

## 10.0 NOISE

### 10.1 INTRODUCTION

- 10.1.1 This chapter of the ES assesses the likely significant effects of the Proposed Development on the environment in respect of noise and vibration. This chapter also describes the methods used to assess the effects; the baseline conditions currently existing at the site and surrounding area; the mitigation measures required to prevent, reduce or offset any likely significant adverse effects; and the likely residual effects after these measures have been adopted.
- 10.1.2 An assessment of the likely significant effects of the Proposed Development with respect to noise has been undertaken including for both the construction phase (temporary) effects and operational phase (permanent) effects. The likely significant effects of vibration during the construction phase (temporary) on residential receptors has also been considered.
- 10.1.3 The study area is the site itself and its immediate surroundings. The study area includes nearby existing residential receptors on Atlantis Avenue, Athena Avenue and Delphi Way which may potentially be impacted by noise impacts associated with the construction and operation of the Proposed Development. Consideration is also given to residential receptors on Purbrook Way which may be impacted by operation of the Proposed Development. These are shown in Figure 10.1 in Appendix 10.2.
- 10.1.4 Appendix 10.1 presents a Noise Impact Assessment for the Proposed Development.

### 10.2 METHODOLOGY AND SCOPE

#### Policy Background

##### National Planning Policy Framework<sup>i</sup> and Noise Policy Statement for England<sup>ii</sup>

- 10.2.1 The main national guidance document for Local Planning Authorities is the National Planning Policy Framework (NPPF) which was updated in July 2021.
- 10.2.2 Paragraph 185 of the National Planning Policy Framework (NPPF) states that planning policies and decisions should:
- “(a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life; and*
- (b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.”*
- 10.2.3 The NPPF also refers to the Noise Policy Statement for England (NPSE) which is intended to apply to all forms of noise, including environmental noise, neighbour noise and neighbourhood noise. The NPSE sets out the Government’s long-term vision to ‘promote good health and a good quality of life

through the effective management of noise within the context of Government policy on sustainable development’ which is supported by the following aims:

- “• avoid significant adverse impacts on health and quality of life; and
- mitigate and minimise adverse impacts on health and quality of life;”

- 10.2.4 The NPSE defines the concept of a ‘significant observed adverse effect level’ (SOAEL) as ‘the level above which significant adverse effects on health and quality of life occur’. The following guidance is provided within the NPSE:

*“It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.”*

#### Planning Practice Guidance<sup>iii</sup>

- 10.2.5 The Planning Practice Guidance (PPG) is written to support the NPPF with more specific planning guidance. The PPG reflects the NPSE and states that noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. It also states that opportunities should be taken, where practicable, to achieve improvements to the acoustic environment. The PPG states that noise can over-ride other planning concerns but should not be considered in isolation from the other economic, social, and environmental dimensions of the proposed development.
- 10.2.6 The PPG expands upon the concept of SOAEL [together with Lowest Observable Adverse Effect Level (LOAEL) and No Observed Effect Level (NOEL)] as introduced in the NPSE and provides a table of noise exposure hierarchy for use in noise impact assessments in the planning system.
- 10.2.7 In general terms, it is considered that a noise impact with an effects level which is lower than SOAEL is acceptable (providing the effect is mitigated to a minimum). There is currently, however, a major discontinuity between the above guidance and objective technical criteria for use in planning noise impact assessments.

#### Local Plan

- 10.2.8 The Havant Borough Council Local Plan 2011 is under review but includes the following:
- E22: Amenity and pollution: Development proposals will be permitted where:*
- Projected levels of noise, odour, vibration, light, water or air pollution do not have a likely significant negative effect on the amenity of existing and future users of the site, nearby occupiers or the wider environment; or*
- Measures are provided which are suitable for the purposes intended and will ensure that any likely significant negative effect on receptor(s) are mitigated to an acceptable level.*

10.2.9 The Havant Borough Council Borough Design Guide SPD includes the following.

*“Policy CS16 High Quality Design*

*Planning permission will be granted for development that is designed to a high standard, which helps to create places where people want to live, work and relax. All development should demonstrate that its design...does not cause unacceptable harm to the amenity of neighbours through smell, the loss of privacy, outlook, noise and overlooking.”*

10.2.10 Policy DM10 of the Havant Borough Core Strategy requires that for development that may cause pollution through noise will only be permitted where *“The health and safety of existing and future users of the site, or nearby occupiers and residents is not put at risk.”*

