Appendix 17.8

Photographic Surveys and Verifiable Photomontage Methodology

Introduction

The assessment of potential visibility from selected viewpoints is typically aided by the use of visually representative material. Visualisations are illustrations that aim to represent an observer's view of a Proposed Development. To this end, a series of computer generated verifiable photomontages have been produced for agreed viewpoint locations within the study area.

To this end, a series of computer generated verifiable photomontages have been produced for the agreed representative viewpoint locations. The photomontage illustrations presented, together with desk based studies and field surveys, have been used to assist professional judgement in the robust assessment of the potential impact of the Main SRFI Site.

The purpose of this document is to set out the method that was followed when preparing the computer generated photomontage and wireline visualisations used to visually represent the Main SRFI Site development within the EIA.

This methodology complies with current industry best practice and is based upon 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 IEMA.
- Scottish Natural Heritage – Visual Representation of Windfarms Version 2.2, 2017

The following visually representative material has been prepared:

- Baseline panoramas illustrating the existing views from the 24 agreed representative viewpoint locations;
- Baseline panoramas illustrating the night time visual context from 6 of the representative viewpoint locations;
- Verifiable photomontage images illustrating the worst case parameters and the maximum massing of the Main SRFI Site and the embedded landscape and visual mitigation as it would appear in the year of opening in winter;
- Verifiable rendered photomontage images presenting the appearance of the illustrative Main SRFI Site masterplan and the embedded landscape and visual mitigation as it would appear: in the year of opening in winter; and
- Verifiable rendered photomontage images to represent the residual visual effects once planting has established in the Summer of year 7 following the completion of the development; and once planting proposals have reached a reasonable level of maturity, which is taken as the Summer of Year 15 following completion of development.

The visualisations have a number of limitations which people should be aware of when viewing them. The images provided give a reasonable impression of the scale of the development in its landscape context but can never be 100% accurate.

The visualisations provide a useful visual aid during the site design process, and during the landscape and visual impact assessment. It should be stressed that visualisations provide a tool for assessment, an image that can be compared with an actual view in the field. They should not be considered as a substitute to visiting a viewpoint in the field. Photomontages combine a photograph of an existing view with a computer-generated image. They provide photo-realistic, rendered representations of how the Proposed Development may look in the context of the existing landscape, as would be seen in a photograph, but not as would appear to the human eye in the field.

Viewpoints

The representative viewpoint numbers, locations and the format of accompanying visualisations have been agreed with South Northamptonshire Council. Baseline panorama photographs have been taken from the twenty four representative viewpoints. The baseline panorama photographs each present a 90 degree field of view illustrating the Main SRFI Site within its landscape setting, and given that the site occupies a wide field of view when seen from such locations.

Photography

A comprehensive photographic study was undertaken with 360° photography captures at each agreed representative viewpoint. This allows for the presentation of the full visual context/field of view. Where possible the photographs were taken in good clear visibility weather conditions. The views were photographed with a full frame digital SLR camera - Canon EOS 5d MK II and fixed50mm lens.

The camera was mounted in landscape format on a tripod with a panoramic head attached. The lens centre (its nodal point) was generally set at an eye level of 1.6m. The camera height was altered if features such as fences or hedges obscured the view. With a twin axis spirit level attached to the hot shoe on the camera, the levelling plate was adjusted to level the camera in both its pitch and roll axes. Use of the panoramic head allows the camera to rotate directly around the lens centre (its nodal point) to avoid parallax effects between incremental photos.

The physical viewpoint location was marked with either a survey nail or wooden/plastic peg hammered in to the ground. A plumb line was used to accurately position the survey nail/peg directly below the lens centre. Camera location co-ordinates were recorded by a chartered surveyor and photographer during the site visit.

Supplementary photos were taken to record the camera setup and survey nail/peg position using a compact point and shoot camera. These were used for reference in case a return to the viewpoint location was required, and also for verification that the correct equipment had been set up and used.

Camera settings were generally set as follows but may have been changed at the photographer's discretion depending on the weather conditions at the time.

- Manual focus
- ISO 100-200
- Evaluative Metering
- White Balance – Set appropriately to the conditions
- Aperture (F-Stop) set between F8-F11 allowing all of the scene to be in focus

The camera was rotated consecutively in 15° increments through a full 360°. This gave 24 shots portrait orientation photos making a 360° photo set panorama. Where necessary, depending on weather conditions, multiple sets of 360° photography per viewpoint were taken to try to attain the optimal image capture across the 360° views. Images were captured using the native camera RAW format to ensure maximum tonal and colour information for image processing. Information such as camera, lens, lighting conditions, weather, date, time of photograph and any other site information worthy of note was recorded on field data sheets.

