

## Memo.

To: Home Farm Lane Knowsley Team

Cc: -

From: Sam Garne, Principal Acoustics Engineer

Date: 13 January 2026

Project: Land at Home Farm Road

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## Noise and Vibration response.

### Audit sheet.

| Rev. | Date       | Description of change / purpose of issue | Prepared | Reviewed | Authorised |
|------|------------|------------------------------------------|----------|----------|------------|
| 0    | 12-01-2026 | For issue.                               | SG       | AP       | PM         |
| 1    | 13-01-2026 | Incorporating comments.                  | SG       | AP       | PM         |

## 1. Introduction.

Hoare Lea has produced the Noise and Vibration Chapter of the Environmental Statement for Land at Home Farm Road (planning reference 25/00486/OUT).

The consultation response has been received from Environmental Health, and this memo provides responses to each of the queries raised.

## 2. Responses.

### 2.1 Vibration effects.

*"1. The noise assessment states that all construction vibration effects are anticipated to be negligible as no piling is proposed, however a vibration assessment or monitoring is required in relation to the potential machinery used on site, for example vibratory rollers may be used for compacting the ground which can cause nuisance to surrounding residents."*

As no piling is proposed within the development, the other potential source of significant levels of vibration is vibratory compaction, assumed primarily as part of the road construction.

According to BS 5228-2, the thresholds at which cosmetic damage could occur in buildings (15 mm/s for light framed structures, or 50 mm/s for reinforced or heavy framed buildings) are significantly higher than the values for adverse human response to vibration. Consequently, the latter has been used to define impact magnitudes for construction vibration; as summarised in the following table.

| Impact magnitude | Vibration level, PPV, mm/s | Description                                                                                                                                                                                        |
|------------------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High             | > 10.0 mm/s                | Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.                                                                         |
| Medium           | ≤ 10.0 mm/s<br>> 1.00 mm/s | It is likely that vibration above 1.00 mm/s in residential environments will cause complaint but can be tolerated over short periods if prior warning and explanation has been given to residents. |
| Low              | ≤ 1.00 mm/s<br>≥ 0.30 mm/s | The threshold at which vibration might be just perceptible in residential environments. The upper value may cause complaint if prior warning is not given to residents.                            |
| Negligible       | < 0.30 mm/s                | Vibration may be just perceptible in the most sensitive situations for most vibration frequencies associated with construction.                                                                    |

**Table 1: Impact magnitude for construction vibration assessment.**

There is an empirical prediction method within BS 5228-2 for vibratory compaction, including both start-up/run down, and steady state conditions. As the details of the vibratory compaction method are unknown, the following conservative assumptions have been made within the prediction:

- Maximum amplitude of drum vibration: 0.8 mm
- Vibrating roller drum width: 1.5 m
- Scaling factor: 106 (33.3% probability of exceedance)
- Number of vibrating drums: 1

The minimum distance between the proposed roads and existing residential receptors is approximately 30 metres. The predicted peak particle velocities (PPV) at the worst-affected receptor are presented below on this basis:

| Condition         | Resultant PPV, mm/s |
|-------------------|---------------------|
| Steady state      | 0.58                |
| Start-up/run down | 0.86                |

**Table 2: Predicted vibration levels from vibratory compaction.**

As presented, both during steady state conditions and during start-up/run down, the vibration level is predicted to have an impact magnitude no higher than Low. A Low magnitude of impact on a High sensitivity receptor equates to a Minor Adverse Effect which is not Significant.

To further reduce the Adverse Effect, engagement with residents is recommended to inform them of the proposed works and that some vibration may be perceptible at times but building damage is unlikely.

Use of non-vibrating ground compaction could also reduce associated vibration levels. Monitoring of the vibration levels during the road construction is recommended to check vibration levels during this phase of the works.

## **2.2 Fixed plant noise assessment.**

*“2. The fixed plant noise assessment for the site indicates that noise limits for the proposed plant (which would include air source heat pumps) are to be set in accordance with the values stated in Table 11.26 of paragraph 11.4.26, which are equivalent to the existing background sound levels for the daytime and*

night-time periods (as shown in Table 11.25). If the cumulative plant noise limits are set equal to the existing background levels, this will result in an increase in the overall ambient noise level in the area, which is undesirable. To prevent this, we request that the cumulative noise level from all fixed plant be controlled to at least 5 dB below the representative background sound level at the relevant time period and at the appropriate assessment location. This approach will ensure that the operation of the plant does not materially alter the existing acoustic environment and that any plant noise will be effectively imperceptible within nearby residential properties. Our proposed condition is provided below."

