Kronospan Low Carbon CHP Facility

Appendix 7B

Visualisation Methodology

Prepared for: Kronospan

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DNS5-4-031

1.0 INTRODUCTION

1.1.1 The purpose of this methodology is to provide an understanding of how visualisation material prepared to support the planning application has been produced. The methodology addresses the production of Zone of Theoretical Visibility mapping and viewpoint visualisations.

1.1.2 It should be recognised that production of visualisations is only one component of a Landscape and Visual Impact Assessment (LVIA), which will consider a range of other factors when identifying and assessing changes to the landscape and to views. The use of visualisations is a useful aid when undertaking LVIA, but the assessment process is not dependent on them. LVIA may be undertaken without use of visualisation material, although for major developments the inclusion of visualisations is accepted practice.

1.1.3 Current good practice regarding the production of visualisations is set out in:

i) Landscape Institute and Institute for Environmental Management and Assessment (3rd edition, 2013), *Guidelines for Landscape and Visual Impact Assessment*. This document is referred to hereafter as 'the GLVIA';

ii) Landscape Institute (2019), *Visual Representation of Development Proposals. Technical Guidance Note 06/19*. This document is referred to hereafter as 'TGN 06/19'.

1.1.4 The remainder of this Methodology document is structured as follows.

1.1.5 Section 2.0 addresses the production of the ZTV mapping that informs the LVIA.

1.1.6 Details of how the Viewpoint locations were selected, and which 'Type' of visualisation has been provided at each Viewpoint are set out in **ES Chapter 7.0 Landscape and Visual Impact Assessment**. This is a requirement of the Technical Methodology specified in Appendix 10 of TGN 06/19.

1.1.7 Section 3.0 gives details of how the viewpoint visualisation material was produced, and includes the remaining details required by the Technical Methodology specified in Appendix 10 of TGN 06/19.

2.0 ZONE OF THEORETICAL VISIBILITY

Data Source

2.1.1 The ZTVs were produced using the 1m LIDAR Digital Surface Model (DSM) available from Natural Resources Wales (NRW) under the terms of the Open Government Licence. The DSM data was captured between 2020 and 2022 and takes account of screening features such as buildings and vegetation.

2.1.2 This data consists of a series of spot levels at 1m intervals. The declared 'root-mean-square error' (RMSE), or the degree of error of the DSM data for any actual on-the-ground height particular location, is 10cm vertical and 35cm horizontal.

ZTV Creation

2.1.3 The ZTVs were calculated and created using QGIS. The ZTV calculation process takes account of the curvature of the earth's surface and light refraction. The eye height of the receptor in the computer model was set at 1.7m above ground level in accordance with guidance set out in GLVIA.

2.1.4 The ZTVs illustrate the following:

i) Theoretical visibility of the proposed boiler house roof (height 44m).
ii) Theoretical visibility of the proposed stack (height 75m).

2.1.5 For the avoidance of any doubt, the ZTVs do not reflect the presence of any of the landscaping that has been implemented in relation to recent planning consents at Kronospan, or any further planting that is required to be implemented as part of recent consents. As such, they present a worst-case scenario of theoretical visibility.

2.1.6 The ZTVs are displayed on **Figures 7-1a-b** of the Environmental Statement (ES).

Limitations

2.1.7 A ZTV, as use of the term theoretical implies, is not an absolute indication of the extent of visibility but rather a computer-generated aid that utilises available relative data to indicate areas of inter-visibility and screening in relation to a specific modelled object. ZTVs are tools to assist the LVIA. The technique aims to give a better understanding of the areas where visibility is likely and unlikely but imperfections in data are such that it must only be seen as an aid to understanding. This limitation needs to be recognised when interpreting the ZTVs.

2.1.8 An additional caveat is that the ZTVs simply illustrate that part of a structure would be theoretically visible. As such, it makes no distinction between a clear view of all or most of a proposed feature and a view of a very small proportion of a feature (for example one corner of a building roof, or the top of a stack). This is especially relevant in the case of the Proposed Development, where views from the surrounding area are often limited by vegetation cover.

