21 sets out the method of evaluating the final operational effect significance for each receptor. A summary of the final significant operational effects is then set out in Table 12.22. These likely significant effects include the effect of mitigation measures embedded into the Proposed Development as described in Table 12.17.

Table 12.21: Evaluation of Final Operational Road Traffic Noise Significance				
Receptor	Short-term magnitude of change	Description of impacts	Effect Significance	Justification

Table 12.21: Evaluation of Final Operational Road Traffic Noise Significance				
R1	Low Decrease	Proposed Development results in a low decrease in noise levels	Not Significant Beneficial	In these circumstances, no adjustment to the initial significance is necessary.
R2	Low / Medium / High Increase (absolute level below the LOAEL)	Proposed Development results in an increase in road traffic noise but all Do-Something Absolute Noise Levels remain below the LOAEL	Not significant Adverse	It is considered that below the LOAEL it is unlikely there would be any adverse effects on health or quality of life or changes to behaviour as a result of noise.
R3	Negligible Increase (absolute Do-Something noise level in opening year (2029) below the LOAEL)	Proposed Development results in negligible change in opening year (2029), increasing to a medium change over the long-term. Absolute Do-Something future noise level (2041) above the LOAEL but below the SOAEL.	Not significant Adverse	Receptor lies within the Gatwick 2040 L_{eq} 51 dB(A) night-time noise contour. The absolute noise levels from road traffic are predicted to be approximately 10 dB below the future aircraft noise and typically 5-8 dB below existing noise levels. The aircraft noise is therefore expected to dominate the noise climate and the medium change in road traffic noise will not likely be significant when considering the wider acoustic context.
R4	Low Decrease	Proposed Development results in a low decrease in noise levels	Not Significant Beneficial	In these circumstances, no adjustment to the initial significance is necessary.
R5	Low Increase (absolute noise level in opening year 2029 below the LOAEL)	Proposed Development results in low change in opening year (2029), increasing to a medium change over the long-term. Absolute Do-Something future (2041) noise level above the LOAEL but below the SOAEL.	Not significant Adverse	The receptor lies within the Gatwick 2040 L_{eq} 51 dB(A) night-time noise contour. The absolute noise levels from road traffic are predicted to be approximately 10 dB below the future aircraft noise and typically 5-8 dB below existing noise levels. The aircraft noise is therefore expected to dominate the noise climate and the medium change in road traffic noise will not likely be significant when considering the wider acoustic context.
R6	Negligible	Proposed Development results in a change in road traffic noise of less than 1 dB in the short-term	Not significant (Adverse of Beneficial)	Imperceptible changes in road traffic noise on Proposed Development opening
R7	Low Increase (absolute noise level on opening below the LOAEL)	Proposed Development results in an increase in road traffic noise but all Do-Something Absolute Noise Levels remain below the LOAEL	Not significant Adverse	It is considered that below the LOAEL it is unlikely there would be any adverse effects on health or quality of life or changes to behaviour as a result of noise.
R8	Moderate / High Decrease	Proposed Development results in a medium or	Significant Beneficial	In these circumstances, no adjustment to the initial significance is necessary.

Table 12.21: Evaluation of Final Operational Road Traffic Noise Significance				
		high decrease in noise levels		
R9	Moderate / High Decrease	Proposed Development results in a medium or high decrease in noise levels	Significant Beneficial	In these circumstances, no adjustment to the initial significance is necessary.
R10	Moderate / High Decrease	Proposed Development results in a medium or high decrease in noise levels	Significant Beneficial	In these circumstances, no adjustment to the initial significance is necessary.
R11	Low / Medium / High Increase (absolute level below the LOAEL)	Proposed Development results in an increase in road traffic noise but all Do-Something Absolute Noise Levels remain below the LOAEL	Not significant Adverse	It is considered that below the LOAEL it is unlikely there would be any adverse effects on health or quality of life or changes to behaviour as a result of noise.
R12	Low Decrease	Proposed Development results in a low decrease in noise levels	Not Significant Beneficial	In these circumstances, no adjustment to the initial significance is necessary.

Table 12.22: Summary of Final Operational Road Traffic Noise Significance		
Type of Effect	**Effect of Significance**	**Receptors**
Adverse	Significant	-
Adverse	Not significant	R2, R3, R5, R7, R11
No Change	Not Significant	R6
Beneficial	Significant	R8, R9, R10
Beneficial	Not Significant	R1, R4, R12

Aircraft noise

Average noise levels (Internal Residential Amenity)

12.10.81 The assessment contained in this chapter considers the potential impact of aircraft noise from the Gatwick Airport 2040 Option 3 (Wide Spaced Mixed Mode) No EATs 2040 L_{eq} 54-72 dB(A) Contours. These are presented in Figure 12.3 and Figure 12.4.