The proposed criteria within the ES chapter are based on achieving a low impact at the existing sensitive receptors in accordance with BS 4142:2014. This equates to a noise limit equal to the existing background sound level.

The methodology within the ES chapter is not dependent on the resultant noise limits. Therefore, if more onerous limits are to be set by the Local Authority, no amendments to the ES chapter are considered necessary.

This is to be conditioned in condition 2 relating to fixed plant noise, as below:

*"2. Fixed Plant Noise- Fixed plant and machinery associated with the development, including air source heat pumps, shall be designed to a level that is at least 5dB(A) below the existing LA90 background noise level as measured during the relevant time period. Any tonal, impulsive and/or irregular noise would be addressed by imposing a penalty as per the methodology set out in BS 4142:2014+A1:2019, Methods for rating and assessing industrial and commercial sound. Noise limits for fixed plant are to apply at a position 1 metre from the closest affected window of the nearest noise sensitive property."*

## 2.3 Calculated noise levels.

*"3. Please provide a map or table detailing the expected noise levels within gardens, at the façade of the houses, and within the properties with windows closed and opened. The internal noise levels have not been stated and the external noise levels state that limited areas close to Knowsley Lane are above 55dB LAeq,16hr, what are the actual levels?"*

The proposal is only outline and therefore locations of specific buildings and garden areas are unknown. It is therefore not possible to calculate specific sound levels within the garden areas or within the dwellings.

Figure 11.4 presents the daytime external noise levels across the site based on indicative massing. This requires further coordination to be used in detailed calculations, but shows that the garden areas are capable of achieving the 'desirable' noise level criterion within BS 8233 throughout the development.

Figure 11.3 includes indicative requirements for ventilation and the control of overheating. These put the potential façade areas into four groups based on daytime and night-time sound levels:

| Colour in Figure 11.3 | Daytime ambient sound level, dB LAeq,16h | Night-time ambient sound level, dB LAeq,8h |
|-----------------------|------------------------------------------|--------------------------------------------|
| Magenta               | 61 – 63                                  | 53 – 55                                    |
| Orange                | 57 – 60                                  | 49 – 52                                    |
| Yellow                | 51 – 56                                  | 43 – 48                                    |
| Not coloured          | 40 – 50                                  | 32 – 42                                    |

**Table 3: Predicted noise levels acting on potential façade areas during daytime and night-time periods.**

The indicative ventilation and overheating assessment provided assumes a sound reduction through an open window of 15 dB for background ventilation, and 8 – 12 dB for the control of overheating. This

performance is dependent on many factors and therefore requires further consideration as the design develops to ensure compliance with BS 8233 and Approved Document O.

It is understood that this is to be conditioned and therefore detailed calculations are to be provided to discharge the relevant condition.

## **2.4 Construction mitigation.**

*"4. The mitigation proposed during construction is to be incorporated into the Construction Management Plan for the site, with construction works starting from 8am Monday to Friday not 7:30am."*

The anticipated construction working hours are 8:00 – 19:00 as presented in Chapter 4 paragraph 4.3.9, so this will be corrected within an ES Addendum for consistency. The final hours and proposed construction noise mitigation are to be submitted and agreed as part of the proposed CEMP (Condition 4).

## **2.5 Noise mitigation scheme.**

*"5. A noise mitigation scheme to be submitted, detailing proposed mitigation on plot-by-plot basis."*

There is insufficient information at outline stage for this to be determined. This is therefore to be developed at detailed design stage. As comment 3, it is understood that this is to be conditioned and therefore detailed calculations are to be provided to discharge the relevant condition.

## **2.6 Night-time noise levels.**

*"Within Appendix 11.1, Table 3: Summary of attend results need to include the Nighttime dB LAeq,T and dB LA90,T."*

Table 3 contains the attended noise survey results. These were conducted during daytime periods only, with the unattended logger position used for the night-time noise levels. These are presented within Appendix 11.1 in Table 2, Figure 2, and Figure 3.

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