West Burton Solar Project

Environmental Statement Appendix 8.1.5: Photography and Photomontage Methodology (Part 1 of 3)

Prepared by: Lanpro Services
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APFP Regulation 5(2)(q)

West Burton
SOLAR PROJECT

Contents

Introduction

A photography and visualisation team was pulled together of leading photography and visualisation specialists from across the UK. Co-ordinated by Lanpro and led by Mike Spence of MSE. Mike brings over 30 years photography and visualisation experience, working on a wide range of complex infrstructure projects, fro major Highways schemes, to Carbon Capture, the power station development, tall buildings and solar projects across the UK.

Mike was a key technical authopr of the Landscape Institute's TGN 06/19 on visualisation of development proposals. He has worked alongside The National Trust, Historic England, English Heritage, RBG Kew, Historic Royal Palaces as well as NatureScot (formerly Scottish Natural Heritage) for whom he is currently working on updates to their windfarm visualisation guidance.

In 2021 Lanpro discussed the scope of the work with Mike Spence to develop a consistent strategy for technical photography and generation of highly accurate visualisations for major solar panel infrastructure. Initial work involved the calculation of the visibility of the solar panels, which were used to identify and agree viewpoints. In the winter of 2022 an initial 57 viewpoints were identified. Winter time photographs were taken between 20 March and 3 April 2022. An additional 15 viewpoints were identified and added in January 2023. All 72 had summer photography taken from the same locations between 8 July and 13 July 2022. An additional 4 viewpoints were added to the list for which only winter time photography was captured (Viewpoints 73 -76).

Verified Photography and 3D Modelling

The photographs were taken with a full frame camera (Canon EOS 5D Mark IV) and 50mm lens combination consistent with Landscape Institute's TGN 06/19, GLVIA3 and the emerging understanding of the requirement for technical photography for visualisation work. As part of the work a total of 76 viewpoints were identified providing views of thedevelopment and visited for summer and winter photography in 2022 & 2023.

Technical Photography

The camera was mounted on a Manfrotto 303 SPH panoramic tripod head, levelled using a Manfrotto Leveller, supported on a Manfrotto Tripod. The tripod head was levelled using a spirit level, to avoid pitch and roll. The camera was set with the centre of the lens 1.60m above ground level. Photographs were taken in Manual mode with an aperture of f/8 or f/11 and a fixed focal length throughout. Photographs were taken in landscape orientation. A Sigma 50mm f/1.4 lens was used for all viewpoint photographs. Two sets of equipment were used. The equipment was identical.

A Single Frame 50mm photograph is insufficient to capture the extents of a wide, linear development. Each view was taken with a series of overlapping 50mm images, as shown above.

To ensure consistent geometry each image was cylindrically re-projected, as above. This ensures that a full 360 degree panorama can be created to match the 3D model view, as shown below:

From the 360 degree panorama a 90 (or 180 degree) degree portion can be extracted to present the visualisations as shown below:

Surveying

The position of each camera location was surveyed using Spectra Precision GNSS equipment with Real Time Kinematic Correction (RTK) which achieves an accuracy down to 1cm in eastings, northings and height (metres Above Ordnance Datum). The equipment included Spectra Precision SP80 & SP85 GNSS smart antennae with Panasonic Toughpad data recorder. Points were saved using DigiTerra software. Photographs of the camera/tripod location were taken.

3D Modelling

MSEnvironmental (MSE) constructed a 3D model using the layout data supplied by Lanpro, OS MasterMap for geo-referencing and Environment Agency LIDAR DTM (2m). 3D point data was used for checking horizontal and vertical alignment.

For all viewpoints a 360 degree view was generated to capture the full extents of the development. This ensured that the full development would be present in the visualisations.

Camera locations surveyed on site were added to the geo-referenced 3D model.

Target points were taken from the existing features in the view and built into the 3D model. This allowed the horizontal and vertical alignment of the photograph and 3D model to be checked, cross-referenced and verified.

Cylindrical renders generated using VRay for Rhino were exported from the 3D modelling software and used to overlay the cylindrical images. Target points from both the photograph and the model view were aligned to ensure a precise fit between the two images.

Visualisations are presented as either AVR 0, 1, 2 or 3. The differences are explained in the Landscape Institute's Technical Guidance Note 06/19: Visualisation of Development Proposals.

The results are presented as a sequence of visualisations as follows:

Existing Winter View

Existing Summer View

3D Model View (Infrastructure)

AVR 3 Photomontage View (Year 1)

AVR3 Photomontage View (Year 15)

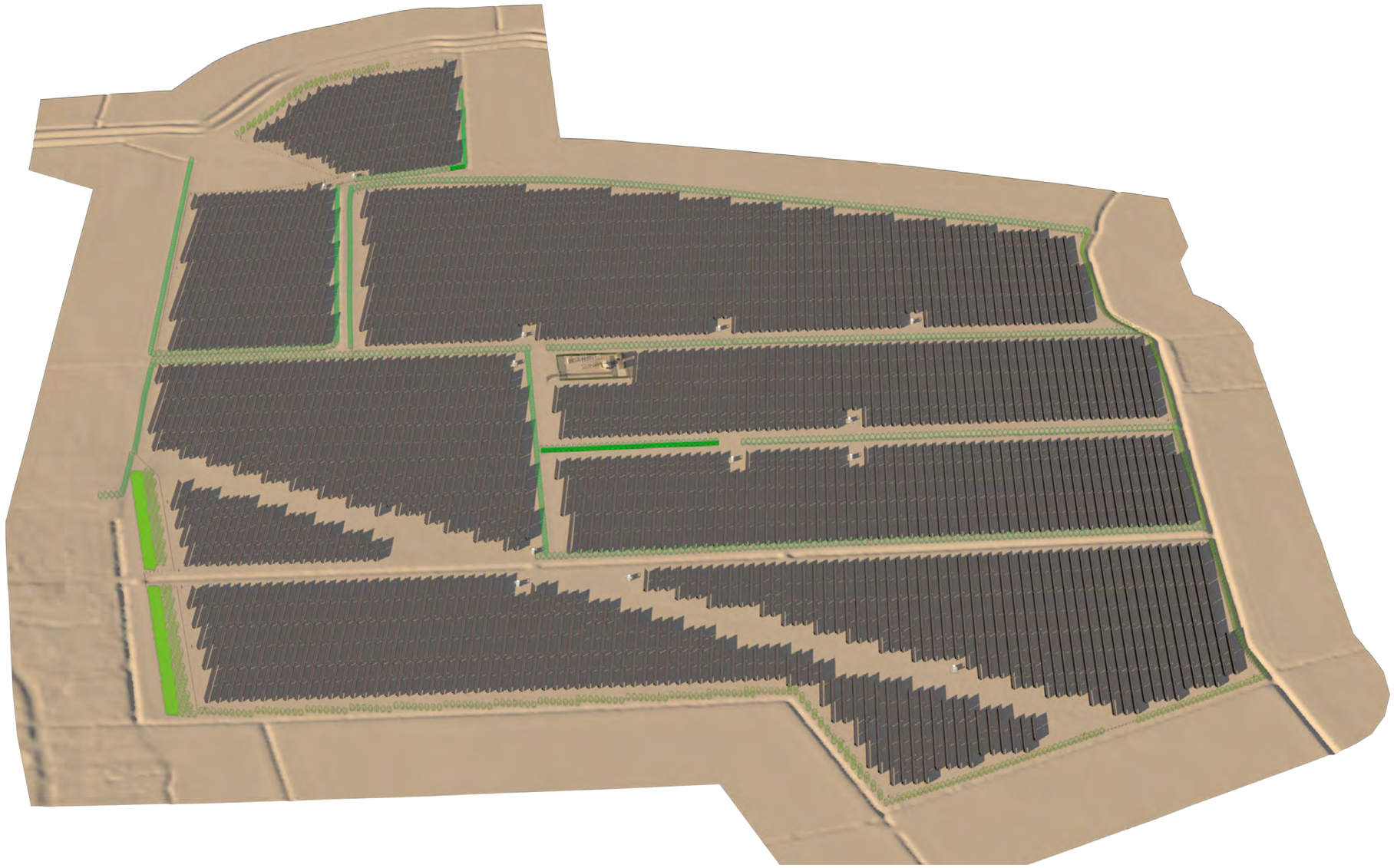
The topography of the site has been generated from Environment Agency LIDAR 2m DTM data, with triangulated surfaces generated using Rhinoterrain.

The model is fully geo-referenced and positioned to correspond with the site layout and elevations supplied in the engineering layouts. Landscaping has been added at two stages: Year 1 & 15. Heights have been specified by Landscape Architects at Lanpro.

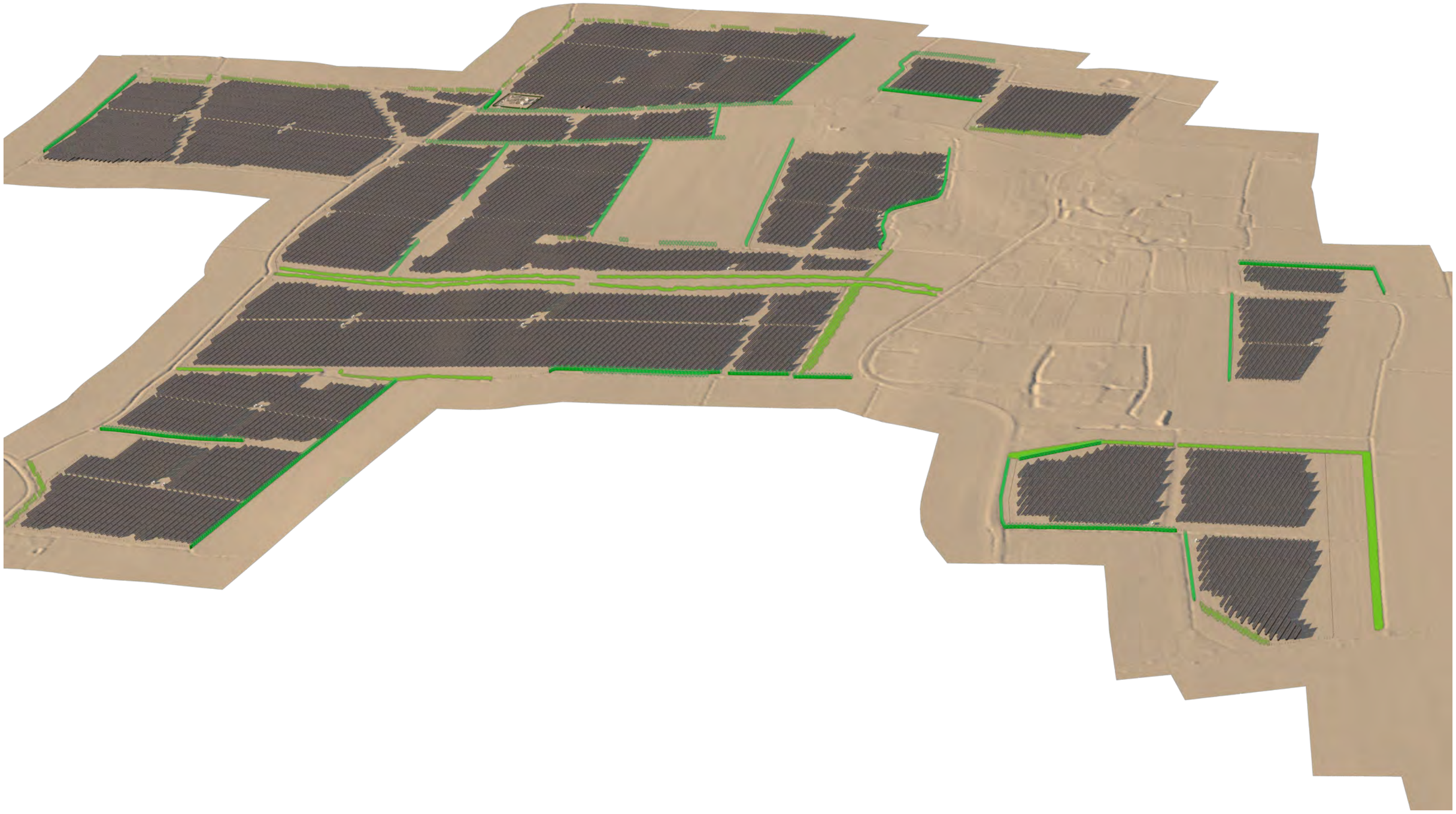
The resultant visualisations are considered to fairly demonstrate the correct scale and massing of the development.

Cameras have been added to the model and the field of view rendered out to precisely match the full 360 degree panoramic cylindrical images using highly precise camera co-ordinates.

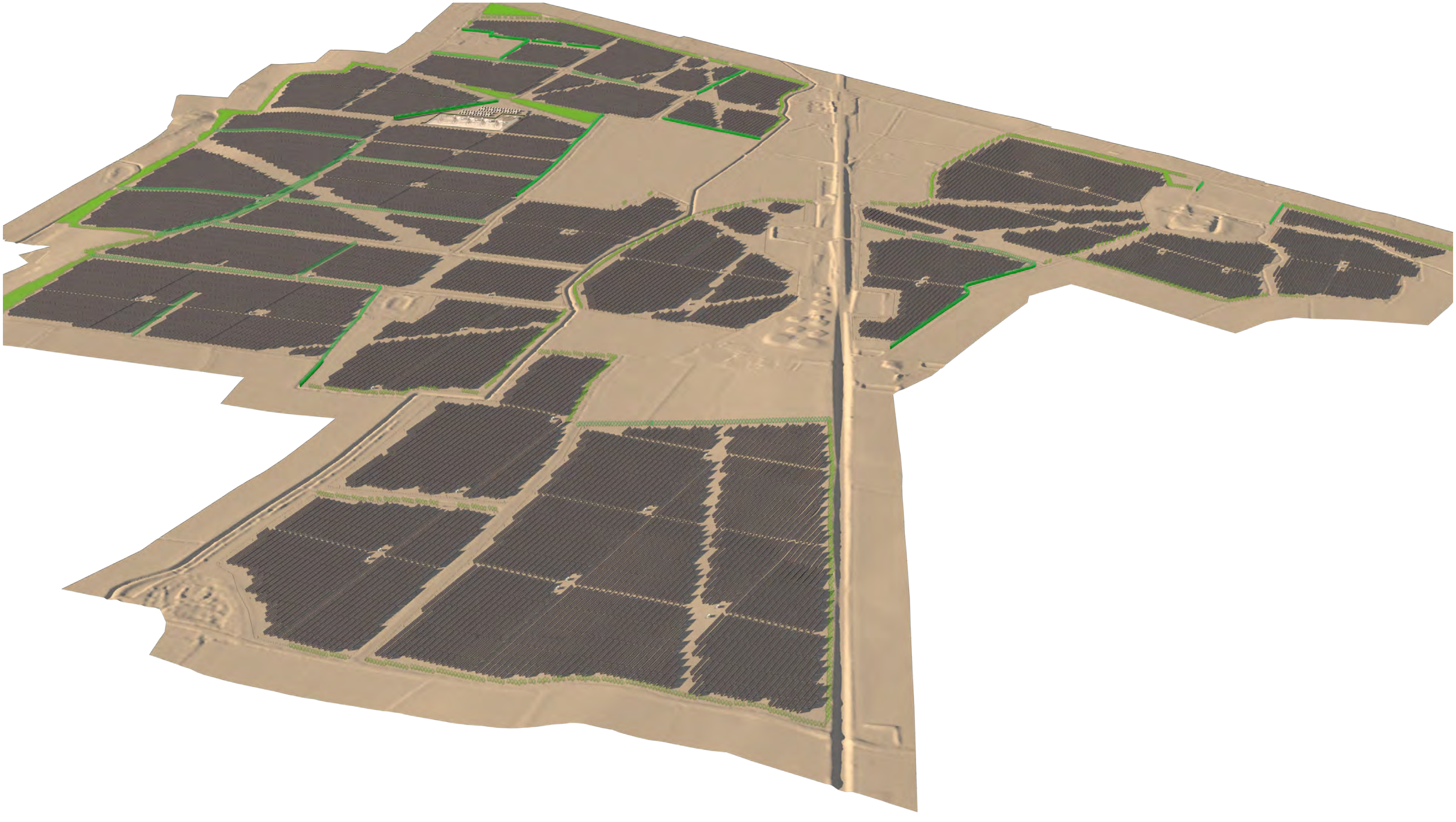
West Burton 1 3D Model (Infrastructure & Year 15 Planting) on 2m LIDAR DTM data (OSGB36)



West Burton 2 3D Model (Infrastructure & Year 15 Planting) on 2m LIDAR DTM data (OSGB36)



West Burton 3 3D Model (Infrastructure & Year 15 Planting) on 2m LIDAR DTM data (OSGB36)



50mm lens on Full Frame Sensor Camera

For decades it has been accepted that a 50mm lens on a full frame sensor camera provides the optimum image to replicate what is seen by the human eye. there are important differences between the human eye (binocular) and the camera lens (monocular). These have been explored in research by The Highland Council & the University of Stirling, as well as by myself through the Landscape Institute. We know that a single frame 50mm image on an A3 sheet of paper provides the same view as that gained in the field by someone with one eye closed. As we are binocular, and normally use both eyes, a different size of image is required, and the reason why we have presented the images as effectively a 75mm image on A2 paper. This gives what The Highland Council, University of Stirling, Scottish Natural Heritage (NatureScot) and the Landscape Institute agree is the most representative size of image to understand the nature and scale of a development on a photograph.

Planar or Cylindrical Projection

All photographs are taken as single frame planar images. Each single frame image has a single point of perspective lying at the centre of the image.To correctly match and align with the 3D modelling software the camera must be mounted on a levelled tripod, and directed towards the proposed development.

When a viewpoint is close to the development, or a development is wide such as this solar farm, it is rarely possible to fit the development on a single frame image. The alternative is to use a series of overlapping 50mm images and generate a ‘cylindrical’ perspective view. This can be a full 360 degree wide panorama.

The 3D model renders have been rendered out in cylindrical (multiple frame images) projection to allow the precise image re-mapping to match the photography.

3D Modelling software

The work has largely been undertaken using Rhino 3D. All 3D modelling has been undertaken in metres and geo-referenced to align with OSGB36. RESOFT Windfarm was also used which is a 3D modelling package which we use to check on vertical and horizontal alignment of the 3D model against the precise image geometry. This is also set up to OSGB36. RESOFT Windfarm has been used to generate the geometric grid from LIDAR DTM data present in all 3D model visualisations.

Viewing Printed Images

The visualisations have been prepared to be printed at A1 wide x A4 high (841 x 297mm) and in the this technical methodology document at A3 (420mm x 297mm), to fully show the original photographic imagery and scale of the proposed development.

The image size is considered to give a fair representation of the view for everyone, and the scale of the development in that view.

Summary

This work has been undertaken in accordance with the the Landscape Institute TGN 06/19 and the developing understanding of visualisation work. The accuracy of camera locations and 3D modelling conforms with the Landscape Institute’s Type 4 (the highest level of accuracy). The 3D modelling has been produced to AVR 3 (photorealistic) and for some views AVR1 (simple dashed line identifying extents).

The photography has been undertaken in an extremely robust manner, using professional full frame sensor DSLR and 50mm lens with levelled tripod. The camera position has been surveyed using highly accurate GNSS equipment, giving high levels of accuracy of camera location. The 3D model has been built in Rhino 3D using detailed information supplied by the engineers aned a comprehensive landscaping scheme supplied by Lanpro. An additional check on the vertical scaling has been undertaken using RESOFT Windfarm.

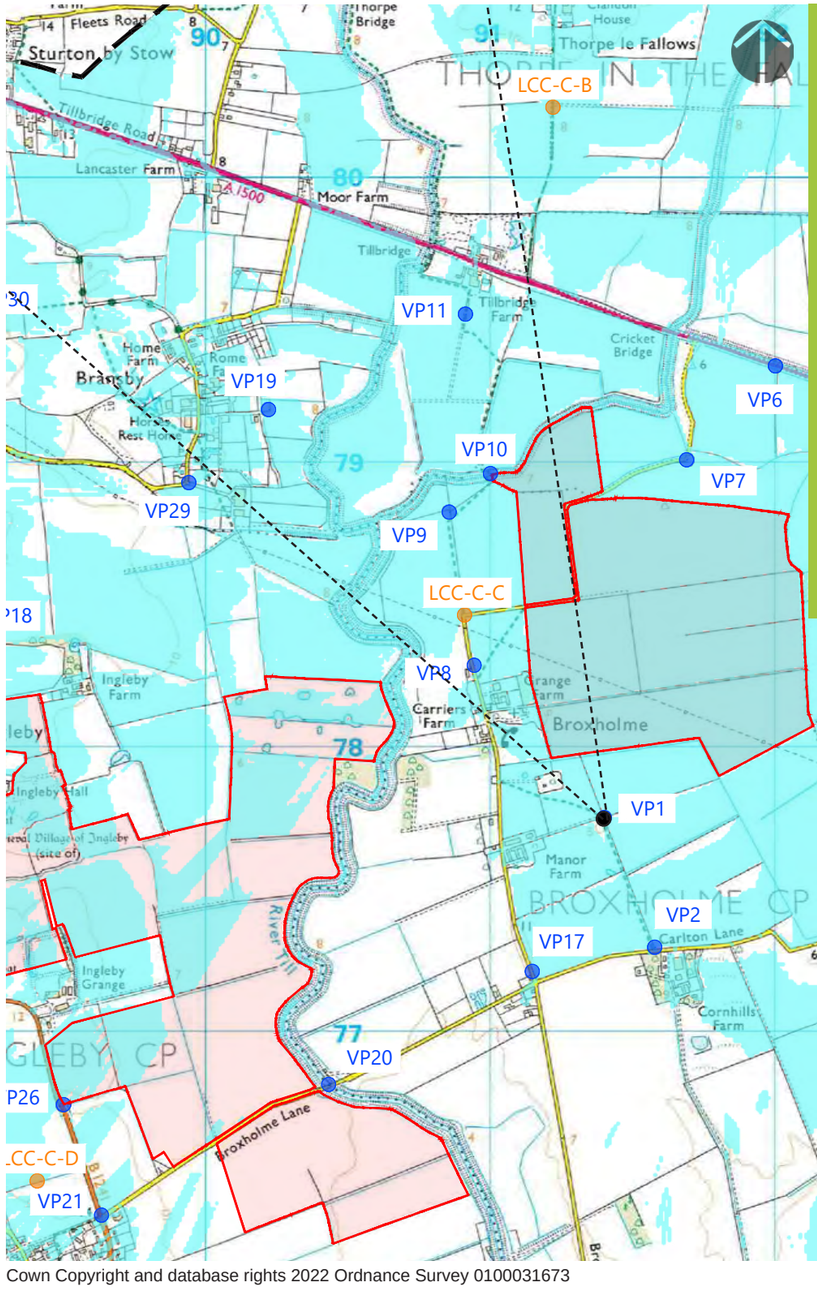
The resultant visualisations are highly accurate.

The photography, surveying and 3D modelling have followed a transparent methodology, and the resultant visualisations and the size at which they are presented are considered robust and fit for purpose to illustrate the positioning, and scale and massing of the proposed scheme in its local and wider context.

APPENDIX 1.1: VIEWPOINT SEQUENCES

Viewpoint 1 (Winter)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 09/03/2022 @ 11:06
- 491395.113 377750.149 7.018mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective

Point of Perspective

Point of Perspective

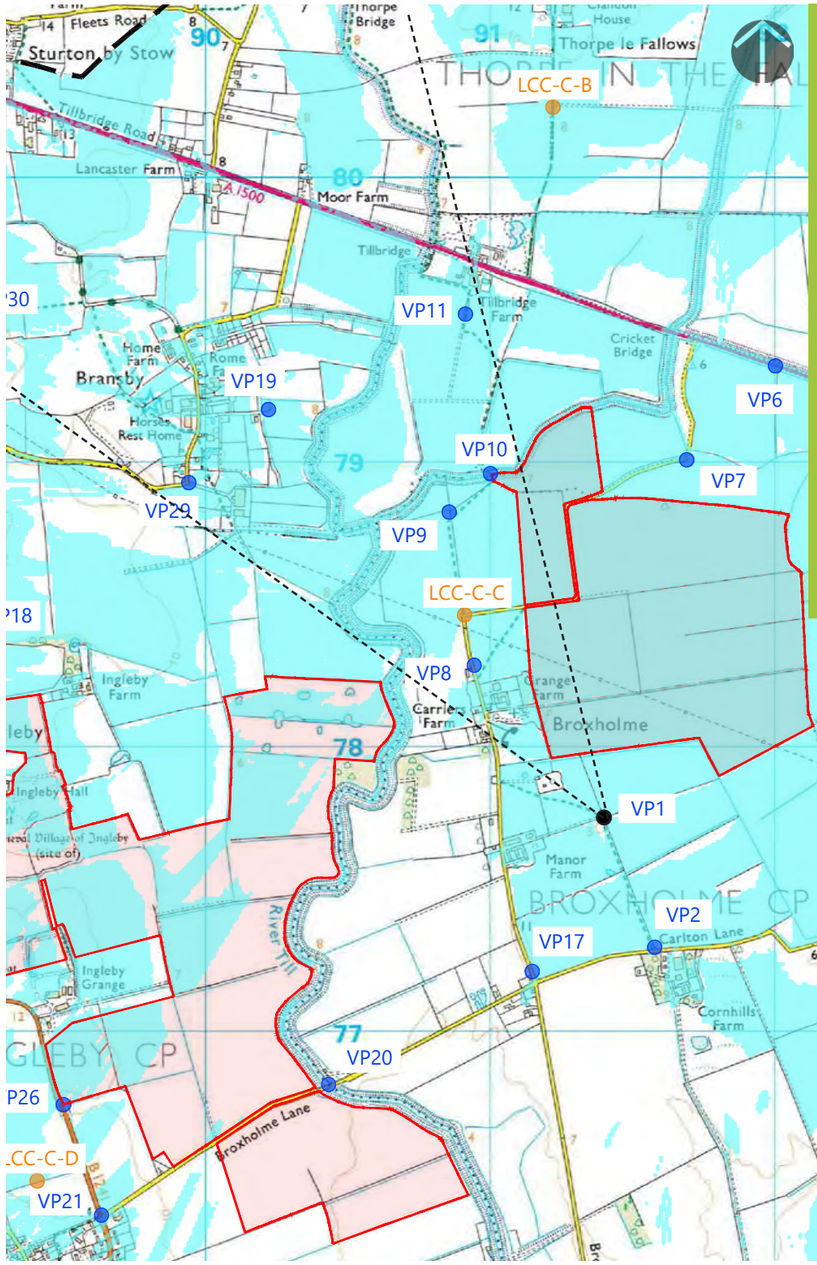
Point of Perspective

Viewpoint 1 Single Frame 50mm image (Winter)

West Burton Solar Project

Viewpoint 1 (Summer)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 08/07/2022 @ 10:41
- 491395.273 377750.294 6.982mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective

Point of Perspective

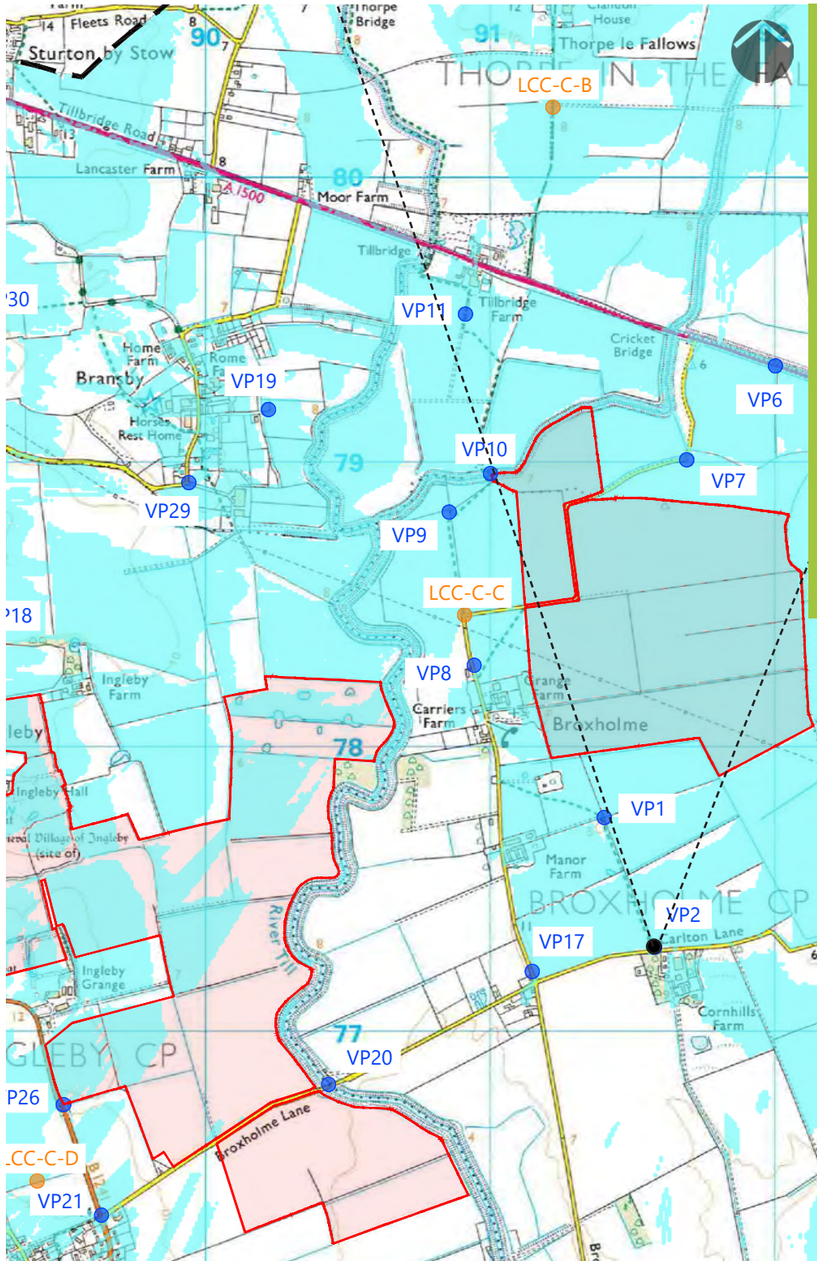
Point of Perspective

Viewpoint 1 Single Frame 50mm image (Summer)

West Burton Solar Project

Viewpoint 2 (Winter)

Camera Location:



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- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 09/03/2022 @ 10:53
- 491575.546 377285.478 10.211mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective

Point of Perspective

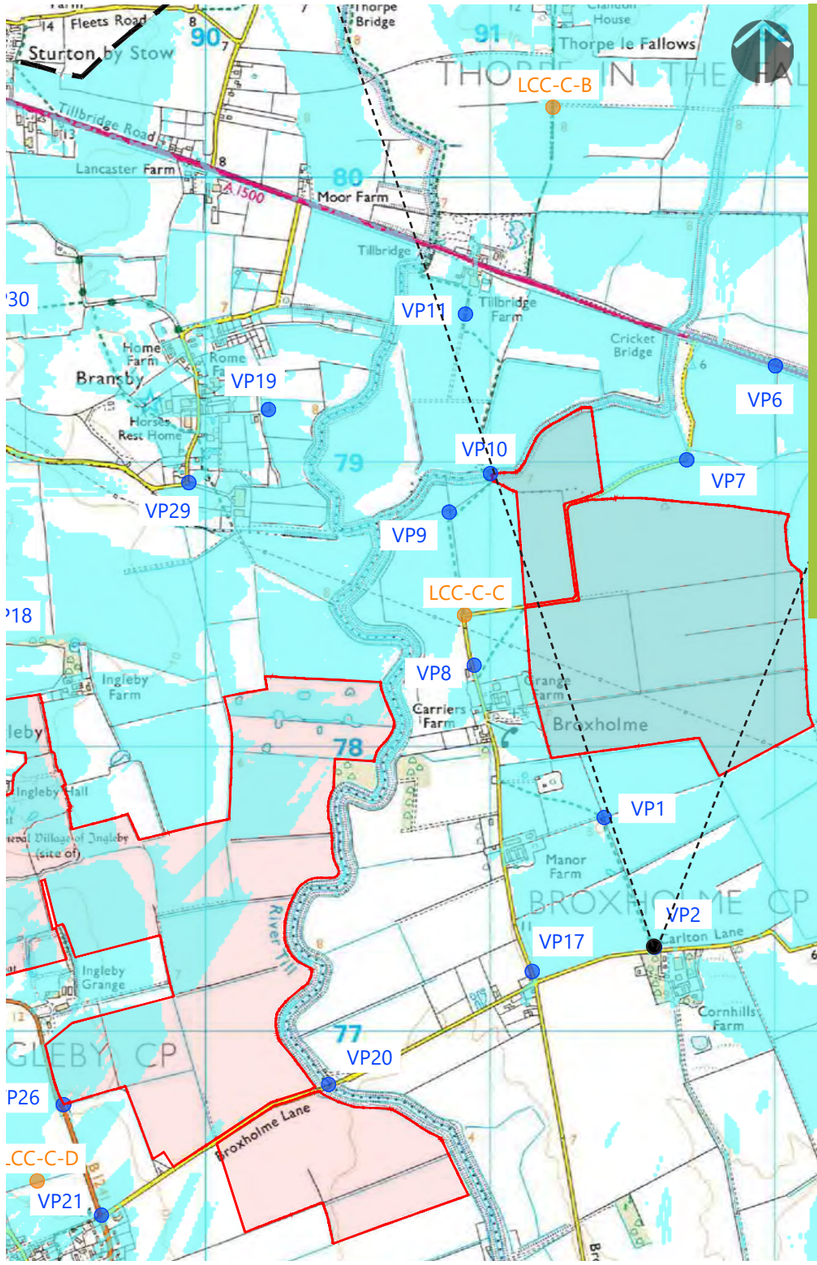
Point of Perspective

Viewpoint 2 Single Frame 50mm image (Winter)

West Burton Solar Project

Viewpoint 2 (Summer)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 08/07/2022 @ 10:41
- 491575.208 377286.149 10.285mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective

Point of Perspective

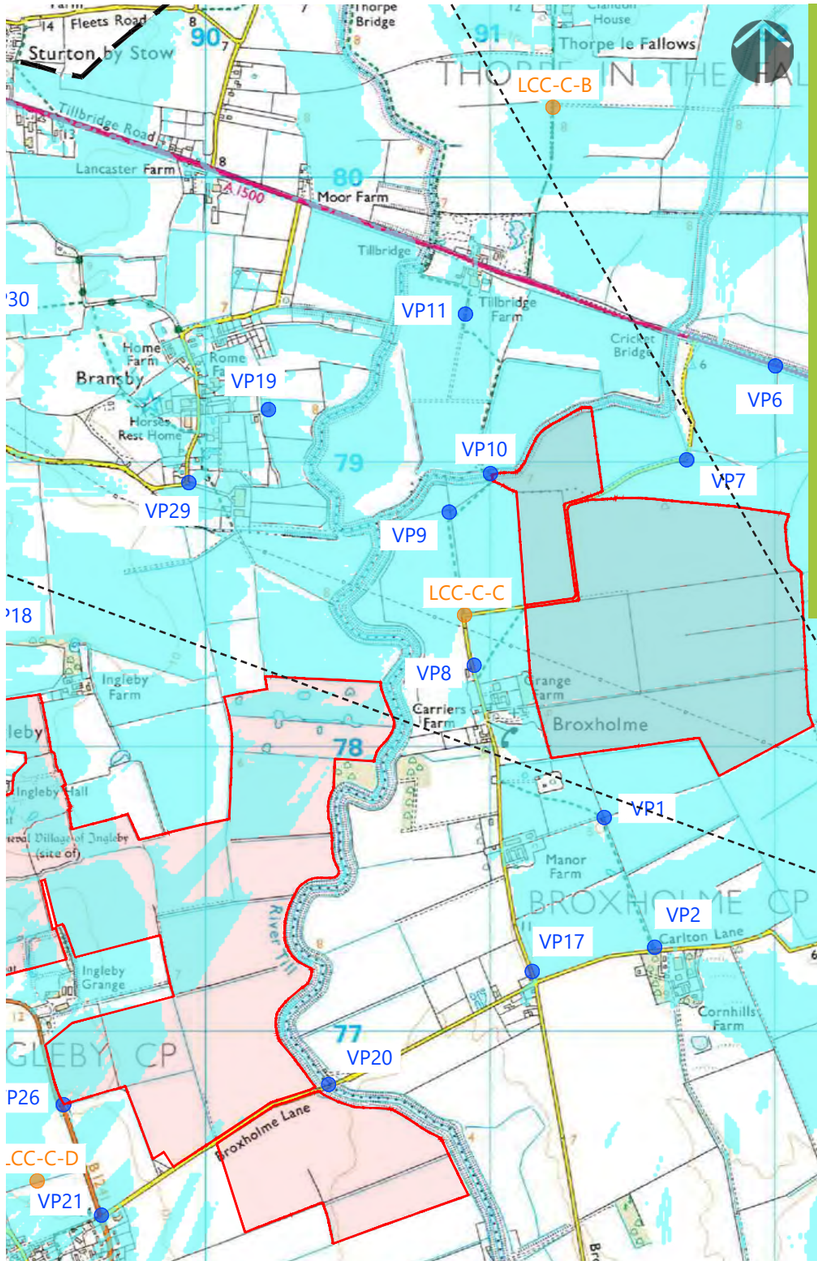
Point of Perspective

Viewpoint 2 Single Frame 50mm image (Summer)