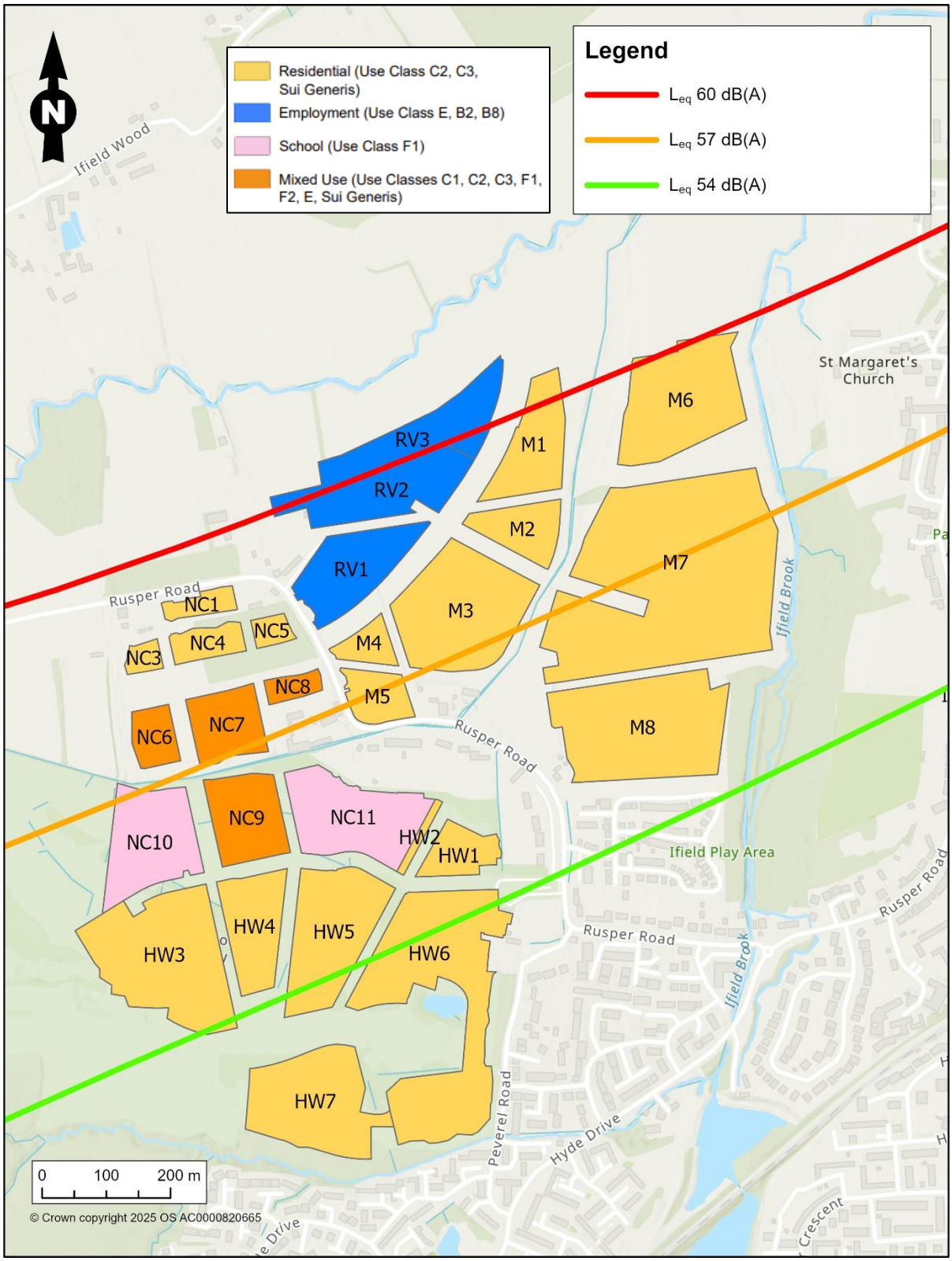

Figure 12.3: Gatwick Airport 2040 Option 3 (Wide Spaced Mixed Mode) No EATs 2040 Leq 54-72 dB(A) Contours Daytime overlain on the Proposed Development's built infrastructure parameters