#### Key Legislation

10.2.11 There is no legislation relating to noise and vibration and relevant guidance is detailed below.

#### Scoping Assessment Stage

10.2.12 A pre-application response has been provided by an Environmental Health Regulatory Officer, Havant Borough Council, dated 23rd September 2022. In this, the Council refers to compliance with the guideline noise levels specified in BS8233:2014. They conclude *“In short, if this application were to proceed to an outline or even full application, I would expect that an acoustic assessment will be provided at this time, with all recommended mitigation measures that may be required, along with an overheating assessment.”*

10.2.13 A noise impact assessment has been undertaken and is included as Appendix 10.1 and the results are summarised herein.

10.2.14 An overheating assessment will be undertaken for Building Regulations purposes and where necessary an alternative strategy to open windows will be determined for the control of overheating in bedrooms at night, in order to comply with the requirements of Approved Document O<sup>iv</sup> for noise.

#### Assessment Methodology

##### IEMA Guidelines for Environmental Noise Impact Assessment: 2014<sup>v</sup>

10.2.15 The IEMA Guidelines consider the process of assessing noise impacts and are relevant for developments where an EIA is required. The Guidelines consider the main steps of a noise impact assessment for EIA purposes, i.e. scoping, baseline studies, noise prediction, assessment, mitigation and reporting.

#### Baseline Noise Environment

10.2.16 Baseline conditions have been determined at the site by noise measurement and full details of this are provided in Appendix 10.1. An ambient noise survey was undertaken on site between 2<sup>nd</sup> and 7<sup>th</sup> December 2022.

10.2.17 The measurement locations are described below and can be seen in Figure 10.1.

- Location 1 – to the east of the site, with line of sight to the A3(M) motorway at a height of 1.5 m above local ground level;
- Location 2 – to the west of the site, near College Road at a height of 1.5 m above local ground

level and a distance of 50 m from the edge of the College Road carriageway.

#### Construction Noise and Vibration

##### British Standard 5228:2009+A1:2014<sup>vi</sup>

10.2.18 British Standard 5228 is the relevant standard for assessing noise and vibration during the construction of the development.

10.2.19 British Standard 5228 Parts 1 and 2 provide detailed advice on the assessment of noise and vibration from construction sites. Part 1 of the standard addresses noise and Part 2 addresses vibration.

10.2.20 BS 5228 Parts 1 and 2 make reference to a number of factors which are likely to affect the significance and acceptability of noise and vibration from construction sites. These are:

- Site location;
- Existing ambient noise levels / existing ambient vibration levels;
- Duration of site operations;
- Hours of work;
- Attitude of the site operator;
- Noise characteristics / vibration characteristics; and
- The effect of vibration on adjacent buildings.

##### BS 5228: Part 1 - Noise

10.2.21 Part 1 of BS 5228 provides guidance concerning methods of predicting and measuring noise from construction activities, and assessing the impact on those exposed to construction noise.

10.2.22 It is generally recognised that for industrial noise the likelihood of complaints is related to the difference between the noise from the industrial source and the existing background noise level. BS 5228, however, recognises that this relationship between response and noise level differences may well be different for construction noise activities, and a greater difference may be tolerated when it is known that the operations are of a relatively short duration. It would be anticipated that the longer the construction activities are scheduled for, the closer the perception of a construction site to a permanent industrial facility, particularly if the construction activities take place at night. It is therefore important to consider the duration of the proposed works in addition to the hours of construction working within the context of the development area.

10.2.23 With respect to hours of work, BS 5228 makes reference to the fact that noise levels generated during the evening (19.00 to 23.00) may need to be lower than the daytime (07.00 to 19.00) period (a figure of 10 dB is quoted) and also that for any night-time operations (23.00 to 07.00) levels should be quieter still.

10.2.24 BS 5228 gives guidance on the assessment of construction noise relative to the existing ambient noise level and this is summarised below for the periods of interest relating to this project.