West Burton Solar Project

Viewpoint 3 (Winter)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 08/03/2022 @ 12:15
- 492728.822 377327.686 7.890mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective

Point of Perspective

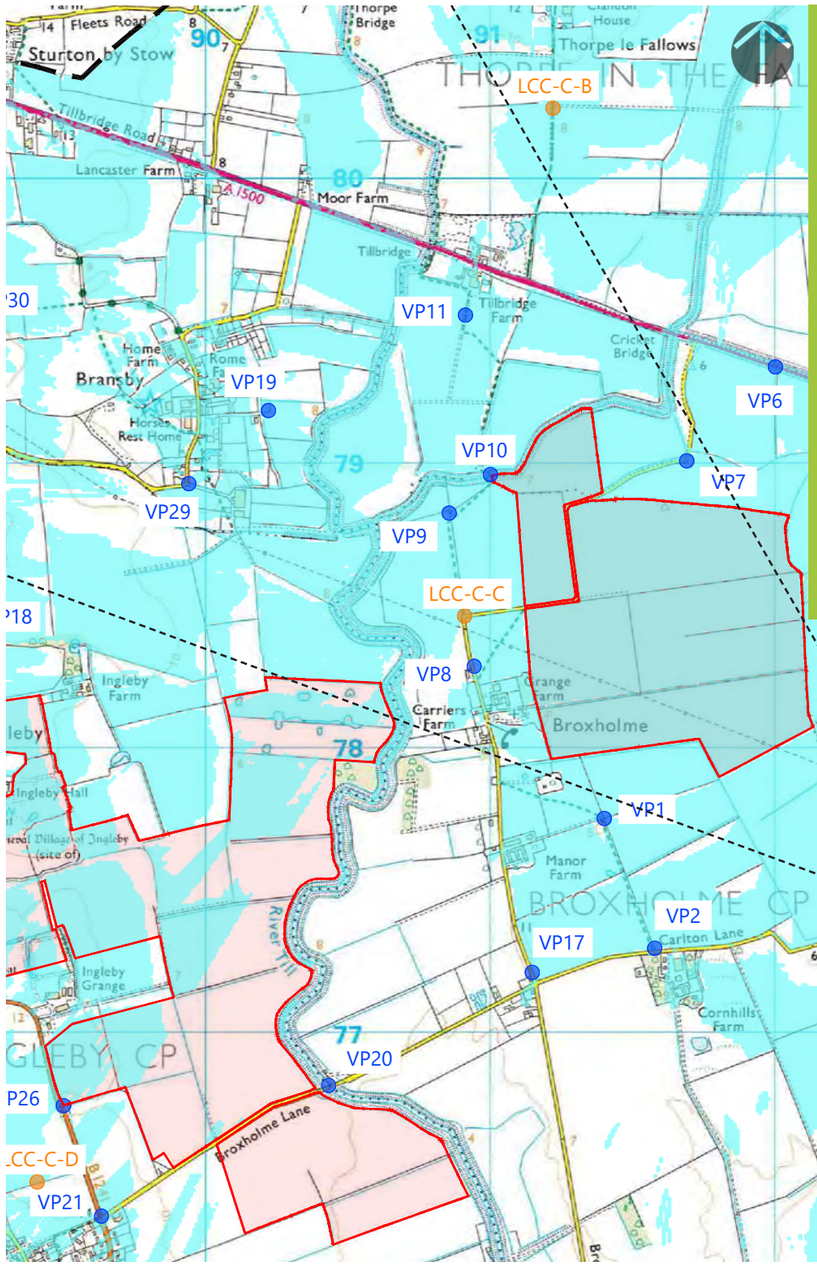
Point of Perspective

Viewpoint 3 Single Frame 50mm image (Winter)

West Burton Solar Project

Viewpoint 3 (Summer)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 08/07/2022 @ 9:14
- 492728.816 377327.82 7.909mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective

Point of Perspective

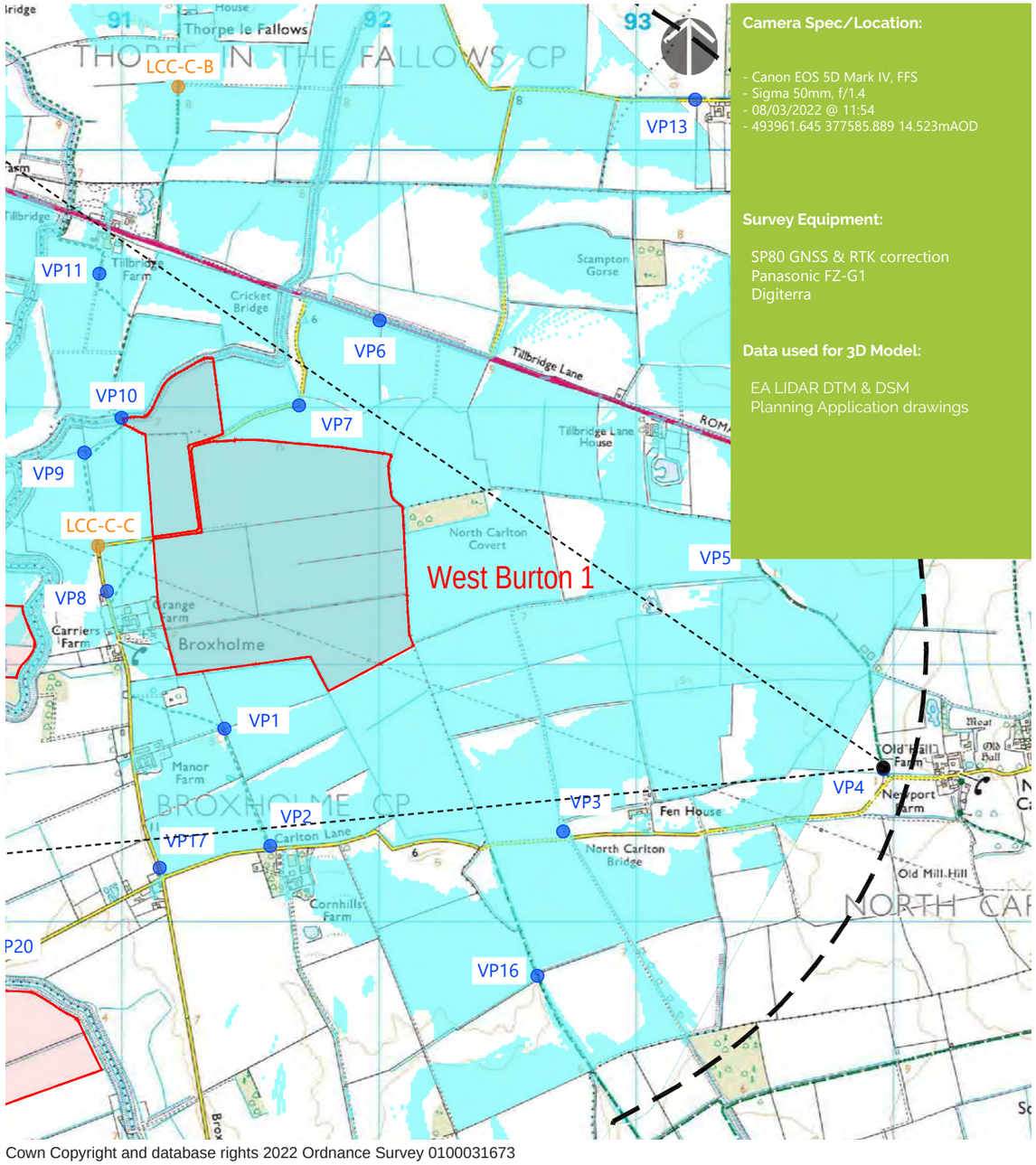
Point of Perspective

Viewpoint 3 Single Frame 50mm image (Summer)

West Burton Solar Project

Viewpoint 4 (Winter)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 08/03/2022 @ 11:54
- 493961.645 377585.889 14.523mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective

Point of Perspective

Point of Perspective

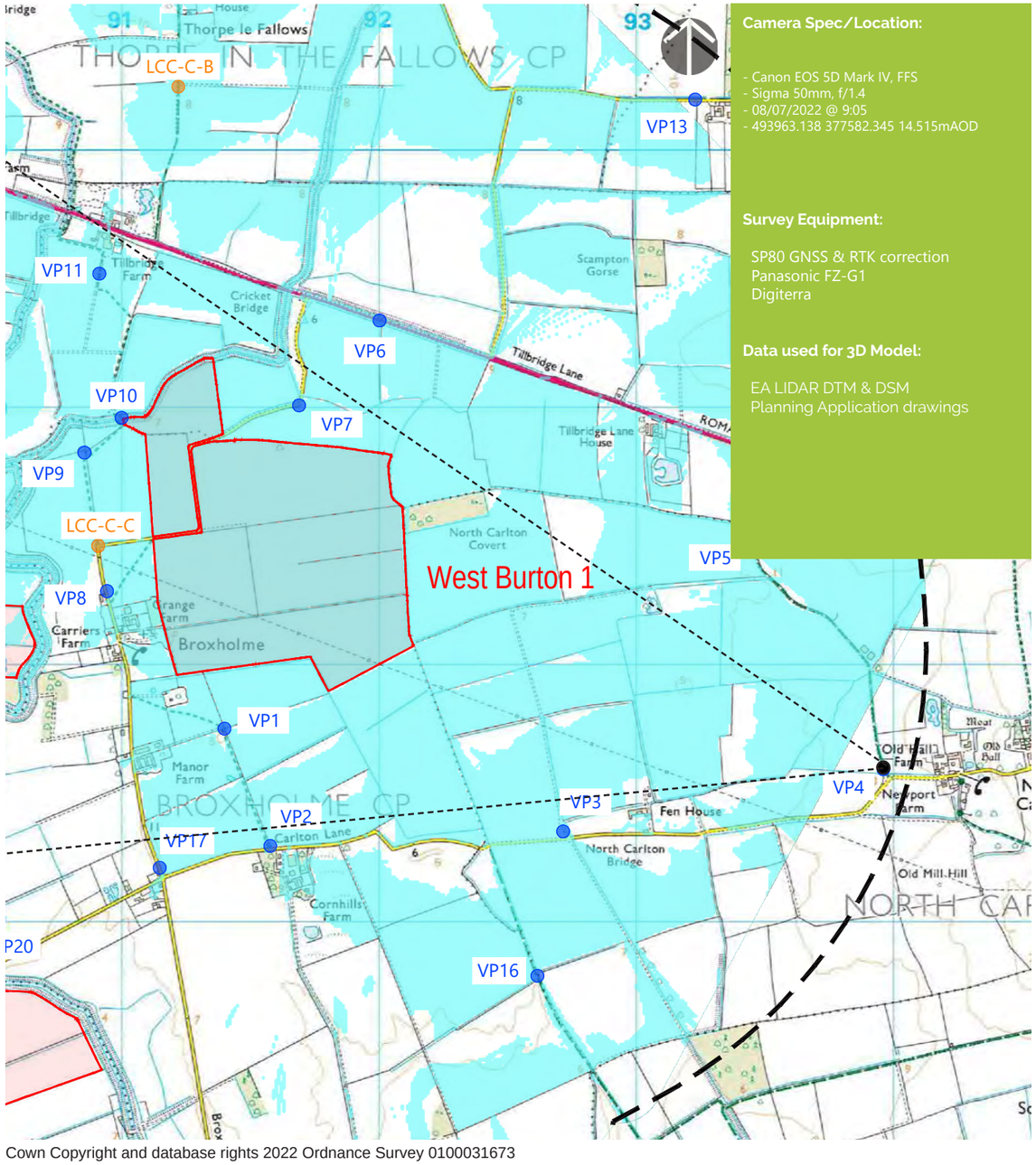
Point of Perspective

Viewpoint 4 Single Frame 50mm image (Winter)

West Burton Solar Project

Viewpoint 4 (Summer)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 08/07/2022 @ 9:05
- 493963.138 377582.345 14.515mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

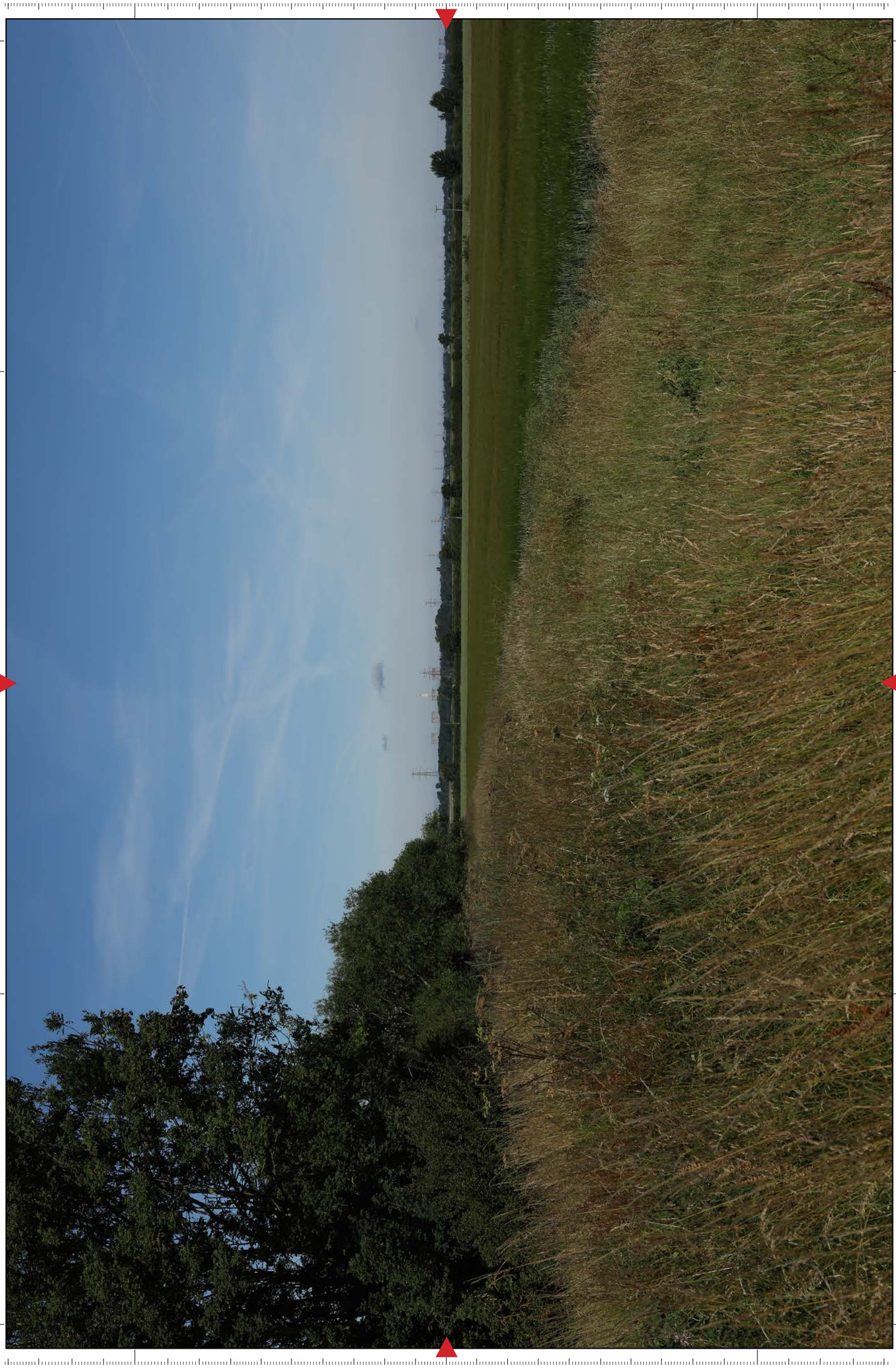
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

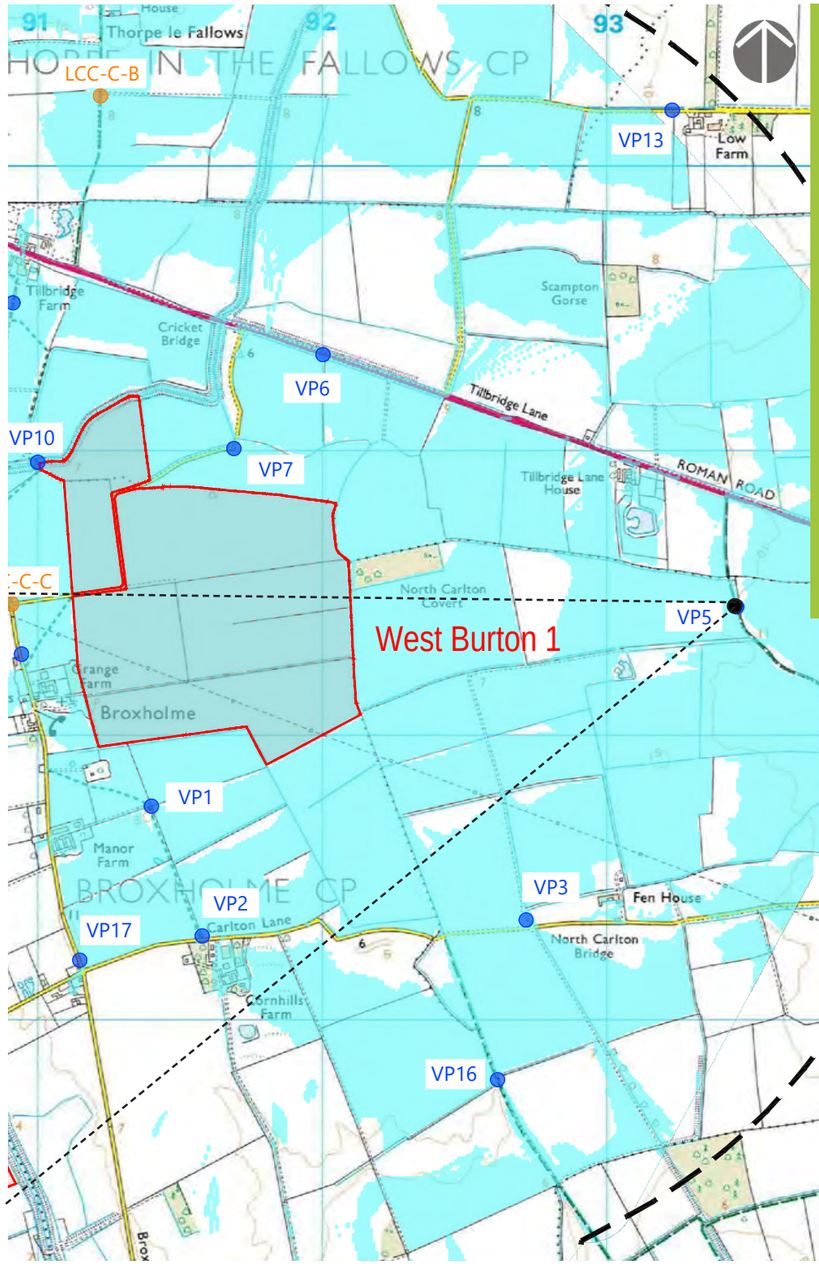
Point of Perspective

Viewpoint 4 Single Frame 50mm image (Summer)

West Burton Solar Project

Viewpoint 5 (Winter)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 08/03/2022 @ 10:06
- 493469.013 378396.121 12.469mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

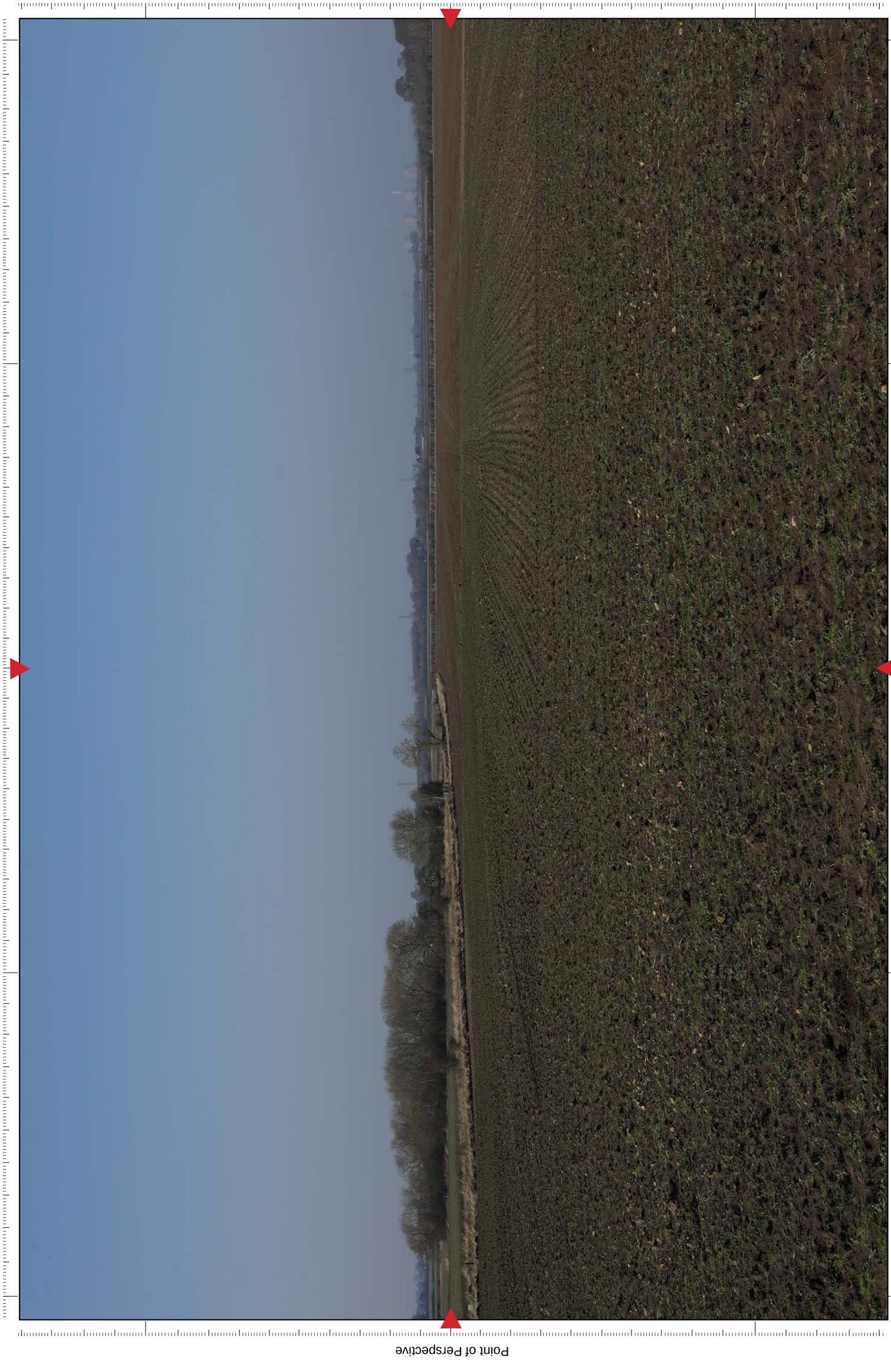
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

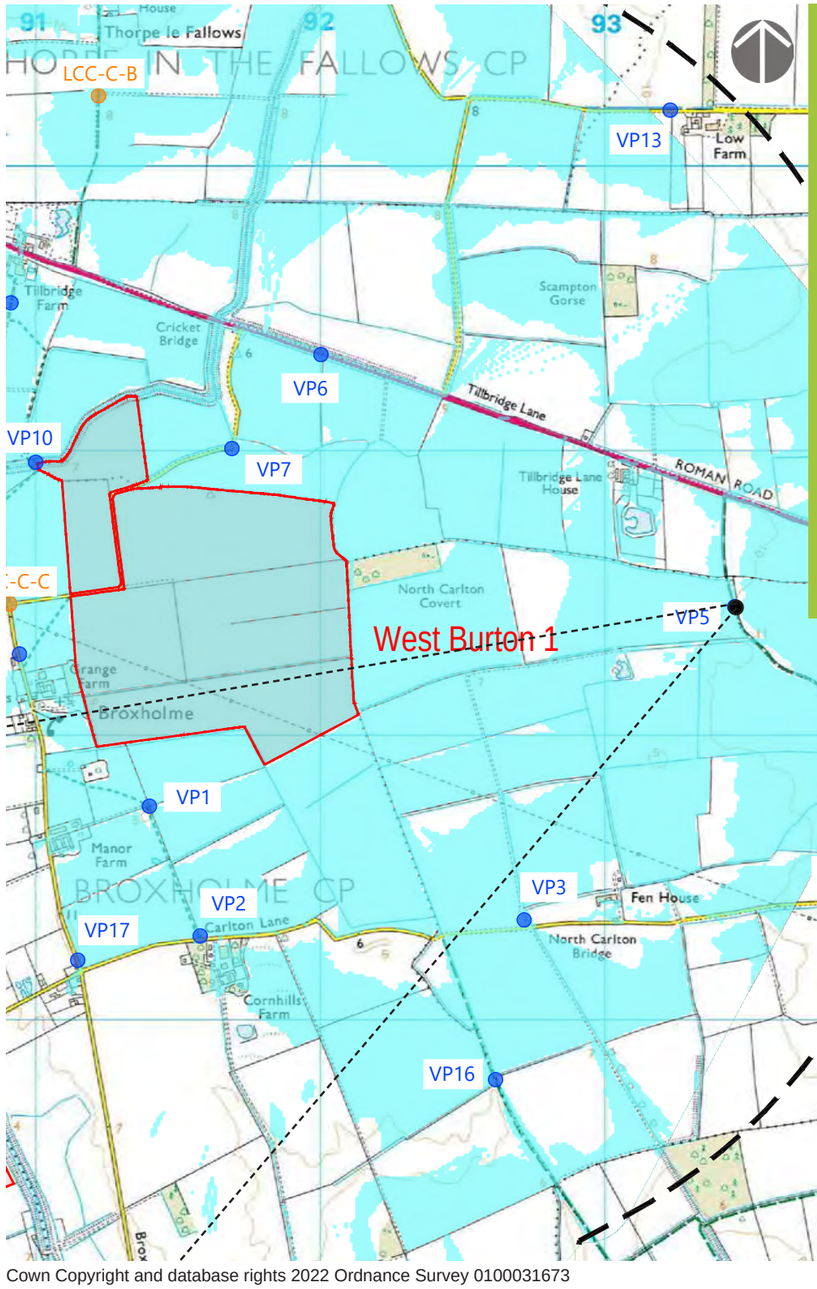
Point of Perspective

Viewpoint 5 Single Frame 50mm image (Winter)

West Burton Solar Project

Viewpoint 5 (Summer)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 04/07/2022 @ 17:40
- 493468.414 378396.326 12.441mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

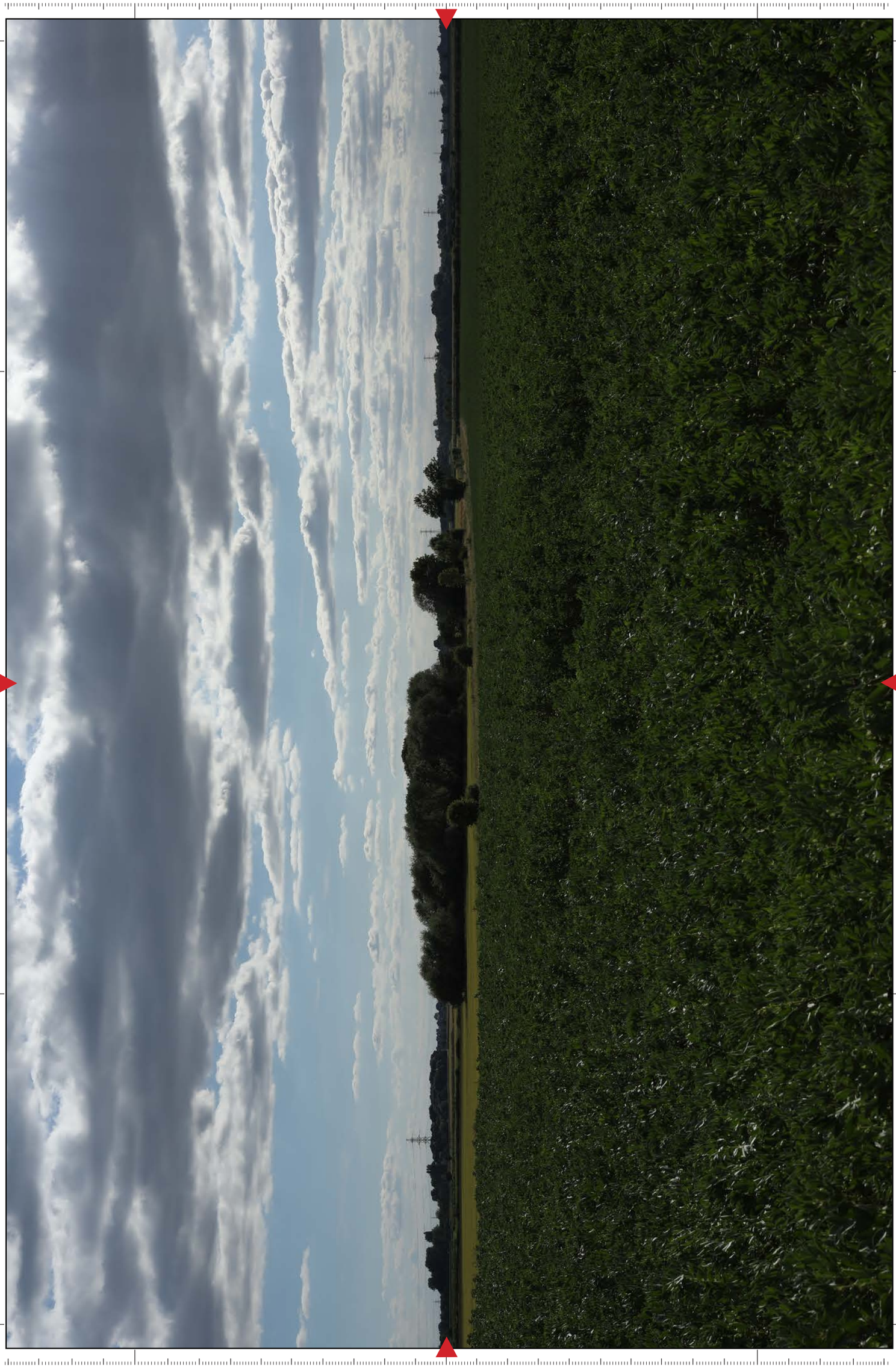
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

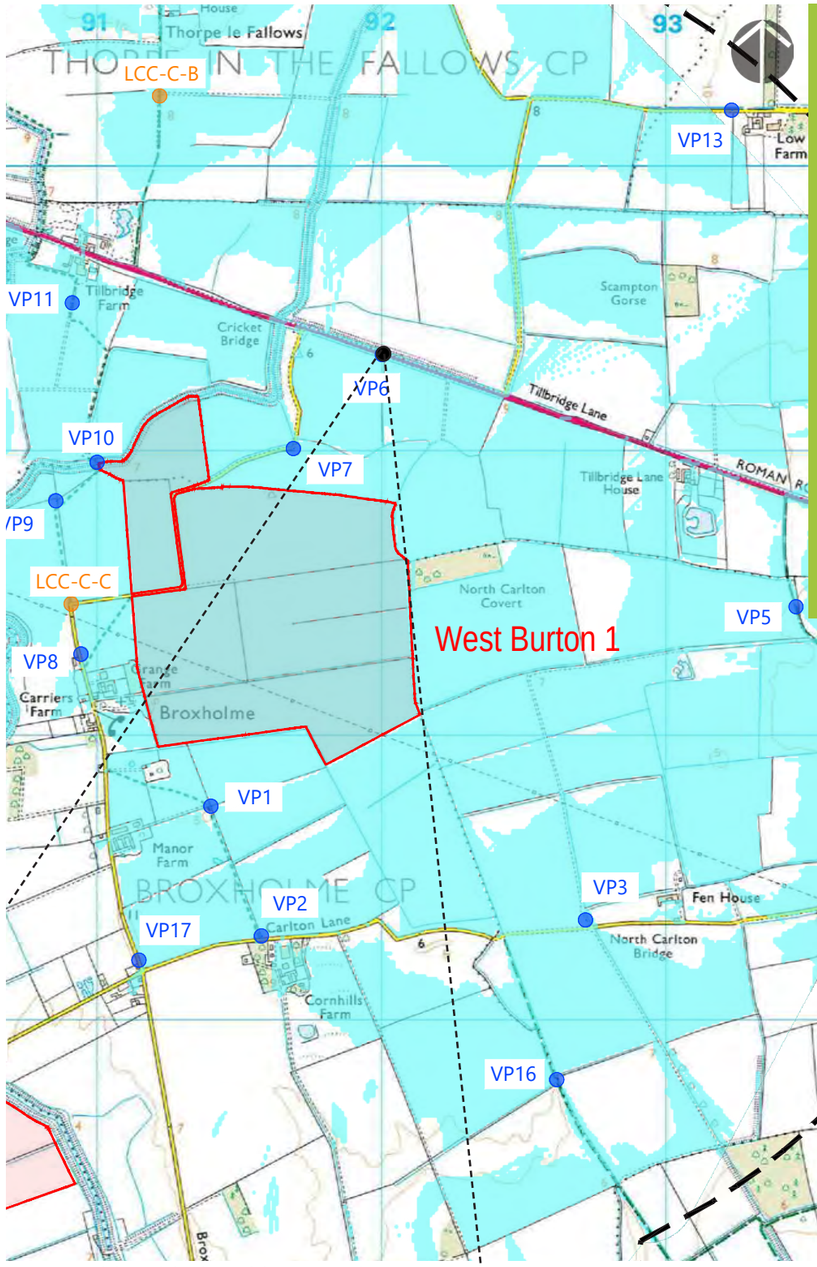
Point of Perspective

Viewpoint 5 Single Frame 50mm image (Summer)

West Burton Solar Project

Viewpoint 6 (Winter)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 09/03/2022 @ 8:55
- 492009.315 379331.150 8.725mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