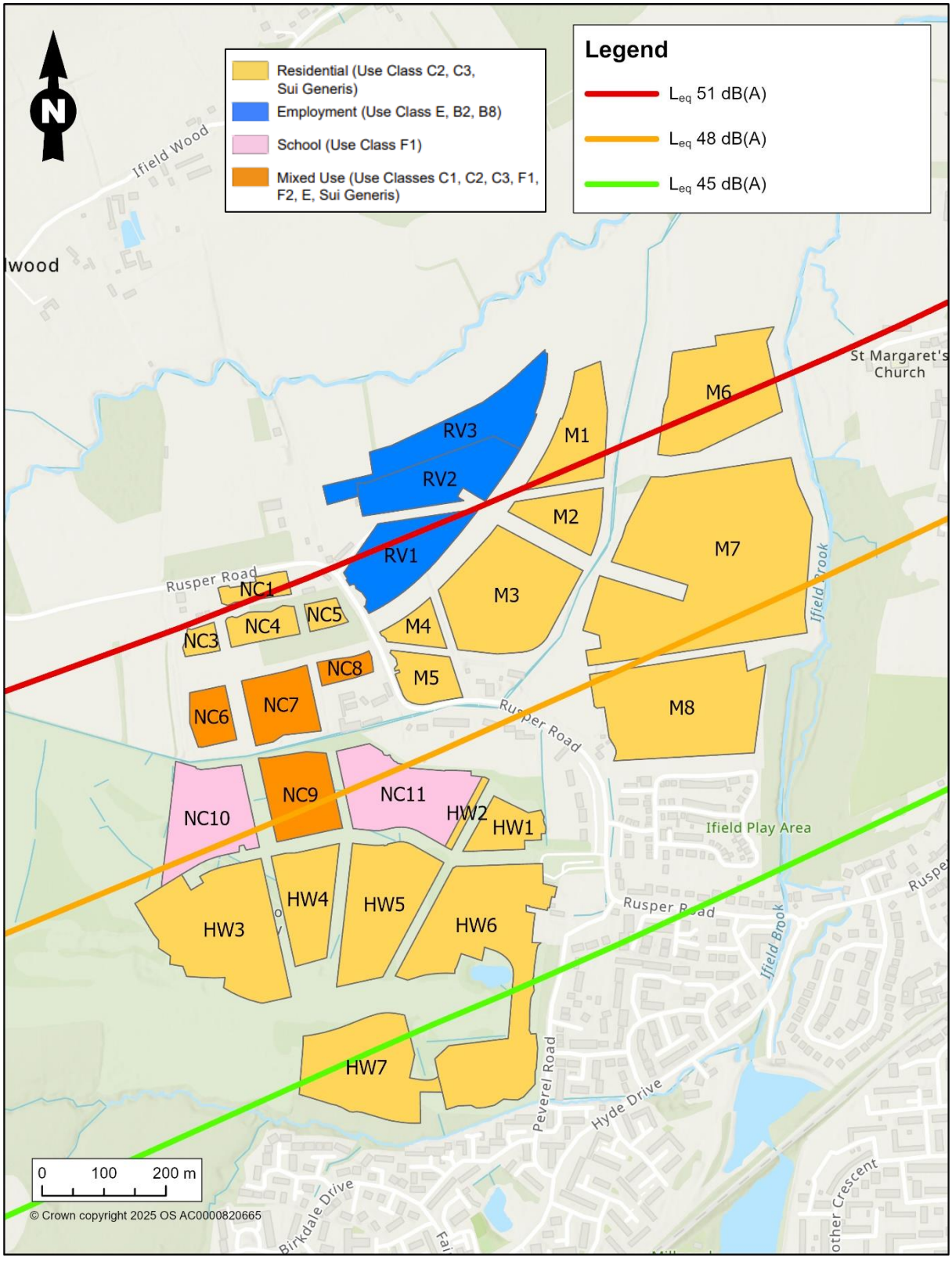

Figure 12.4: Gatwick Airport 2040 Option 3 (Wide Spaced Mixed Mode) No EATs 2040 Leq 54-72 dB(A) Contours Night-time overlain on the Proposed Development's built infrastructure parameters

12.10.82 It was agreed via consultation with the Local Authorities and as stated in the 2024 ES Scoping Report (ES Volume 2 Technical Appendix 2.1) that residential development would not be placed within the 60 dB(A) $L_{eq,16hour}$ Gatwick aircraft noise contour.

12.10.83 The Proposed Development masterplan has been designed to not place residential development within the 60 dB(A) $L_{eq,16hour}$ Gatwick aircraft noise contour, when considering the Second Runway Option 3 (Wide Spaced Mixed Mode) No EATs 2050 L_{eq} 54-72 dB(A) Contours.

12.10.84 It should be noted that when considering the Gatwick Airport 2040 Option 3 (Wide Spaced Mixed Mode) No EATs 2040 L_{eq} 54-72 dB(A) Contours, some of the proposed residential development parameters would fall just within the 60 dB(A) $L_{eq,16hour}$.

12.10.85 However, this does not necessarily mean that residential dwellings would be placed within this area of the Site, and according to indicative phasing, development within this area of the Site would fall within the last phase of the development. The residential development within the last (or any) phase of the Site would be designed to accommodate the prevailing Gatwick Airport noise contours at that time.

12.10.86 The assessment has used the Gatwick Airport 2040 Option 3 (Wide Spaced Mixed Mode) No EATs 2040 L_{eq} 54-72 dB(A) Contours, as advised by Gatwick Airport Limited. These contours are based on the second southern runway at Gatwick Airport being brought forward. Whilst land is safeguarded for a second southern runway, there are is no current commitment to bringing the second southern runway forward. The assessment is considered worst-case and the likelihood of the second southern runway materialising is deemed to be limited.

12.10.87 Paragraphs 5.5.18 and 5.519 of the Gatwick Airport Master Plan 2019 states that "noise levels with the existing main runway are expected to reduce by 2028 and the downward trend generally continues through to 2032. This reduction results from the introduction of quieter 'new generation' aircraft which will replace existing aircraft types over this period. In noise exposure terms this change in fleet mix is forecast to outweigh the effects of increasing flight numbers. For example, the 'A320 neo' and 'B737 Max 8', aircraft that are expected to make up nearly 50% of the Gatwick fleet by 2028, will be about 4dB quieter on departure and 2dB quieter on approach compared to current equivalent aircraft. This is expected to reduce Gatwick's noise footprint despite increased movements."

12.10.88 It should be noted that the Gatwick Airport 2040 Option 3 (Wide Spaced Mixed Mode) No EATs 2040 L_{eq} 54-72 dB(A) Contours do not show the 51 dB(A) $L_{eq,16hour}$ contour which would indicate a LOAEL (see Table 12.8).

12.10.89 Considering the 2040 Option 3 (Wide Spaced Mixed Mode) No EATs contours, the daytime and night-time LOAELs would be expected to be exceeded across the Proposed Development.

12.10.90 No areas of the Proposed Development are expected to fall within a NOAEL (<51dB $L_{Aeq,16hr}$) for daytime average noise levels.

12.10.91 An area of approximately 9,509m^2 of development plots HW6/7 (residential plots) is expected to exceed the night-time LOAEL. The remainder of the HW6/7 plot is not expected to exceed the LOAEL and therefore night-time effects could be NOAEL for a small area of the Site.

12.10.92 For proposed on-site residential receptors, the daytime magnitudes of impact and significance of effects, prior to mitigation, are summarised below:

- 54-56 dB(A) $L_{eq,16hour}$: direct, permanent long-term, **Moderate Adverse** effects which would be **significant**; and
- 57-60 dB(A) $L_{eq,16hour}$: direct, permanent long-term, **Major Adverse** effects which would be **significant**.