Table 10.1 Construction Noise Threshold of Significant Effect

| Period of Assessment                                                | Category A | Category B | Category C |
|---------------------------------------------------------------------|------------|------------|------------|
| Evenings & weekends (Saturday 13.00 – 23.00 & Sunday 07.00 – 23.00) | 55         | 60         | 65         |
| Daytime (07.00 – 19.00) and Saturdays (07.00 – 13.00)               | 65         | 70         | 75         |

- 10.2.25 The Category A threshold is to be used when ambient noise levels (when rounded to the nearest 5 dB) are less than the Category A values. Category B threshold values are to be used when ambient noise levels (when rounded to the nearest 5 dB) are the same as the Category A values and Category C is used when ambient noise levels (when rounded to the nearest 5 dB) are higher than the Category A values.
- 10.2.26 If the total noise level (ambient plus construction noise) exceeds the appropriate category threshold value, then a significant effect is deemed to occur.

**BS 5228: Part 2 - Vibration**

- 10.2.27 Part 2 of BS 5228 provides guidance on the control of vibration from construction activities and assessing its impact on those exposed to it.
- 10.2.28 The standard does not recommend absolute criteria for vibration but advises that the peak particle velocity (PPV) descriptor should be used as an indicator of both human response and effects on buildings. Table 10.2 below is reproduced from BS 5228 and provides guidance on the effects of vibration levels in terms of human response.

Table 10.2 Guidance on Effect of Vibration Levels – Human Response

| Vibration Level (PPV) | Effect                                                                                                                                                                                          |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0.14 mm/s             | Vibration might just be perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration. |
| 0.3 mm/s              | Vibration might just be perceptible in residential environments.                                                                                                                                |
| 1 mm/s                | It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.                  |
| 10 mm/s               | Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.                                                                      |

**Noise and Vibration from General Construction Activity**

- 10.2.29 At this stage, detailed construction methodologies are not available. The assessment therefore concentrates on the potential noise impacts in line with BS 5228 for such works and methods of mitigation. Information relating to the likely construction activities taking place on the site have been provided in Chapter 3:Description of Development. The construction period is likely to run from 2025 until 2030.

- 10.2.30 Detailed assessments of construction noise and vibration will be undertaken when the construction and piling methods are finalised and will consider proposed residential properties which form part the Proposed Development as well as existing noise sensitive receptors.

**Noise from Construction Vehicles**

- 10.2.31 Noise from construction vehicles has also been considered based on details of HGV movements as provided in Chapter 5: Traffic and Transport. The assessment of noise from construction vehicles will depend on the vehicle type, routes, time of day and number of movements.

**Operational Traffic Noise**

**Calculation of Road Traffic Noise <sup>vii</sup> and Design Manual for Roads and Bridges <sup>viii</sup>**

- 10.2.32 The Department of Transport Publication ‘Calculation of Road Traffic Noise (CRTN, 1988) provides guidance and methodology for the assessment and prediction of noise levels from road traffic.
- 10.2.33 The Design Manual for Roads and Bridges (LA111 May 2020) Noise and Vibration (DMRB) provides a method for the assessment of road traffic effects by assessing the change in the  $L_{A10,18hr}$ .
- 10.2.34 The increase in noise level from road traffic, as a result of the projected future traffic flows has been assessed in accordance with the guidance of CRTN and the DMRB. The calculations have been based upon the baseline and projected flows provided by the project transportation consultants for the following scenarios:
- Baseline year (2023) – The current baseline prior to the development;
  - 2033 Baseline without the development – The future baseline including committed developments, without the development;
  - 2033 Baseline with the development - The future 2033 baseline including committed developments, with the whole of the development.
- 10.2.35 The above scenarios have been selected in order to assess the increase in noise level from road traffic due to the Proposed Development, compared to the current (2023) baseline. The 2033 scenario with the Proposed Development has been selected to show a worst-case scenario for 2033, with the whole of the development completed. The future baseline scenarios include committed developments, to allow cumulative effects to be assessed.
- 10.2.36 In relation to traffic noise, the DMRB rates impacts through consideration of the change in  $L_{A10,18hr}$  for the short and long-term as reproduced in Tables 10.3 and 10.4 below.

