

## APPENDIX 5.2: VISUAL AIDS

### Guidance and Standards Used

1. All Visibility Maps (ZTVs), photography, visualisations (wirelines and photomontages) and their graphical presentation has been undertaken in line with the Landscape Institute's Technical Guidance Note 06/19, Visual Representation of Development Proposals. All ZTVs have been prepared by Stephenson-Halliday whilst photography and visualisations have been prepared by HCUK.

### The Computer Model

2. To generate wireline visualisations and photomontages, computer models of the proposed site and study area are produced. Autodesk 3DS Max is used to create a 3D computer model of the proposed development representing the specified geometry and position of the proposed development, and the existing landform (terrain). The landform information is derived from 50m resolution terrain data incorporating 5m resolution terrain data around the site and each viewpoint and viewpoints where required (either by local guidance, or where it is judged to be needed for accurate modelling).
3. The computer models include the entire study area and all calculations take account of the effects caused by atmospheric refraction and the Earth's curvature. The computer models do not take account of the screening effects of any intervening objects such as vegetation, buildings or other non-terrain features, unless expressly stated.
4. The computer models combine the existing landform with the model of the proposed development and detailed data collected in the field to enable the output of accurate visual and graphical information and associated data for presentation as finished figures.

### Visibility Maps: Zone of Theoretical Visibility

5. Zone of Theoretical Visibility (ZTV) maps have been generated using GIS to assist in identifying areas where visibility would not occur as well as viewpoint selection, illustrate areas from where part or all of the proposed development may be visible and to indicate its potential influence in the wider landscape.
6. Unless expressly stated, the visibility maps present the extent of potential visibility on the basis of a 'bare ground' scenario: They do not account for the effects of screening and filtering of views as a result of intervening features (e.g. buildings, trees, hedgerows, etc) and so tend to over-estimate visibility, both in terms of the area from which the project can potentially be seen and potentially in terms of the extent of the development visible from a particular viewpoint.
7. ZTVs which include vegetation and buildings may use real height information derived from standard DSM products such as LiDAR – this approach is typically used for smaller study areas and urban areas. For larger study areas assumed heights are used which are stated on the ZTV figure. The location and extent of woodland and buildings is derived from OS Open data and assumed heights for these are added to the bare ground model. As a result, the ZTV study does not take account of all above ground features – only those included as woodland and buildings in the OS mapping at the time the ZTV was prepared. These ZTV studies present a more realistic visibility pattern than bare ground studies, but do not take detailed account of felling cycles, tree growth, demolition or construction.

## Visualisations: Annotated Photos (Type 1)

8. Baseline photography has been undertaken at each representative viewpoint location using a high-quality digital SLR camera with full frame sensor and a 50mm fixed focal length lens – in accordance with the relevant guidance identified above. The resulting photographs are stitched using Adobe Photoshop. Cylindrical mapping is used for panoramas. Images are presented at either A3 or on wide format sheets, in accordance with Technical Guidance Note 06/19, and are annotated to indicate the extent of the proposed development and highlight any important features within the view.

## Visualisations: Photomontages (Types 3 & 4)

9. Baseline photography has been undertaken at each agreed representative viewpoint location using a high-quality digital SLR camera with full frame sensor and a 50mm fixed focal length lens, in combination with a panoramic head equipped tripod at 1.6m height Above Ground Level (AGL) unless stated otherwise – in accordance with the relevant guidance identified above. The resulting photos are combined into panoramas using Adobe Photoshop photo stitching software and saved as cylindrical and planar projection versions for use in visualisation production.
10. Using the computer model, a wireline diagram showing the proposed development is generated for each viewpoint to meet the relevant requirements of guidance.
11. To produce a photomontage, the above wireline is combined with the photographic panorama using Adobe Photoshop. Detailed viewpoint information as recorded on site (e.g. GPS grid co-ordinates; ground level information; compass bearings; and any other known references; etc) is used to enable the accurate alignment of the photographs with the computer model. A perspective match is achieved between the computer generated wireline and the photographs by iteratively adjusting the parameters until all the major features in the image are aligned satisfactorily. The proposed development is then rendered using Autodesk 3DS Max taking into account the time and conditions occurring on the day of the photography to provide a realistic image.
12. A minimal amount of image processing is undertaken. Where necessary, the contrast between the background photograph and the proposed development is increased to ensure that the development is apparent in the photomontage, as far as possible. It should be noted that there is an element of professional judgement inherent in the illustration of the changes represented by any photomontage.
13. The information shown on the visualisations and within the LVIA is generated via the computer model or from mathematical calculations.
14. The completed base photography, wirelines, photomontages and accompanying data are then presented as figures using desktop publishing/graphic design software to meet the relevant guidance requirements.

## Data Accuracy

15. The Trimble GPS camera locations used Trimble survey data accurate to 30-50mm in position and level. The CAD 3d model for the Proposed Development contained large parts of the existing structure within it. In particular the new EAF is partly located within existing built structures. The alignment of the model with existing structures was matched with the photography to a high degree of accuracy that conforms to LI TGN guidance.