12.10.93 For proposed on-site residential receptors, the night-time magnitudes of impact and significance of effects, prior to mitigation, are summarised below:

- <45 dB(A) $L_{eq,8hour}$: direct, permanent long-term, **Negligible Adverse** effects which would not be significant;

- 45-47 dB(A) $L_{eq,8hour}$: direct, permanent long-term, **Minor Adverse** effects which would not be significant;
- 48-50 dB(A) $L_{eq,8hour}$: direct, permanent long-term, **Moderate Adverse** effects which would be **significant**; and
- ≥51 dB(A) $L_{eq,8hour}$: direct, permanent long-term, **Major Adverse** effects which would be **significant**.

Night-time maximum noise levels

12.10.94 New houses typically rely on passive, single sided ventilation such as open windows or ventilators. Approved Document O (ADO) of the Building Regulations (2021 edition) provides a simplified means of determining the suitability of such solutions with respect to overheating.

12.10.95 ADO places all parts of the UK except urban and some suburban parts of London in a 'moderate' risk category, which also applies to the Proposed Development. The guidance states:

"*Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.*

- *40 dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am).*
- *55 dB L_{AFmax}, more than 10 times a night (between 11pm and 7am)."*

12.10.96 ADO states that bedrooms with no cross ventilation should equal or exceed a free area of 4% of the floor area of the room. Typically, this is expected to result in a 9dB reduction of noise. For the Proposed Development this would equate to maximum allowable external noise level of 64 dB L_{AFmax}.

12.10.97 The Gatwick Airport Second Runway Option 3 (Wide Spaced Mixed Mode) No EATs 2040 Summer Night N60 Contours show that a maximum noise level of 60 dB L_{max} will be exceeded more than 25 times a night for all residential development plots, except for HW3-HW7.

12.10.98 The results of the baseline noise surveys undertaken by Ramboll also showed that maximum noise levels from aircraft were typically ≥67 dB L_{AFmax}, including in measurement locations that would sit within the proposed residential development plots HW3-HW7.

12.10.99 At this outline stage for residential properties, it is therefore expected that opening windows cannot be used as a strategy to mitigate against external noise break-in during overheating conditions, across all residential development plots. The noise level limits of ADO are expected to be exceeded across the proposed residential development with windows open. Therefore, windows will be required to be closed and alternate passive or active means of ventilation will be required.

12.10.100 Without mitigation, internal noise levels are expected to result in direct, permanent long-term, **Major Adverse** effects which would be **significant**.

External Amenity Noise Levels

12.10.101 Aircraft noise has been considered as the most likely noise source to give rise to significant adverse effects to external amenity areas, as mitigation cannot be provided to reduce the potential impact of aircraft noise on private gardens within the Proposed Development.

12.10.102 Considering the Gatwick Airport Second Runway Option 3 (Wide Spaced Mixed Mode) No EATs 2050 L_{eq} 54-72 dB(A) Contours, no residential development would be within the 60 dB(A) $L_{eq,16hour}$ contour.

12.10.103 Considering the Gatwick Airport Second Runway Option 3 (Wide Spaced Mixed Mode) No EATs 2040 L_{eq} 54-72 dB(A) Contours, an area of approximately 2,118m^2 of development plot M1 and 570 m^2 of development plot M6 and would sit within the 60 dB(A) $L_{eq,16hour}$ contour. If

residential gardens were included with these areas, **Major-Unacceptable Adverse** effects would be expected to occur which would be significant. However, it is understood that whilst these development plots are allocated for residential development, residential dwellings and private gardens would not be placed within the Site areas that sit within the 60 dB(A) $L_{eq,16hour}$ contour that is applicable at the time of the reserved matters planning application. Over time as there are developments in aircraft noise (i.e. becoming quieter) and if the southern second runway is not progressed then the 60 dB(A) $L_{eq,16hour}$ contour is likely to move northwards, nearer to Gatwick Airport, meaning the full extent of plot M1 and plot M6 could be developed with residential dwellings and private gardens. This would be secured by an appropriately worded planning condition.

12.10.104 Considering aircraft noise, the following residential plots would be expected to experience noise levels of 57-60 dB(A) $L_{eq,16hour}$ and would constitute direct, permanent long-term, **Major Adverse** effects which would be **significant**, prior to mitigation:

- NC1-NC8;
- RV1-RV2; and
- M1-M7 (not all of plots M3, M5, M6 and M7 would sit within areas giving rise to Major Adverse effects).

12.10.105 The following residential and education (high sensitivity receptors) plots would be expected to experience noise levels of 54-56 dB(A) $L_{eq,16hour}$ and would constitute direct, permanent long-term, **Moderate Adverse** effects which would be **significant**, prior to mitigation:

- M3, M5, M7, M8 (for areas of 'M' blocks that would not sit within areas giving rise to Major Adverse effects);
- NC9, NC10 and NC11; and
- HW1-HW7 (not all of plots HW3, HW5, HW6 and HW7 would sit within areas giving rise to Moderate Adverse effects).

12.10.106 The following residential plots would be expected to experience noise levels <54 dB(A) $L_{eq,16hour}$ and would constitute direct, permanent long-term, **Minor Adverse** effects which would not be significant:

- HW3, HW5, HW6 and HW7 (for areas of 'HW' blocks that would not sit within areas giving rise to Moderate Adverse effects);

12.10.107 No areas of the Site are expected to experience noise levels of <50 dB(A) $L_{eq,16hour}$ from aircraft noise and therefore, **Negligible Adverse** effects are not expected for any areas of the development.

12.10.108 The potential impact of road traffic noise on external amenity areas cannot accurately be defined at this stage, as development layouts are not known. Any screening or building massing close to the CWMMC could provide screening of road traffic noise to private gardens within the Site. Additionally, through Good Acoustic Design of the Proposed Development, it is expected that significant effects on external amenity areas due to road traffic noise can be avoided.