Table 10.3 Classification of Magnitude of Noise Impacts in the Short-term

| Predicted Change in $L_{A10, 18hr}$ , dB | Magnitude of Impact |
|------------------------------------------|---------------------|
| 0                                        | No change           |
| 0.1 – 0.9                                | Negligible          |
| 1 – 2.9                                  | Minor               |
| 3 – 4.9                                  | Moderate            |
| 5+                                       | Major               |

Table 10.4 Classification of Magnitude of Noise Impacts in the Long-term

| Predicted Change in $L_{A10, 18hr}$ , dB | Magnitude of Impact |
|------------------------------------------|---------------------|
| 0                                        | No change           |
| 0.1 – 2.9                                | Negligible          |
| 3 – 4.9                                  | Minor               |
| 5 – 9.9                                  | Moderate            |
| 10+                                      | Major               |

BS 8233:2014<sup>ix</sup> and World Health Organisation<sup>x</sup>

- 10.2.37 BS 8233:2014 provides design guidance for dwelling houses, flats and rooms in residential use and recommends that internal noise levels in dwellings do not exceed 35 dB  $L_{Aeq, 16 \text{ hour}}$  in living rooms and bedrooms during the day and 30 dB  $L_{Aeq, 8 \text{ hr}}$  in bedrooms at night.
- 10.2.38 BS 8233 also notes that:
- “Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or  $L_{Amax, F}$ , depending on the character and number of events per night.”*
- 10.2.39 The World Health Organisation (WHO) provides guidance on desirable internal noise levels to minimise the risk of sleep disturbance. The WHO 2000 guidelines<sup>xi</sup> suggest internal noise levels not exceeding 30 dB  $L_{Aeq, 8hr}$  or regularly exceeding 45 dB  $L_{Amax, f}$  for a good night’s sleep.

Approved Document O

- 10.2.40 Approved Document O requires all new dwellings to provide mitigation to control overheating. The overheating mitigation strategy must be usable, and Section 3 of the approved document provides thresholds for night-time noise levels within bedrooms. The document states:
- “Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits:*
- a. 40dB  $L_{Aeq, T}$ , averaged over 8 hours (between 11pm and 7am).*
- b. 55dB  $L_{AFmax}$ , more than 10 times a night (between 11pm and 7am).”*

Receptor Sensitivity

- 10.2.41 Existing noise sensitive receptors have been identified from plans of the surrounding area and during site visits. The nearest noise sensitive receptor groups are shown in Figure 10.1 and described below:
- Receptor A – Residential properties on Atlantis Avenue to the west of College Road to the west of the site;
- Receptor B – Residential properties at the eastern end of Athena Avenue to the west of the site;
- Receptor C – Residential properties at the eastern end of Delphi Avenue to the west of the site;

Receptor D – Residential properties adjacent to Purbrook Way to the north of the site.

Table 10.5 Methodology for Determining Receptor Sensitivity

| Sensitivity | Examples of Receptor                                                                                                                                           |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High        | The receptor/resource has little ability to absorb change without fundamentally altering its present character, or is of international or national importance. |
| Moderate    | The receptor/resource has moderate capacity to absorb change without significantly altering its present character, or is of high importance.                   |
| Low         | The receptor/resource is tolerant of change without detriment to its character, is of low or local importance.                                                 |

- 10.2.42 Based on the methodology in Table 10.5 and Table 7.10 of reference 5, it is considered that the existing and proposed noise sensitive receptors considered herein are of low sensitivity.

Impact Magnitude

- 10.2.43 The magnitude of any impact associated with construction works is undertaken in accordance with BS5228: 2009 Parts 1 and 2.
- 10.2.44 As assessment of noise impact from increases and changes in road traffic associated with the Proposed Development is undertaken in accordance with the DMRB assessment methodology at identified existing and proposed receptor locations. The assessment uses traffic count and predicted traffic movement data from the traffic assessment. The -magnitude of noise impact is determined using the DMRB assessment method which compares predicted noise levels for existing, short-term and long-term conditions.
- 10.2.45 A noise impact assessment has been undertaken based on baseline noise survey results from December 2022 and acoustic calculations. Calculations have determined external building fabric requirements (including glazing and ventilation) such that internal noise levels do not exceed the guidance values provided by BS 8233 and WHO. Where required, mitigation is specified to ensure internal noise levels achieve relevant criteria.

Effect Significance

- 10.2.46 The assessment of significance is based on Table 10.6 below with particular reference to receptors of low sensitivity.