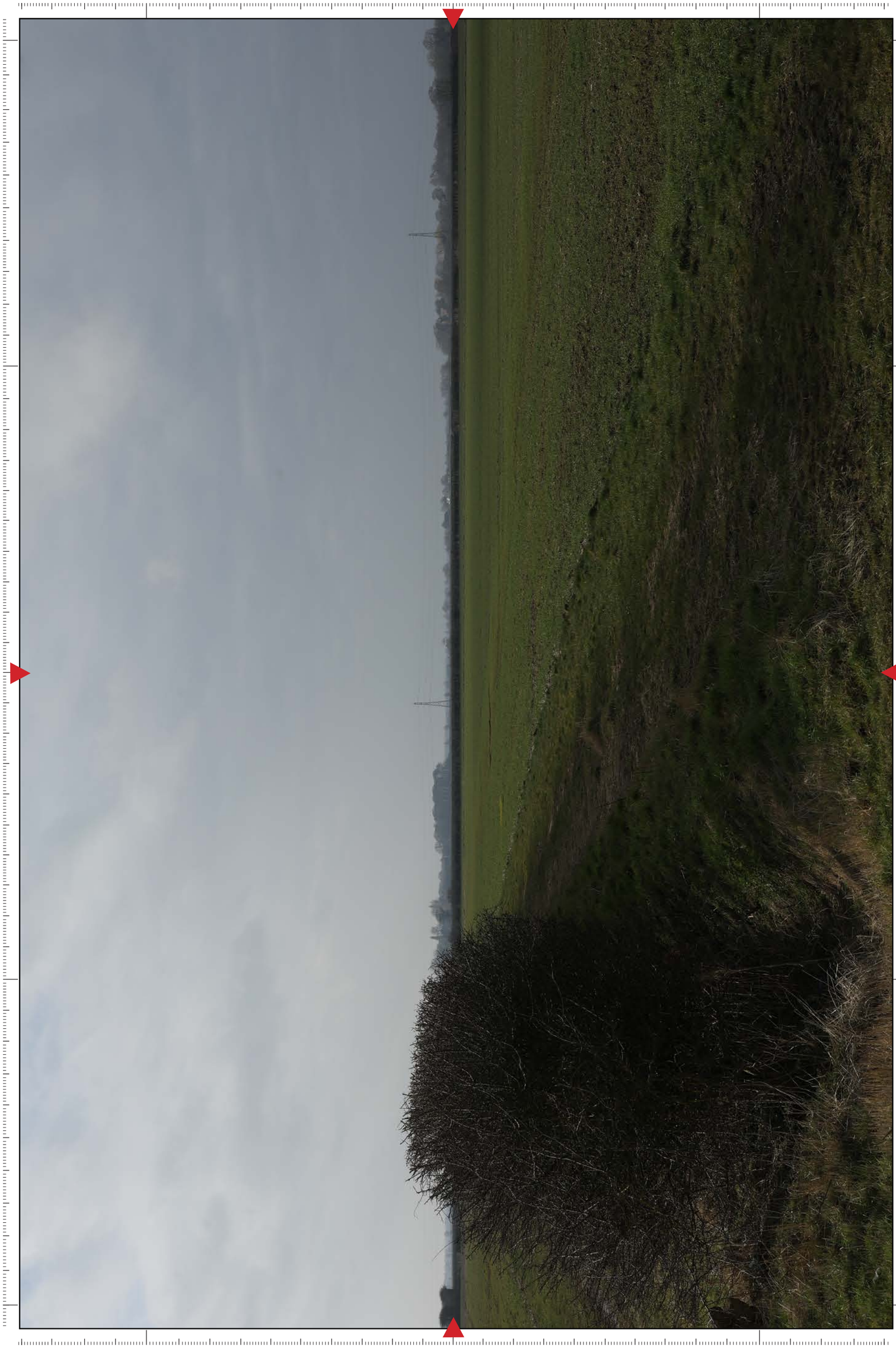
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

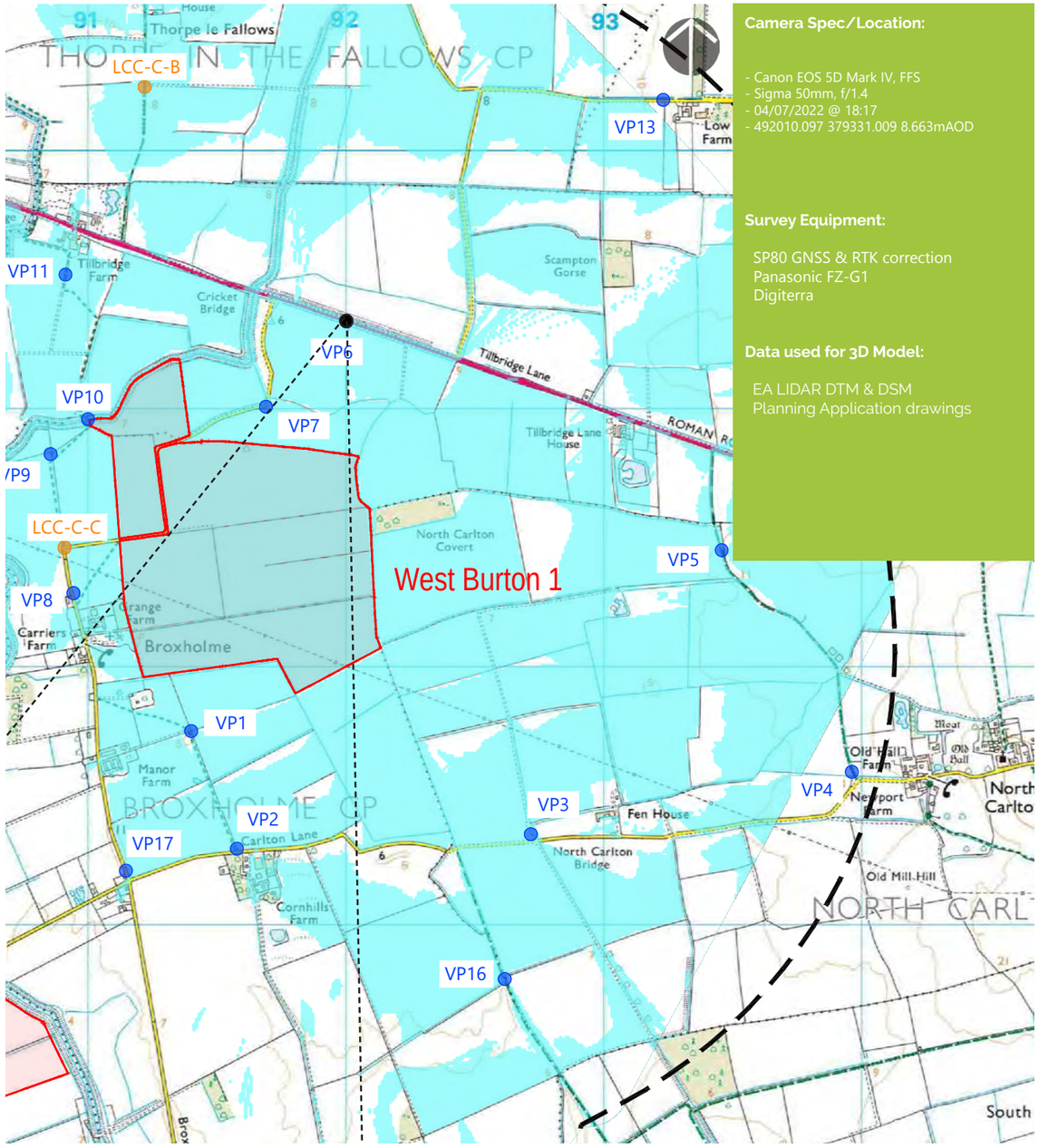
Point of Perspective

Viewpoint 6 Single Frame 50mm image (Winter)

West Burton Solar Project

Viewpoint 6 (Summer)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 04/07/2022 @ 18:17
- 492010.097 379331.009 8.663mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

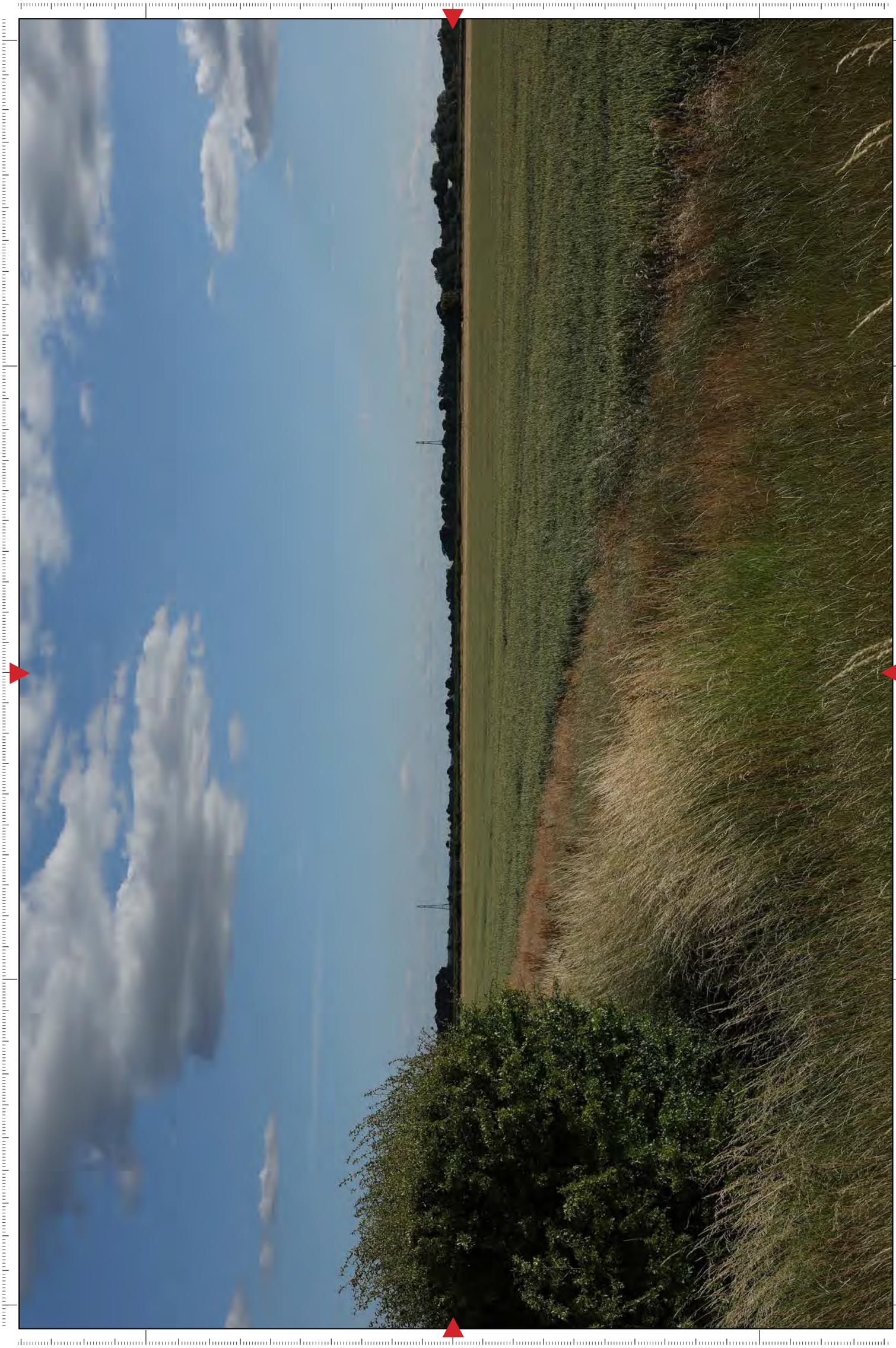
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

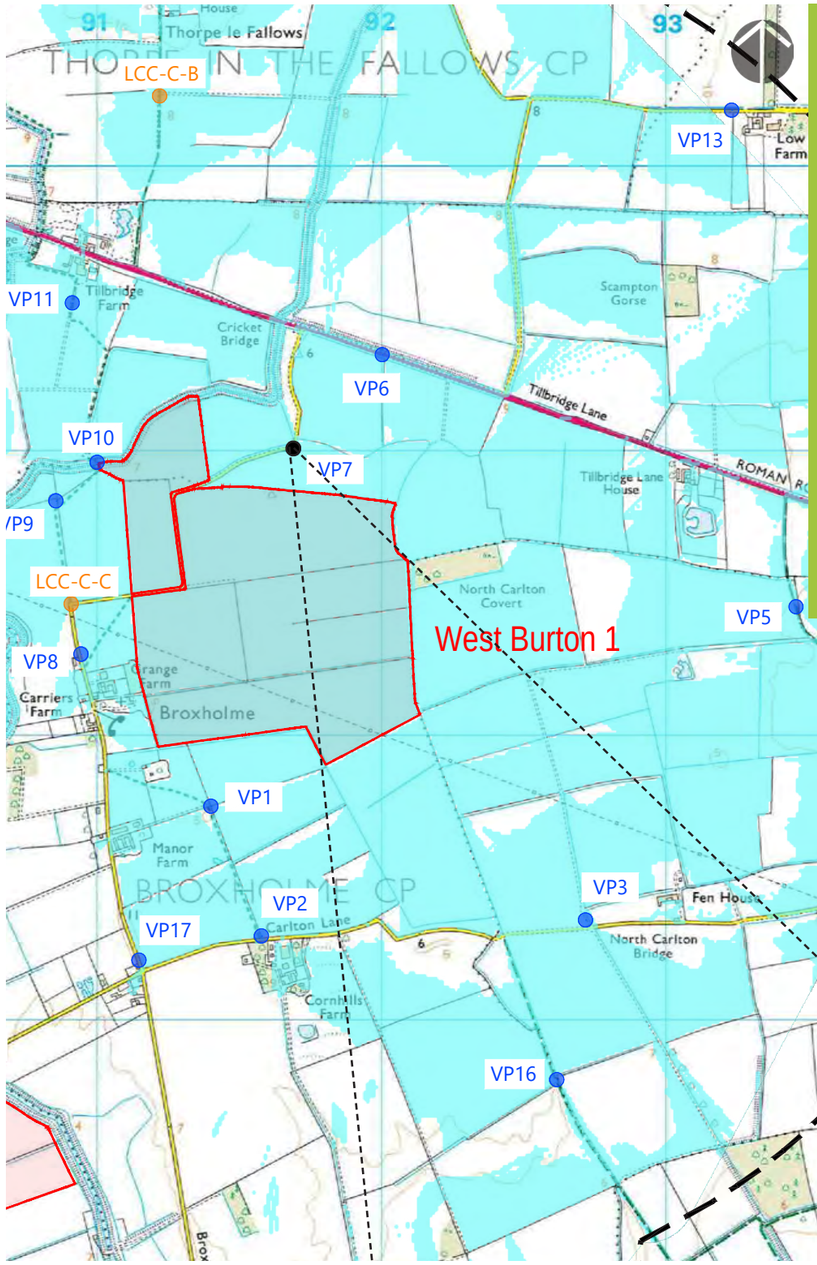
Point of Perspective

Viewpoint 6 Single Frame 50mm image (Summer)

West Burton Solar Project

Viewpoint 7 (Winter)

Camera Location:



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- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 09/03/2022 @ 8:40
- 491684.620 379000.170 7.755mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

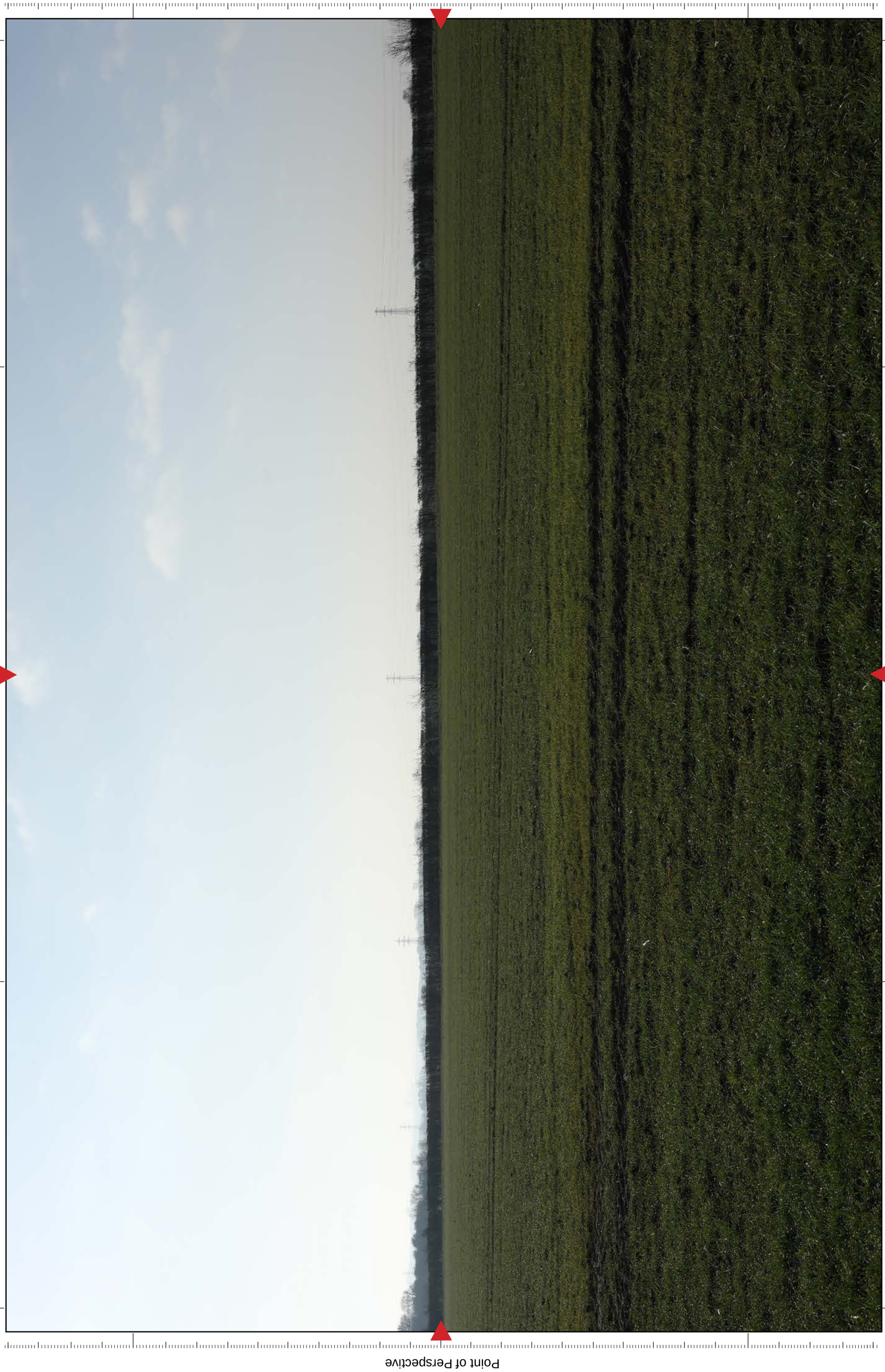
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

Point of Perspective

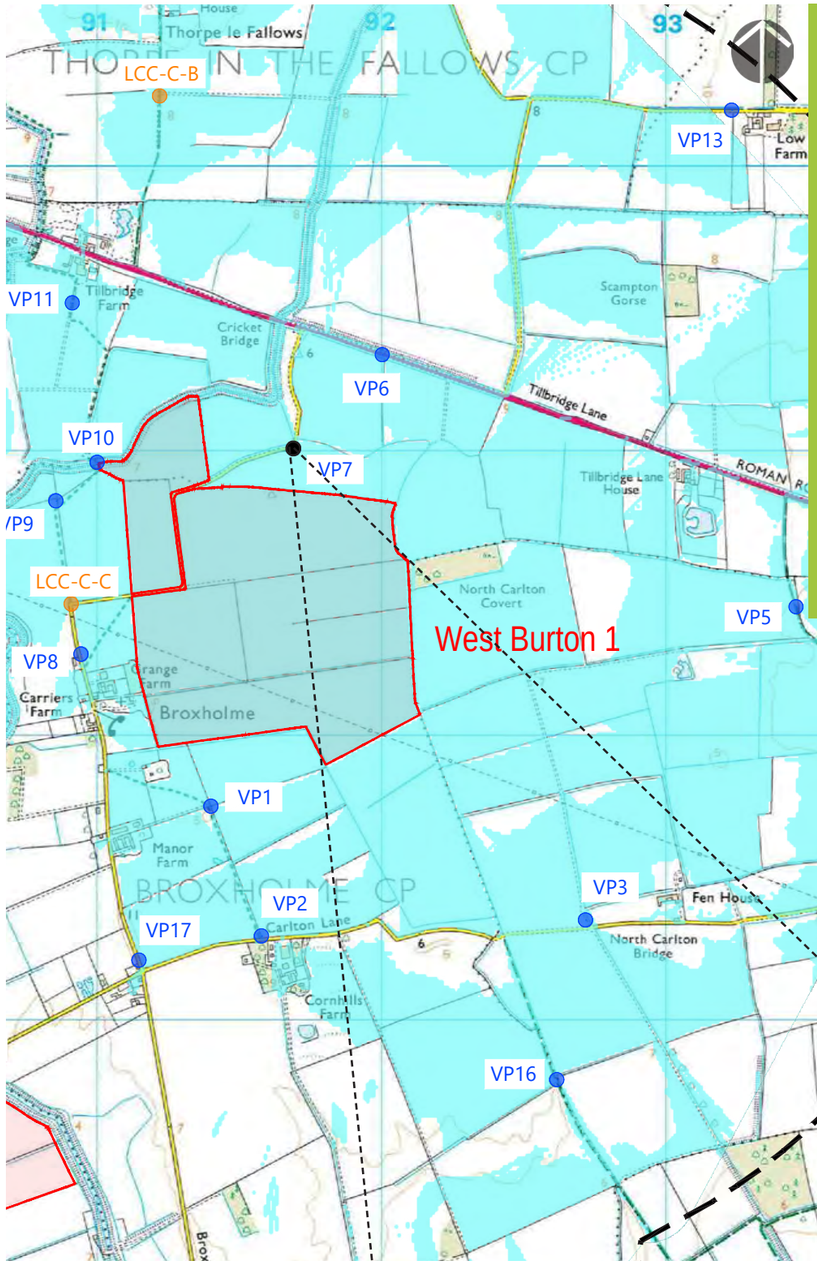
Point of Perspective

Viewpoint 7 Single Frame 50mm image (Winter)

West Burton Solar Project

Viewpoint 7 (Summer)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 04/07/2022 @ 18:05
- 491682.41 378999.95 7.902mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

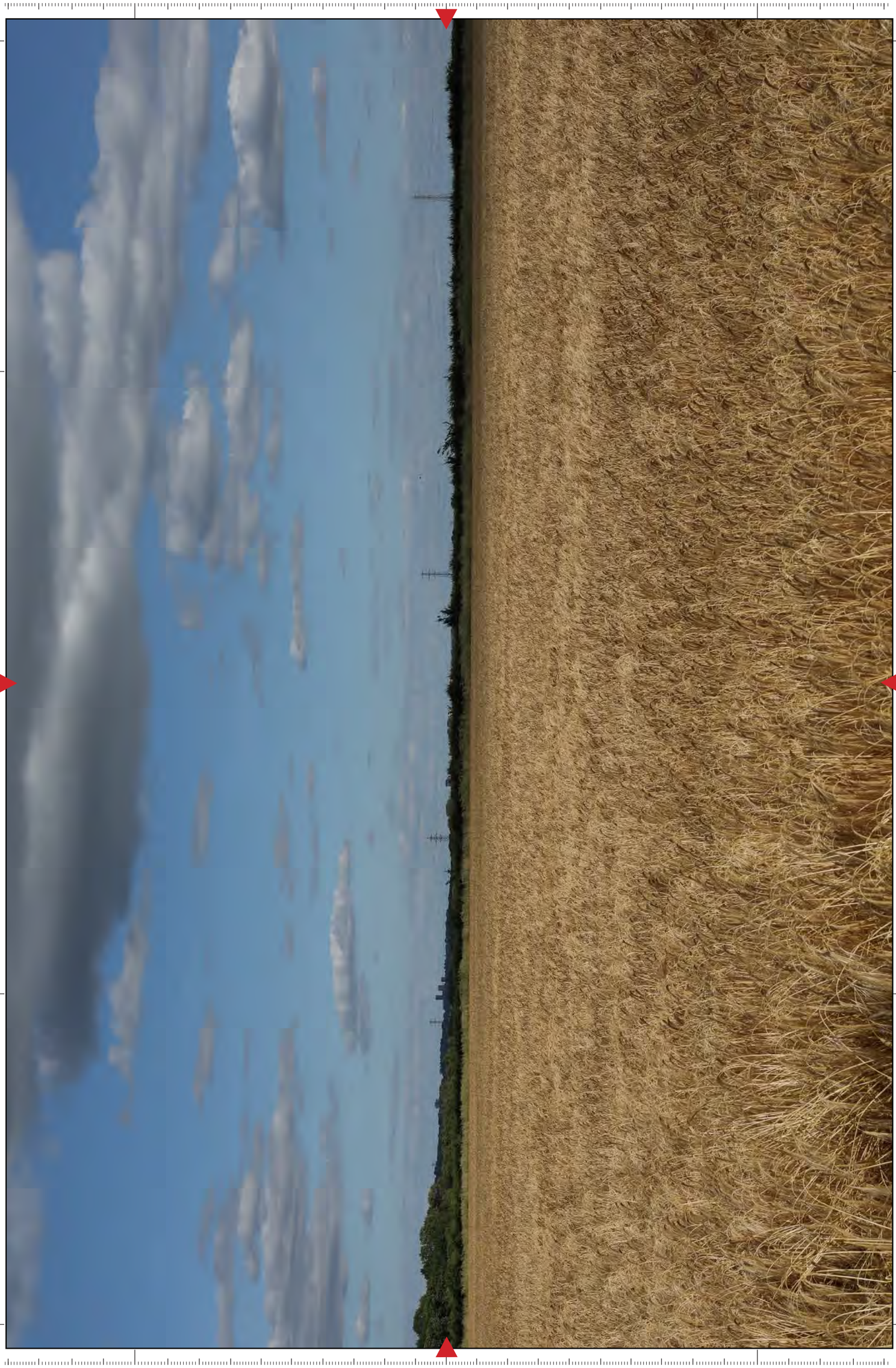
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

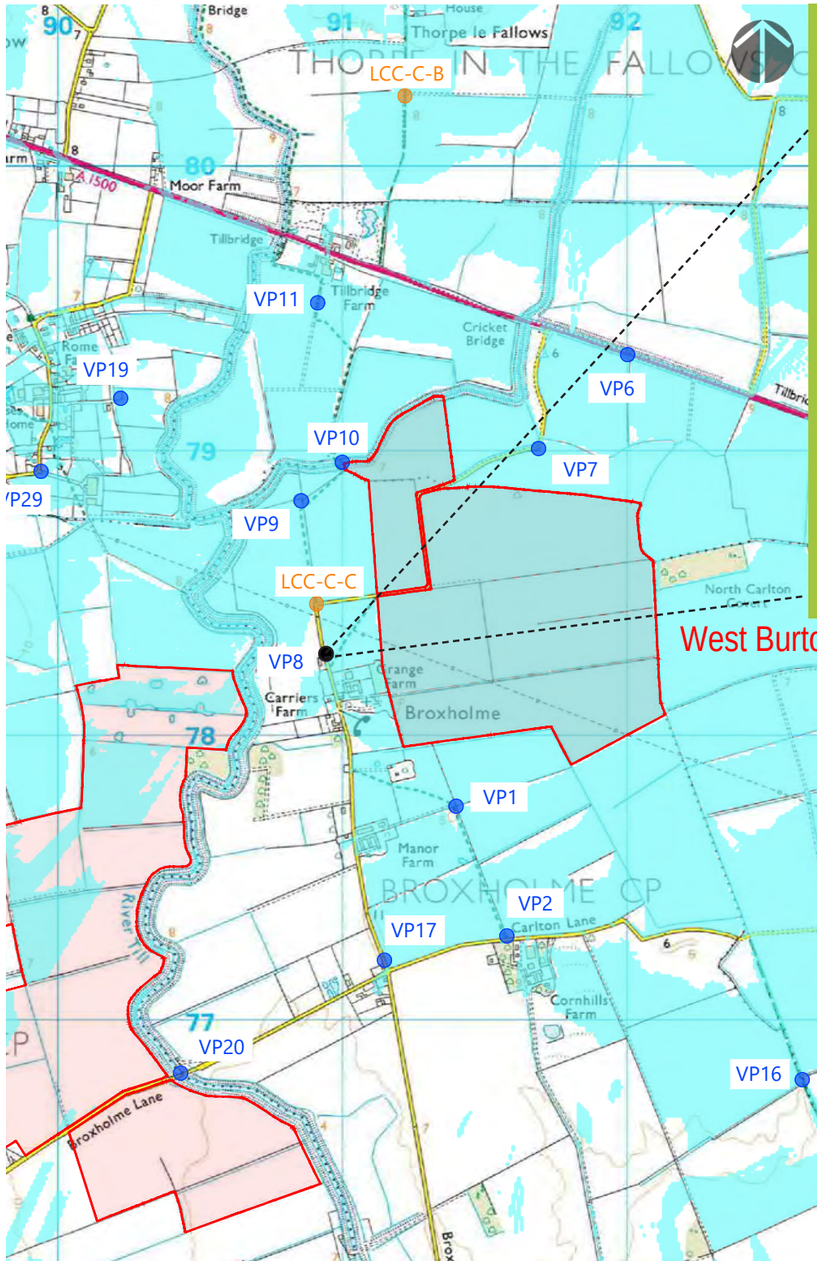
Point of Perspective

Viewpoint 7 Single Frame 50mm image (Summer)

West Burton Solar Project

Viewpoint 8 (Winter)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 10/03/2022 @ 12:48
- 490943.947 378283.549 10.375mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

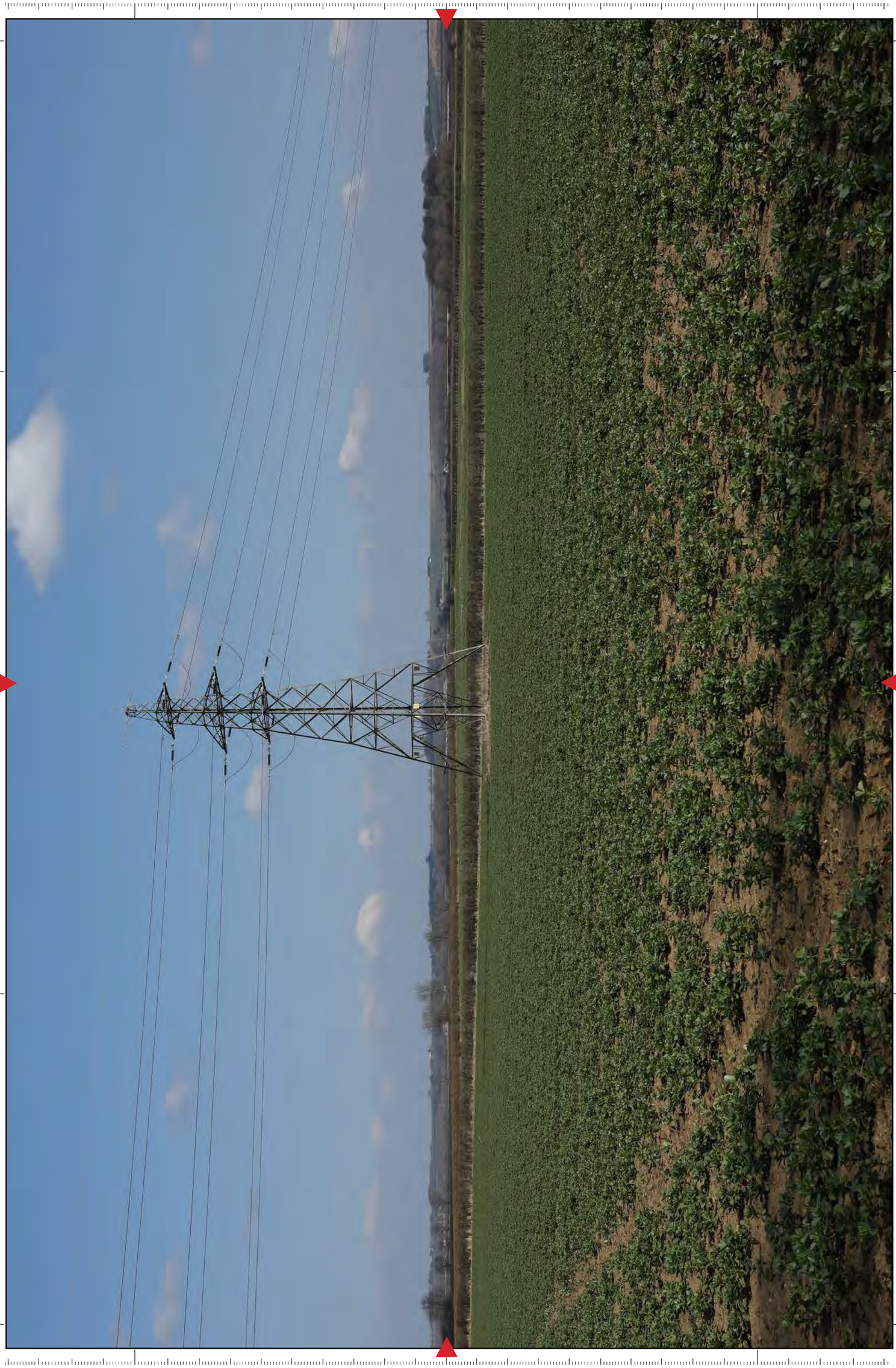
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

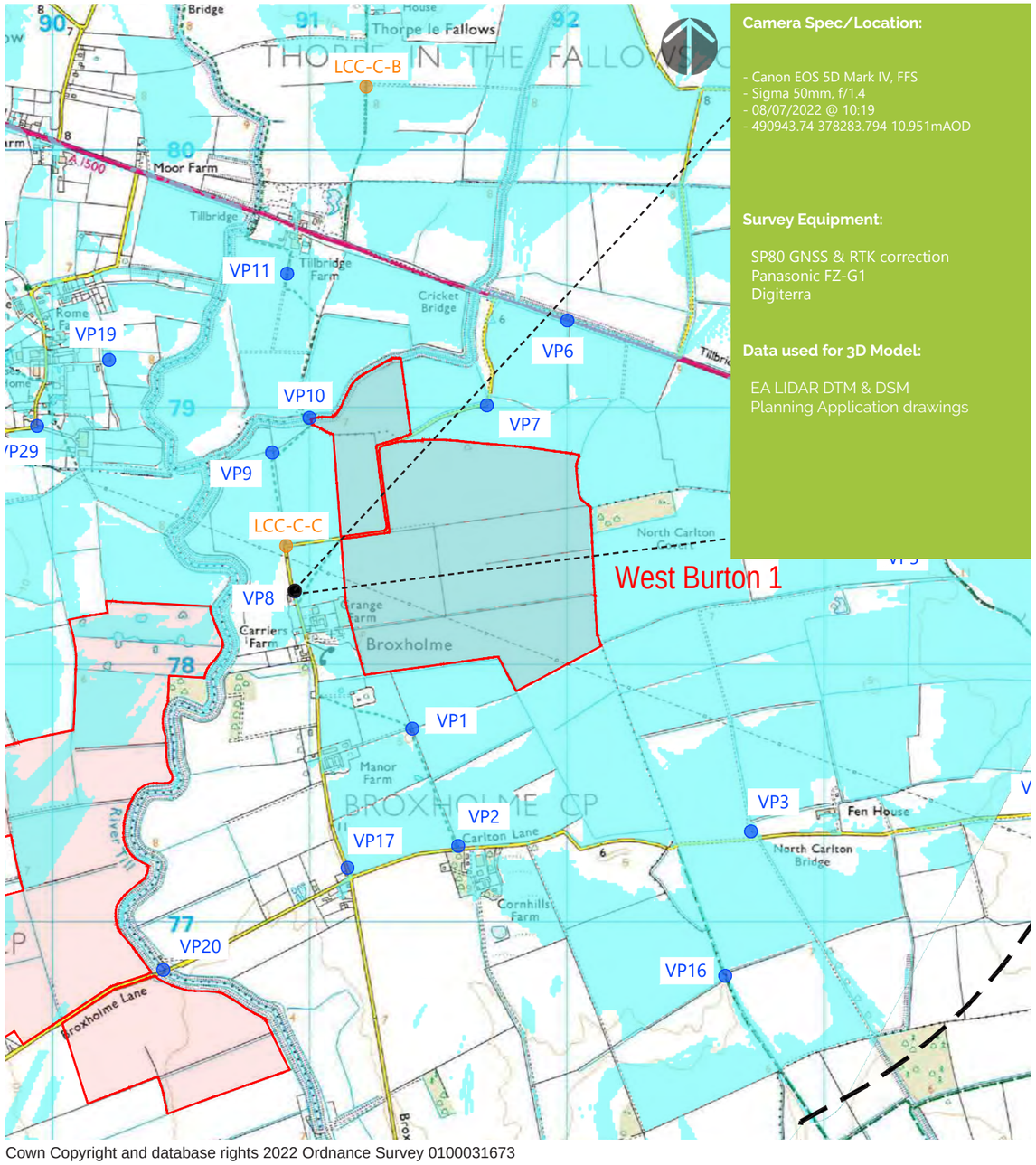
Point of Perspective

Viewpoint 8 Single Frame 50mm image (Winter)