Fixed Plant Installations

12.10.109 Details of plant selections for commercial premises are not known at this time. Therefore, this section sets noise emission limits for building services plant.

12.10.110 Horsham District Council have requested the plant noise emission limit to be set at 5dB below the background noise level to avoid incremental increases in background noise.

12.10.111 The representative background noise levels at each monitoring location are detailed below. The representative values were selected by carrying out statistical analysis on all measured

values throughout the day and night-time and taking the lowest modal value. The associated plant noise emission limits of 5 dB below background have also been provided.

Table 12.23: Representative Background Noise Levels and Emission Limits

Measurement Location	Representative Daytime Background Noise Level, dB $L_{A90,1hr}$	Daytime Rating Level Limit, dB $L_{Ar,T}$	Representative Night-time Background Noise Level, dB $L_{A90,15min}$	Night-time Rating Level Limit, dB $L_{Ar,T}$
LT1	33	28	30	25
LT2	35	30	35	30
LT3	37	32	30	25
LT4	36	31	28	23

12.10.112 A rating level of ≤30 dB $L_{Ar,T}$ is deemed to be very low.

12.10.113 It is proposed that noise emissions may not exceed 30 dB $L_{Ar,T}$ at the boundary of the Site. This would allow internal ambient noise levels at receptors directly at the Site boundary to be limited to approximately 20 dB $L_{Ar,T}$ through an openable window. This is significantly below the BS 8233:2014 design limit of 30 dB $L_{Aeq,T}$ during the night-time.

12.10.114 The above noise emission limits would apply to the cumulative noise levels of all plant items associated with the Proposed Development.

12.10.115 Noise emissions from these plant items would be controlled to meet a suitably worded planning requirement using standard noise control measures, such as attenuators, enclosures, and screens.

12.10.116 By designing to the criteria outline above, effects are expected to be direct, permanent long-term, **Negligible Adverse** effects which would not be significant.

12.11 Assessment of Residual Effects

Additional Mitigation

Demolition and Construction Stage

12.11.1 Specification of additional mitigation for the demolition and construction stages is not considered practicable at this stage, above those included in the Outline CEMP (ES Volume 2 Technical Appendix 5.1) and the Phase 1 OCEMP (10051123-ARC-XXX-ZZ-TR-CM-00001).

12.11.2 Once the detailed design of the Proposed Development is known, it is expected that updated demolition and construction noise and vibration assessments would be completed to inform future Reserved Matters planning applications. Any required additional mitigation would be expected to be identified following the outcome of these assessments and be included in Detailed CEMPs to be secured via a planning condition.

12.11.3 However, given the proximity of some existing off-Site noise sensitive receptors to the Site boundary, and the proximity of future noise on-Site sensitive receptors in relation to earlier phases of the Proposed Development, additional mitigation may not be practicable or effective in reducing demolition and construction noise levels.

12.11.4 It is therefore likely that some temporary significant effects may remain.

12.11.5 A Construction Traffic Management Plan (CTMP) for Phase 1 (10051123-ARC-XXX-ZZ-TR-TP-0001) has been prepared by Arcadis and is submitted with the hybrid planning application. No further mitigation is deemed to be required in respect of construction road traffic.

Completed Development Stage

Road traffic noise

12.11.6 No Additional Mitigation is proposed with regards to operational road traffic noise. A noise barrier and bund have been included as part of the Embedded Mitigation.

Residential development layout

12.11.7 The Proposed Development masterplan has been designed to not place residential development within the 60 dB(A) $L_{eq,16hour}$ Gatwick aircraft noise contour, when considering the Second Runway Option 3 (Wide Spaced Mixed Mode) No EATs 2050 L_{eq} 54-72 dB(A) Contours. It should be noted that when considering the Gatwick Airport 2040 Option 3 (Wide Spaced Mixed Mode) No EATs 2040 L_{eq} 54-72 dB(A) Contours, some of the proposed residential development would fall just within the 60 dB(A) $L_{eq,16hour}$. However, this does not necessarily mean that residential dwellings would be placed within this area of the Site, and development within this area of the Site would fall within the indicative last phase of the development. The residential development within the last (or any) phase of the Site would be designed to accommodate the prevailing relevant Gatwick Airport noise contours at that time.

12.11.8 It is therefore recommended that a planning condition is used to state that no residential dwellings should be placed within the 60 dB(A) $L_{eq,16hour}$ contour until such time as the prevailing noise contours would permit it. Any future reserved matters planning application would need to detail the proposed development layout against the prevailing Gatwick Airport noise contours.

12.11.9 As illustrated on the Land Use Parameter Plan (WOI-HPA-PLAN-PP03-01), the Proposed Development has allocated space within Plots M7 and M8 that are considered appropriate for Gypsy and Traveller pitches. The space allocated for the Gypsy and Traveller pitches is commensurate with the HDC contextual masterplan contained within the Regulation 19 version of the HDC Draft Local Plan.

12.11.10 When considering the Gatwick Airport 2040 Option 3 (Wide Spaced Mixed Mode) No EATs 2040 Leq 54-72 dB(A) Contours, these pitches would experience noise levels above the SOAEL and the effects have the potential to be significant (assuming standard residential dwelling criteria apply). However, it is not expected that mitigation can be reasonably or practicably provided to avoid significant effects in these areas.

Internal residential amenity

12.11.11 The night-time noise level limits of ADO are expected to be exceeded across the proposed residential development with windows open. Therefore, windows will be required to be closed with alternate passive or active means of ventilation required. Windows will be able to be opened, however dwellings would be designed so that suitable ventilation is in place so there is the option that windows can remain closed at night.