2.1.9 The ZTVs produced using the DSM do reflect the presence of screening features in the landscape. However, it should be recognised that the DSM reflects a single moment in time (i.e. when the underlying aerial photography was taken). In reality, the extent and / or height of vegetation cover is dynamic and changes as vegetation inevitably increases in stature over time and / or is planted, trimmed or removed. Similarly, there is potential for buildings to have been erected, demolished or modified, subsequent to the data being captured.

2.1.10 Additionally, the DSM tends to assume that vegetation captured forms a solid visual barrier, when in reality views can sometimes be available through leaves and branches, especially in winter when deciduous foliage is absent. As such, the real-world visibility of the Proposed Development could potentially be underestimated in places. Field work undertaken as part of the LVIA included groundtruthing the ZTVs and confirmed that it is a relatively accurate depiction of visibility.

2.1.11 Finally, the DSM does not distinguish between the ground surface and the surface of structures and vegetation. As a consequence, the ZTV output may indicate visibility from areas known to be occupied by woodland and buildings. Whilst in theory it may be possible for people to experience the views from such locations (by climbing onto roofs, or into the tops of trees), this is not representative of typical day to day visibility, and as such there is the potential to overstate the actual visibility of the Proposed Development. Ordnance Survey open mapping data (OS Zoomstack Woodland) has been added to the ZTV figures, to mask out mapped areas of tree cover.

3.0 VIEWPOINT VISUALISATIONS

Photography

2022

3.1.1 Photography taken during 2022 was shot using a Canon EOS 5D Mark II digital single lens reflex (DSLR) camera with a full-frame sensor, using a 50mm lens. The camera was mounted on a tripod to ensure a stable support and minimise camera shake. The camera was mounted on a panoramic tripod head with built-in spirit level (Nodal Ninja 3 MkII), which allows for the rotation of the camera at fixed intervals around a fixed point in vertical alignment with the camera lens, thereby eliminating parallax error. The camera was levelled using an auto-leveller device (Nodal Ninja EZ-Leveler II). The camera height was 1.5 m above the ground.

3.1.2 All photographs were taken in landscape format. Photographs were taken over a full 360-degree sweep from each viewpoint location. The precise location of each photograph was recorded using a hand-held Garmin Oregon 600 GPS device (which has an accuracy of approximately 3m). A photograph was also taken of the tripod location (these photographs are included in Annex A). Following the Site visit, the GPS data was loaded into Google Earth, and the location of the GPS waypoints were finetuned manually where necessary to reflect the actual tripod location.

2024

3.1.3 Photography taken in 2024 was shot using a Canon EOS 6D Mark II digital single lens reflex (DSLR) camera with a full-frame sensor, using a 50mm lens. The camera was mounted on a tripod (Manfrotto 55) to ensure a stable support and minimise camera shake. The camera was mounted on a panoramic tripod head (Manfrotto MH057A5), which allows for the rotation of the camera at fixed intervals around a fixed point in vertical alignment with the camera lens, thereby eliminating parallax error. The camera is levelled using a bubble spirit level and an auto-leveller device (Manfrotto 338). A wired remote shutter release was used to take each photograph, further minimising camera shake. Camera height was 1.63m above the ground.

3.1.4 All photographs were taken in landscape format. Photographs were taken over a full 360-degree sweep from each viewpoint location. The precise location of each photograph was recorded using an Emlid Reach RS2+ GPS Receiver using NTRIP corrections to give an accuracy of less than 3cm. A photograph was also taken of the tripod location (these photographs are included in Annex A).

Photomontages and Wireframes

Introduction

3.1.5 Photomontages are computer generated images, showing images of the Proposed Development superimposed upon the existing photography, with the aim of producing a visualisation that should give a realistic impression of how the Proposed Development would appear within the landscape.