West Burton Solar Project

Viewpoint 8 (Summer)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 08/07/2022 @ 10:19
- 490943.74 378283.794 10.951mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective

Point of Perspective

Point of Perspective

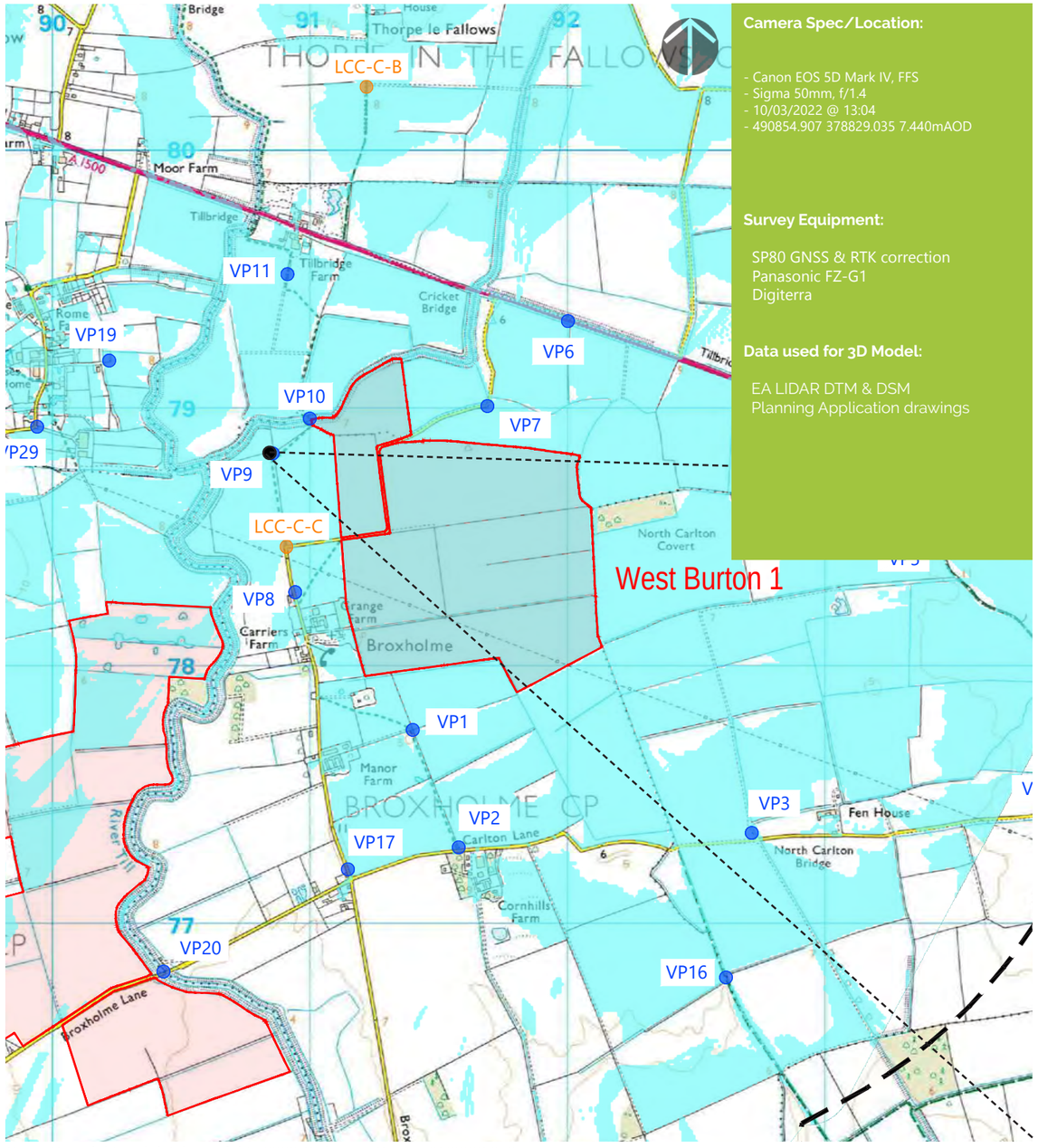
Point of Perspective

Viewpoint 8 Single Frame 50mm image (Summer)

West Burton Solar Project

Viewpoint 9 (Winter)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 10/03/2022 @ 13:04
- 490854.907 378829.035 7.440mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

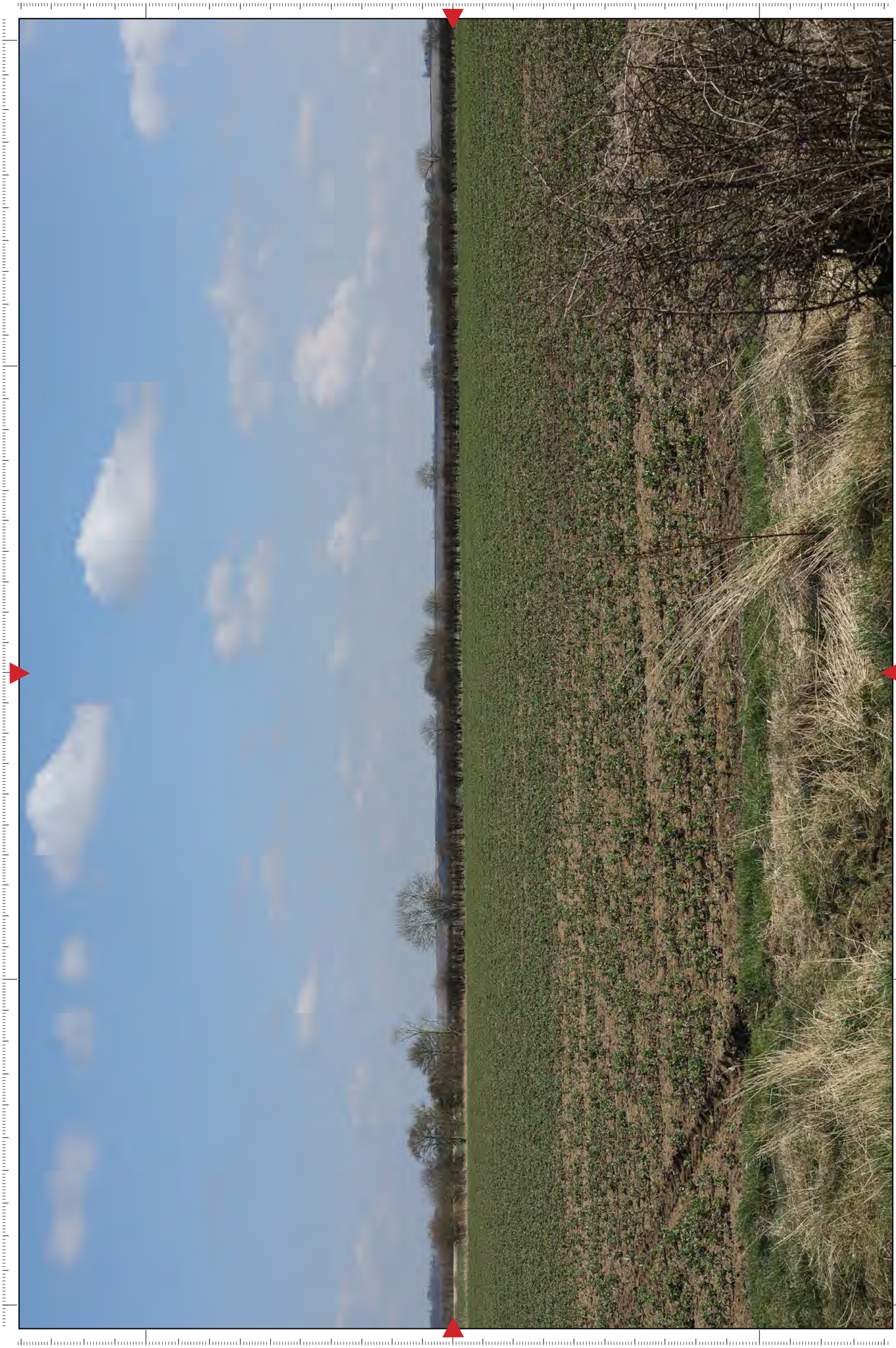
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

Point of Perspective

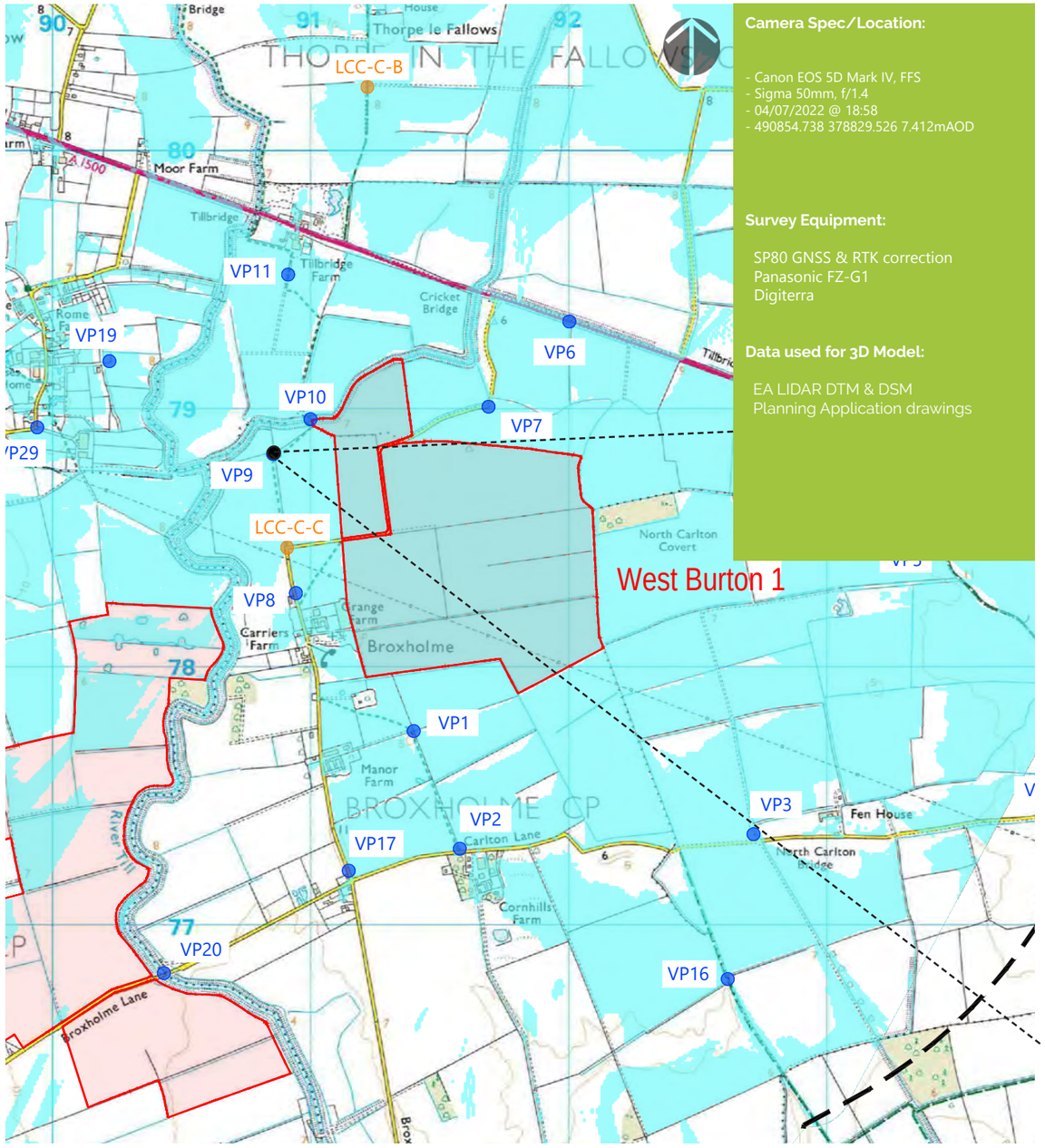
Point of Perspective

Viewpoint 9 Single Frame 50mm image (Winter)

West Burton Solar Project

Viewpoint 9 (Summer)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 04/07/2022 @ 18:58
- 490854.738 378829.526 7.412mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

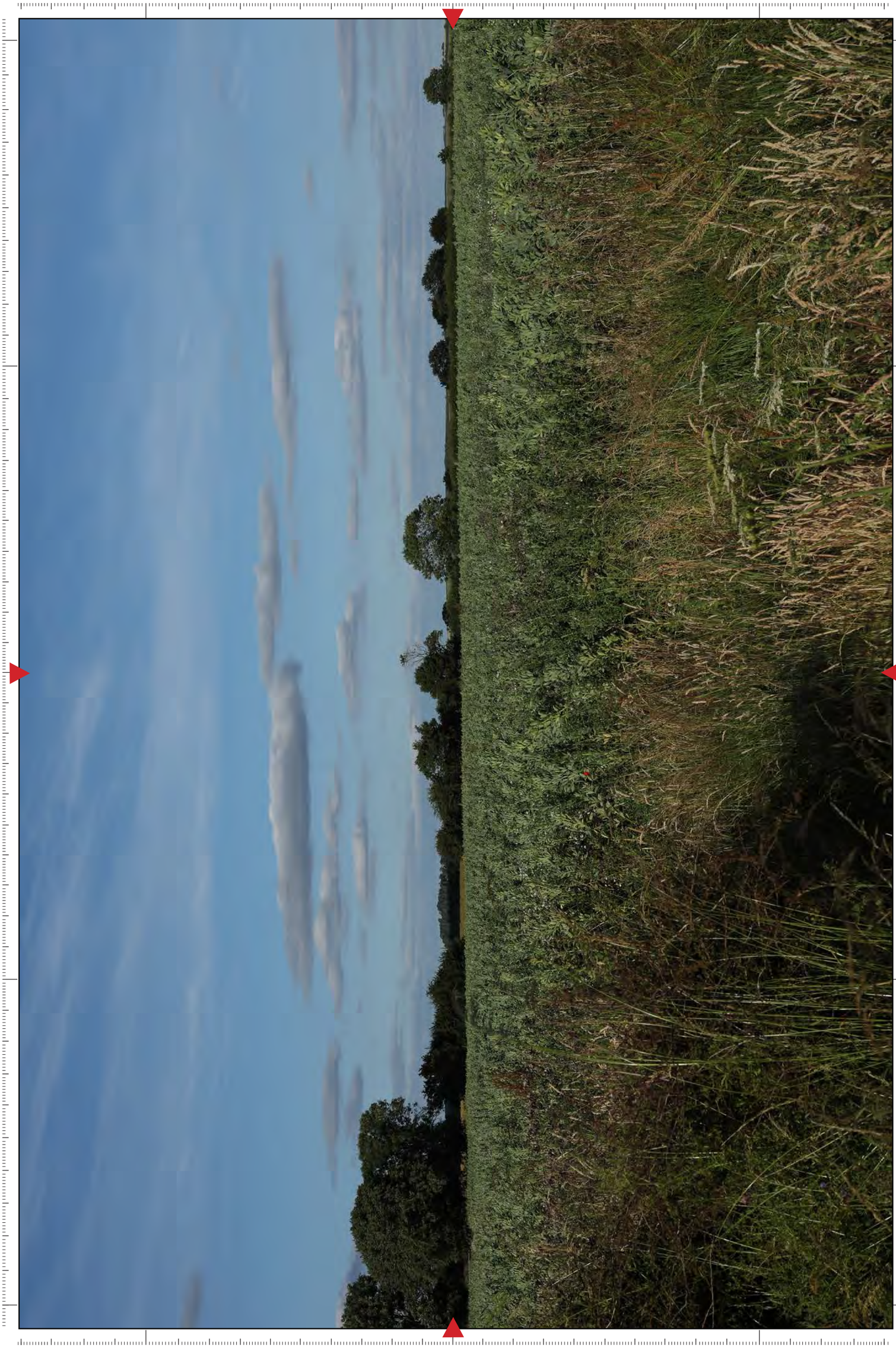
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

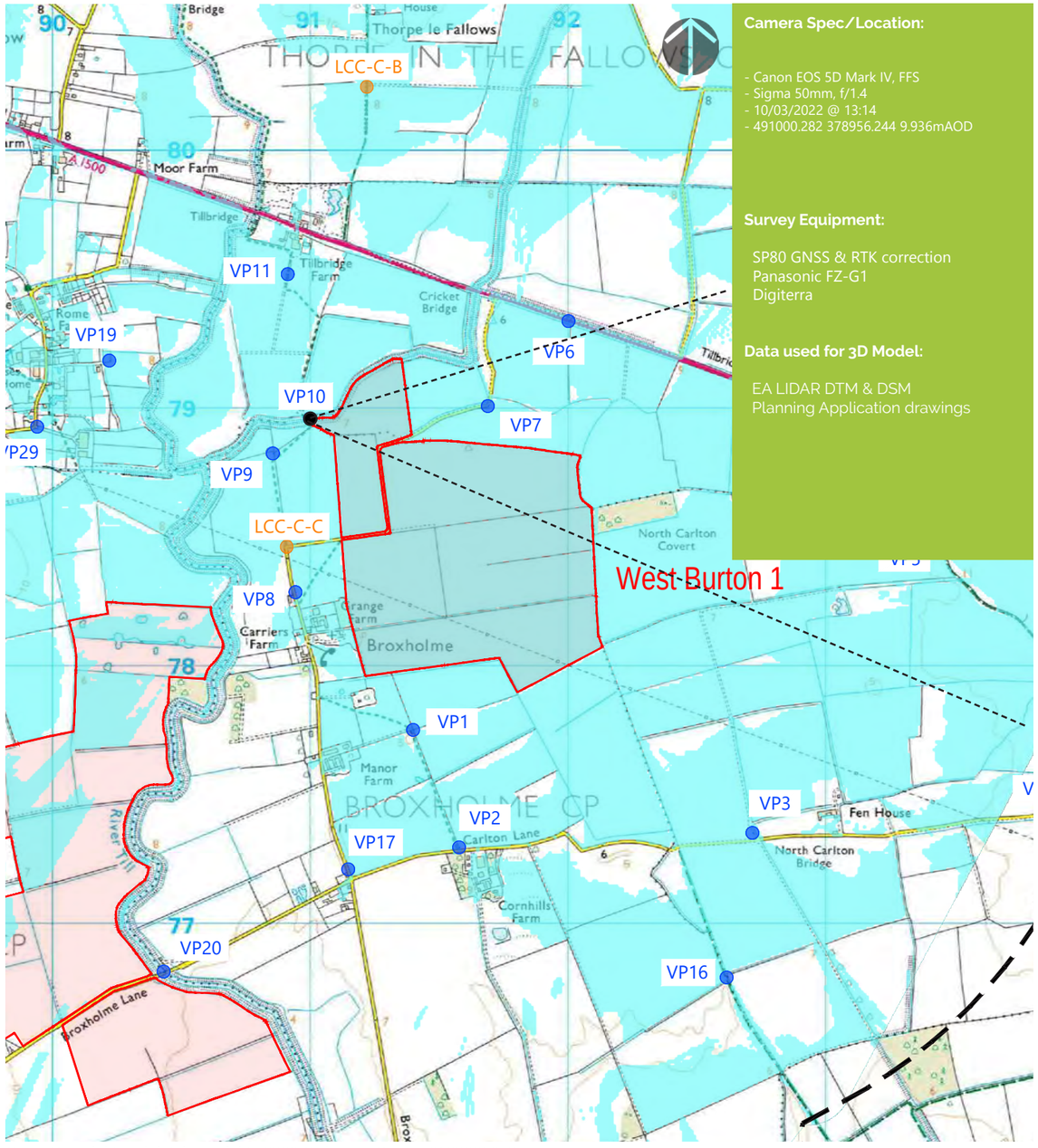
Point of Perspective

Viewpoint 9 Single Frame 50mm image (Summer)

West Burton Solar Project

Viewpoint 10 (Winter)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 10/03/2022 @ 13:14
- 491000.282 378956.244 9.936mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

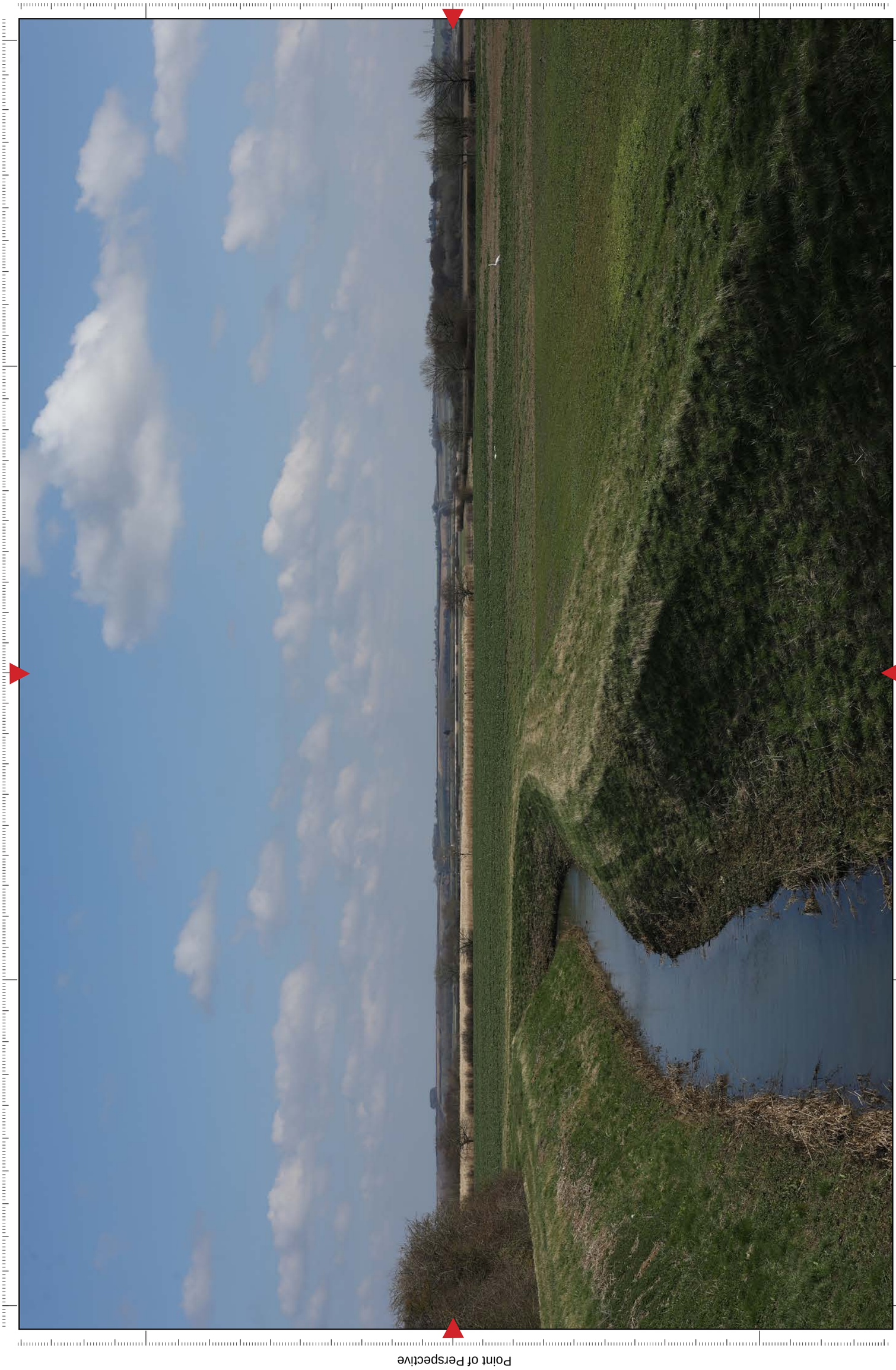
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

Point of Perspective

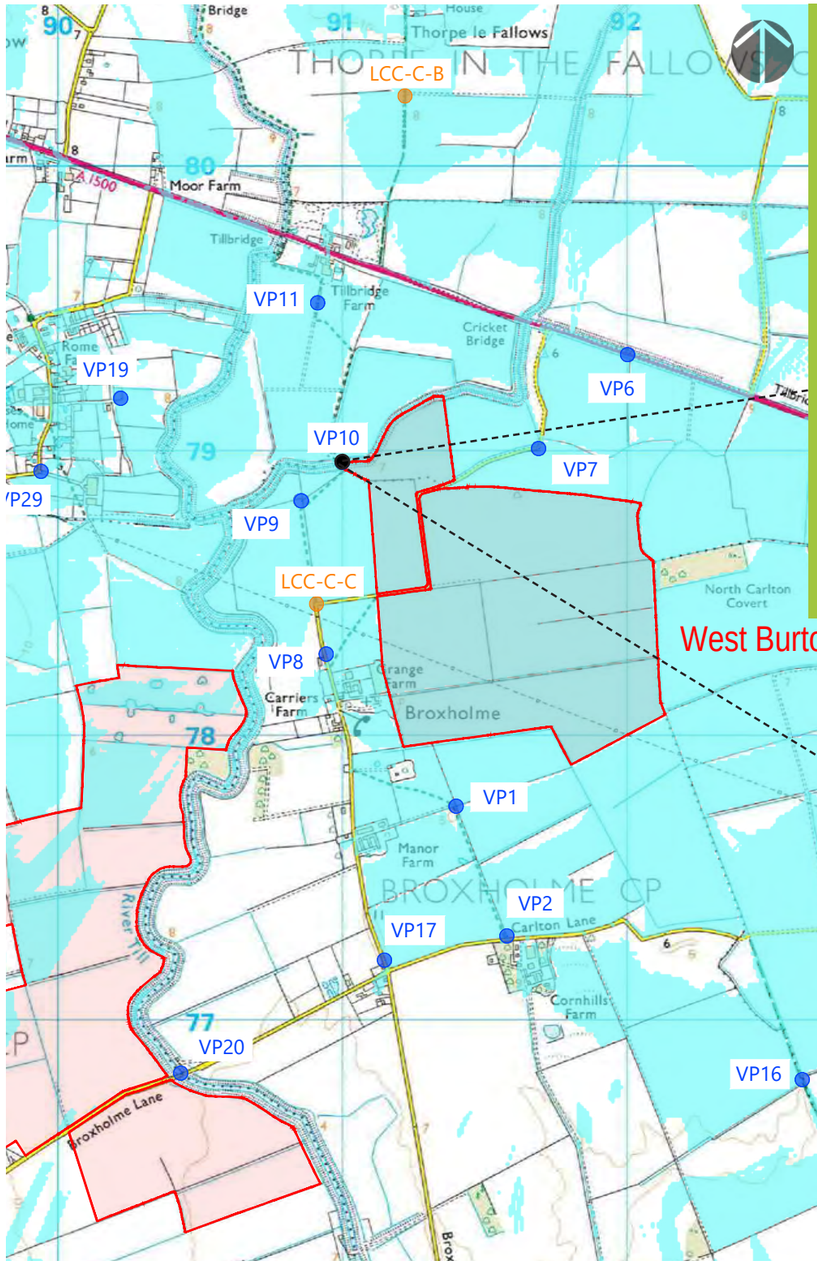
Point of Perspective

Viewpoint 10 Single Frame 50mm image (Winter)

West Burton Solar Project

Viewpoint 10 (Summer)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 04/07/2022 @ 19:08
- 491000.237 378956.713 9.921mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

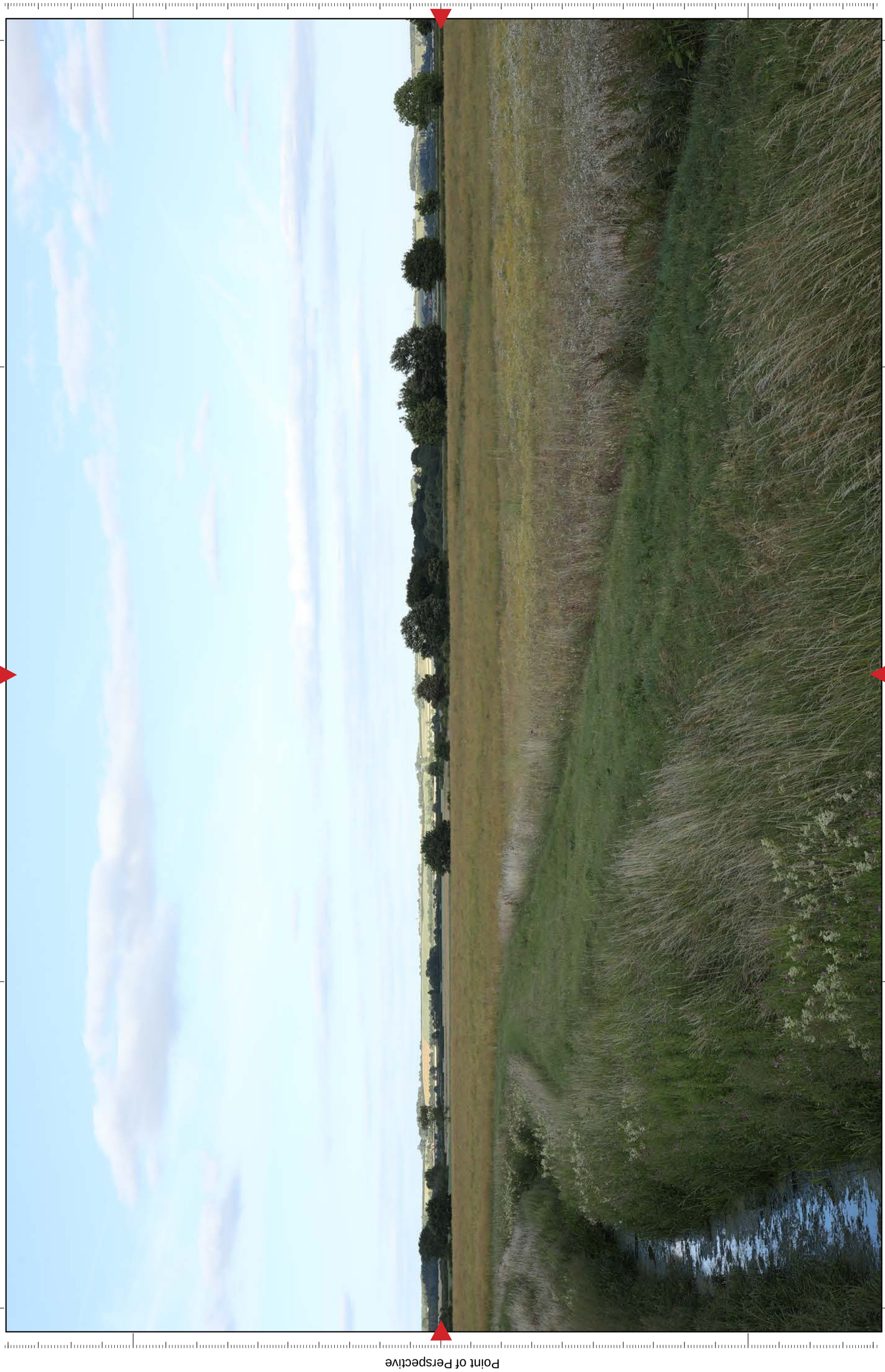
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

Point of Perspective

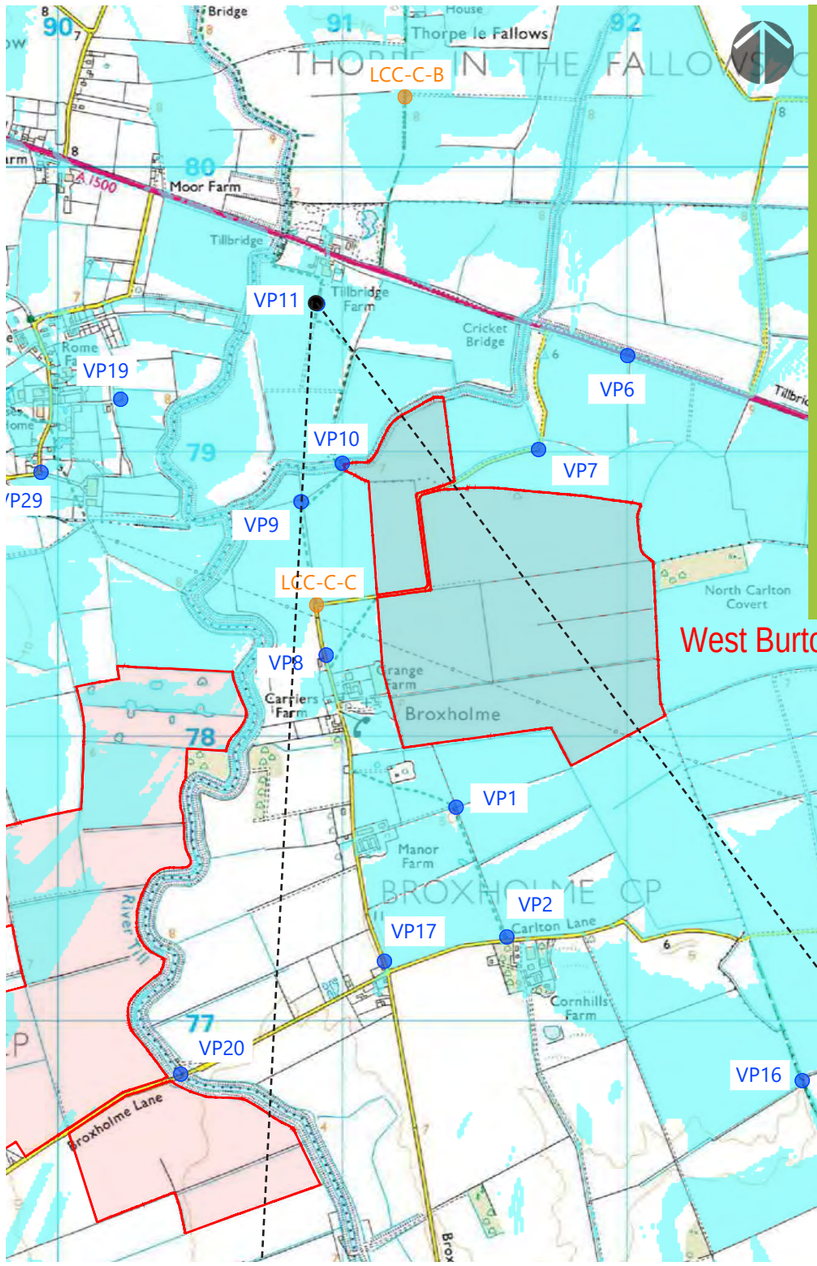
Point of Perspective

Viewpoint 10 Single Frame 50mm image (Summer)

West Burton Solar Project

Viewpoint 11 (Winter)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 10/03/2022 @ 13:30
- 490898.841 379449.437 9.065mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