Survey Data Collection

Where possible the site visits were attended by both the photographer and chartered surveyor at the same time.

A Leica Total Station was used to accurately record the camera position and capture an array of selected survey reference points used to camera match and calibrate the photography. The total station had a target cross hair image capture facility. These cross hair images, which show exactly where each survey point was taken, were used as visual reference showing what each surveyed co-ordinate point represents in 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. Where some points were out of range for full X,Y,Z data capture or were non-reflective a bearing was taken.

A number of survey points were recorded along the entire 360° panorama to verify the overall viewpoint alignment.

Where a viewpoint did not contain many or any fixed targets suitable for surveying, temporary targets were used and survey coordinates were captured. The temporary targets were subsequently removed from the images using Adobe Photoshop.

Using standard RSK field note sheets back up data was recorded by photographer and surveyor at each viewpoint. These data sheets collected data such as date and time of visit, weather conditions, camera settings and survey point features.

The survey data was post-processed by the chartered surveyor to increase accuracy and then supplied in an Excel table for each set of viewpoint photography. This data consisted of co-ordinates for the camera and surveyed reference points along with a bearing for each reference point relative to the camera position. These bearings were used to calibrate the finalised 360° panorama.

Photography Processing & Stitching

Using Adobe image processing software, the quality of the RAW data images were checked, and if necessary any minor adjustments were made to sharpening, colour, brightness and contrast. JPEGs were created from these RAW files. Using Autopano photo stitching software, the JPEGs were stitched into 360° panoramas using a cylindrical projection. The images were inspected to ensure that no ghosting had occurred and no stitching misalignment had taken place.

360° Photo Calibration and Survey Point Alignment

Once the images had been aligned with the survey data, the final field of view for the assessment was selected. The overall views are made up of multiples of 90° which are referred to as baseline images. From the 360° panorama a full resolution, cropped area representing that field of view was exported. This was subsequently imported into the 3DS Max software for use as the background image to align and render the site model against.

Viewpoint Setup and Camera Matching

3DS Max with a VRAY plug-in was used to create the photomontage renders, using the survey data, photography and site model.

Surveyed X, Y, Z co-ordinates of reference points and the camera position were set in 3DS Max. Survey points were represented by cross hairs. The camera position was replicated using a Physical Camera with correct settings taken from the photography EXIF data.

The sun lighting environment was set using details from the EXIF material and global positioning. This included settings for the time of photography, date of photography, time zone and site longitude and latitude.

At this stage a 360° panorama was rendered showing the survey point markers to check overall accuracy of the survey data set in 3DS Max.

Where helpful Government LIDAR DSM data was also used to help check and verify correct alignment.

Once each viewpoint had its survey points put in place the camera was set to the required field of view and view direction.

Background imagery, cut from the viewpoint 360º photography for the required field and direction of view was added.

Modelling and Rendering

The 1:1 scale site model was setup within 3dsMax. Checks were made to establish that the site model was correctly located and sized. Initial renders were made and any tuning of alignment, lighting and model textures took place.

With the cameras and lighting set, renders were output for post production in Photoshop. The site renders, that included the site upon opening and various years of landscape mitigation, were brought into Photoshop where they are placed in their correct relationship to background and foreground details in the photography using masking techniques.

At this stage it was necessary, in some viewpoints, to perform a slight overall horizontal rotation of the background image in Photoshop to compensate for residual misalignment /levelling of the photography which may be associated with weather and ground conditions upon data capture.

Photomontage Presentation Layouts

Final image outputs per viewpoint consist of two field of view types:

90° Cylindrical baseline panorama images.

The 90° baseline panoramas show overall existing visual context. These are inserted into an A1 template. Image size on sheet is 820mm x 130mm with a principle viewing distance of 522mm at A1.

53.5° Rectilinear images - existing and proposed.

These cover the sections of the viewpoint where the proposed development would be visible. They simulate the size and visible field of view as perceived by the average human from that viewpoint. These are inserted into an A1 template. Image size on sheet is 820mm x 260mm. This gives a principle viewing distance of 812.5mm at A1.

To aide in understanding the relationship of the 53.5° images to the 90° baseline images, the extent of view of the 53.5° images is shown underneath the 90 degree images.

Each view has its own A4 location map and data sheet. This is annotated with specific camera and viewpoint information.

When printing there should be no scaling or fit to page options selected as this would alter the size of the image. A high quality print setting with a minimum resolution of 300 dpi should be used.