12.11.12 Outline glazing ratings that could be suitable to control noise break-in to future dwellings are provided in ES Volume 2 Technical Appendix 12.5, along with passive or active means of ventilation.

12.11.13 It is expected that the measures outlined above, alongside Good Acoustic Design would be employed in the design of the Proposed Development. Details of the required mitigation measures would be secured via appropriate planning condition for each phase of the Proposed Development.

External Amenity Noise Levels

12.11.14 Considering the Gatwick Airport Second Runway Option 3 (Wide Spaced Mixed Mode) No EATs 2040 L_{eq} 54-72 dB(A) Contours, it is anticipated that mitigation measures cannot reasonably be provided to avoid significant effects in all areas of the Proposed Development.

12.11.15 Good Acoustic Design would be used where possible to reduce aircraft noise levels in external amenity areas but reducing all areas to noise levels that would give rise to a NOAEL or LOAEL is not expected to be possible.

12.11.16 Aircraft noise levels are expected to reduce in the future, due to new technologies and as older aircraft are retired from fleets. This in turn may reduce the potential magnitude of impacts.

12.11.17 Paragraph of 3(v) of Element 3 – External Amenity Area Noise Assessment of ProPG (2017) states:

"Where, despite following a good acoustic design process, significant adverse noise impacts remain on any private external amenity space (e.g. garden or balcony) then that impact may be partially off-set if the residents are provided, through the design of the development or the planning process, with access to:

- *a relatively quiet facade (containing openable windows to habitable rooms) or a relatively quiet externally ventilated space (i.e. an enclosed balcony) as part of their dwelling; and/or*
- *a relatively quiet alternative or additional external amenity space for sole use by a household, (e.g. a garden, roof garden or large open balcony in a different, protected, location); and/or*
- *a relatively quiet, protected, nearby, external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings; and/or*
- *a relatively quiet, protected, publicly accessible, external amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minutes walking distance)."*

12.11.18 As illustrated in the Landscape and Public Realm Parameter Plan (WOI-HPA-PLAN-PP01-01) Parks and Gardens, and Green Space, would be provided throughout the Proposed Development. It is expected that provision of these spaces, in the south of the Site, would provide alternate quieter external amenity space for residents of the Proposed Development.

Fixed Plant Installations

12.11.19 It is expected that additional noise surveys and noise impact assessments will be completed to inform Reserved Matters planning applications for each phase of the Proposed Development. Such assessments could be secured via suitably worded planning conditions.

Enhancement Measures

12.11.20 No enhancement measures are proposed in respect of noise and vibration.

Demolition and Construction Residual Effects

Demolition and Construction Noise

12.11.21 As additional mitigation is not deemed practicable at this stage, the residual demolition and construction noise effects remain as reported in the assessment of effects section.

Demolition and Construction Vibration

12.11.22 As additional mitigation is not required, the residual demolition and construction vibration effects remain as reported in the assessment of effects section.

Construction Road Traffic Noise

12.11.23 As additional mitigation is not required, the residual demolition and construction traffic noise effects remain as reported in the assessment of effects section.

Completed Development Residual Effects

Operational road traffic noise

12.11.24 As no Additional Mitigation is proposed for Operational Road Traffic Noise, the residual effects remain as reported within the assessment of effects section Table 12.22.

Internal residential amenity

12.11.25 With suitable design of the proposed residential glazing and ventilation strategies, the internal noise level guidance of BS 8233:2014 and overheating noise level requirements of Building Regulations Approved Document O are expected to be achieved. This is expected to be secured through an appropriately worded planning conditions as part of Reserved Matters planning applications. The effects would therefore be expected to be direct, permanent, long-term, **Negligible Adverse** and not significant.

External amenity noise levels

12.11.26 Through the use of Good Acoustic Design and the provision of alternate external amenity spaces within the masterplan, effects would be expected to be direct, permanent long-term, Minor Adverse (not significant) to **Moderate Adverse** (significant).

Fixed Plant Installations

12.11.27 By designing to the plant noise limits, it is expected that effects would be direct, permanent, long-term, **Negligible Adverse** and not significant. This is expected to be secured through appropriately worded planning conditions as part of Reserved Matters planning applications.

12.12 Summary of Residual Effects

12.12.1 Table 12.24 provides a tabulated summary of the outcomes of the noise and vibration assessment of the Proposed Development.

12.12.2 With regard to demolition and construction effects, only the highest effect has been presented for each receptor across all construction phases as to represent a worst-case scenario. These effects will be short-term and not necessarily carried over the entire construction period.

12.12.3 With regard to operational road traffic noise effects, some effects are predicted to me moderate or major but not significant. For full justification over the significance of these effects, refer to Table 12.21 and Table 12.22.