Table 10.6 Effect Significant Matrix

|                         |           | Magnitude of Impact   |                    |                  |                      |
|-------------------------|-----------|-----------------------|--------------------|------------------|----------------------|
|                         |           | Substantial magnitude | Moderate magnitude | Slight magnitude | Negligible magnitude |
| Sensitivity of Receptor | Very High | Major                 | Major              | Intermediate     | Neutral              |
|                         | High      | Major                 | Intermediate       | Minor            | Neutral              |

|  |        | Magnitude of Impact   |                    |                  |                      |
|--|--------|-----------------------|--------------------|------------------|----------------------|
|  |        | Substantial magnitude | Moderate magnitude | Slight magnitude | Negligible magnitude |
|  | Medium | Major                 | Intermediate       | Minor            | Neutral              |
|  | Low    | Intermediate          | Minor              | Neutral          | Neutral              |

10.2.47 Noise and vibration effects that are minor to major adverse are considered significant in EIA terms.

#### Limitations of the Assessment

10.2.48 Comprehensive noise surveys have been undertaken to minimise uncertainty of ambient noise levels at the site. Calibration of all instrumentation was checked before and on completion of the surveys and no drift in calibration level was observed. The calibration of all equipment is traceable to National Standards.

10.2.49 Although BS 5228 provides methods for predicting the likely noise levels from construction works, they are based on detailed information including the type and number of each plant item, their location and the length of time they are in operation. As there is no detailed information currently available regarding the specific construction plant and techniques that will be in operation on the site during the construction period, accurate prediction is not possible at this stage.

10.2.50 No information is available regarding the proposed community centre and this will be subject to a full noise assessment once the anticipated uses are defined.

10.2.51 These limitations are not anticipated to affect the robustness of the assessment for EIA purposes.

### 10.3 BASELINE ENVIRONMENT

#### Existing baseline

10.3.1 Environmental noise measurements were obtained between 2<sup>nd</sup> and 7<sup>th</sup> December 2022. In addition, an environmental noise survey was undertaken over a 3 hour period near the boundary of College Road on 7<sup>th</sup> December 2022. Appendix 10.1 contains the technical details relating to this survey.

10.3.2 Noise measurement locations are shown in Figure 10.1. Location 1 was located to the east of the site, facing the A3(M) motorway at a high of 1.5 m above ground level. Location 2 was located to the west of the site, facing College Road at a high of 1.5 m above ground level and a distance of 50 m from the edge of the College Road carriageway.

10.3.3 The results of the survey at Location 1 are summarised below in Table 10.7.

**Table 10.7 Summary of Measured Ambient Noise Levels**

| Location | Sound Pressure Level (dB)              |                                          |                      |
|----------|----------------------------------------|------------------------------------------|----------------------|
|          | Daytime (07:00 – 23:00) $L_{Aeq,16hr}$ | Night-time (23:00 – 07:00) $L_{Aeq,8hr}$ | Typical $L_{Amax,f}$ |
|          |                                        |                                          |                      |

|   |    |    |    |
|---|----|----|----|
| 1 | 77 | 71 | 81 |
|---|----|----|----|

10.3.4 At Location 2, the survey was undertaken in accordance with the shortened method described in CRTN (Department of Transport. Calculation of Road Traffic Noise, 1988). The  $L_{A10,3hr}$  has been calculated to be 63 dB. The measured  $L_{A10,3hr}$  value has been converted to a daytime figure of 60 dB  $L_{Aeq,16hr}$ .

#### Future baseline

10.3.5 Calculations of the change in road traffic noise level from the 2023 baseline case, as a result of the additional vehicle movements projected for the future scenarios without the Proposed Development are shown in Table 10.8.

**Table 10.8 Change in Road Traffic Noise Without Proposed Development**

| Scenario                                 | Receptor                     | Predicted Change in $L_{A10,18hr}$ From 2023 Baseline |
|------------------------------------------|------------------------------|-------------------------------------------------------|
| Future baseline 2033 without development | Receptor A - Atlantis Avenue | 0.3 dB                                                |
|                                          | Receptor B - Athena Avenue   | 0.3 dB                                                |
|                                          | Receptor C - Delphi Avenue   | 0.3 dB                                                |
|                                          | Receptor D - Purbrook Way    | 0.3 dB                                                |

### 10.4 MITIGATION WITHIN THE SUBMITTED DESIGN

#### Design

10.4.1 An acoustic fence ranging from 3 – 4 m in height (minimum surface density 15kg/m<sup>2</sup>) has been included along the eastern site boundary with the A3(M) to minimise the impact of road traffic noise on this part of the site.

