The Lake Lothing (Lowestoft) Third Crossing Order 201[*]

Lake Lothing THIRD CROSSING

Document 6.3: Environmental Statement Volume 3 Appendices

Appendix 10A

Verified Photomontage Methodology

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Verified Photomontage Methodology	

1. OVERVIEW

1.1. The purpose of this appendix is to set out the method for preparing the verifiable computer generated photomontages, with the aid of 3D visualisations, from an agreed range of viewpoints for the scheme townscape assessment.

1.2. The photomontages have been used to visually represent the scheme within the environmental impact assessment, to respond to consultation responses and to comply with current industry best practice. The methodology has been guided by the following documents:

- Landscape Institute Advice Note 01/2011: Photography and photomontage in landscape and visual assessment;
- Guidelines for Landscape and Visual Impact Assessment - 3rd edition (GLVIA3) – Landscape Institute and the Institute of Environmental Management and Assessment; and
- Scottish Natural Heritage – Visual Representation of wind farms February 2017.

1.3. The verifiable photomontages are based on accurately captured and surveyed verifiable photography. Photographs were captured between March 2017 and October 2017.

2. PHOTOGRAPHY

2.1. The method for taking photographs included the following procedures:

- Where possible, the scheme was positioned in the middle of the panorama. Photographs were taken in suitable weather conditions;
- The views have been photographed with a full frame digital SLR camera with a fixed 50mm lens. A Canon 5D Mark III was used;
- The camera was mounted in landscape format on a tripod with a panoramic head attached. The lens centre (its nodal point) was set at an eye level of 1.5m although the camera height may have been different if features such as fences or hedges obscured the view;
- A plumb line was used to accurately position the survey nail directly below the lens centre. Camera location co-ordinates were taken by the surveyor during the site visit;
- The camera was levelled using a levelling plate and levelling centre column;
- The camera was set to manual focus; ISO100-200 with an aperture set to record an adequate depth of field (F8-F11) and white balance set appropriately to conditions;
- The camera was rotated between 15-20° to allow for a 50% overlap between each photograph;
- Images were captured in RAW format; and
- The photography and surveying were undertaken simultaneously in order to avoid problems with markers in soft ground moving or being removed altogether.

3. FIELD OF VIEW

3.1. Each viewpoint of the scheme required a panorama using stitched individual images each with a field of view of 38 degrees. The extents of the scheme and its relevant townscape context determined the horizontal field of view required for photography and photomontage from any given viewpoint. Professional judgement was used to determine the required horizontal field of view to best represent the scheme from each viewpoint.

4. VERIFIABLE SURVEYING

4.1. A Leica Total Station was used by the surveyor to accurately record the camera position and also capture an array of selected survey reference points used to camera match and calibrate the photography. All survey points were captured in the British National Grid (BNG) co-ordinate system, recording an X, Y and Z co-ordinate for each.

4.2. Each camera location was surveyed together with a series of clearly defined detail points within the image (e.g. corners of road markings, features on road signs, corners of building features etc.). Where a viewpoint did not contain many or any fixed targets suitable for surveying, temporary targets were set up to allow the survey to be completed at the same time as the photography.

4.3. Each image had a sufficient amount of clearly defined detail points taken across the width of the image and at near, mid and far distance (i.e. a balance of points across the photograph). Where possible these numbered between 8-12 points. Each detail point was given a unique number that related to the viewpoint number;

4.4. The survey data was post-processed by the surveyor to increase accuracy and then supplied in digital form for each set of viewpoint photography.

5. MODEL ASSEMBLY

5.1. Surveyed X, Y, Z co-ordinates of reference points and the camera position were set up in 3DS Max.

5.2. The 3D building computer model was provided by the design engineers and was georeferenced to position it accurately.

5.3. Within the 3D software a virtual camera was set up using the coordinates provided by the surveyor and aligned with the reference markers.

5.4. A lighting environment was set up within the 3D software, using the metadata stored in the image and surveyor location data.

5.5. A 3DS Max model file for each viewpoint was assembled before rendering. The assembled model contains the relevant digital terrain model tiles and any structures, buildings or further elements that can be seen in the viewpoint.

6. CAMERA MATCHING

6.1. The process of camera matching creates a virtual camera in the same location and height, and pointing in the same direction as the physical camera used on site to capture the image. Each viewpoint has it survey points in place and the camera was set to the required field of view and view direction which was enerally between 75-90°.

6.2. The process involved accurately positioning the 3D model of the scheme within each existing view. This was achieved through a process of matching the surveyed points in the digitised image with those recorded by the survey team.

6.3. The survey points and specifications of the lens type relating to each view were also entered into 3DS Max.

6.4. The survey points of the camera position and each clearly defined detail point (relating to specified objects in the view) were then highlighted on the digitised image.

6.5. Once the process of camera matching was completed, the 3D model of the scheme was accurately positioned within each of the views captured. This was achieved by rendering the camera matched 3D model of the scheme within 3DS Max at the same size as the digitised existing view.

6.6. To aid in greater accuracy of real life camera settings and the production of cylindrical projection, wide angle panoramas which match the photography stitch, a plug-in programme called Vray was used. Each of the views was rendered using the Vray Rendering Engine software.

6.7. Individual elements were rendered out using different map channels to create masks (for example mask for the digital terrain model, earthworks, overhead line equipment, fencing, shadows etc). These masks ensured

each visible element of the scheme could be independently selected when individually placed into the Adobe Photoshop file for final production.

7. PRODUCING THE PHOTOMONTAGE

7.1. The JPEGs were lens corrected and then stitched into a panorama using a cylindrical projection within Adobe Photoshop. The panoramas were checked for general accuracy by the lead landscape architect at this initial stage before proceeding.

7.2. The renders of the 3D model were superimposed onto the photos in Adobe Photoshop. The foreground of the photos visible in front of the scheme were then copied and masked to ensure the render of the 3D model sat accurately within the depth of the view. The compositing process involved digitally removing existing features such as trees that were within the extents of the scheme.

7.3. The textured render of the 3D model was then further adjusted to match the resolution, colouring and saturation of the photograph captured to create an accurate impression of what the textures of the scheme will look like.

7.4. Soft landscaping was then added in Adobe Photoshop to as accurately as possibly reflect how the scheme would look in Years 1 and 10, taking into account growth rates of any planting.

8. PHOTOMONTAGE PRESENTATION LAYOUTS

8.1. The standard Layout is A3 Landscape with a field of view generally between 75° - 90°. Each view is annotated with specific camera and viewpoint information and if necessary any disclaimers.

8.2. Should the photomontages be printed, then printing settings should select ‘no scaling’ or ‘fit to page’ options as otherwise this would alter the size of the image. A high quality print setting with a minimum resolution of 300 dpi should be used.

9. RECOMMENDED VIEWING DISTANCES

9.1. It is recommended that the photomontages are viewed at an optimum viewing distance in relation to the size of printed photomontage, to give a correct sense of scale.

9.2. The images are provided at A3 size for practicality, and do not lend themselves to direct comparison out in the field.

9.3. For viewing in the field, it is more practical to use a set of 40 degree sections from the panorama, printed on A3 landscape sheets (with the image filling the full height of the paper). These can then be held up at the correct distance from the eye (as noted above) and at the height photographed from, and this would then match what is being seen in the field.