Table 12.24: Summary of Residual Noise and Vibration Effects

Receptor	Description of Residual Effect	Additional Mitigation	Scale and Significance of Residual Effect **	Nature of Residual Effect*				
				+ -	D I	P T	R IR	St Mt Lt
Demolition and Construction								
R8, R9, R10, NC1, NC6, NC7, NC8, NC10, M2 – M7, HW5	Generation of demolition and construction (activities and plant noise)	None proposed	Major (significant)	-	D	T	R	St
R11, R12, R7, HW1, NC11, HW2, HW3, RV1, RV3		None proposed	Moderate (significant)	-	D	T	R	St

Table 12.24: Summary of Residual Noise and Vibration Effects								
R1 – R7, HW4, HW6, NC9, M8		None proposed	Minor (not significant)	-	D	T	R	St
All other receptors		None proposed	Negligible (not significant)	-	D	T	R	St
R3, R11, R12	Generation of demolition and construction plant vibration	None proposed	Minor (not significant)	-	D	T	R	St
R1, R10	Generation of demolition and construction plant vibration	None proposed	Moderate (not significant)	-	D	T	R	St
All receptors	Construction road traffic noise	None proposed	Negligible (not significant)	-	D	T	R	St
Completed Development								
R2, R11	Operational Road Traffic Noise	None Proposed	Major (not significant)	-	D	P	IR	Lt
R5, R7			Minor (not significant)	-	D	P	IR	Lt
R3, R6			Negligible (not significant)	-	D	P	IR	Lt
R1, R4, R12			Minor (not significant)	+	D	P	IR	Lt
R11			Major (not significant)	+	D	P	IR	Lt
R8, R9, R10			Major (significant)	+	D	P	IR	Lt
All residential receptors	Aircraft noise (internal residential)	Suitably designed building façades/glazing and ventilation strategies, secured by suitably worded planning conditions. No residential dwellings to be placed within the 60 dB(A) $L_{eq,16hour}$ contour until such time as the prevailing noise contours would permit it, secured by a suitably worded planning condition.	Negligible	-	D	P	IR	Lt

Table 12.24: Summary of Residual Noise and Vibration Effects								
All permanent residential receptors	External amenity noise levels	Good Acoustic Design and provision of alternate green external amenity spaces	Minor (not significant) to Moderate (significant)	-	D	P	IR	Lt
Gypsy & Traveller receptors	External amenity noise levels	None Proposed	Moderate (significant)	-	D	P	IR	Lt
All receptors	Plant Noise Emissions	Setting plant noise limits at the boundaries with existing noise sensitive receptors	Negligible (not significant)	+	D	P	IR	Lt
Notes: * - = Adverse/ + = Beneficial/ +/- Neutral; D = Direct/ I = Indirect; P = Permanent/ T = Temporary; R=Reversible/ IR= Irreversible; St- Short term/ Mt –Medium term/ Lt –Long term. **Negligible/Minor/Moderate/Major								

12.13 Cumulative Effects

Intra-Project Effects

12.13.1 As explained in ES Volume 1 Chapter 2: EIA Process and ES Methodology, intra-project cumulative effects are discussed in ES Volume 1 Chapter 16: Cumulative Effects.

Inter-Project Effects

12.13.2 Table 12.25 provides a summary of the likely cumulative effects resulting from the Proposed Development and the cumulative developments.

Table 12.25: Inter-Project Cumulative Effects				
Cumulative Development	**Demolition and Construction**		**Completed Development**	
	Cumulative Effects Likely?	**Reason**	**Cumulative Effects Likely?**	**Reason**
DC/10/1612 DC/17/2481	No	Although the distance between the Proposed Development and the cumulative scheme(s) is less than 300 m, the construction phases are unlikely to coincide.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were not significant.
CR/2018/0894/OUT CR/2016/0294/OUT DC/16/1677 CR/2023/0357/OUT EIA/24/0006 CR/2017/0997/OUT CR/2023/0197/FUL CR/2014/0415/ARM CR/2021/0174/FUL	No	Distance between the Proposed Development and the cumulative scheme is more than 300 m.	No	Cumulative development traffic was included in the operational assessment of effects, which showed effects were not significant.

Table 12.25: Inter-Project Cumulative Effects

Cumulative Development	Demolition and Construction		Completed Development	
	Cumulative Effects Likely?	Reason	Cumulative Effects Likely?	Reason
CR/2022/0187/FUL CR/2023/0223/FUL CR/2024/0554/FUL CR/2022/0707/CON CR/2019/0542/FUL CR/2022/0407/OUT CR/2020/0037/FUL CR/2020/0192/RG3				
Gatwick Airport development consent order (DCO)	No	The nearest construction works that would be required as part of this scheme would be approximately 1.1km from the northern boundary of the Proposed Development, at the nearest point. These works would be of sufficient distance from existing receptors that could be affected by the construction works at the Proposed Development.	No	Aircraft noise generated by this scheme would be broadly similar to the aircraft noise levels that are generated by Gatwick Airport's current operation. The northern standby runway would only be used for additional departures. It is understood that this scheme would not happen in combination with the second southern runway on which the assessment in this chapter is based. Therefore, the assessment presented in this chapter is deemed to be worst- case.

Demolition and Construction Cumulative Effects

12.13.3 All cumulative schemes are in excess of 300 m of the Site and are not expected to combine with the construction stage effects of the Proposed Development.

Completed Development Cumulative Effects

12.13.4 It is unlikely that there will be cumulative completed development road traffic noise effects as traffic flows associated with the cumulative developments with submitted planning applications have been included in the traffic data used in the completed development assessment. All residual effects of this assessment were not significant.

12.14 Summary of Assessment

Background

12.14.1 This chapter has detailed the potential noise and vibration effects due to the construction and completed development stages of the Proposed Development. The assessment of construction and completed development stages has been undertaken taking into account the relevant national and local guidance and regulations.

12.14.2 Environmental noise surveys were undertaken at the Site to establish the existing noise climate. Data obtained during the surveys were used to inform the noise modelling and assessment of demolition and construction noise effects, and potential operational effects. The survey identified that road traffic noise and aircraft noise are the dominant noise sources on-Site and within the study area.

12.14.3 Noise prediction modelling has been completed to account for the future predicted road traffic noise levels with the completed development and cumulative schemes in place. Road traffic noise has been assessed alongside the potential future aircraft noise contours associated with the second southern runway for Gatwick Airport. These predictions have informed the outline mitigation strategies for residential façades.

