

Annex F: Noise and Vibration Assessment Monitoring and Methodology

(All sites)

Baseline noise monitoring

1. Based on the potentially significant effects identified in Section 6.3, a scheme of baseline noise monitoring will be devised to obtain all pertinent data. This will comprise the following.
 - Monitoring of road traffic noise levels at strategic locations on the A41 to the west of site, and on other significant roads around the each of the sites to calibrate the baseline road traffic noise model. Noise levels would be monitored continuously, over a minimum of 24 hours (subject to access/security constraints), in order to obtain indicative $L_{A10, 18hr}$ (daytime) and $L_{A10, pkr}$ (night-time) noise levels. Noise surveys may be extended to include a weekend if deemed necessary.
 - Monitoring of noise levels associated with the MOD railway, at the approximate positions of the nearest proposed residential area on north of Graven Hill and properties close to the line in the south-west of Ambrosden. Noise measurements would include a series of short term SEL (Single Event Level) measurements. Additionally, noise levels would be measured continuously over a minimum of 24 hours. Measurements would be used to calibrate a rail traffic noise model, in terms of $L_{Aeq, 16hr}$ (daytime) and $L_{Aeq, 8hr}$ (night-time). Noise surveys may be extended to include a weekend if deemed necessary.
 - Monitoring of noise levels at a representative sample of receptors around all sites. Again, noise levels would be measured continuously over a minimum of 24 hours, and would be used to calibrate the combined effects of the road and rail traffic noise models. Data would also be used to define background noise levels at receptors in order to assess industrial/commercial operations. Noise surveys may be extended to include a weekend if deemed necessary.
2. The proposals for monitoring and noise sensitive receptors to be included in the assessment will be discussed and agreed with the local Environmental Health Officer (EHO) prior to any assessment being undertaken.

Assessment methodology

3. The following methodologies would be used to assess the effects identified in Section 6.3.

Construction activity noise

4. The construction methodology will be reviewed, and the potential for significant effects will be discussed with the EHO. If sufficient information is available concerning the construction methodology (including typical plant to be used, construction areas and duration etc.) then a model of worst case construction noise effects during the various phases will be produced using the LimA noise modelling software, in accordance with the calculation methodology of BS5228-1:2009 '*Code of Practice for Noise and Vibration Control on Construction and Open Sites*'. Predicted construction noise levels will be assessed with reference to the guidance contained within Appendix E of BS5228-1:2009, and with respect to existing baseline noise levels at the affected receptors.
5. An assessment of vibration effects associated with construction activities will be presented, assuming information on construction methods and plant is available. Reference will be made to BS5228:2009 Part 2. Construction methodology will determine significance of impacts. If this includes piling, the precise piling method will affect significance of effects e.g. driven piles or bored piles; drop hammer rig or hydraulic rig. Duration of these activities and hours of working will also influence effects.

Road and Rail Traffic noise

6. The effect of predicted operational traffic flows on noise emissions from the local road network will be modelled using LimA, in accordance with the calculation methodology of CRTN (1988) '*Calculation of Road Traffic Noise*'. A baseline noise model will be produced from existing traffic flows to determine the existing noise climate due to road traffic. The change in noise levels due to additional operational traffic will then be calculated using a difference map between the baseline, and worst case operational traffic years.
7. A similar approach will be undertaken for the assessment of construction traffic noise, provided that sufficient information regarding the construction programme is available, for the likely worst case construction years (to be determined by the programme phasing).
8. It should be noted that the Guidance set out in the *Design Manual for Roads and Bridges* (Volume 11, Section 3, Part 7, Noise and Vibration (HA 213/08)) states that a 25% increase in road traffic flows is needed for a 1dB(A) increase in road traffic noise levels, which is the minimum change that can be detected by the human ear in the short term (e.g. on opening of a project). Should operational traffic result in an increase of road traffic flows of less than 25% for the opening year of the Scheme then noise effects from changes in road traffic flows will be scoped-out of the assessment.
9. The 'Calculation of Railway Noise' methodology would be used to predict changes in noise levels, based upon rail traffic flow and railway usage data. Changes in noise levels would initially be assessed in accordance with the IEMA/IoA draft guidelines on noise impact assessment.

Site suitability (Graven Hill site only)

10. The LimA noise model of road and rail traffic effects at the worst case operational traffic years will be expanded to include industrial/commercial noise sources due to the existing and proposed employment uses and rail noise sources (e.g. freight on MOD lines). The result will be a comprehensive noise map which can be used to evaluate the suitability of the site for the proposed end uses. The following methodologies will be used for the different proposed uses within the proposed development at Graven Hill.
 - Residential properties: The daytime and night-time Noise Exposure Categories from PPG24 '*Planning and Noise*' will be used to identify the suitability of the site for this residential development. BS4142:1997 '*Rating industrial noise affecting mixed use residential and commercial areas*' will be used to assess effects from any existing/future industrial/commercial noise sources on existing and future receptors (including the potential Holding Centre adjacent A-site). If required, calculations will be undertaken and assessed in accordance with BS8233:1999 '*Sound Insulation and Noise Reduction for Buildings - Code of Practice*', to determine the need for any environmental design to be incorporated into any future residential units (glazing/ventilation or stand-offs etc.).
 - Commercial properties: If required, calculations will be undertaken and assessed in accordance with BS8233:1999 '*Sound Insulation and Noise Reduction for Buildings - Code of Practice*', to ensure acceptable standards of internal noise for the type of work required, concentration, etc. Due to the proximity of some of the proposed employment areas on Graven Hill site to the A41, up-rated glazing/ventilation units may be required in order to achieve suitable internal conditions within offices during the daytime.
 - School: If required, calculations will be undertaken in accordance with Building Bulletin 93: Acoustic Design of Schools (BB93) to enable measures that need to be incorporated in the design of the school on the north of the Graven Hill site to be identified for provision within the Scheme, although the detailed design of any school would not be considered as part of the ES.

Annex G: Landscape and Visual Assessment for Graven Hill Site

Attached separately