OAKLANDS FARM SOLAR PARK

Applicant: Oaklands Farm Solar Ltd

The Applicant's Response to the Second Written Questions
Response to Question 9.1
October 2024
Document Ref: EN010122/D4/12.3 – Q9.1
Version: Deadline 4

The Examining Authority's Second Written Questions

The Applicant's Supplementary Response to Question 9.1

b) Please could the Applicant set out the calibration undertaken of the digital terrain model to actual ground levels?

1. The submitted visualisations were prepared by LUC using a model calibrated in accordance with industry guidance, and using an industry standard dataset. Following comments from Ms Abbott LUC have reviewed the process, and remain confident that the visualisations are appropriately accurate representations of the Proposed Development based on maximum design parameters. Modelling was carried out by a suitably qualified visualisation expert with over 20 years' experience, and also quality assured by an Associate Director in the Visualisation team, with also over 20 years of experience undertaking this type of work.

2. The calibration of the digital terrain model (DTM) to actual ground levels was checked both through the use of digital markers which were placed into the virtual model, and by cross checking the DTM against the alternative LiDAR dataset. The 'Ordnance Survey Terrain 5' (OST5) DTM was used here so as to be consistent with the dataset used for the engineering design. The alternative which was used for cross checking is the LiDAR DTM data. LiDAR data typically provides data with a 1m grid spatial resolution. Both OST5 and LiDAR are standard industry datasets.

3. The visualisation work conforms with the Landscape Institute's guidance (2019): Visual Representation of Development Proposals and the 3rd Edition of the Guidelines on Landscape and Visual Impact Assessment (GLVIA3) (2013). As such, the visual representations of the Proposed Development that are provided are accurate and can be relied upon to inform the determination of visual effects.

4. The OST5 mid-resolution height data digital terrain model has a 5m grid spacing, and up to a 2.5m vertical height Root Mean Square Error (RMSE[1]). As such, spot heights are provided at 5m intervals, based upon a square grid. This industry standard DTM dataset was downloaded and imported into a three-dimensional (3D) environment using the software '3DS Max'. The terrain was matched (geolocated) to the correct X and Y coordinates, and to the correct height. Modelled 'virtual cameras' were accurately geolocated within the scene using a combination of GPS coordinates taken on site, and satellite photography. The virtual camera heights were determined by referencing their X and Y coordinates against the OST5 DTM height data, and adding 1.5m to accommodate the camera tripod, giving a typical viewer height of 1.5m above ground level, as required by the industry standard guidance listed above.

5. Identifiable features within the landscape (e.g. posts, pylons, turbines, signs, buildings etc) were located on satellite photography and grid reference locations and heights Above Ordnance Datum (AOD) were recorded. These features were replicated using virtual 'markers' within the digital 3D scene in the model. When the digital scene was overlaid

[1] RMSE – Root Mean Square Error: this is the square root of the mean of the squares of the errors between observations, such as GPS points. The definition is taken from OS Terrain 5 User Guide and Technical Specification. A 2.5 RMSE means that there is an accepted margin for error of up to 2.5 metres (vertical height).

onto the baseline photography, the camera positions were then adjusted, so as to accurately align the digital markers and actual features within the landscape.

6. A two-dimensional (2D) outline of the PV panels was provided to LUC's modellers by the project engineers. 3D models of each panel were then modelled and placed in the correct position on the digital terrain model, based on the georeferenced Computer Aided Design (CAD) drawings supplied by the project engineers. Each 2D outline of a panel was then raised up or lowered to sit at an average of 2.7m above ground level (i.e. the maximum height of the highest part of the proposed PV panels), and to create a 3D scene which fits with the actual ground levels.

7. LUC can confirm that calibration of the model was carried out in accordance with the industry standard guidance listed above.

c) Please could the Applicant provide a detailed response to the comments made by Diane Abbott [REP1-043] on Figures 10c, 10f, 10g, 10j, 10k, 10o and 10p [APP109] (Viewpoint 1: Coton Road), and Figure 11c [APP-110] (Viewpoint 2: Cross Britain Way), in each case setting out how accurate it considers that its own visualisations are, with reasoning?