10.4.2 The building fabric of the dwellings included in the Proposed Development is designed to ensure acceptable internal noise levels are achieved within the new dwellings. Where necessary, this will include acoustically rated glazing and alternative means of ventilation.

10.4.3 The proposed residential properties on the western site boundary are oriented to face towards College Road, allowing rear gardens to be screened from road traffic noise.

10.4.4 Apartment blocks have been located along the eastern site boundary and these will provide screening to more westerly parts of the site. These apartments will be provided with a mechanical ventilation and recovery (MVHR) system.

#### Construction

10.4.5 Construction noise at existing and proposed residential dwellings will be controlled to acceptable levels by implementation of appropriate best practice measures, following the general recommendations of BS 5228. Construction noise may also be controlled by way of limiting hours of work.

- 10.4.6 A Construction Environmental Management Plan (CEMP) will be developed to ensure that construction noise levels are minimised, and this is expected to be enforced via a planning condition.
- 10.4.7 Mitigation measures to control construction noise and vibration are likely to include the following:
- All plant items will be properly maintained and operated according to manufacturers' recommendations in such a manner as to avoid causing excessive noise. All plant items should be sited so that the noise effects at nearby noise-sensitive properties are minimised;
  - Where appropriate, plant items will be fitted with silencers or acoustic enclosures;
  - Hoarding will be erected around the construction works to shield residential properties from noisy activities;
  - Deliveries will be scheduled to arrive during daytime hours only and vehicles will be routed so as to minimise disturbance to local residents. Delivery vehicles will be prohibited from waiting within the site or on the public highway with their engines running;
  - If necessary, operating times of particularly noisy activities may be reduced;
  - Good communication will be maintained with the occupants of nearby residential properties to inform them of works progress.
- 10.4.8 Construction vibration will be considered in more detail when the piling method has been identified. Where ground conditions allow, a low vibration method of piling will be utilised. Good management of piling vibration will minimise any impact at nearby residential receptors including reasonable working hours and good communication with occupants of nearby residential properties.
- 10.4.9 A Construction Traffic Management Plan (CTMP) will be included as part of the CEMP, which will include measures to control the noise impact from construction vehicles and this is expected to be enforced via a planning condition.

10.5 LIKELY SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE SCHEME

Construction Phase Effects

- 10.5.1 There are limitations as identified previously, such that accurate prediction of noise levels from general construction activity, under BS 5228, is not possible at this stage.
- 10.5.2 Nevertheless, it is anticipated that construction noise (assessed under BS 5228) may give rise to a short-term moderate noise impact during periods where particularly noisy activity is taking place at the closest points to nearby existing noise-sensitive properties (low sensitivity) as identified in Figure 10.1. There is therefore potential for a short-term, adverse effect of minor significance, although this will reduce as workings move away from sensitive receptors. For the majority of the time, when workings are more distant from noise-sensitive properties, it is anticipated that any effects will be neutral.
- 10.5.3 Based on the above, as a worst-case there is the potential for temporary, minor adverse effects from construction noise.
- 10.5.4 It is anticipated that HGV movements associated with construction would be dispersed across the working day outside of the AM and PM peak periods and this would form part of the CTMP discussed above. Any noise impact associated with construction vehicles will depend upon the vehicle type, routes, time of day and number of movements.

- 10.5.5 It is understood that there will be 90 HGV movements per day during peak periods of construction. Calculations have been undertaken, assuming these are dispersed across a 10 hour day, of the change in road traffic noise level at existing receptors to the west of College Road and the results are shown in Table 10.9 below.

Table 10.9 Change in Road Traffic Noise During Construction

| Receptor                     | Predicted Change in L <sub>A10,18hr</sub> during Construction |
|------------------------------|---------------------------------------------------------------|
| Receptor A – Atlantis Avenue | 0.3 dB                                                        |
| Receptor B – Athena Avenue   | 0.3 dB                                                        |
| Receptor C – Delphi Avenue   | 0.3 dB                                                        |

- 10.5.6 Based on the above, as a worst-case there is the potential for temporary, negligible impact resulting in a neutral effect due to noise from construction vehicles.
- 10.5.7 Construction vibration will be considered once the piling method for the construction works has been identified. Depending on the piling method, and subject to good management, vibration from construction is not likely to be significant at the nearest sensitive properties.