3.1.6 Wireframes show a computer-generated outline of the Proposed Development, superimposed upon the existing photography. These illustrate which elements of the Proposed Development are likely to be visible from particular locations, and which elements are likely to be screened by intervening features.

3d Model

3.1.7 A digital model of the Proposed Development was created based upon design information provided by the Applicant. This was imported into industry standard software (Autodesk 3DStudioMax), along with the viewpoint survey data recorded in the field (as discussed above). This enables a series of 'camera' points to be created within the 3d model, reflecting the view from each viewpoint towards the Proposed Development.

3.1.8 A series of markers were added to the model, representing real-world locations such as topographic features, vegetation and buildings. The locations of these markers were determined via the use of aerial imagery (e.g. Google Earth), Environment Agency LIDAR data, and OS Mastermap.

3.1.9 The models were then lined up with the individual photograph that focuses on the Site. The markers were used to ensure that the model lines up both horizontally and vertically as accurately as possible with the photograph (by matching the markers with the real-world equivalent), and to assist with identifying which features in the photograph would appear 'in front' of the Proposed Development, which would appear 'behind' and which, if any would be removed.

3.1.10 Once the models are lined up as accurately as possible, the Proposed Development was rendered, having regard to the particular materials and colours that are to be used, and to reflect light conditions typical of the time and date of the photography.

Photomontage Production

3.1.11 Following the lining up of the 3D model with the photograph that includes the Site, and the rendering of the Proposed Development, the full sweep of photos taken from each viewpoint were stitched together using the software package PTGui. The software reads the exif data attached to each individual photograph file to identify the specifications of the camera and lens, ensuring accurate production of the stitched panoramic image.

3.1.12 The resulting stitched viewpoint image was loaded into Adobe Photoshop. Any parts of the Proposed Development that would not be visible from an individual viewpoint due to the presence of intervening features were cropped out.

Limitations

3.1.13 It should be understood that viewpoint visualisations can never provide an exact match to what is experienced in reality. Visualisations are tools in the assessment process but independent from it. They illustrate the view in the context of a specific date, time and weather conditions, that would be seen within a photograph and not as seen by the human eye. As such, visualisations need to be used in conjunction with site visits and should be considered in the context of the totality of views experienced from the viewpoint and not just focussed on the Proposed Development.

3.1.14 Photography was taken in January, March and July 2022, and February 2025 and as such reflects visibility at those times of year.

3.1.15 The software (3DStudioMax) used to produce the model of the Proposed Development from each Viewpoint does not take account of the curvature of the earth's surface, and assumes a flat horizon. The effects of the earth's curvature do influence what is visible, especially in longer range views. If a flat horizon is assumed, then a feature located approximately 5km away from any viewpoint would appear approximately 1.7m higher than in reality. As such the model slightly exaggerates the height that the Proposed Development would appear in each view. As all of the viewpoints are located relatively close to the Proposed Development any discrepancies in the height of the proposed new structures would be minor. As such, it is not considered that this is material to the conclusions of the LVIA.

Presentation & Viewing

3.1.16 Once the final viewpoint images have been produced, they are inserted into a Figure template, which also includes information about the viewpoint, including the date and time of photography, and details of the camera used.

3.1.17 The images presented on each sheet are displayed at an enlargement factor in accordance with the guidance set out in TGN 06/19. The enlargement factor is stated on each sheet.

3.1.18 The field of view displayed for each Viewpoint has been determined in accordance with the guidance set out in TGN 06/19 and is stated on each sheet.

3.1.19 Each sheet should be printed at the size stated on it. All printed sheets should be viewed **held flat at a comfortable arm's length**.

Annex A: Tripod Location Photographs

Viewpoint A

Viewpoint B

Viewpoint C

Viewpoint D

Viewpoint E

Viewpoint F

Viewpoint G

Viewpoint H

Viewpoint I

Viewpoint J

Viewpoint K

Viewpoint L

Viewpoint M

No tripod photo

Viewpoint N

Viewpoint Q

Viewpoint R

Viewpoint U

Viewpoint V

Viewpoint W

Viewpoint X