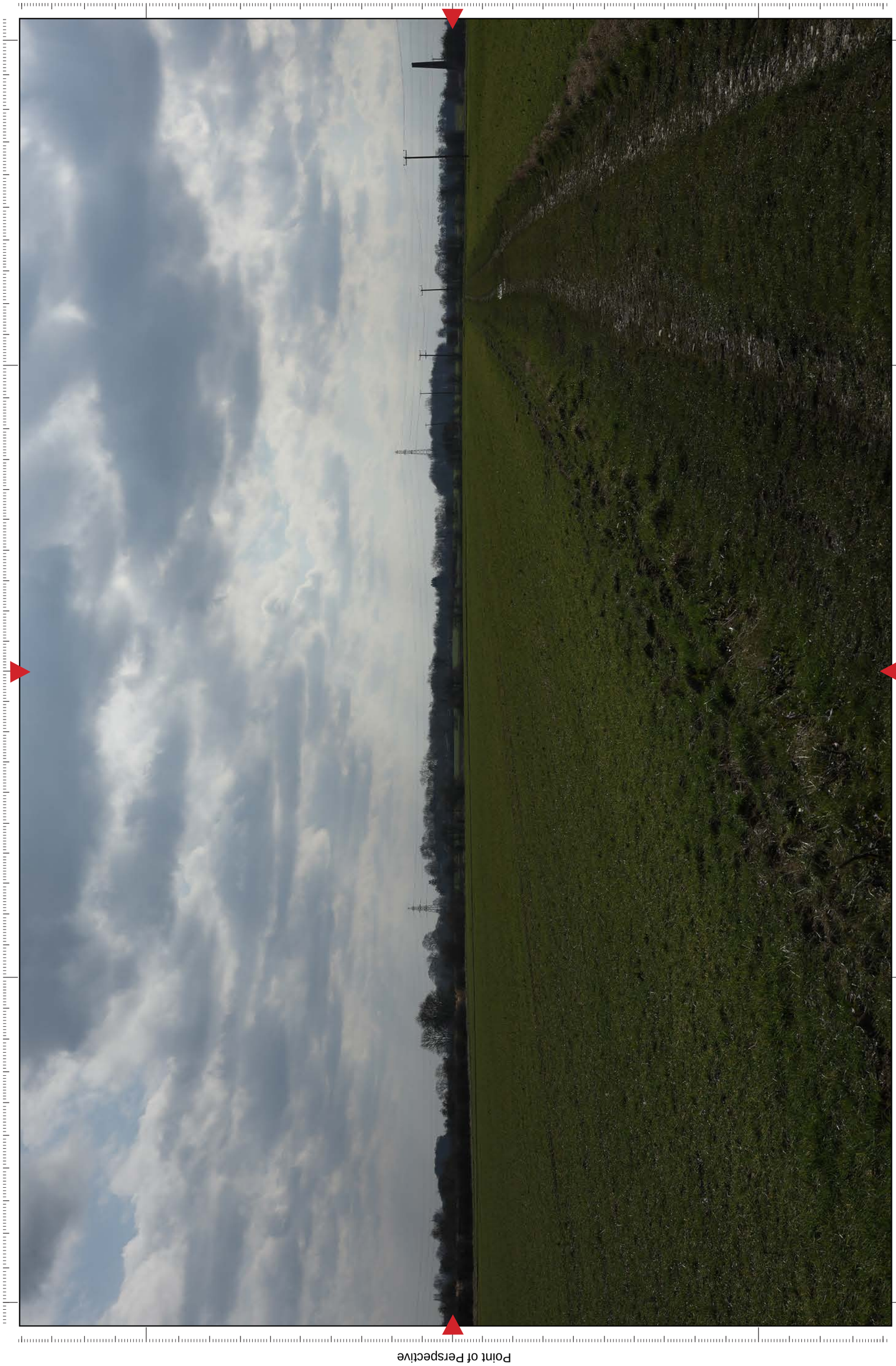
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

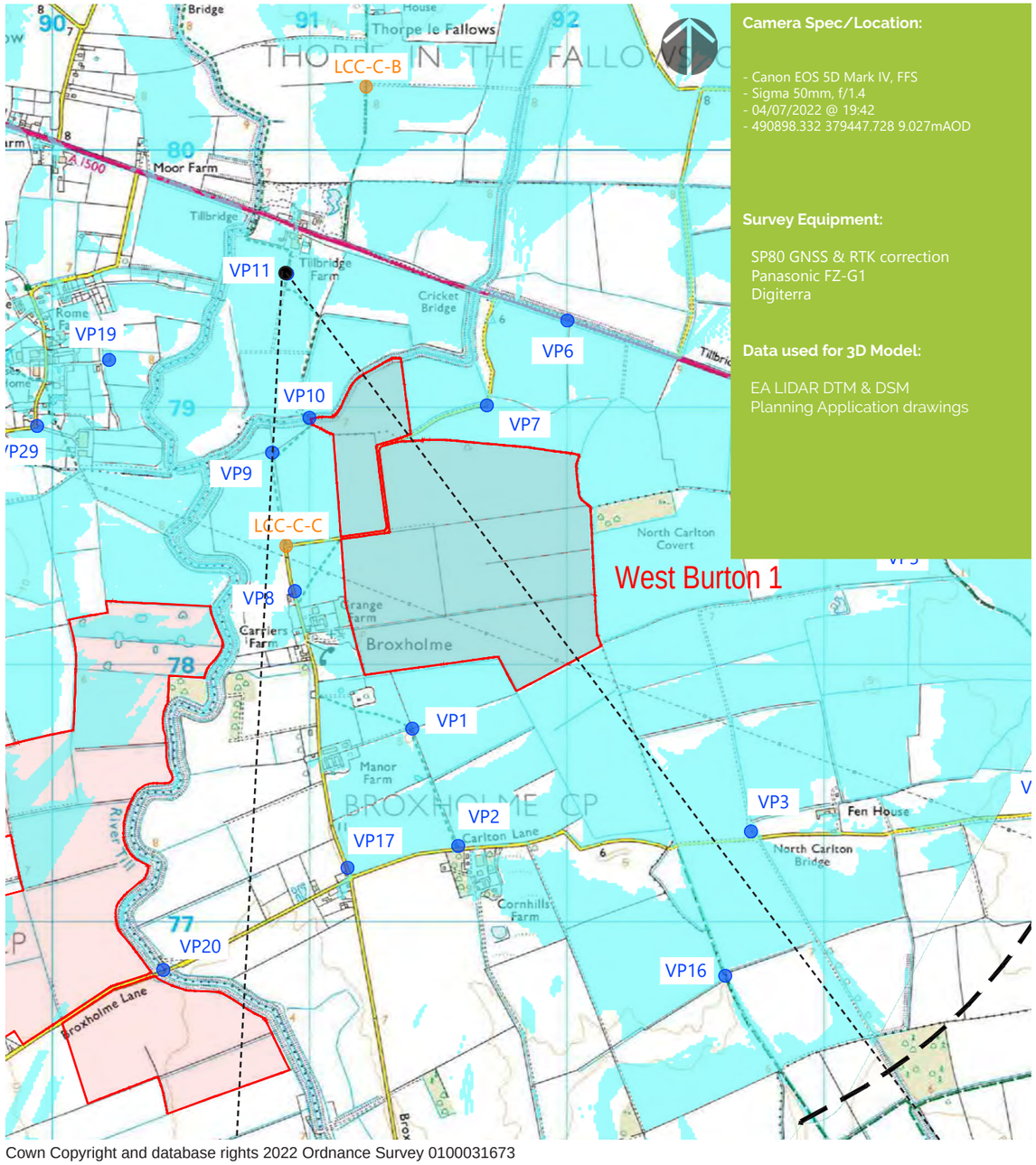
Point of Perspective

Viewpoint 11 Single Frame 50mm image (Winter)

West Burton Solar Project

Viewpoint 11 (Summer)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 04/07/2022 @ 19:42
- 490898.332 379447.728 9.027mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

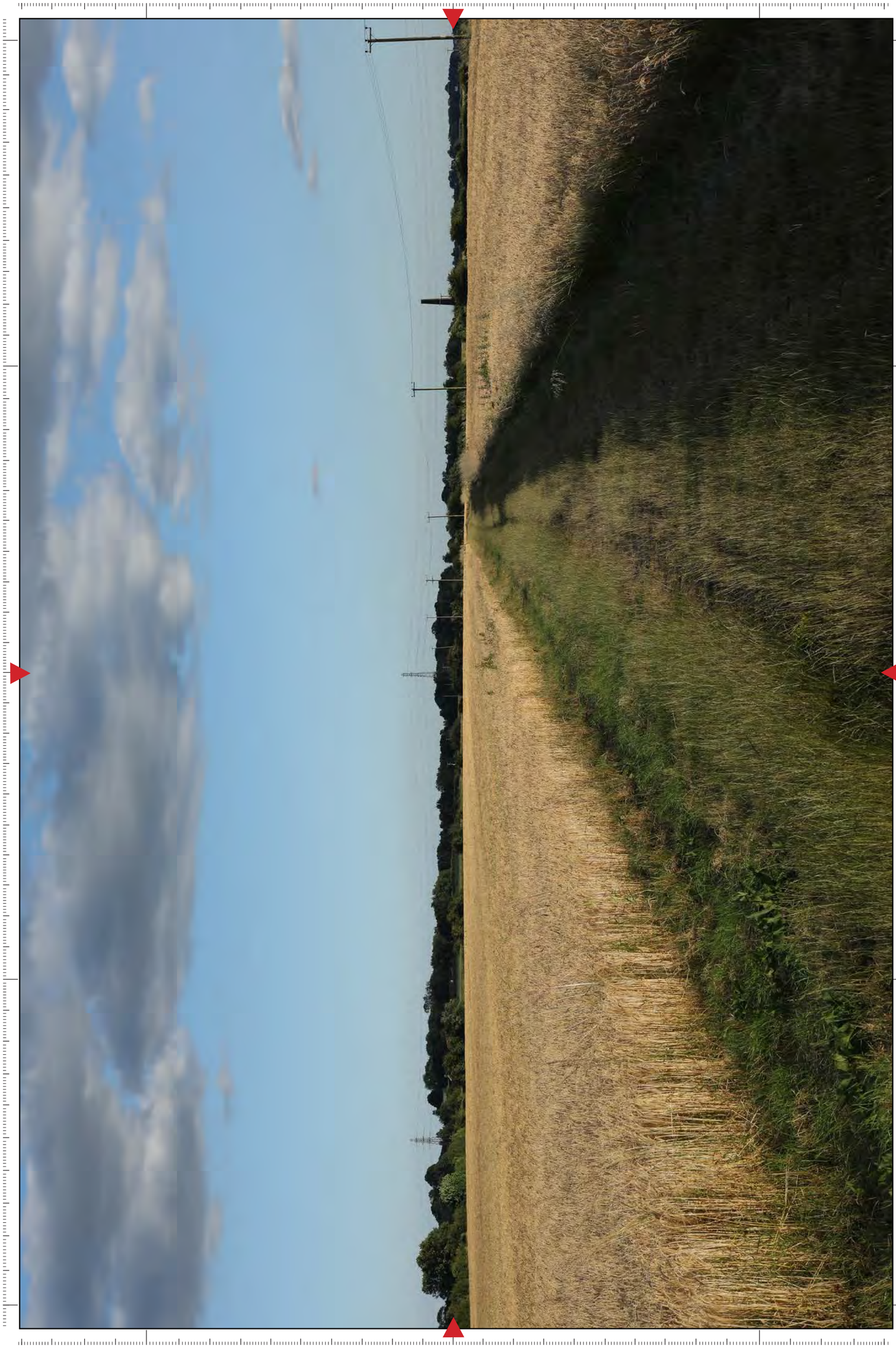
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

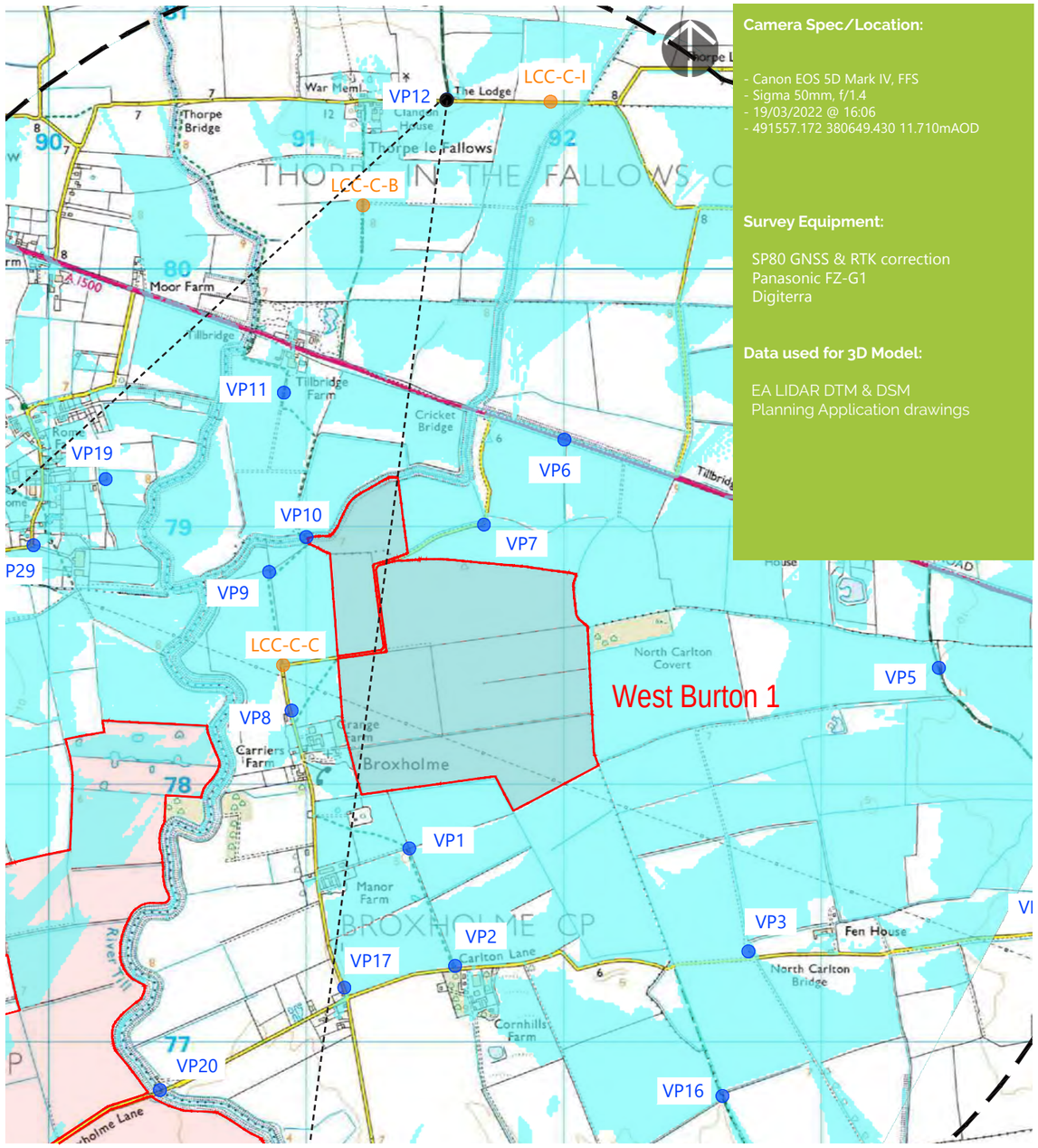
Point of Perspective

Viewpoint 11 Single Frame 50mm image (Summer)

West Burton Solar Project

Viewpoint 12 (Winter)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 19/03/2022 @ 16:06
- 491557.172 380649.430 11.710mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective

Point of Perspective

Point of Perspective

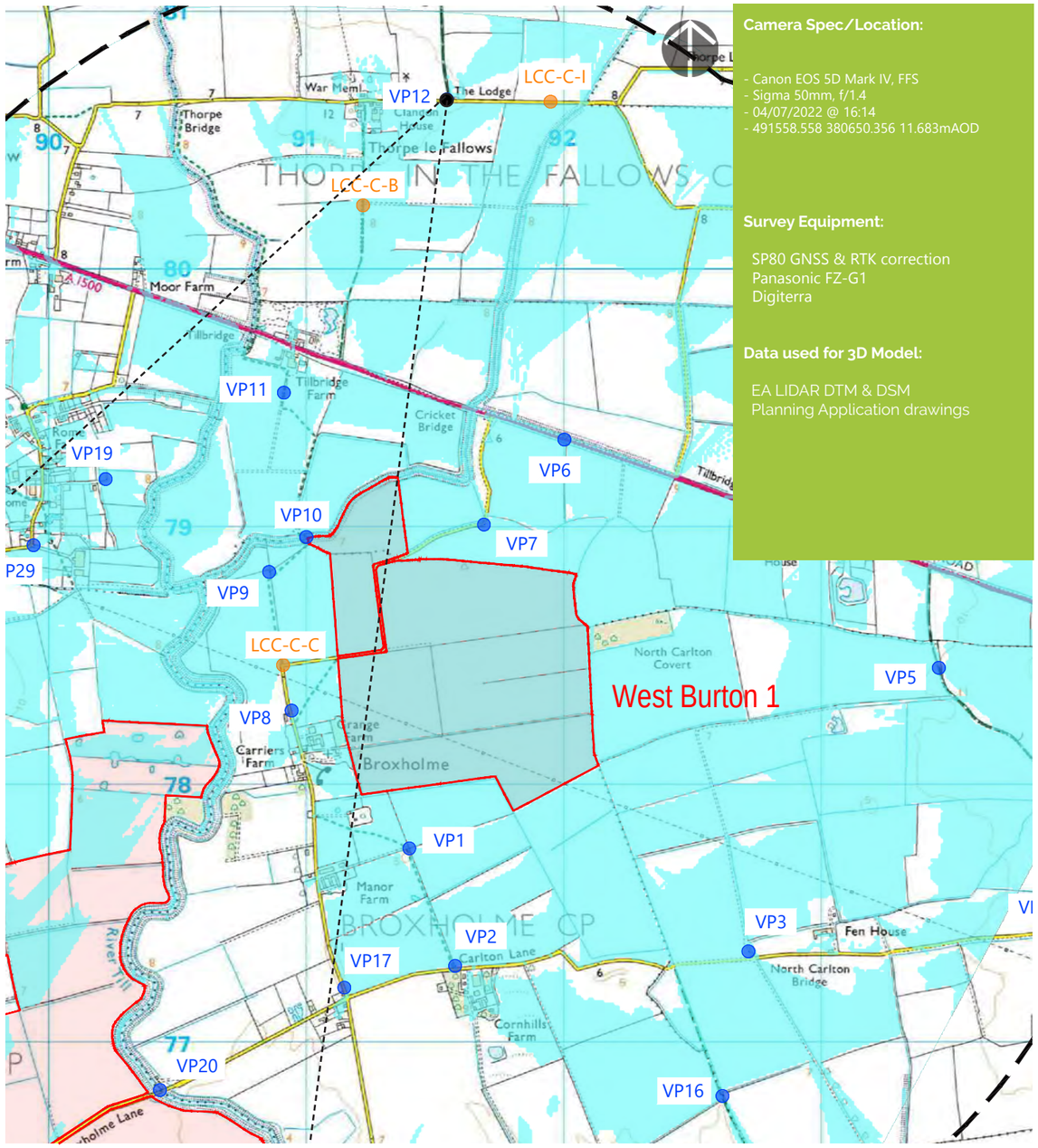
Point of Perspective

Viewpoint 12 Single Frame 50mm image (Winter)

West Burton Solar Project

Viewpoint 12 (Summer)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 04/07/2022 @ 16:14
- 491558.558 380650.356 11.683mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective

Point of Perspective

Point of Perspective

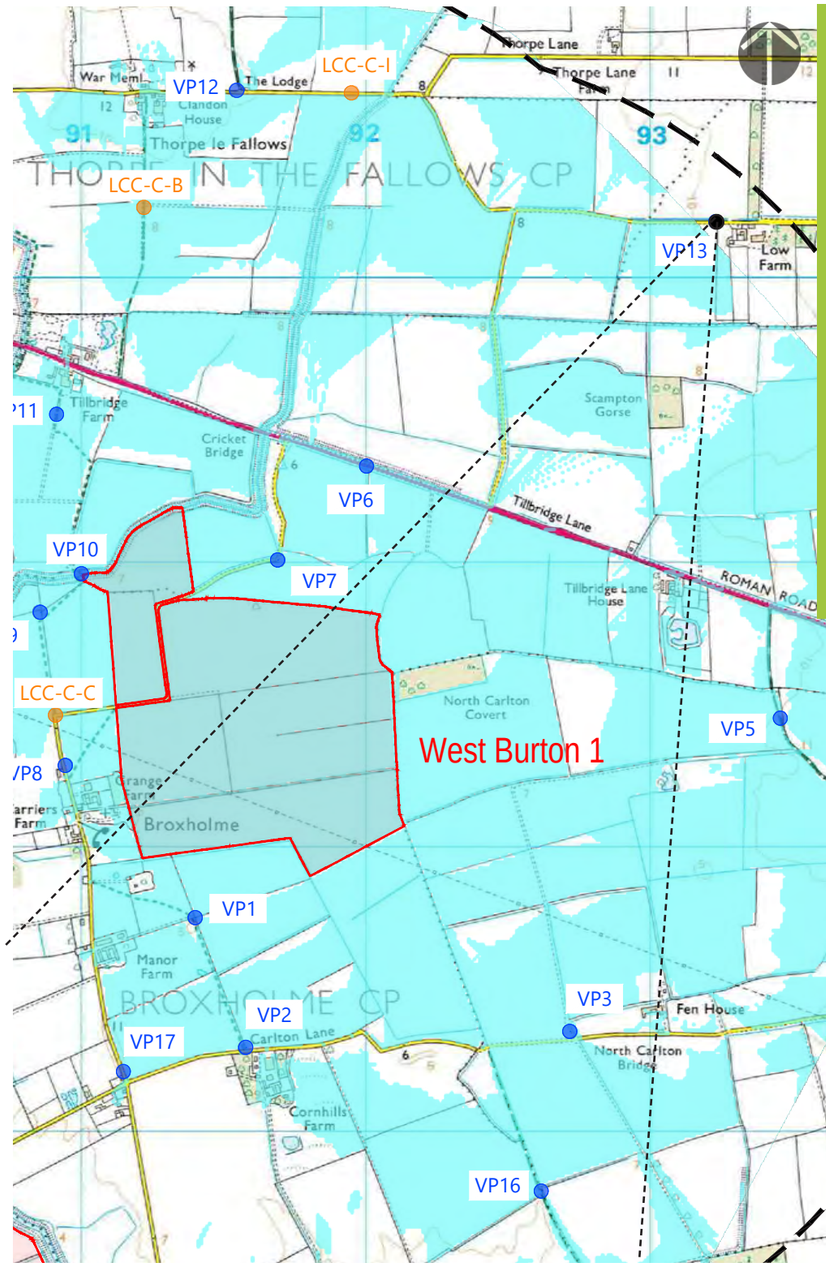
Point of Perspective

Viewpoint 12 Single Frame 50mm image (Summer)

West Burton Solar Project

Viewpoint 13 (Winter)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 08/03/2022 @ 10:36
- 493236.110 380191.625 11.993mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

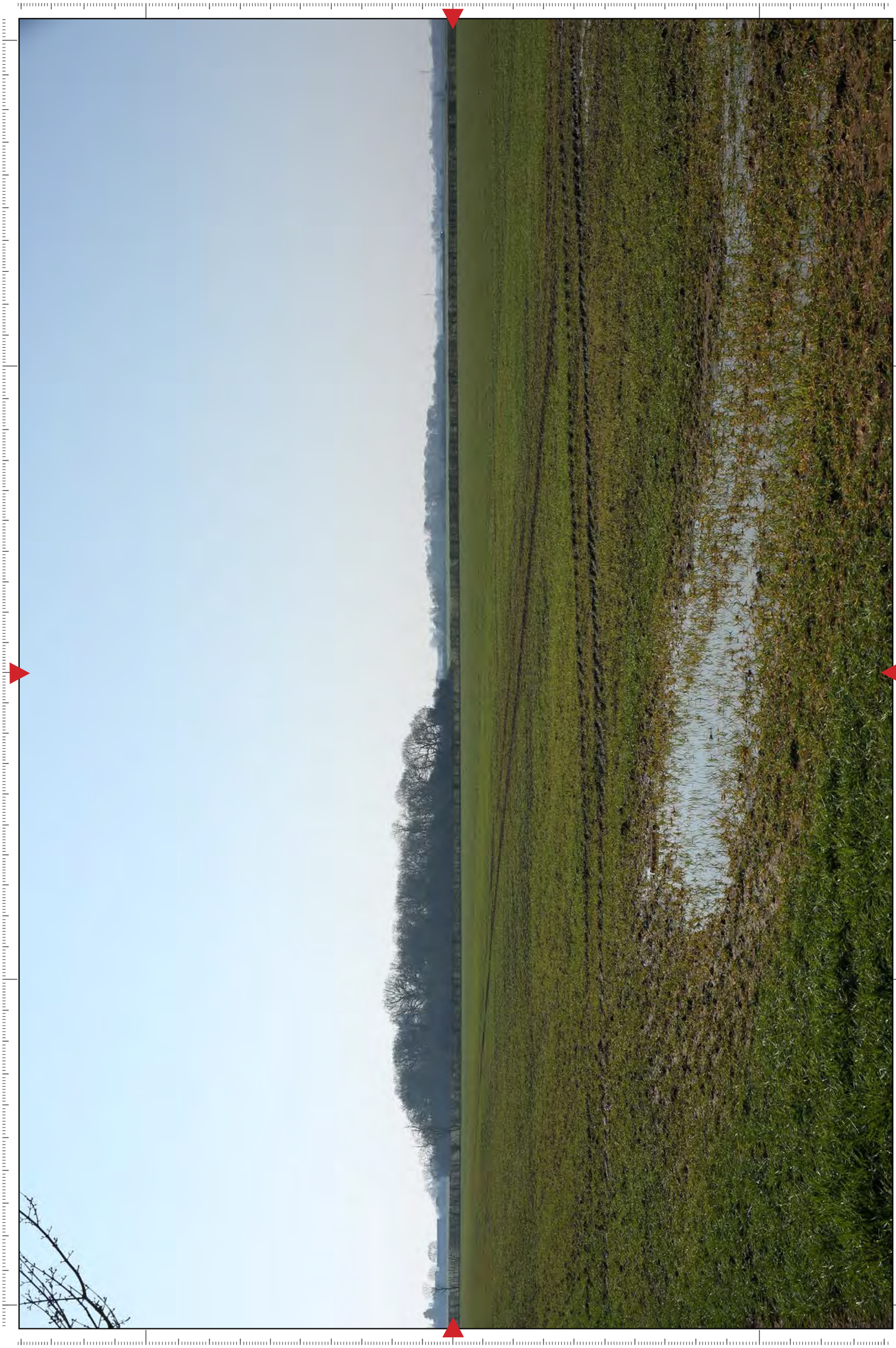
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

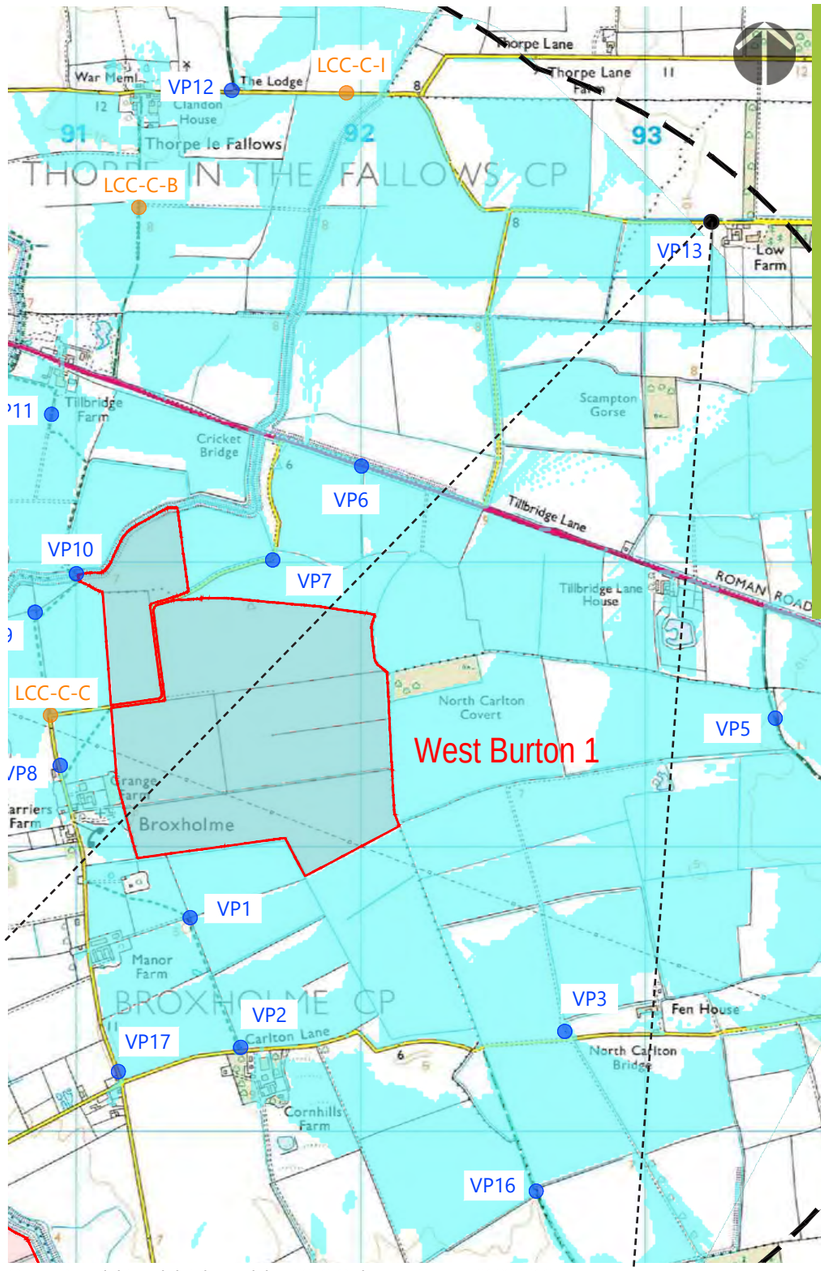
Point of Perspective

Viewpoint 13 Single Frame 50mm image (Winter)

West Burton Solar Project

Viewpoint 13 (Summer)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 04/07/2022 @ 16:42
- 493236.658 380191.908 11.985mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

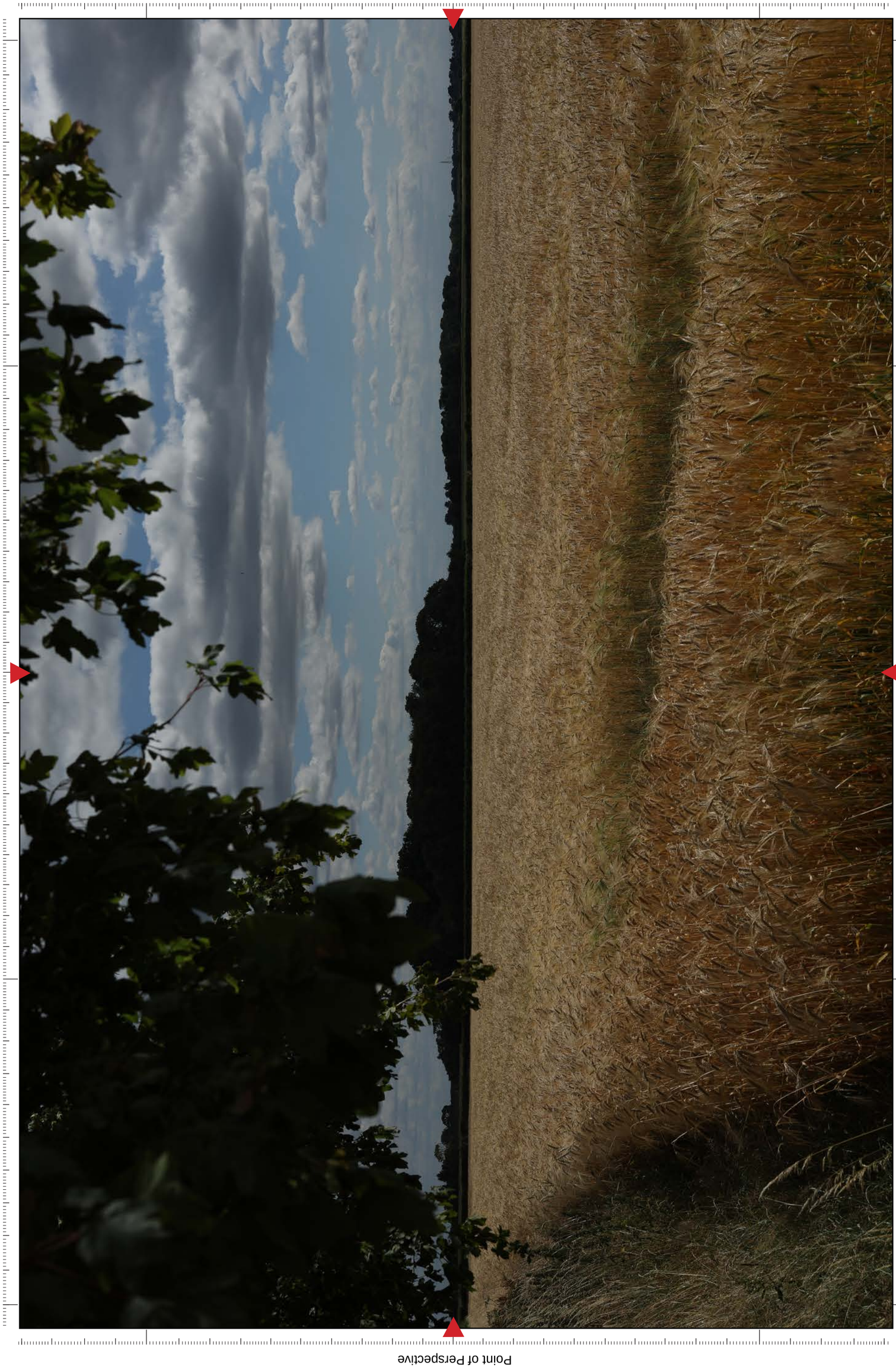
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

Point of Perspective

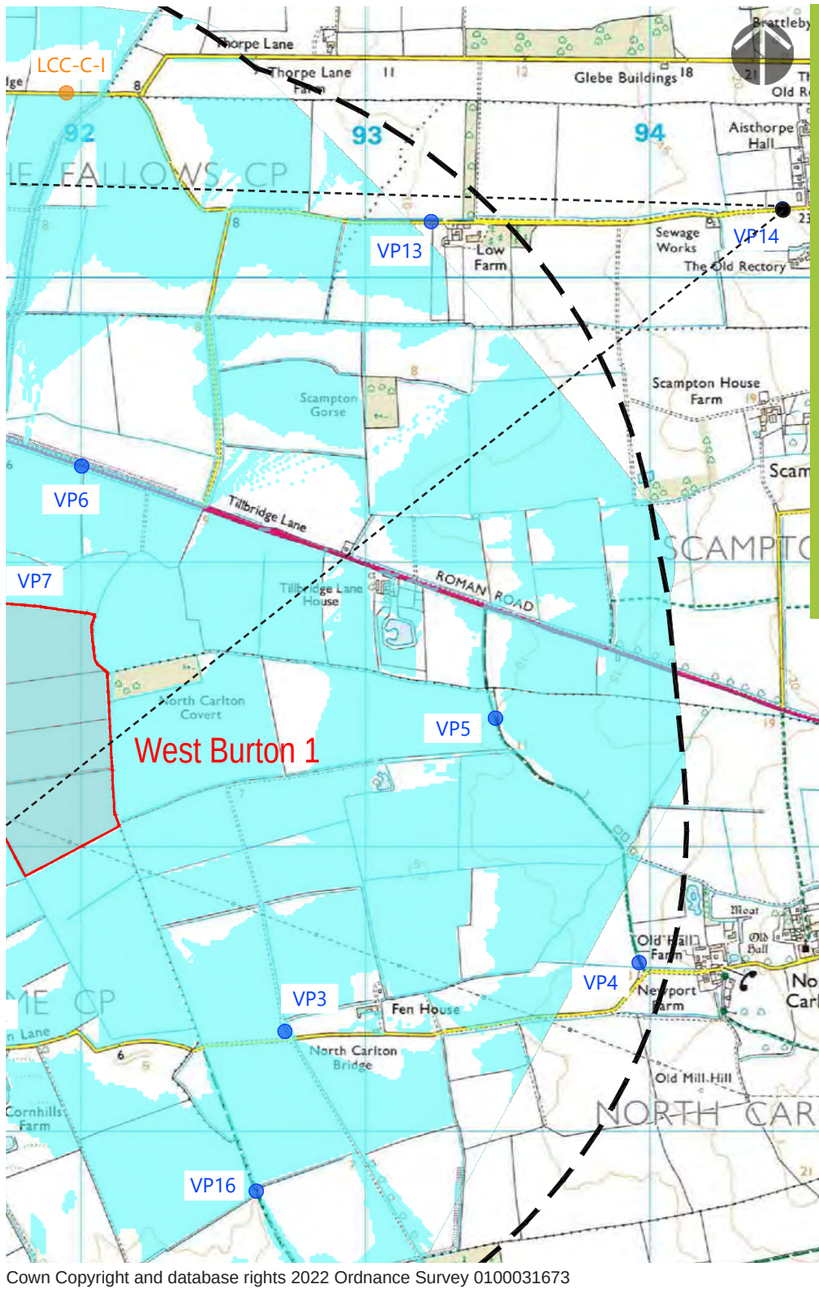
Point of Perspective

Viewpoint 13 Single Frame 50mm image (Summer)

West Burton Solar Project

Viewpoint 14 (Winter)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 08/03/2022 @ 11:04
- 494435.863 380234.860 21.000mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective

Point of Perspective

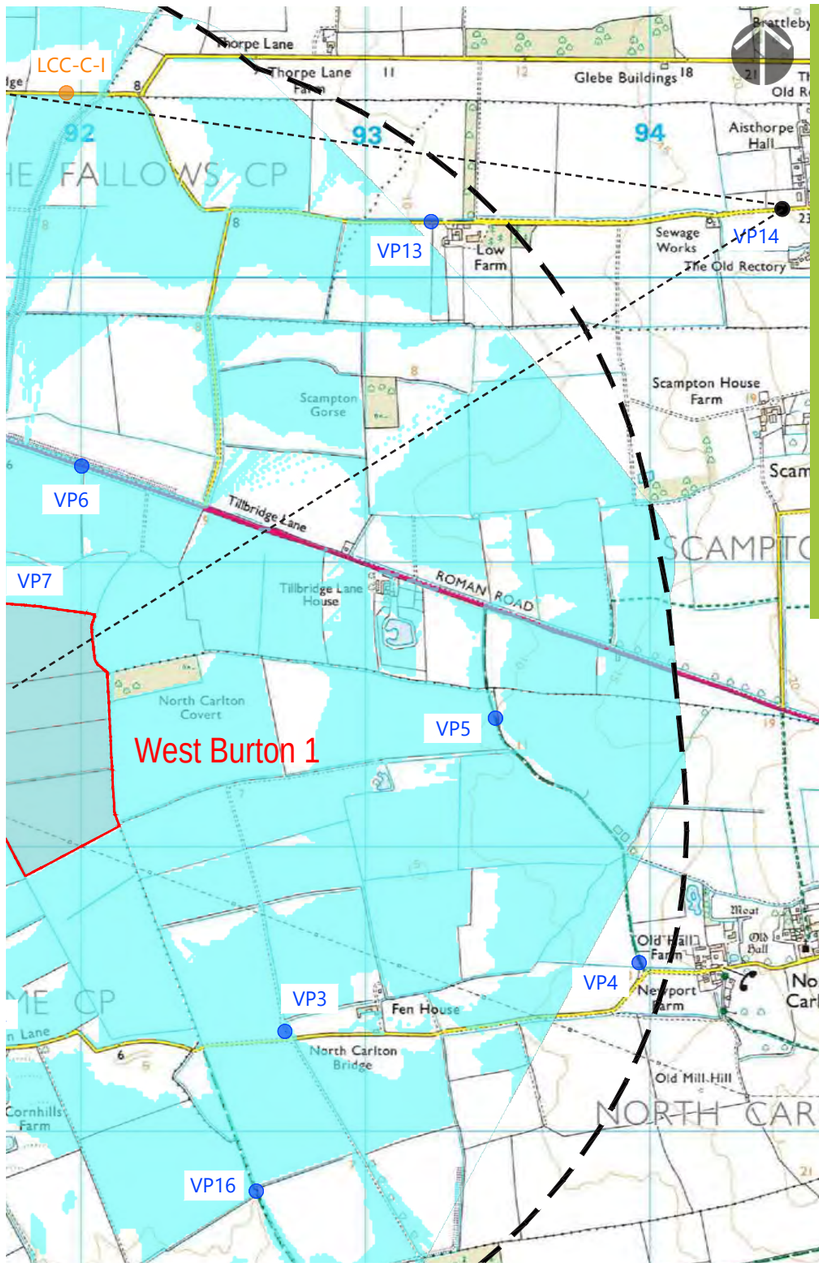
Point of Perspective

Viewpoint 14 Single Frame 50mm image (Winter)

West Burton Solar Project

Viewpoint 14 (Summer)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 04/07/2022 @ 16:56
- 494435.044 380234.868 20.901mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective

Point of Perspective

Point of Perspective

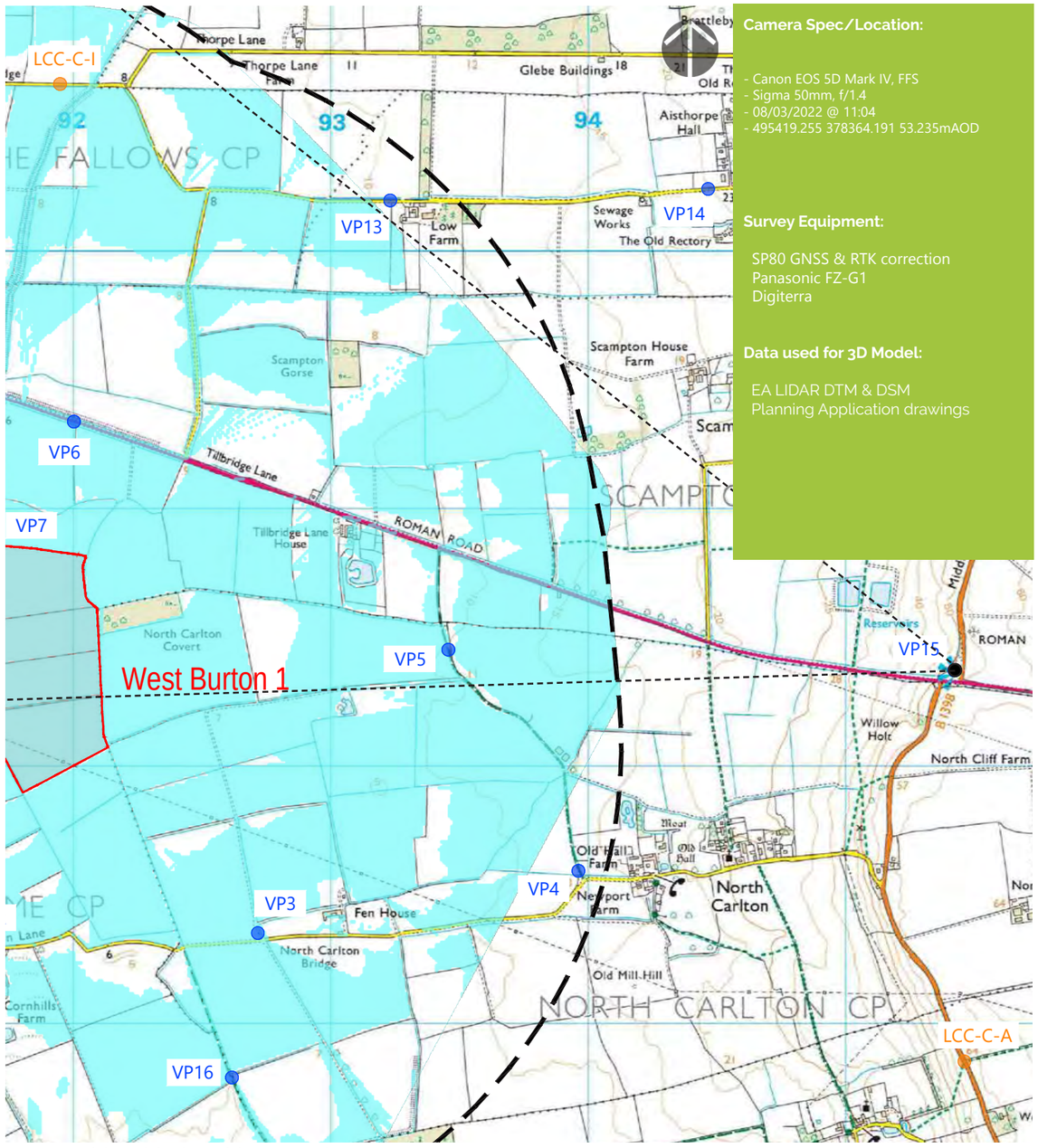
Point of Perspective

Viewpoint 14 Single Frame 50mm image (Summer)

West Burton Solar Project

Viewpoint 15 (Winter)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 08/03/2022 @ 11:04
- 495419.255 378364.191 53.235mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

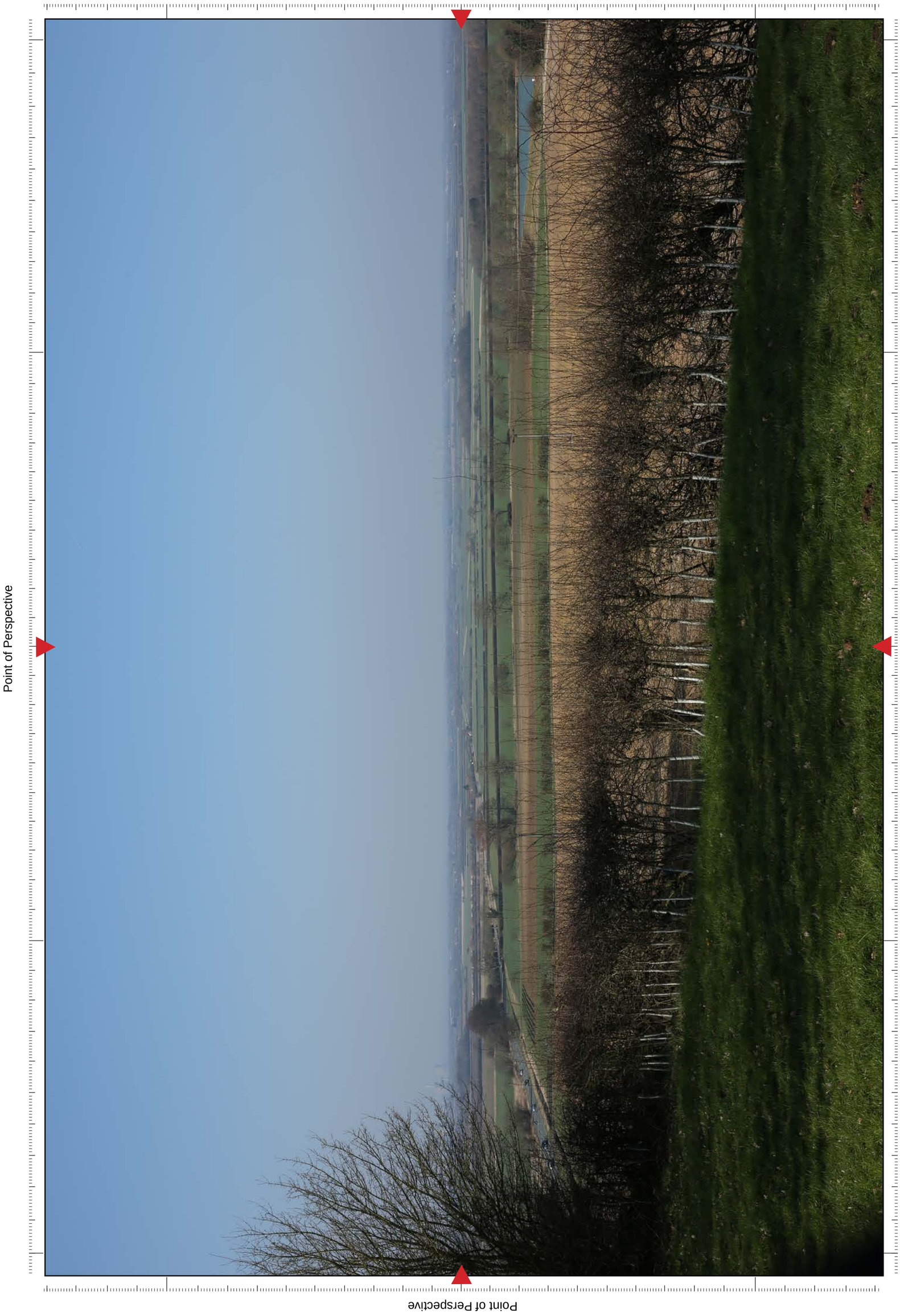
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

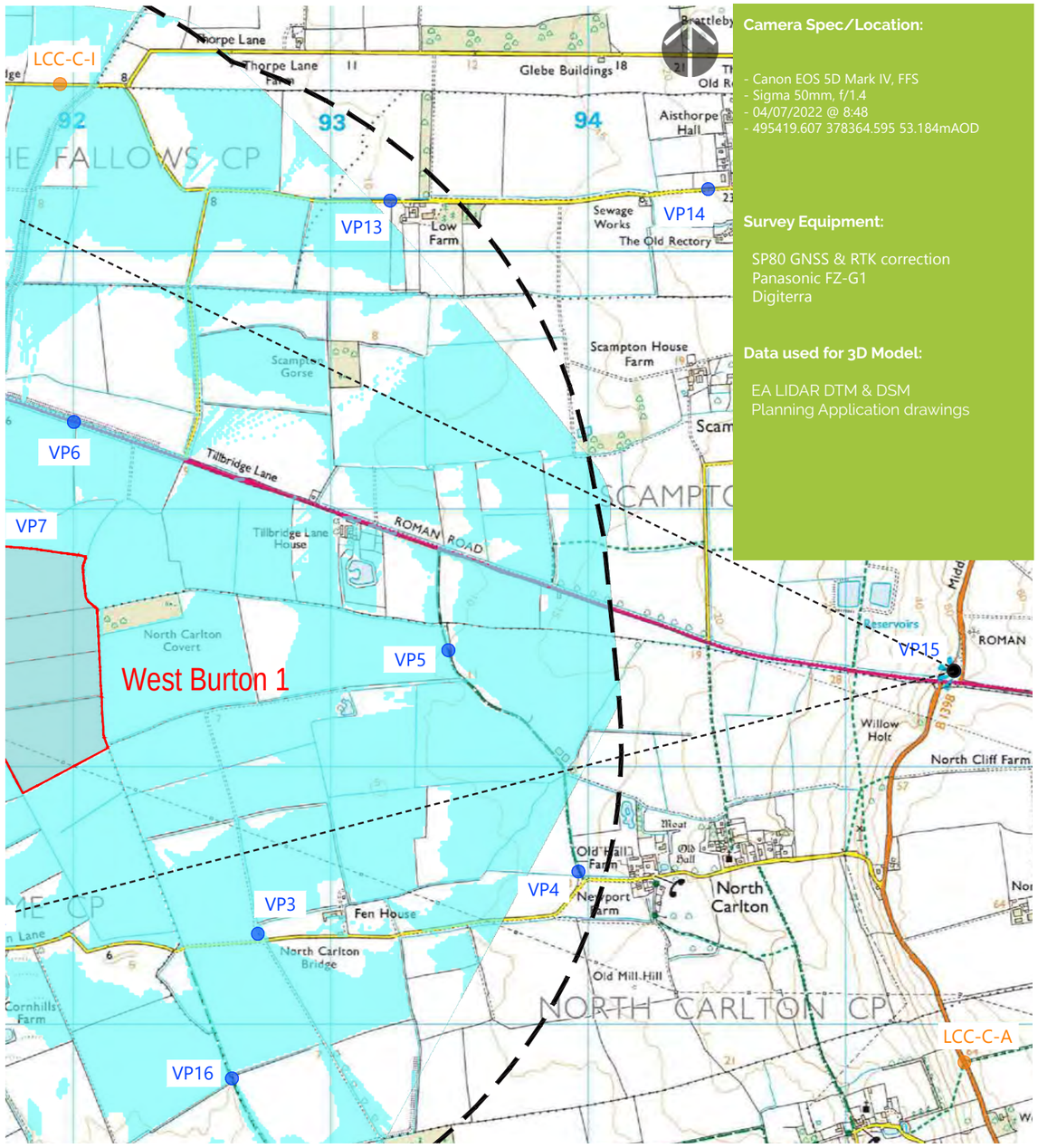
Point of Perspective

Viewpoint 15 Single Frame 50mm image (Winter)

West Burton Solar Project

Viewpoint 15 (Summer)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 04/07/2022 @ 8:48
- 495419.607 378364.595 53.184mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

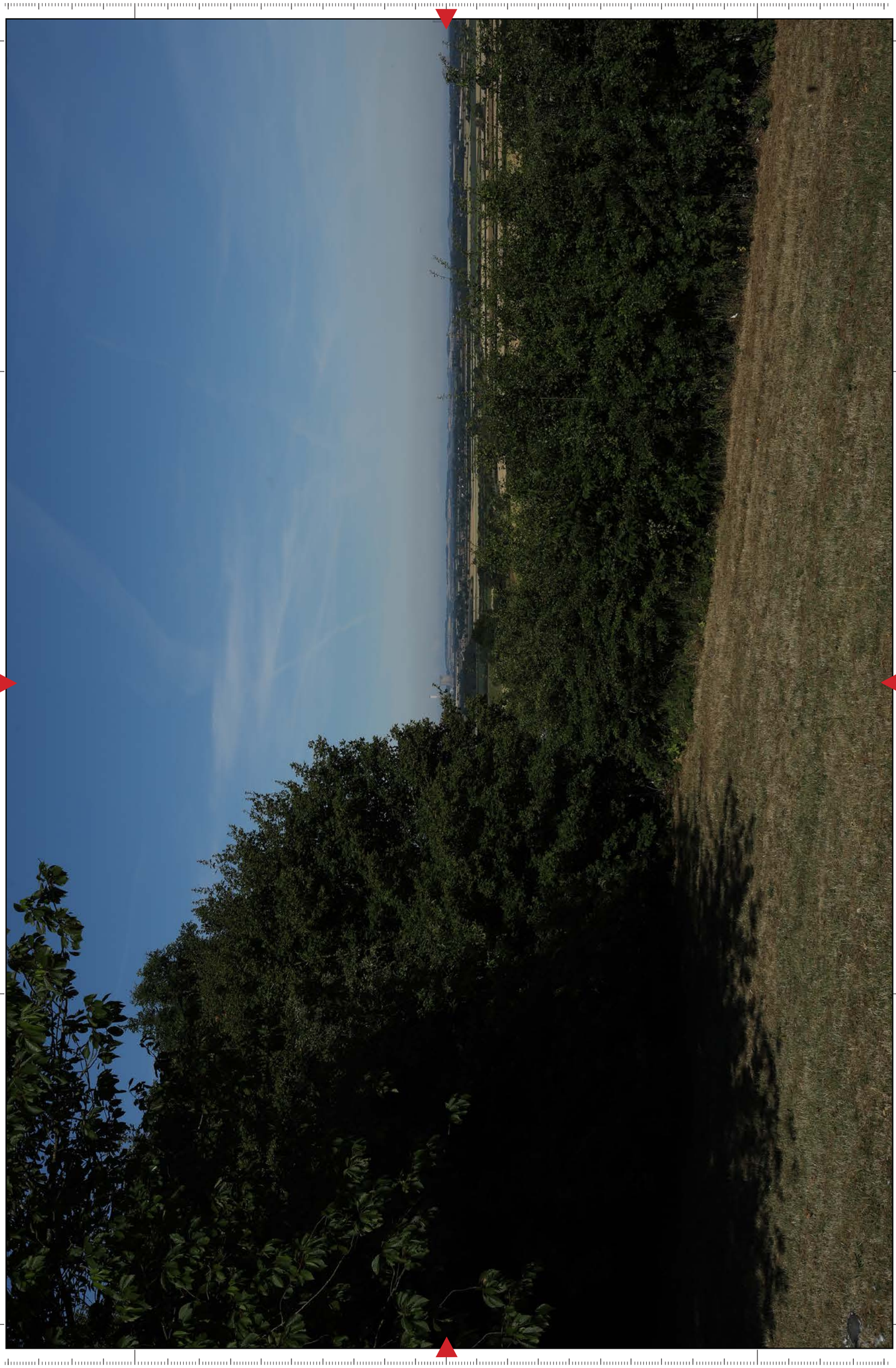
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

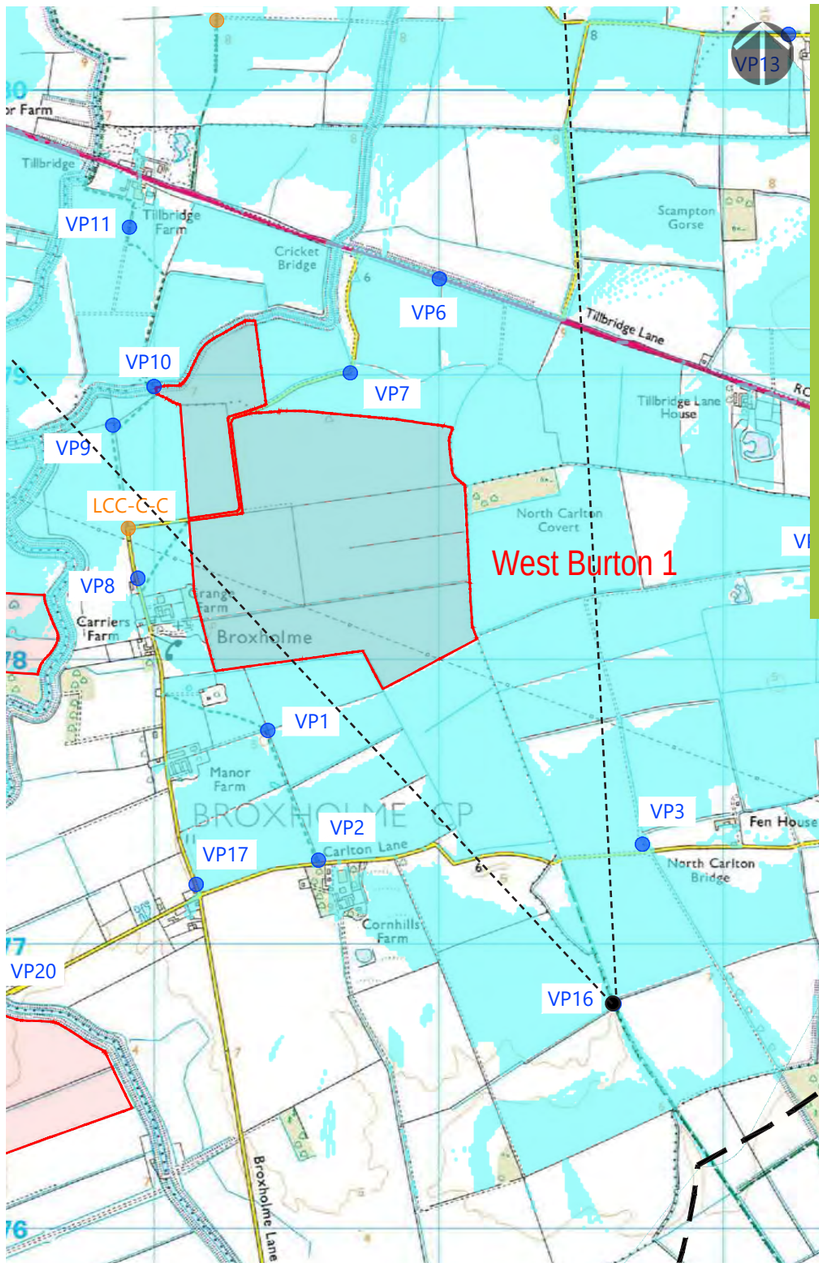
Point of Perspective

Viewpoint 15 Single Frame 50mm image (Summer)

West Burton Solar Project

Viewpoint 16 (Winter)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 08/03/2022 @ 12:39
- 492610.999 376792.374 7.087mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

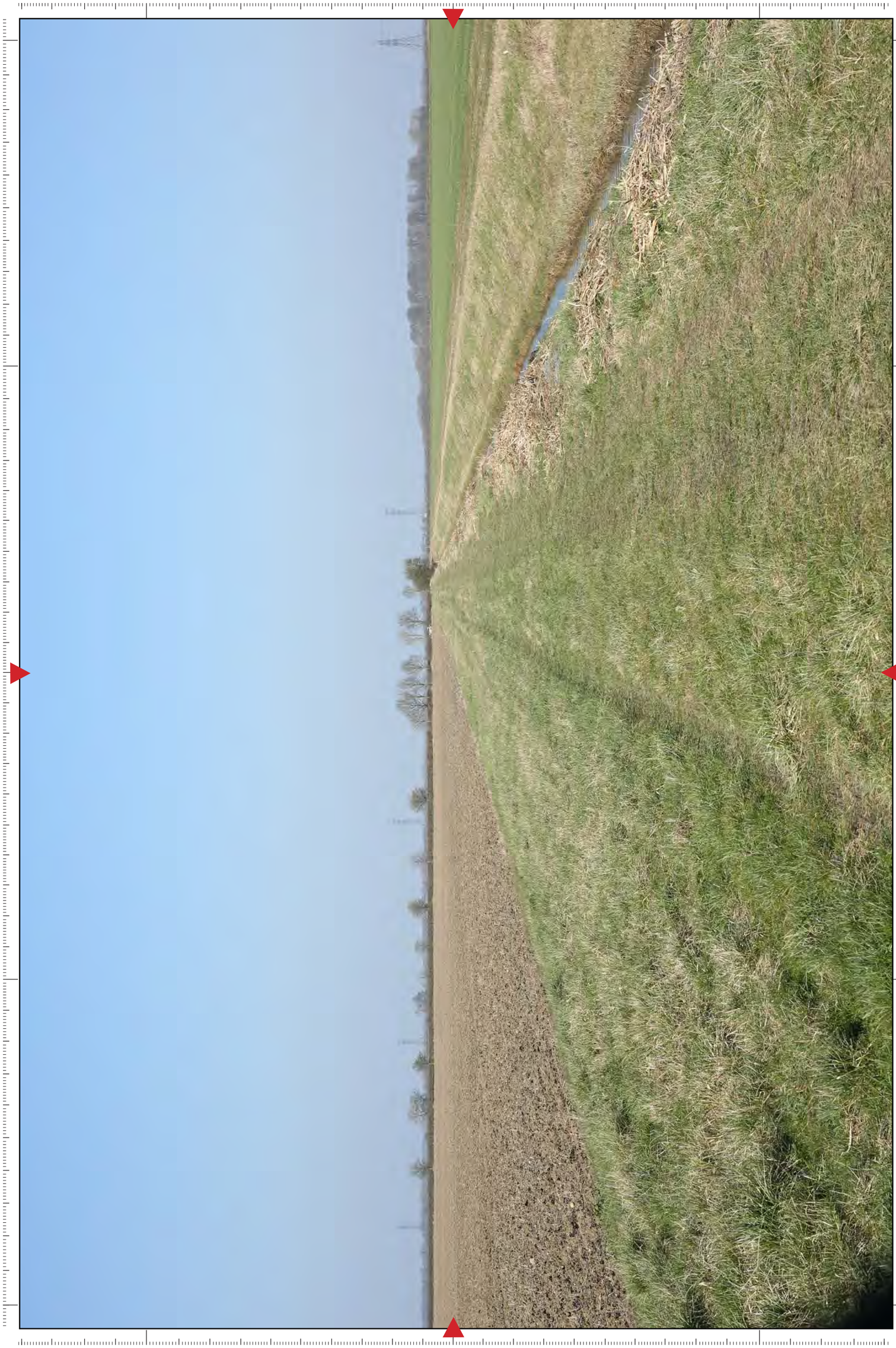
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

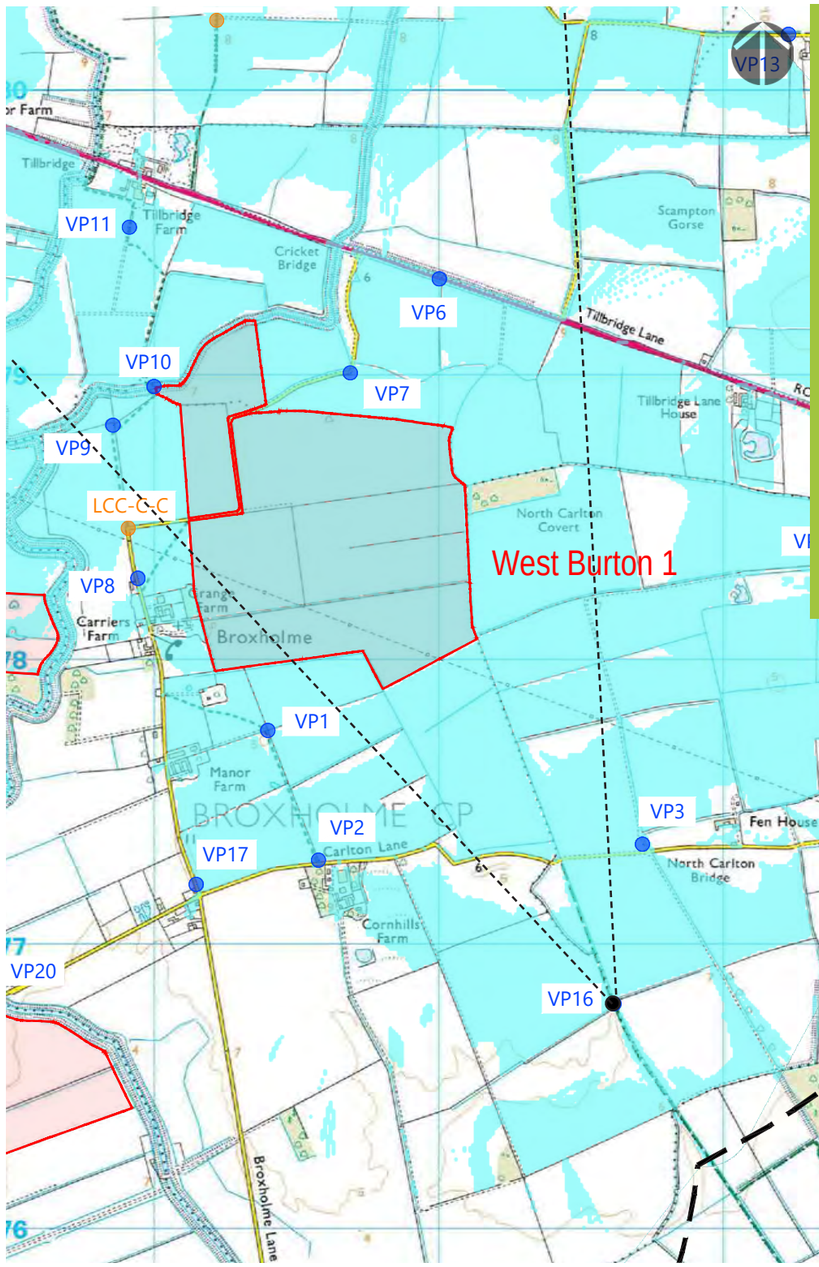
Point of Perspective

Viewpoint 16 Single Frame 50mm image (Winter)

West Burton Solar Project

Viewpoint 16 (Summer)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 04/07/2022 @ 9:30
- 492610.443 376791.653 6.537mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

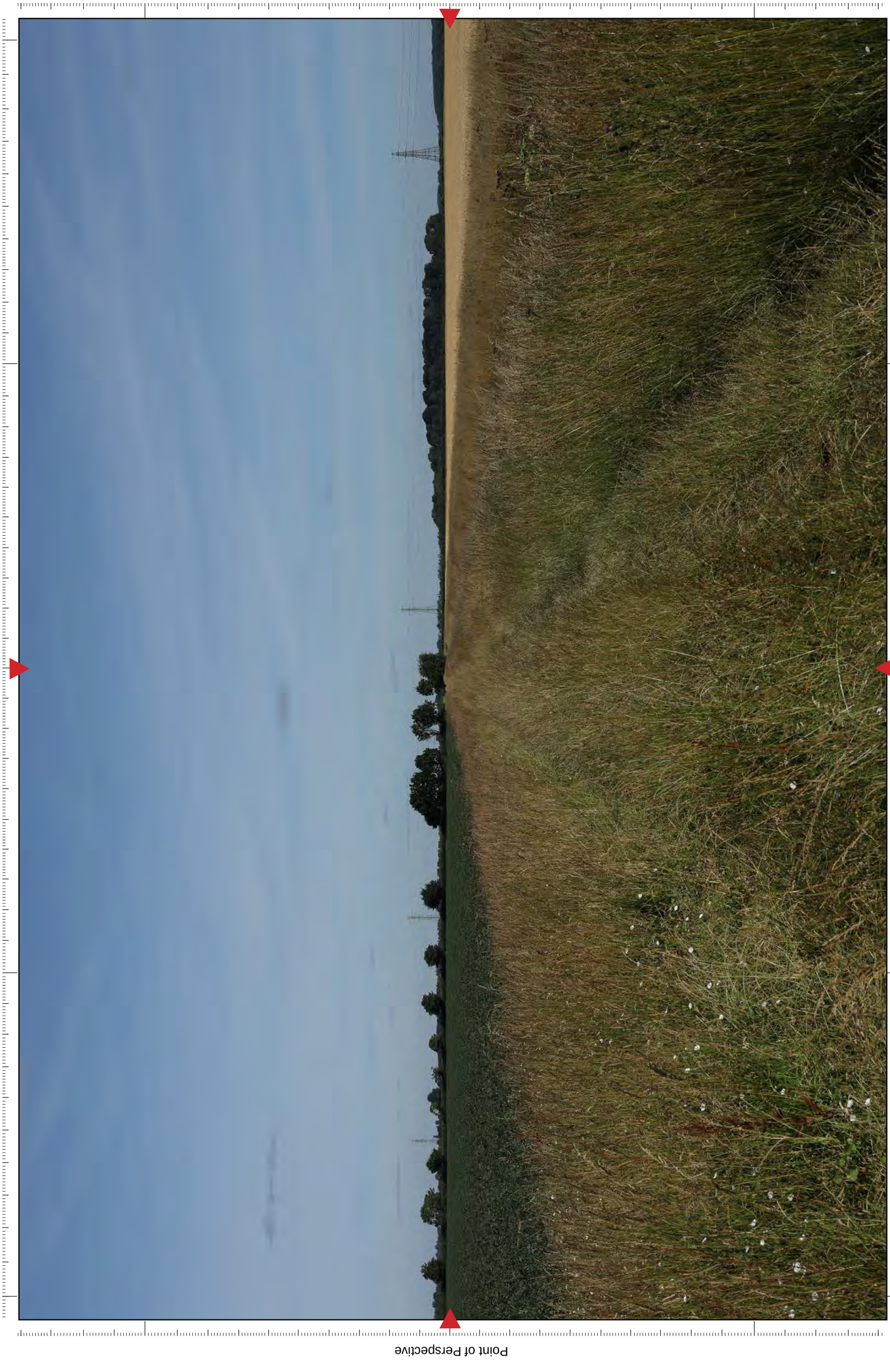
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

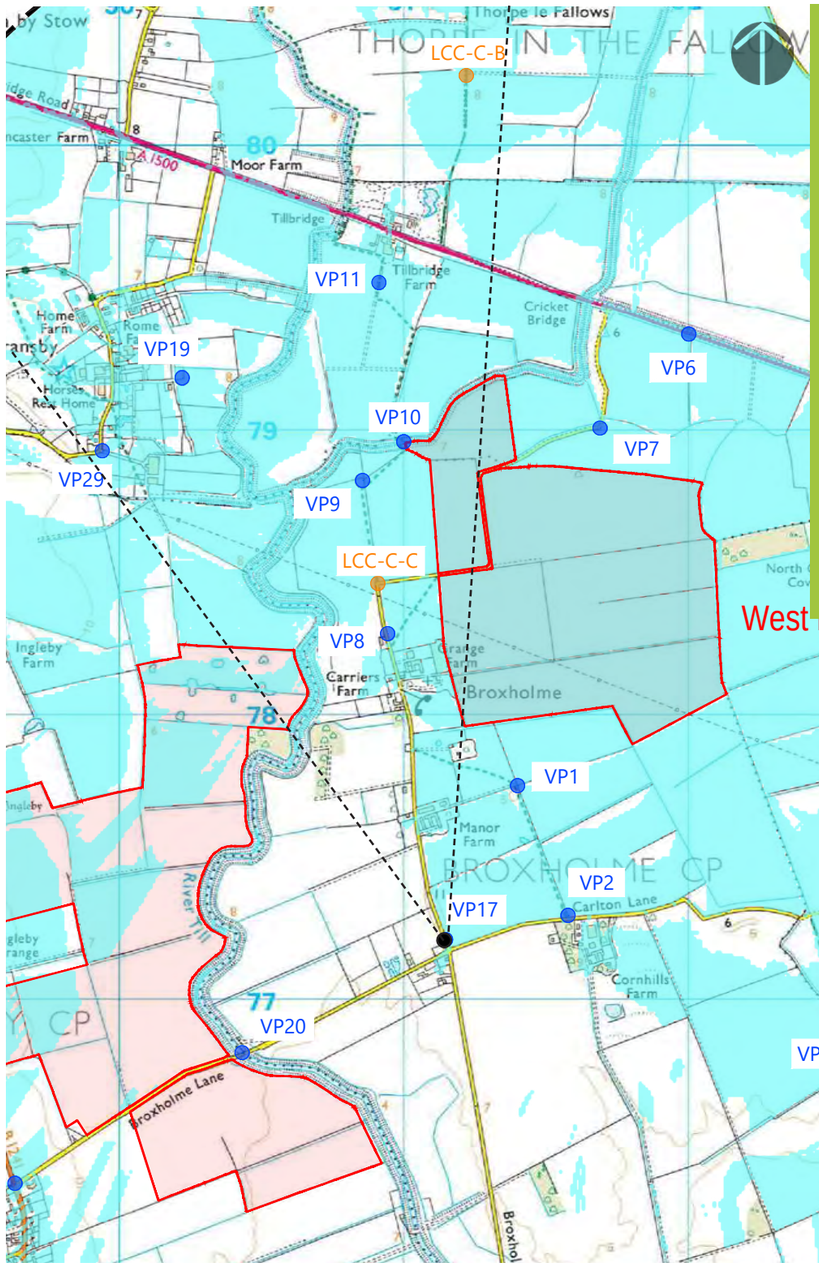
Point of Perspective

Viewpoint 16 Single Frame 50mm image (Summer)