Operational Phase Effects

- 10.5.8 Calculations of the change in road traffic noise level from the 2023 baseline case, as a result of the additional vehicle movements projected for the future scenarios with the development are shown in Table 10.10.

Table 10.10 Change in Road Traffic Noise With Development

| Scenario                              | Receptor                     | Predicted Change in L <sub>A10,18hr</sub> From 2023 Baseline |
|---------------------------------------|------------------------------|--------------------------------------------------------------|
| Future baseline 2033 with development | Receptor A – Atlantis Avenue | 3.5 dB                                                       |
|                                       | Receptor B – Athena Avenue   | 3.5 dB                                                       |
|                                       | Receptor C – Delphi Avenue   | 3.5 dB                                                       |
|                                       | Receptor D – Purbrook Way    | 0.5 dB                                                       |

- 10.5.9 The maximum anticipated increase in traffic noise levels due to the Proposed Development along with the 2033 Baseline, without committed developments, is 3.5 dB L<sub>A10,18hr</sub> for receptors to the west of College Road. As assessed in accordance with Tables 10.2, 10.3 and 10.5, this is considered a moderate impact and a minor adverse effect in the short-term and a minor impact with a neutral effect in the long-term.
- 10.5.10 For residential receptors adjacent to Purbrook Way, the maximum anticipated increase in traffic noise levels due to the Proposed Development along with the 2033 Baseline, without committed developments, is 0.5 dB L<sub>A10,18hr</sub>. As assessed in accordance with Tables 10.2, 10.3 and 10.5, this is considered a negligible impact with a neutral effect in the short-term and a negligible impact with a neutral effect in the long-term.

- 10.5.11 For the Proposed Development, across the vast majority of the site, noise levels in external amenity areas during the day are predicted to be no greater than 50 - 55 dB  $L_{Aeq, 16hr}$  and as such will meet the aspirational limit of 55 dB  $L_{Aeq, 16hr}$  specified in BS 8233.
- 10.5.12 For those properties highlighted in Figure 10.2, 1.8 m high close board fences (minimum surface density 12 kg/m<sup>2</sup>) will be used as boundary treatment to ensure noise levels are mitigated and reduced to a minimum. External noise is therefore considered to be a negligible impact with a neutral effect.
- 10.5.13 Apartments to the east of the site are to be provided with balconies and noise levels there will be in excess of 55 dB  $L_{Aeq, 16hr}$ . In relation to such a situation, BS 8233 states the following:  
*“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, urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors...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.”*
- 10.5.14 Furthermore, the PPG states that *“noise impacts may be partially offset if residents have access to...a relatively quiet, protected, external publicly accessible amenity space...that is nearby (e.g. within a 5 minute walking distance).”*
- 10.5.15 It is confirmed that occupiers of these apartments will have access to public open spaces within 5 minutes walking distance and noise levels in these are anticipated to be less than 55 dB  $L_{Aeq, 16hr}$ . This is therefore considered to be a moderate impact with a minor effect.
- 10.5.16 Acoustic modelling has been undertaken and  $L_{Aeq}$  noise contours for the day and night-time periods are presented in Figures 10.3 and 10.4. On the basis of that modelling and drawings provided by the Applicant for the Proposed Development,, noise mitigation measures have been defined for proposed residential dwellings, in terms of acoustic glazing and alternative ventilation. These will ensure that the noise level inside the proposed new properties will fall within acceptable limits (considered to be 35 dB  $L_{Aeq, 16hr}$  during the day and 30 dB  $L_{Aeq, 8hr}$  / 45 dB  $L_{Amax, f}$  for regular events at night). Full details of this are provided in Appendix 10.1. The mitigation measures proposed indicate that the adverse impact of existing noise sources upon the Proposed Development will be slight to moderate. This results in an effect ranging from neutral to minor which is not significant.
- 10.5.17 An overheating assessment will be undertaken for Building Regulations purposes and where necessary an alternative strategy to open windows will be determined for the control of overheating in bedrooms at night, in order to comply with the requirements of Approved Document O for noise.

## **10.6 ADDITIONAL MITIGATION, COMPENSATION AND ENHANCEMENT MEASURES**

- 10.6.1 None proposed. Construction vibration will be considered in more detail when the piling method has been identified. Where ground conditions allow, a low vibration method of piling will be utilised. Good management of piling vibration will minimise any impact at nearby residential receptors including reasonable working hours and good communication with occupants of nearby residential properties.