8. As a result of the calibration process set out above, in LUC's professional opinion, the visualisations are accurate to an appropriate degree, within the normal limitations of the process. The visualisations have been thoroughly tested by spot testing heights of all elements within the scene for the viewpoints examined here. It should be noted that the visualisations are one of several tools which are used to determine levels of effect, and that professional judgements are also informed by inspections in the field, and examination of other figures such as the Zone of Theoretical Visibility (ZTV), in order that they are fully sense checked.

9. Any possibility of slight variations that could occur through the use of different digital terrain model datasets (i.e. OST5 DTM or LiDAR DTM) are explained below. It is important to note that such slight variations would not change the resulting assessment of effects as reported in the Landscape and Visual Assessment (LVIA). The LVIA states that for users travelling along Coton Road, the change in view (as represented by Viewpoint 1) would result in a major (significant) adverse overall level effect at Year 1. The assessment is precautionary in that it considers effects to remain significant (moderate) at Year 10, reflecting the fact that planting takes a long time to fully mature. Similarly, for users of the Cross Britain Way/ National Forest Way (travelling along a localised section of the route between Walton-on-Trent and Rosliston), the LVIA assesses that the change in view (as represented by Viewpoint 2) would result in a major (significant) adverse overall level effect at Year 1, and is precautionary in that it considers effects to remain significant (moderate) at Year 10.

Viewpoint 1: Coton Road at the Twin Oak Tree (looking North) - Figures 10b/10c

10. Further to this query, heights of the existing elements were checked and have been modelled at the correct scale.

11. The 3m height suggested by Ms Abbot for the portacabin is taller than that proposed by the Applicant, and distorts how the rest of the view is perceived. The model was produced with an assumed portacabin height of 2.3m.

12. Having reviewed the positioning of PV panels within the field on the left of the access track, it is noted that the maximum height of the panels could vary to a small degree if based on an alternative LiDAR DTM dataset. This is given that more complex topographical features

may not always be picked up in OST5 DTM data. However, it is recognised as an industry standard dataset, providing a useful proxy for exact ground levels. As noted above, OST5 DTM data was used here as it was the data used for the engineering modelling, and enabled consistency with the engineered design.

13. It is confirmed that the visualisation is accurate in terms of informing an understanding of the nature of the effect.

Viewpoint 1: Coton Road at the Twin Oak Tree (looking East Towards Lads Grave) - Figures 10f/10g

14. Further to this query, heights of the existing elements were checked with virtual markers and it is confirmed that they were modelled at the correct scale. It is not possible to accurately replicate the fence post measured by Ms Abbot as it is not visible in aerial photography.

15. As before, testing indicated that there would be a slight variation if LiDAR DTM data was used instead of OST5 DTM data. However, as elsewhere, the visualisation which is provided is accurate in terms of informing an understanding of the nature of the effect.

Viewpoint 1: Coton Road at the Twin Oak Tree (looking roughly South) - Figures 10j/10k

16. Further to this query, heights of the existing elements were checked and it is confirmed that they were modelled at the correct scale.

17. Perspective has not been fully taken into account by Ms Abbot, as the heights of existing elements (as measured by Ms Abbot) are unlikely to be at exactly the same distance from the camera as the element they are being used to gauge the scale of. For example, it is apparent that the existing gate (measured at 1.1m high by Ms Abbot) is significantly further forward when compared to the actual position of the proposed security gate.

18. Testing has indicated that there would be a slight variation if LiDAR DTM data was used instead of OST5 DTM data, but it is confirmed that the visualisation is accurate in terms of informing an understanding of the nature of the effect.

Viewpoint 1: Coton Road at the "Twin Oak Tree" (West towards Oakland's Farm) - Figures 10o/10p

19. Further to this query, heights of the existing elements were checked and it is confirmed that they were modelled at the correct scale. The LUC team note that cows can not be used to accurately gauge scale and distance, and may be closer to or further away from the virtual camera than perceived, and when compared to the PV panels on the horizon line.

Viewpoint 2: Cross Britain Way (looking roughly North) - Figures 11b/11c

20. Further to this query, heights of the existing elements were checked and it is confirmed that they were modelled at the correct scale.