12.14.4 The assessment provided is based on the:

- The Gatwick Airport Second Runway 2040 Option 3 (Wide Spaced Mixed Mode) No EATs 2040 Leq 54-72 dB(A) Contours; and
- the Gatwick Airport Second Runway 2040 Option 3 (Wide Spaced Mixed Mode) No EATs 2040 Summer Night N60 Contours.

12.14.5 This is deemed to provide a worst-case assessment, and the noise impacts associated with the use of the Gatwick Airport northern standby runway, which the Secretary of State is minded to approve, would be deemed to be no worse than assessed in this chapter.

Demolition and Construction Effects

12.14.6 Using industry standard noise data for typical demolition and construction activities, predictions were undertaken to provide an estimate of the potential noise emissions from the Proposed Development during the demolition and construction works at identified NSRs.

12.14.7 Considering the proposed embedded mitigation measures included in the OCEMP (ES Volume 2 Technical Appendix 5.1) and Phase 1 OCEMP (10051123-ARC-XXX-ZZ-TR-CM-00001), temporary adverse effects are expected, with significant adverse predicted for the nearest existing off-Site and future on-Site NSRs of the Proposed Development, due to the proximity of these NSRs to the works.

12.14.8 Demolition and construction vibration may give rise to temporary adverse effects. These effects are unlikely to be significant due to the expected duration and if prior notice is given to receptors that are likely to be affected. In addition, construction vibration effects from piling are unlikely to be significant if low noise and vibration piling techniques are used. Further construction vibration assessments will be required once construction methodologies have been fully developed at a later design stage. Such assessments and any proposed mitigation measures would need to be submitted as part of a reserved matters planning application and secured be an appropriately worded planning condition.

12.14.9 Demolition and construction traffic is not expected to give rise to significant effects at any receptor location.

Completed Development Effects

12.14.10 A Site suitability assessment for permanent residential use was undertaken for the Proposed Development. Outline measures for glazing and ventilation strategies have been designed to meet national legislation and guidance. If suitable glazing and ventilation strategies are secured by suitably worded planning condition:

- Internal noise levels in residential dwellings would achieve the required standards.
- Internal noise levels in residential dwellings during overheating conditions would achieve the required standards.
- External amenity noise levels would range from negligible to significant adverse, due to aircraft noise which cannot practicably be mitigated. Alternate external amenity space would be provided to reduce effects on future receptors.

12.14.11 A site suitability assessment for residential use was also undertaken with regard to the allocated space within Plots M7 and M8 that are considered appropriate for Gypsy and

Traveller pitches. The space allocated for the Gypsy and Traveller pitches is commensurate with the HDC contextual masterplan contained within the Regulation 19 version of the HDC Draft Local Plan.

12.14.12 Assuming that standard residential dwelling criteria apply, the pitches would experience noise levels that give rise to significant effects. However, it is not expected that mitigation can be reasonably or practicably provided to avoid significant effects in these areas.

12.14.13 A Site suitability assessment for non-residential use was undertaken for the Proposed Development. Mitigation measures for glazing and ventilation strategies are subject to development during detailed design to meet national legislation and guidance. Suitable glazing and ventilation strategies to meet the relevant internal ambient noise level criteria will be secured by suitably worded planning conditions.

12.14.14 Changes in road traffic noise levels are not expected to result in significant adverse effects at any receptor in the short term and long term.

12.14.15 Changes in road traffic noise level are expected to result in significant beneficial effects at receptors R8, R9 & R10 in the long term.

12.14.16 Subject to the use of future noise surveys and assessments to inform reserved matters planning applications and suitably worded planning conditions, it is expected that significant effects in respect of noise from fixed plant installations can be avoided.

Cumulative Effects

12.14.17 Cumulative effects due to demolition and construction noise and vibration are not expected due to the distances between the receptor locations and the cumulative schemes.

12.14.18 The cumulative noise levels predicted at the façades of the proposed development consider the 2041 future traffic flows with the completed development and cumulative schemes in place. Subject to suitable glazing and ventilation strategies being secured by suitably worded planning conditions:

- Internal noise levels in residential dwellings would achieve the required standards.
- Internal noise levels in residential dwellings during overheating conditions would achieve the required standards.
- External amenity noise levels would range from negligible to significant adverse, due to aircraft noise which cannot practicably be mitigated. Alternate external amenity space would be provided to reduce effects on future receptors.

12.14.19 Changes in road traffic noise levels are not expected to result in significant effects at any receptor in the short term and long term.

12.14.20 It is unlikely that there will be cumulative completed development aircraft noise effects (specifically regarding the Gatwick Airport Northern Runway DCO) as during the daytime, all development plots lie outside of the 2038 N65 Day contour from Gatwick Airport where significant effects could occur. During the night-time some of the development plots lie within the 2038 N60 Night contour however, the assessment in this chapter considers the 2040 N60 night-time contour which is more onerous. Consideration of the N60 night-time contours over the N65 night-time contours is considered to be a worst-case scenario. The N60 night-time contours show that the maximum noise levels at night (across the site) would be too high to achieve the internal noise level criteria of Building Regulations Approved Document O (using open windows alone). Therefore, suitable glazing/ventilation strategies will be required to achieve the criteria. Overall, the DCO effects are not expected to be any worse than as have been assessed within this Chapter for 2040.

12.14.21 Subject to the use of future noise surveys and assessments to inform reserved matters planning applications and suitably worded planning conditions, it is expected that significant effects in respect of noise from fixed plant installations can be avoided.