- 10.6.2 An overheating assessment will be undertaken for Building Regulations purposes and where necessary an alternative strategy to open windows will be determined for the control of overheating in bedrooms at night, in order to comply with the requirements of Approved Document O for noise.
- 10.6.3 This could include external shading, solar film for windows or ventilation with cooling.
- 10.6.4 A full noise impact assessment will be undertaken for the proposed community centre once the anticipated uses are defined. The assessment will specify noise limits and noise mitigation measures as required to ensure that plant and community centre uses result in no significant impact at proposed residential receptors.

## **10.7 ASSESSMENT SUMMARY AND LIKELY SIGNIFICANT RESIDUAL ENVIRONMENTAL EFFECTS**

### **Construction Phase**

- 10.7.1 Implementation of the mitigation measures described in paragraphs 10.4.5 – 10.4.7 above will ensure that any noise effects associated with construction workings will be neutral adverse and not significant for the majority of the duration of the workings for existing residential receptors.
- 10.7.2 Construction vibration mitigation measures outlined in 10.4.8 will ensure that vibration effects will be neutral adverse and not significant at receptors for the majority of the duration of the construction workings.

### **Operational Phase**

- 10.7.3 The assessment indicates that the effect of road traffic due to the Proposed Development will be neutral in the short and long term for most residential receptors. For properties to the west of College Road, the effect will be intermediate in the short-term and minor in the long term.
- 10.7.4 The effect of existing noise sources upon future receptors within the Proposed Development will be no greater than minor.

Table 10.13    Assessment Summary and Residual Environmental Effects

| Summary description of the identified impact             | Sensitivity of Receptor | Impact Magnitude                                                | Significance and Nature of Effect                           | Additional Mitigation | Residual Impact Magnitude                                       | Residual Significance and Nature of Effect                  | Confidence Level |
|----------------------------------------------------------|-------------------------|-----------------------------------------------------------------|-------------------------------------------------------------|-----------------------|-----------------------------------------------------------------|-------------------------------------------------------------|------------------|
| Construction                                             |                         |                                                                 |                                                             |                       |                                                                 |                                                             |                  |
| Construction Noise on Existing Receptors                 | Low                     | Slight - Moderate                                               | Short term minor effect, long term neutral effect           | None                  | Slight - Moderate                                               | Short term minor effect, long term neutral effect           | High             |
| Construction Vehicle Noise on Existing Receptors         | Low                     | Negligible                                                      | Short term neutral effect                                   | None                  | Negligible                                                      | Short term neutral effect                                   | High             |
| Construction vibration                                   | Low                     | Slight - Moderate                                               | Short term minor effect, long term neutral effect           | None                  | Slight - Moderate                                               | Short term minor effect, long term neutral effect           | Moderate         |
| Operation                                                |                         |                                                                 |                                                             |                       |                                                                 |                                                             |                  |
| Road Traffic on Existing Receptors                       | Low                     | Negligible – moderate short term, negligible to minor long term | Neutral – minor effect short term, neutral effect long term | None                  | Negligible – moderate short term, negligible to minor long term | Neutral – minor effect short term, neutral effect long term | High             |
| Existing Road Traffic Noise Impact on Proposed Receptors | Low                     | –Slight - Moderate                                              | Neutral - Minor                                             | None                  | –Slight-Moderate                                                | Neutral - Minor                                             | High             |

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- i Department for Communities and Local Government. National Planning Policy Framework, updated 2021.
- ii DEFRA, Noise Policy Statement for England, March 2010.
- iii National Planning Practice Guidance, Department of Communities and Local Government (revised July 2019).
- iv Building Regulations. Approved Document O – Overheating, June 2022
- v IEMA Guidelines for Environmental Noise Impact Assessment, Nov 2014
- vi British Standards Institution (2009 + A1:2014) British Standard 5228: Code of practice for noise and vibration control on construction and open sites. Parts 1 & 2
- vii Calculation of Road Traffic Noise (CRTN), Department of Transport, 1988.
- viii DMRB, LA111 Noise and Vibration, May 2020
- ix British Standards Institution. British Standard 8233: Guidance on sound insulation and noise reduction for buildings, 2014
- x World Health Organisation. Guidelines for Community Noise, 2000.