West Burton Solar Project

Viewpoint 17 (Winter)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 09/03/2022 @ 10:41
- 491149.911 377202.531 11.991mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

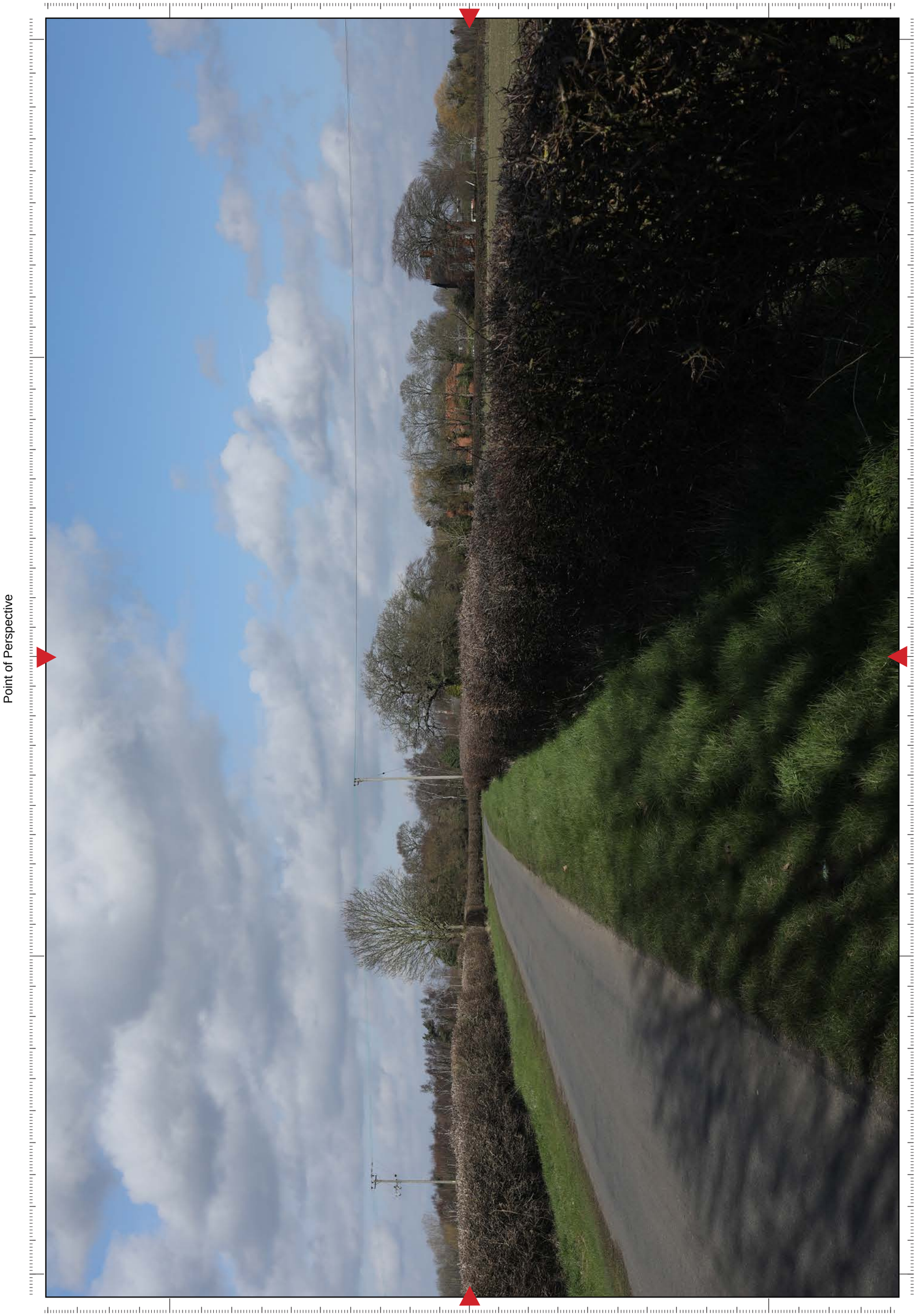
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

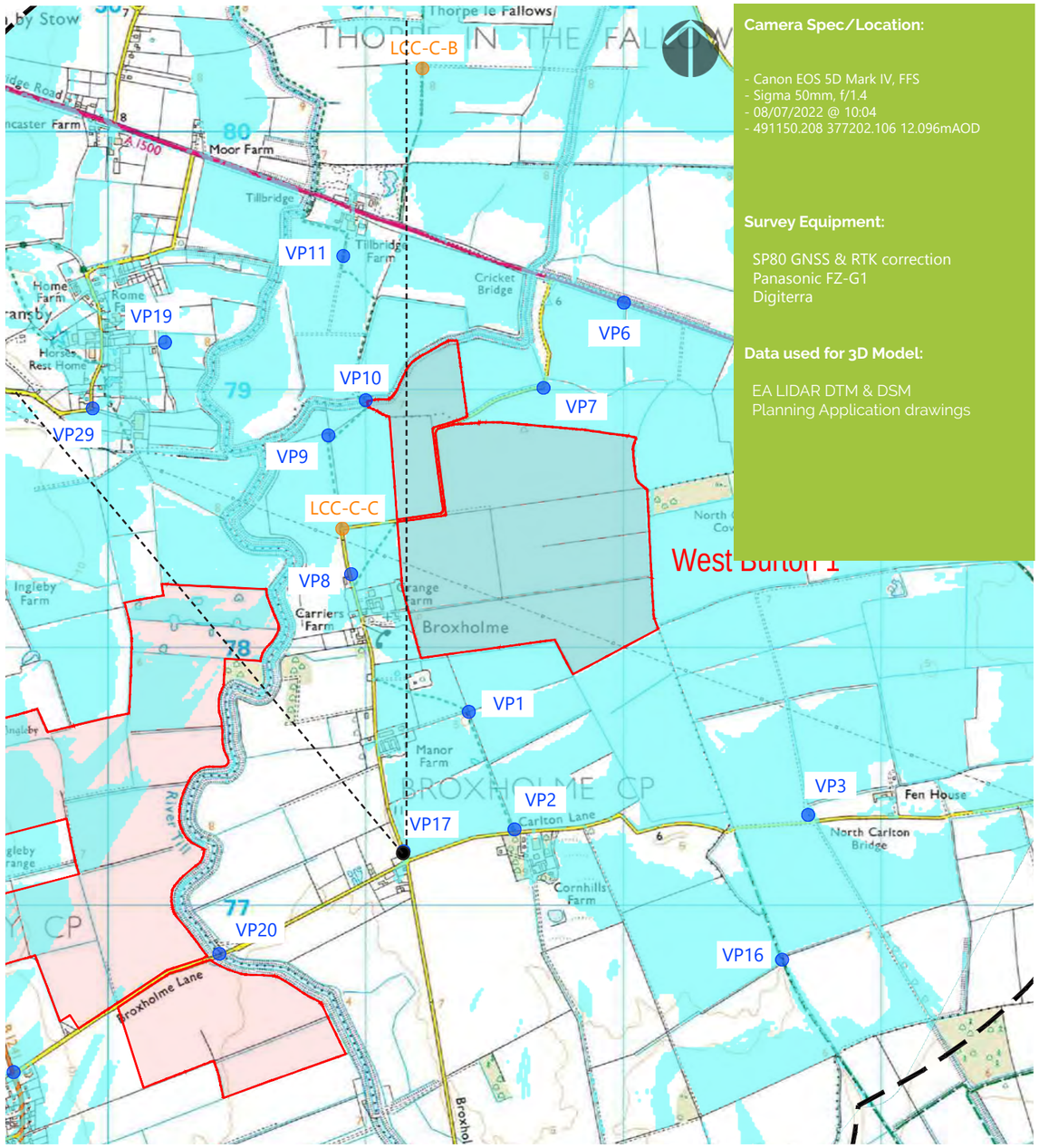
Point of Perspective

Viewpoint 17 Single Frame 50mm image (Winter)

West Burton Solar Project

Viewpoint 17 (Summer)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 08/07/2022 @ 10:04
- 491150.208 377202.106 12.096mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective

Point of Perspective

Point of Perspective

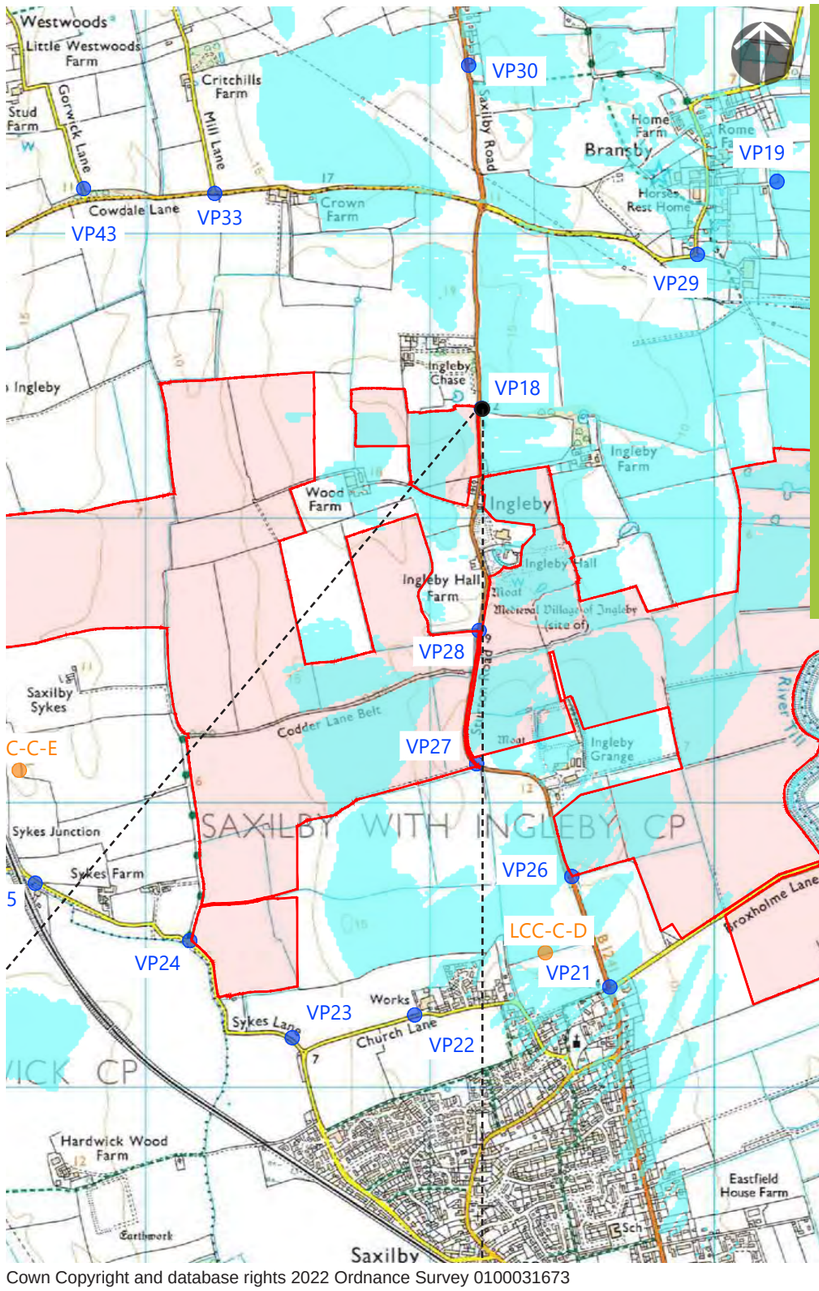
Point of Perspective

Viewpoint 17 Single Frame 50mm image (Summer)

West Burton Solar Project

Viewpoint 18 (Winter)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 19/03/2022 @ 16:50
- 489181.298 378394.937 13.859mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective

Point of Perspective

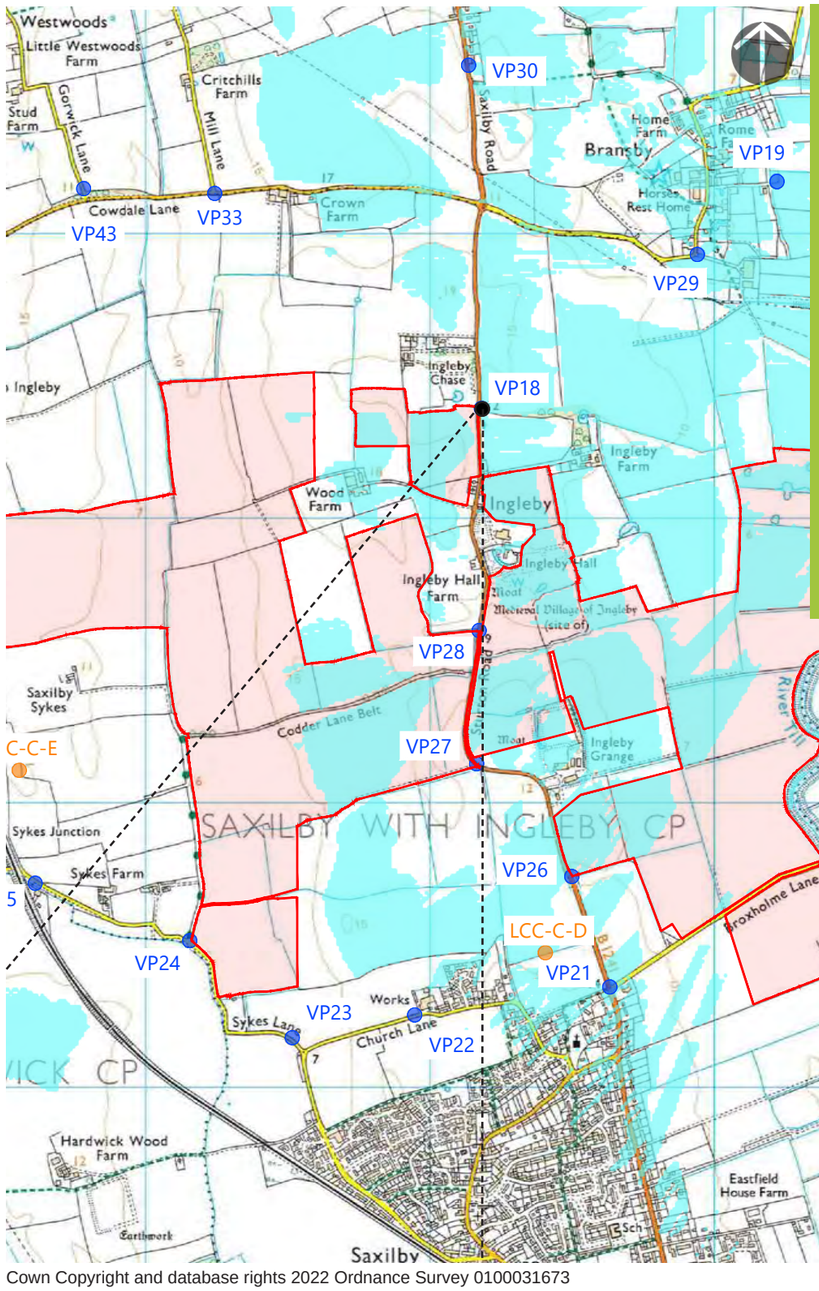
Point of Perspective

Viewpoint 18 Single Frame 50mm image (Winter)

West Burton Solar Project

Viewpoint 18 (Summer)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 08/07/2022 @ 12:23
- 489181.653 378395.681 13.896mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective

Point of Perspective

Point of Perspective

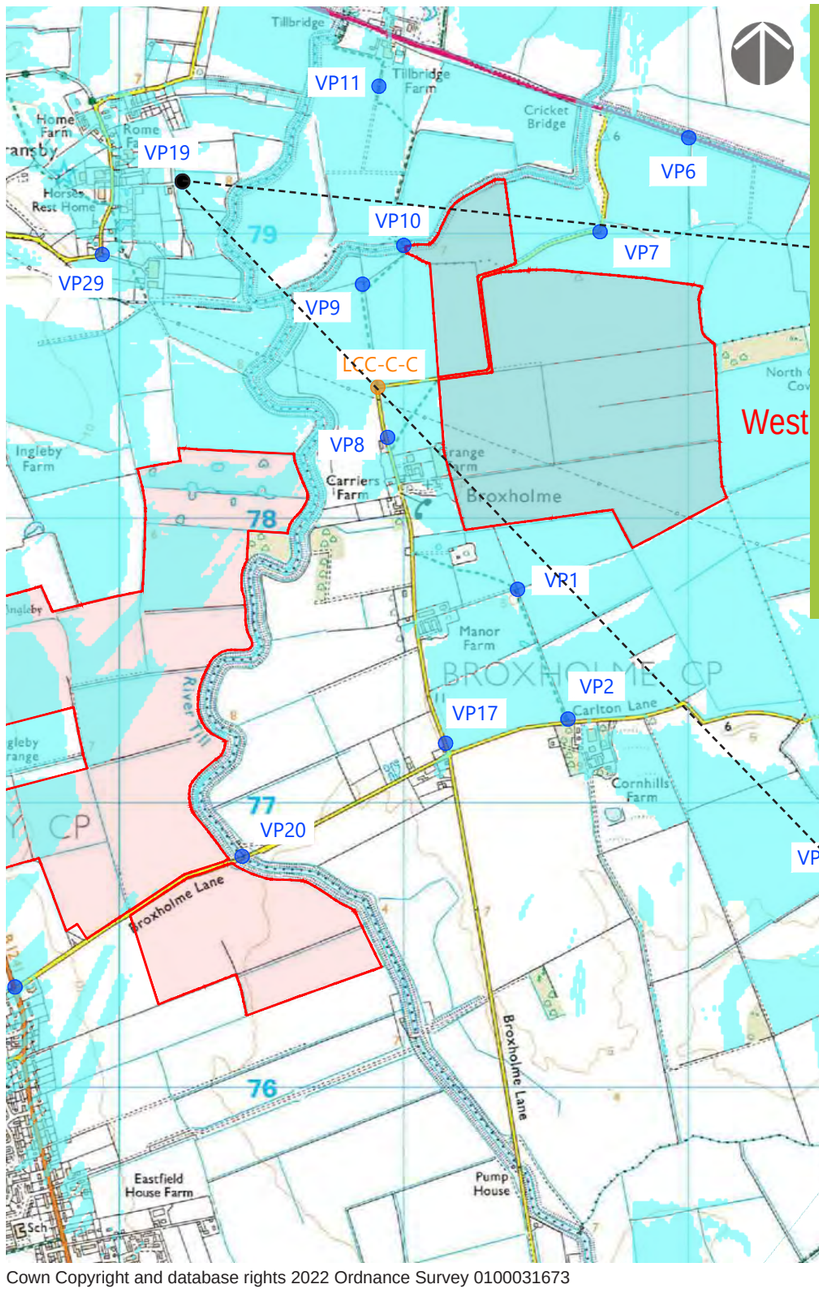
Point of Perspective

Viewpoint 18 Single Frame 50mm image (Summer)

West Burton Solar Project

Viewpoint 19 (Winter)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 19/03/2022 @ 16:30
- 490197.934 379171.458 7.685mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

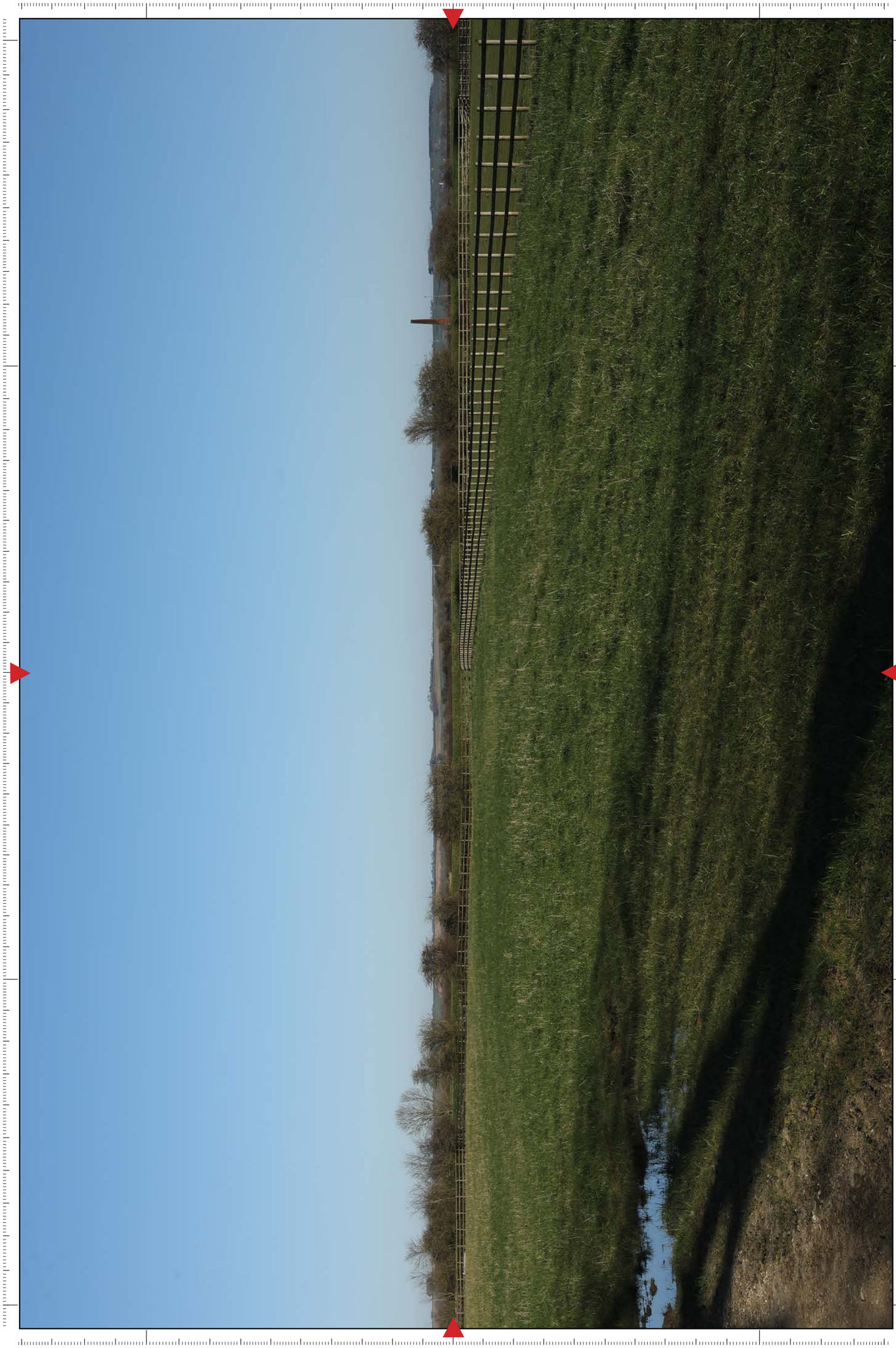
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

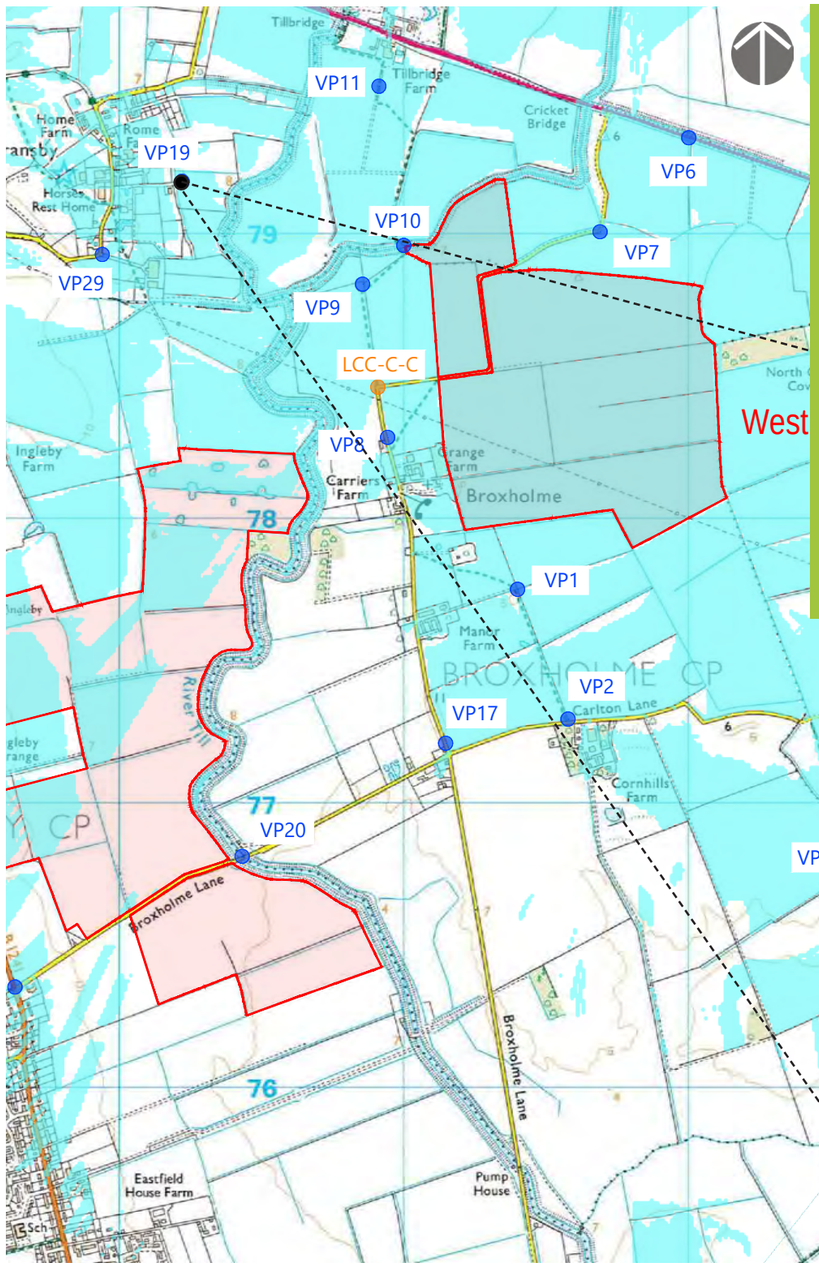
Point of Perspective

Viewpoint 19 Single Frame 50mm image (Winter)

West Burton Solar Project

Viewpoint 19 (Summer)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 04/07/2022 @ 15:27
- 490197.911 379171.351 7.65mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

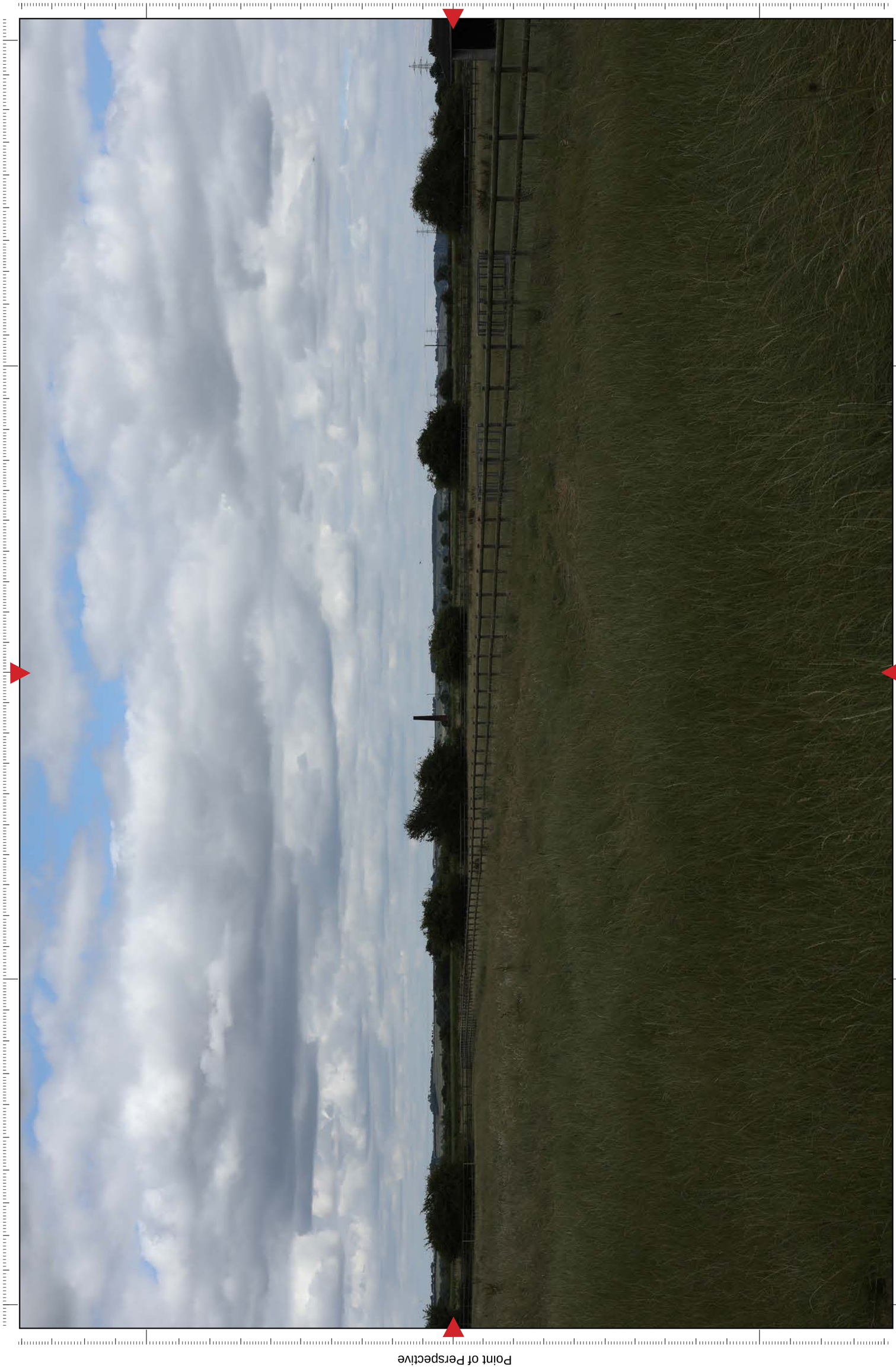
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

Point of Perspective

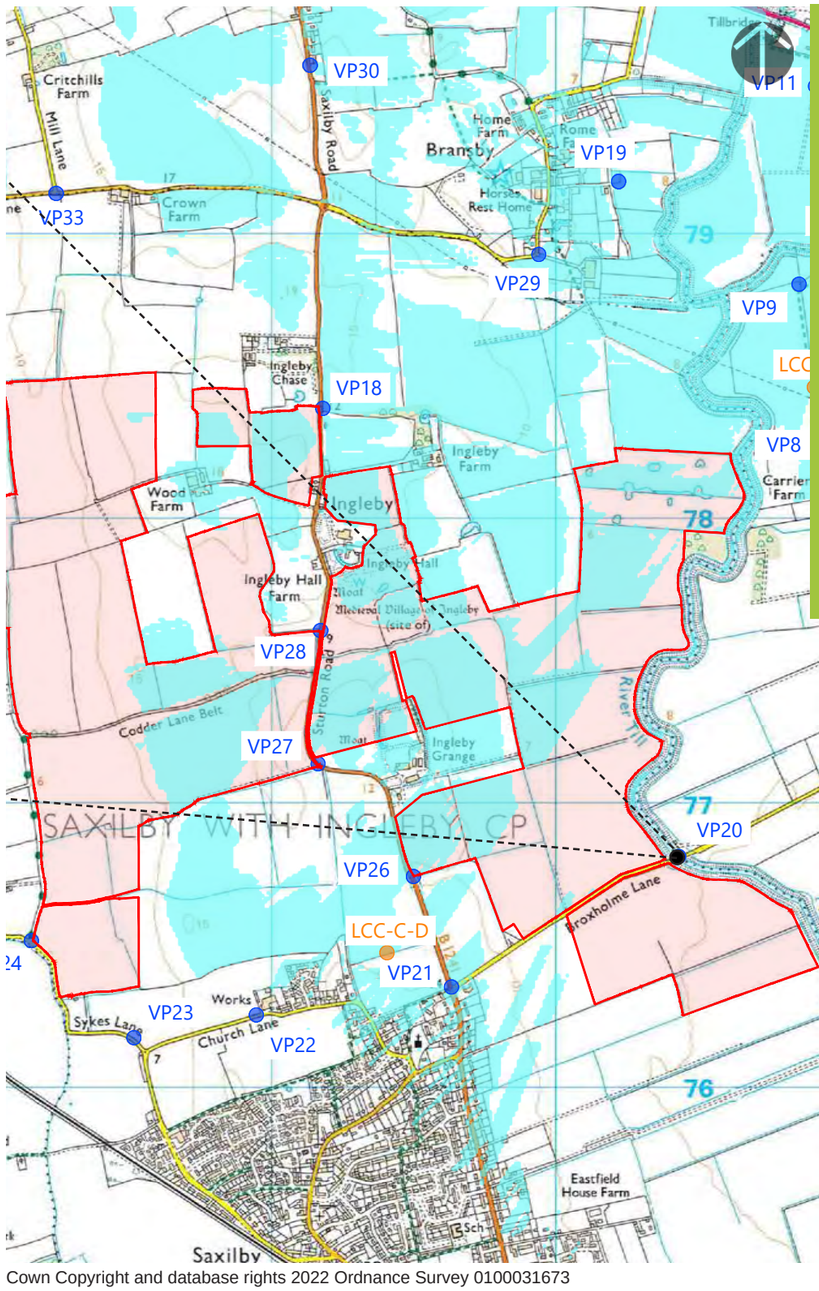
Point of Perspective

Viewpoint 19 Single Frame 50mm image (Summer)

West Burton Solar Project

Viewpoint 20 (Winter)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 09/03/2022 @ 11:27
- 490430.983 376809.194 8.447mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective

Point of Perspective

Point of Perspective

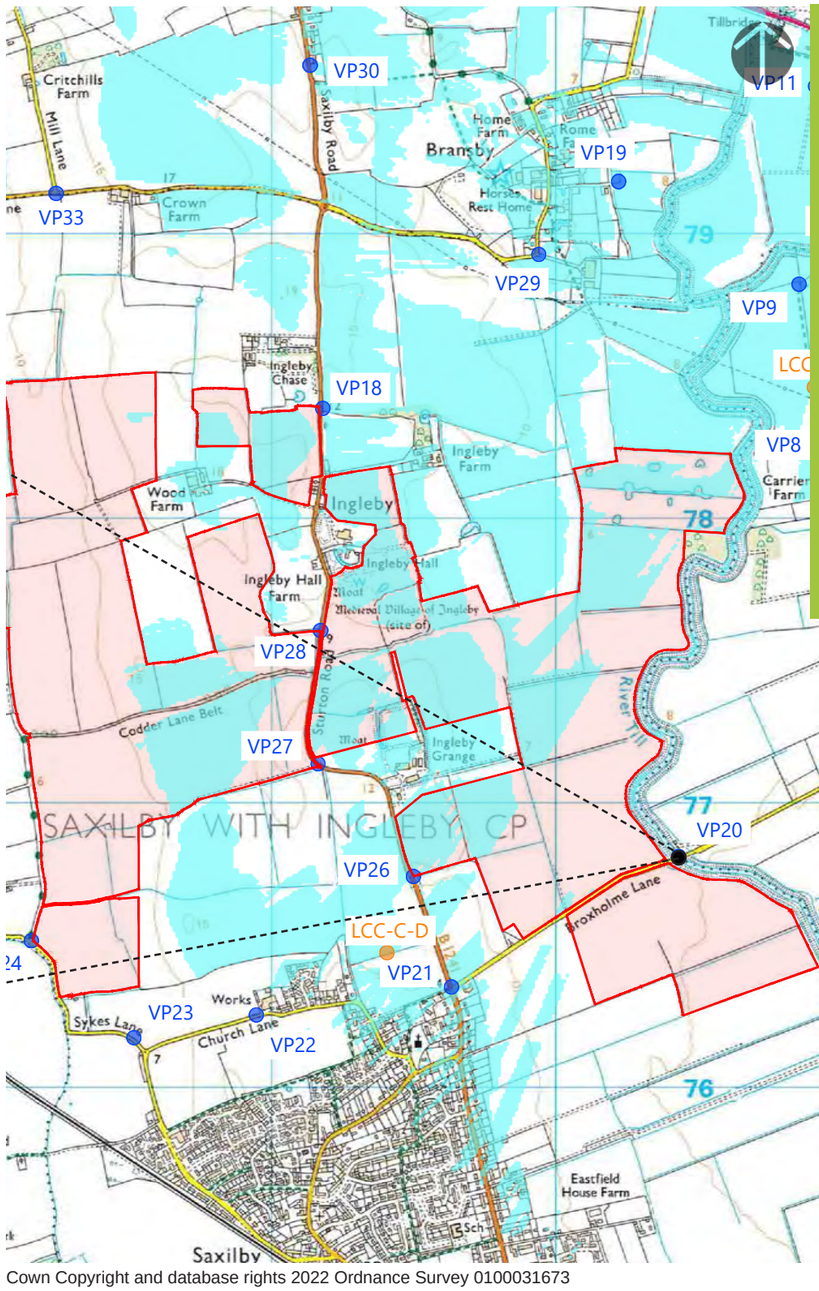
Point of Perspective

Viewpoint 20 Single Frame 50mm image (Winter)

West Burton Solar Project

Viewpoint 20 (Summer)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 08/07/2022 @ 13:53
- 490431.117 376809.225 8.447mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective

Point of Perspective

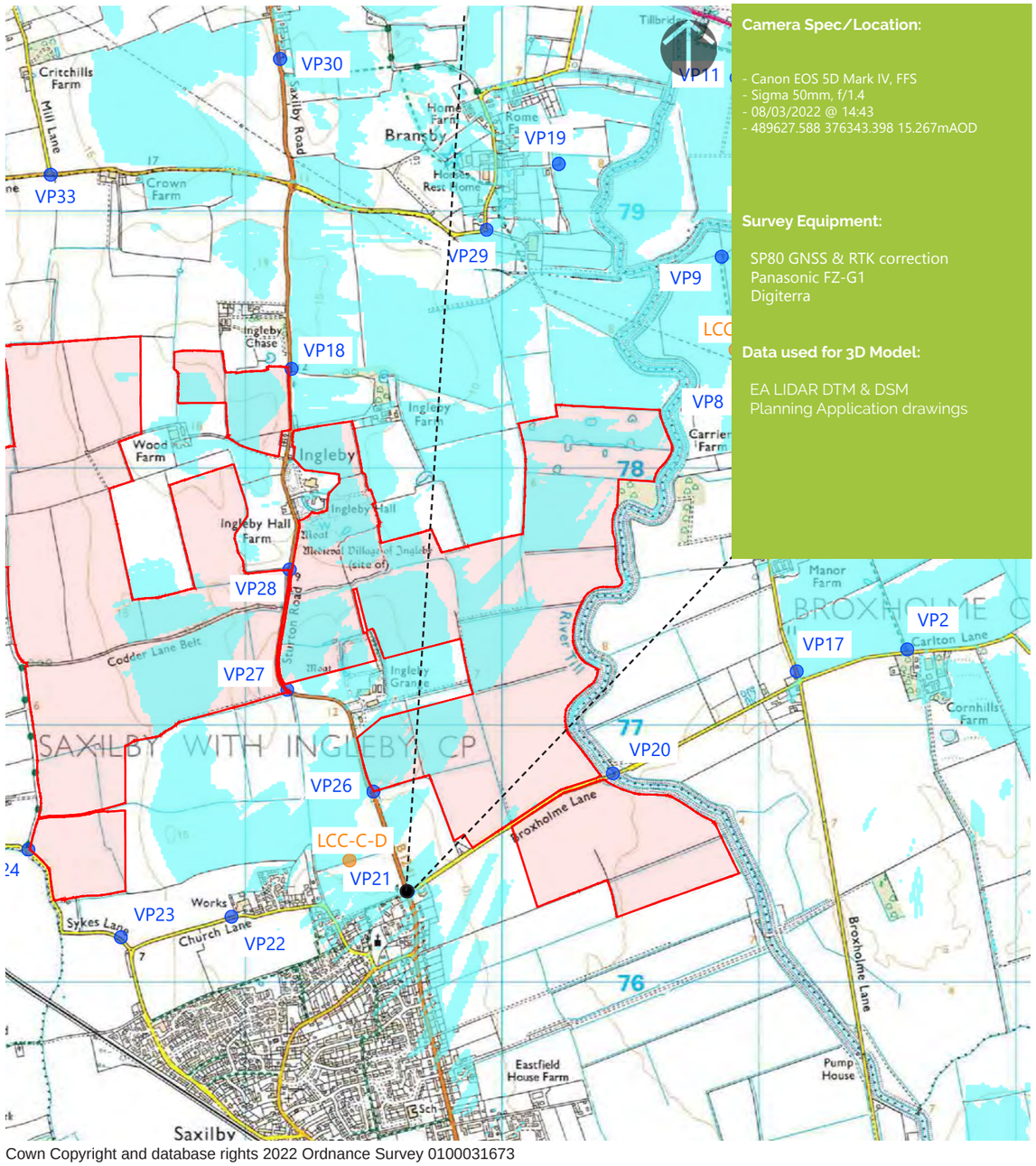
Point of Perspective

Viewpoint 20 Single Frame 50mm image (Summer)

West Burton Solar Project

Viewpoint 21 (Winter)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 08/03/2022 @ 14:43
- 489627.588 376343.398 15.267mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective

Point of Perspective

Point of Perspective

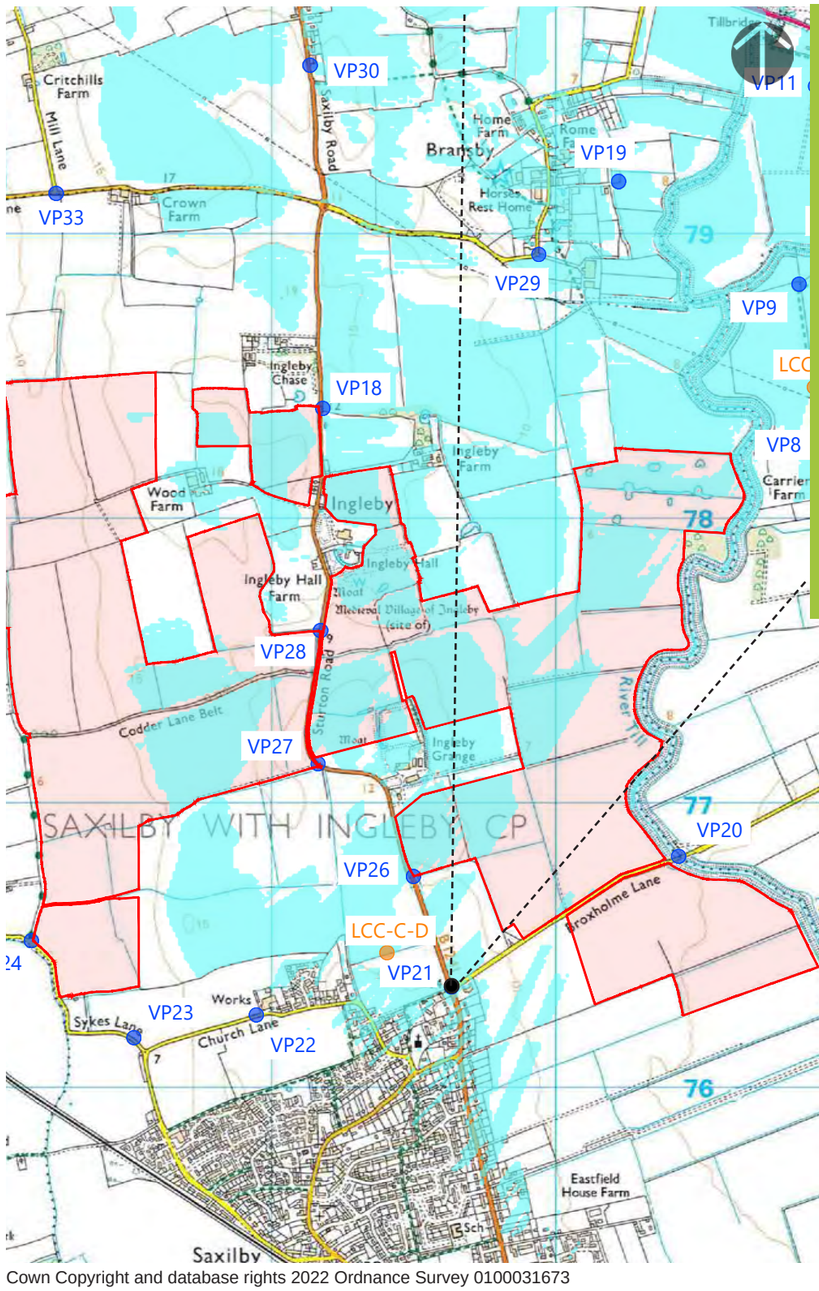
Point of Perspective

Viewpoint 21 Single Frame 50mm image (Winter)

West Burton Solar Project

Viewpoint 21 (Summer)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 08/07/2022 @ 13:40
- 489627.649 376343.519 15.195mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective

Point of Perspective

Point of Perspective

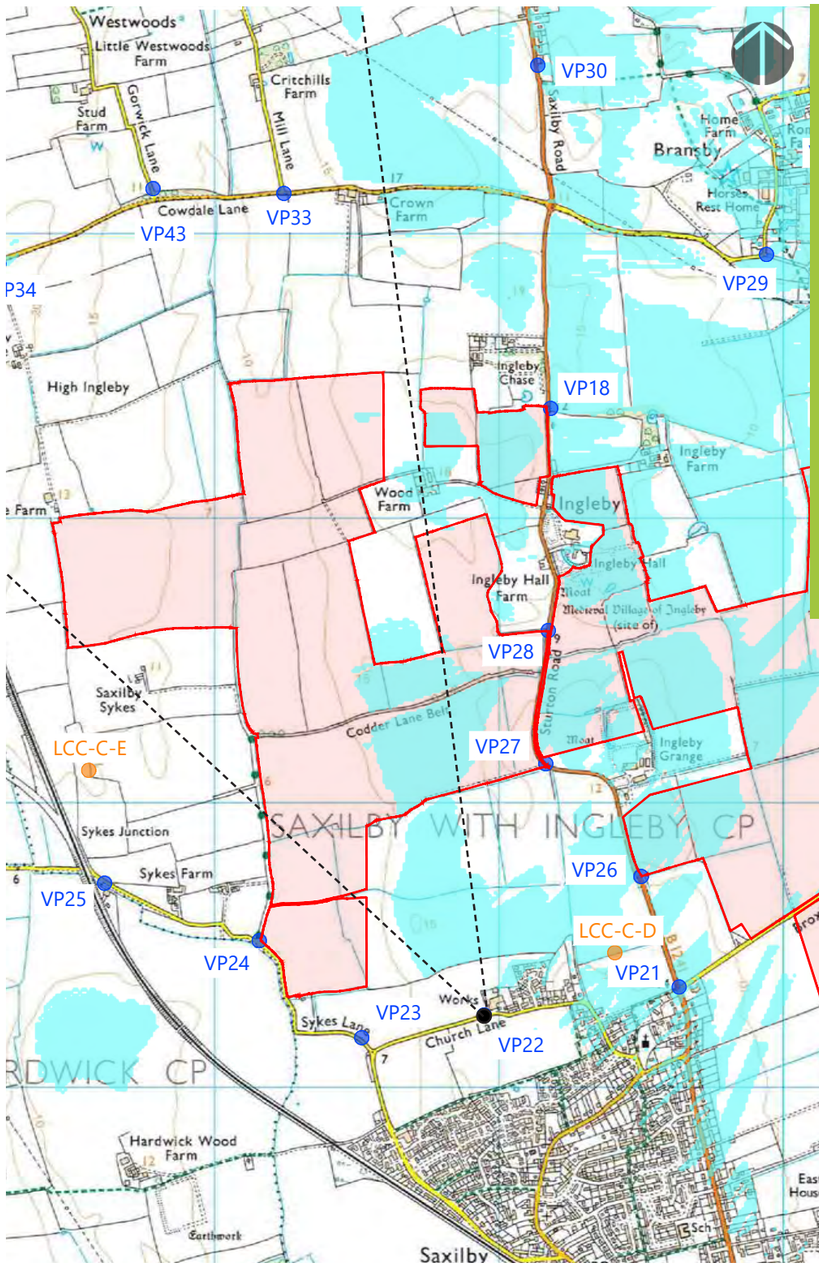
Point of Perspective

Viewpoint 21 Single Frame 50mm image (Summer)

West Burton Solar Project

Viewpoint 22 (Winter)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 08/03/2022 @ 14:59
- 488969.831 376255.235 16.142mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

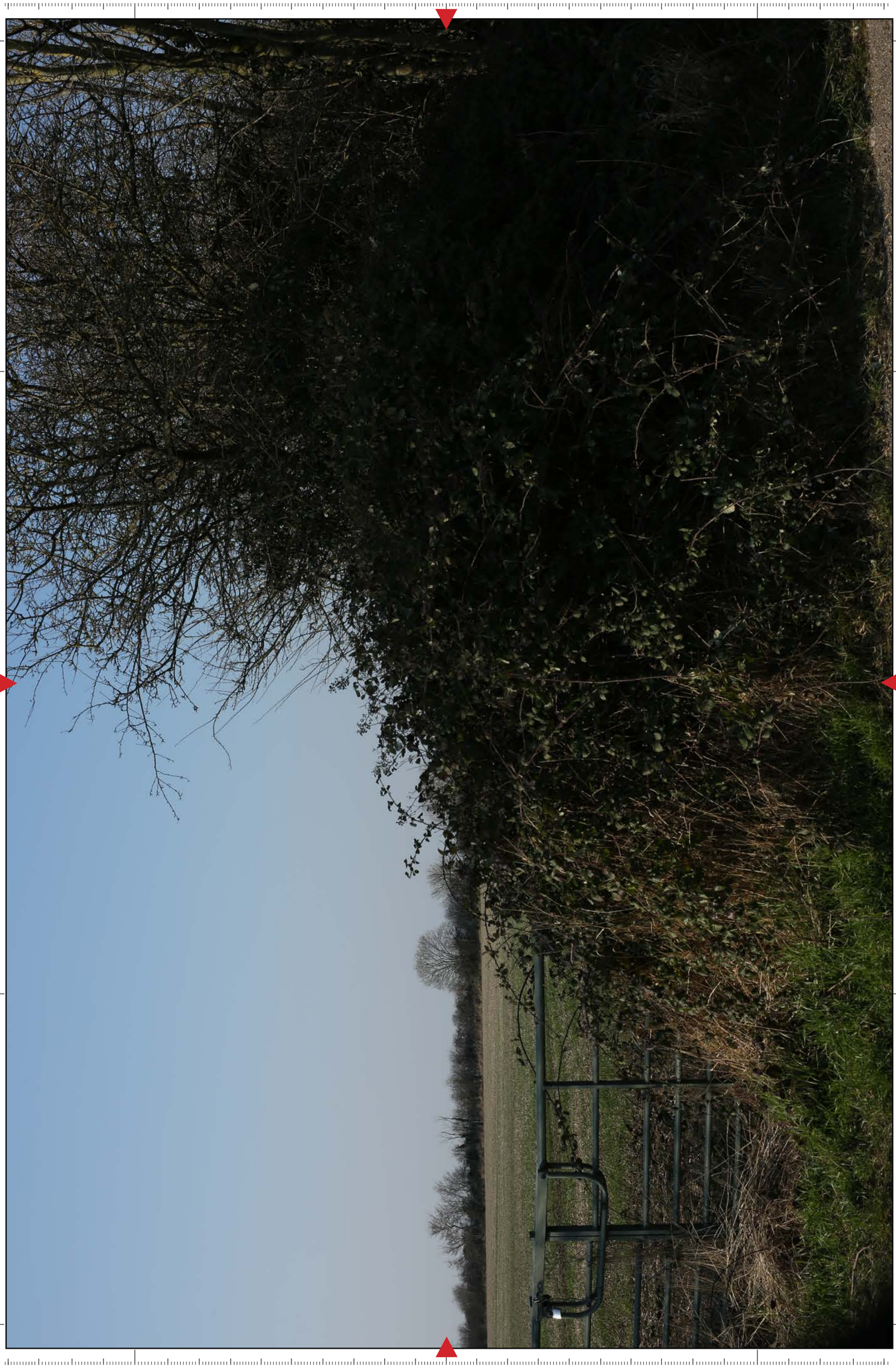
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

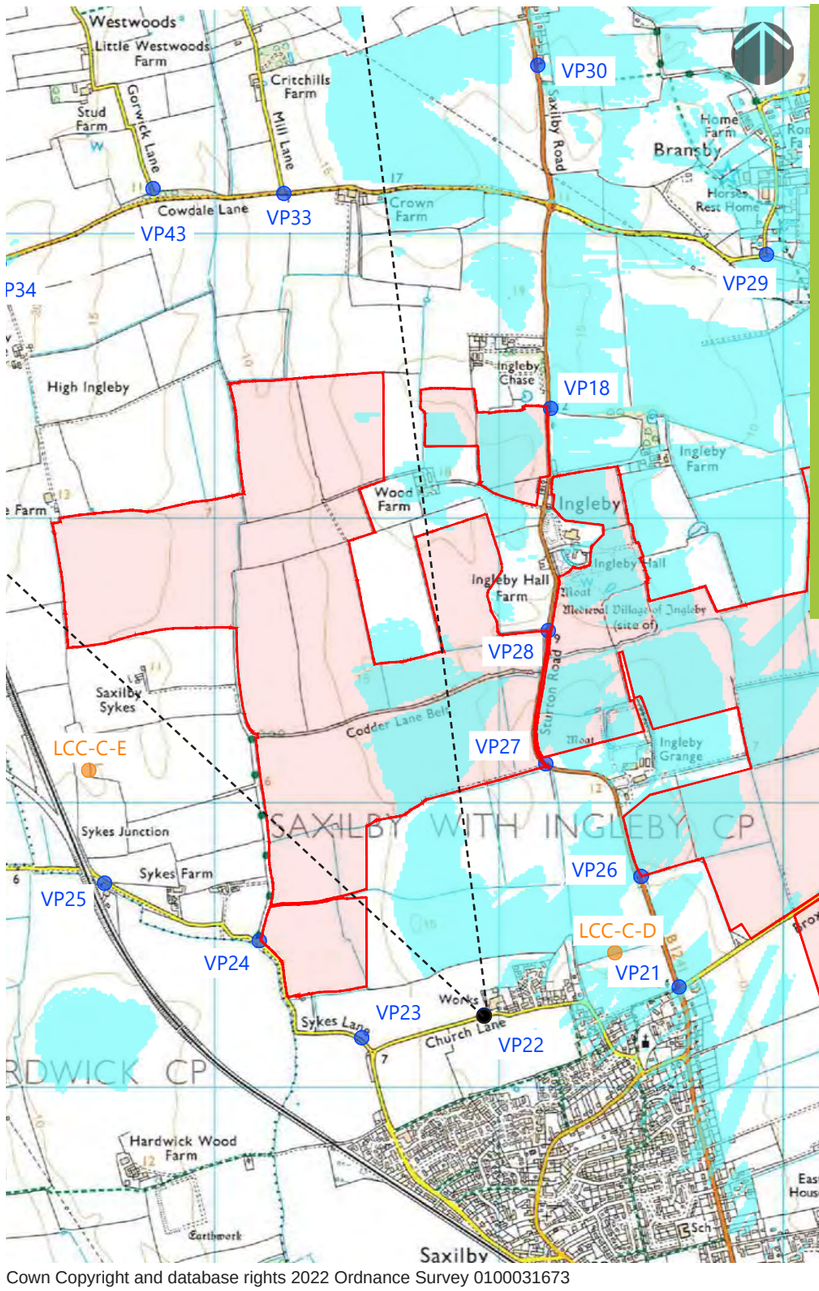
Point of Perspective

Viewpoint 22 Single Frame 50mm image (Winter)

West Burton Solar Project

Viewpoint 22 (Summer)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 08/07/2022 @ 14:49
- 488970.521 376254.754 16.091mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

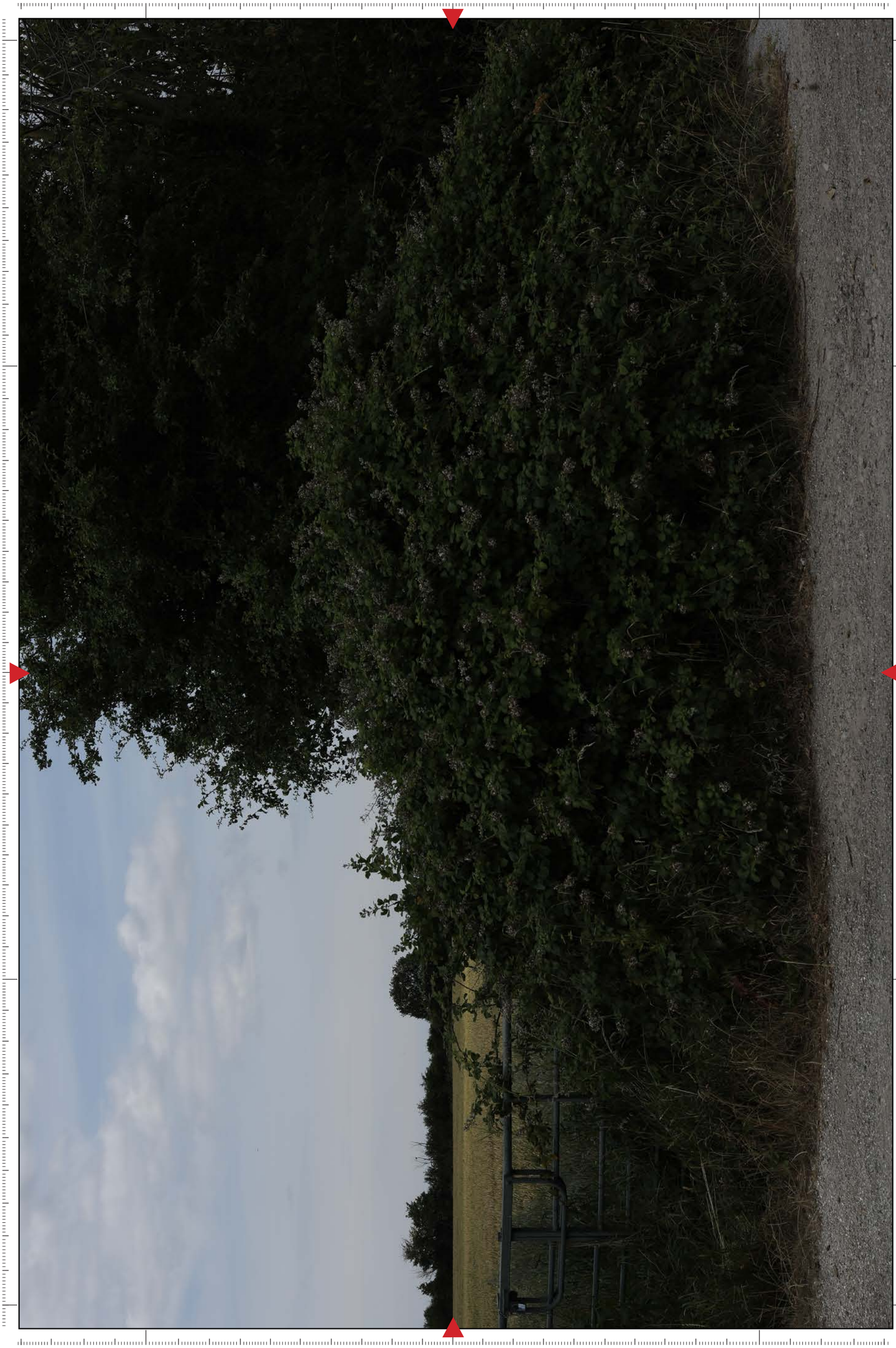
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

Point of Perspective

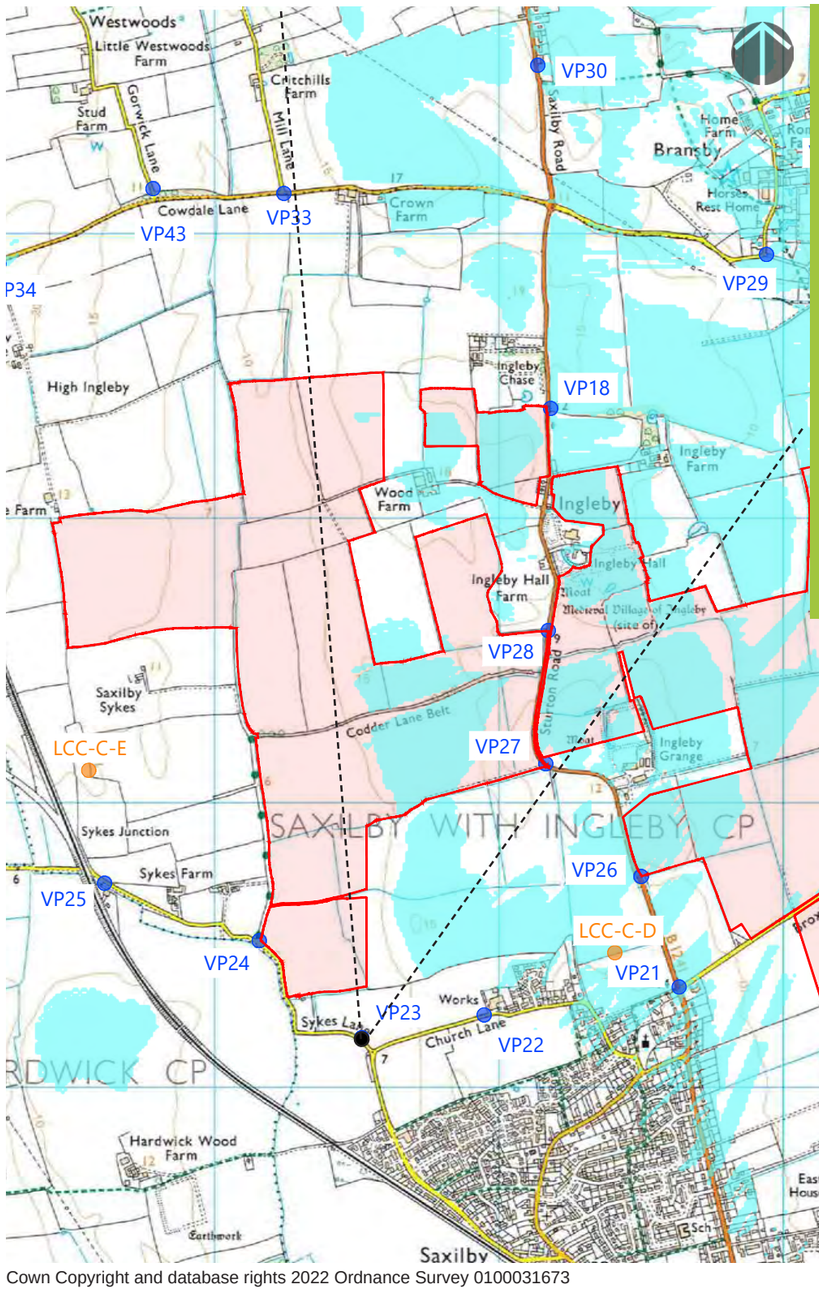
Point of Perspective

Viewpoint 22 Single Frame 50mm image (Summer)

West Burton Solar Project

Viewpoint 23 (Winter)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 08/03/2022 @ 15:13
- 488515.650 376169.458 9.132mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

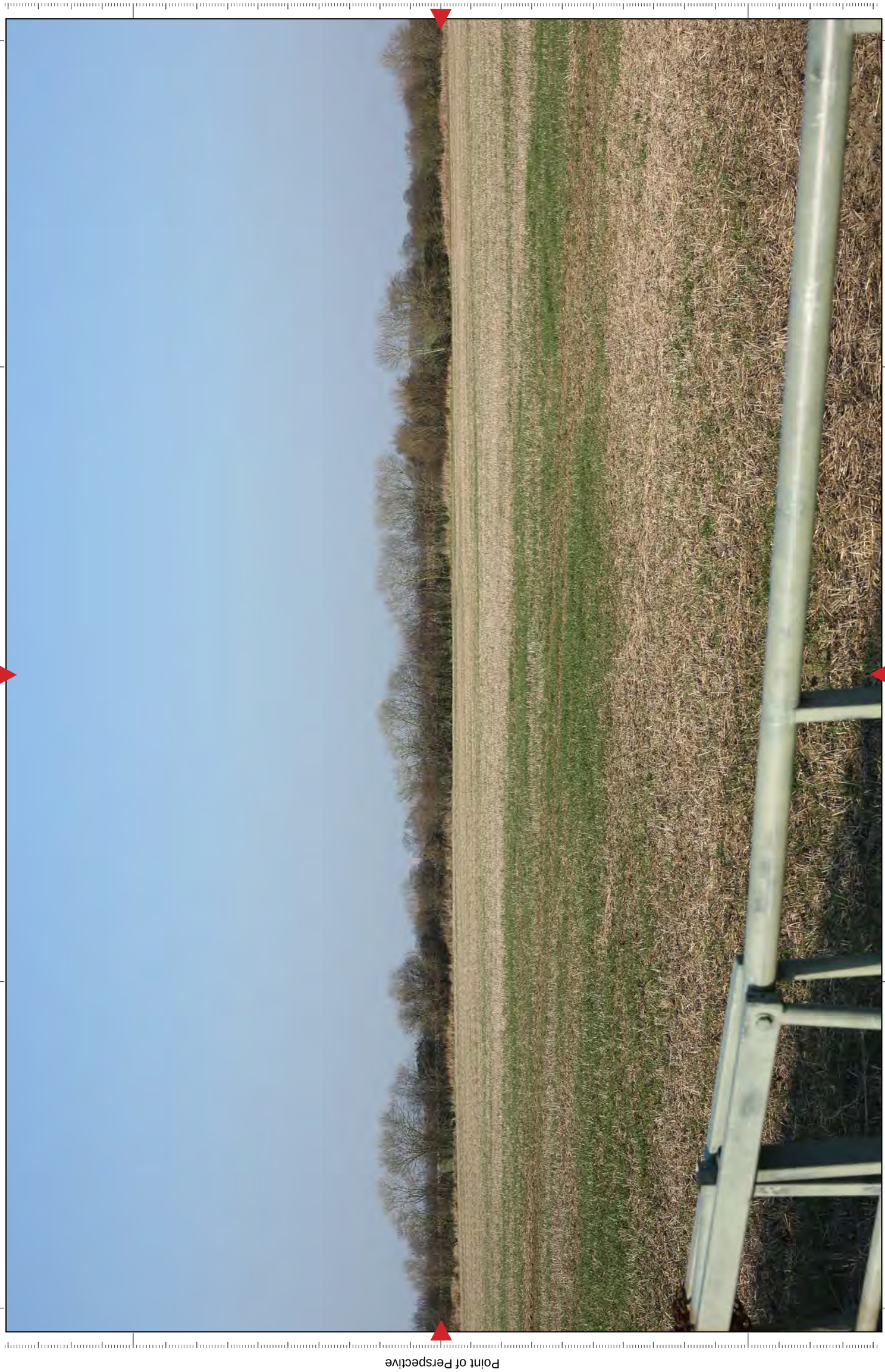
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

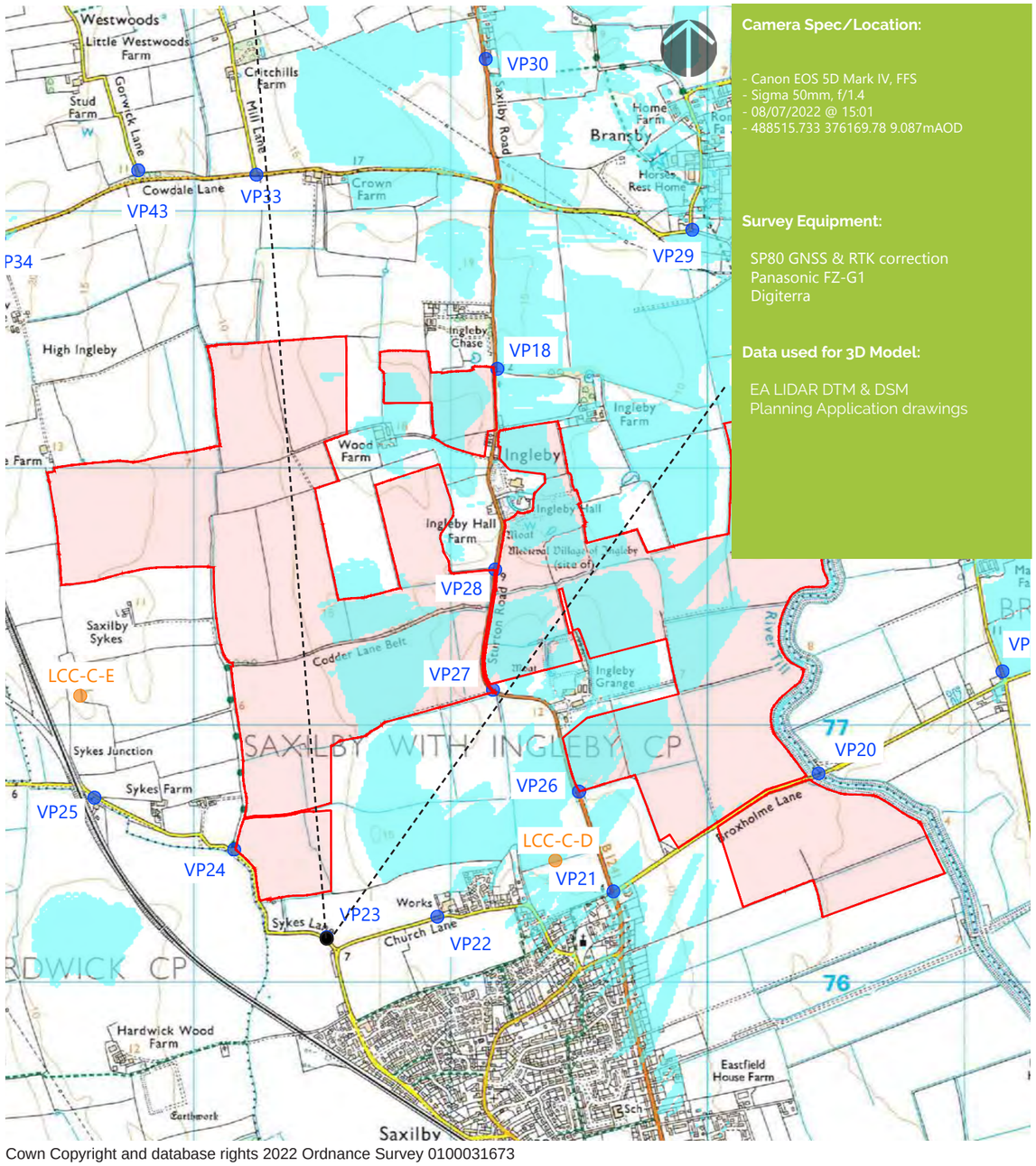
Point of Perspective

Viewpoint 23 Single Frame 50mm image (Winter)

West Burton Solar Project

Viewpoint 23 (Summer)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 08/07/2022 @ 15:01
- 488515.733 376169.78 9.087mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective

Point of Perspective

Point of Perspective

Viewpoint 23 Single Frame 50mm image (Summer)

West Burton Solar Project

Viewpoint 24 (Winter)

Camera Location:

Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 08/03/2022 @ 15:26
- 488155.897 376515.775 7.878mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective

Point of Perspective

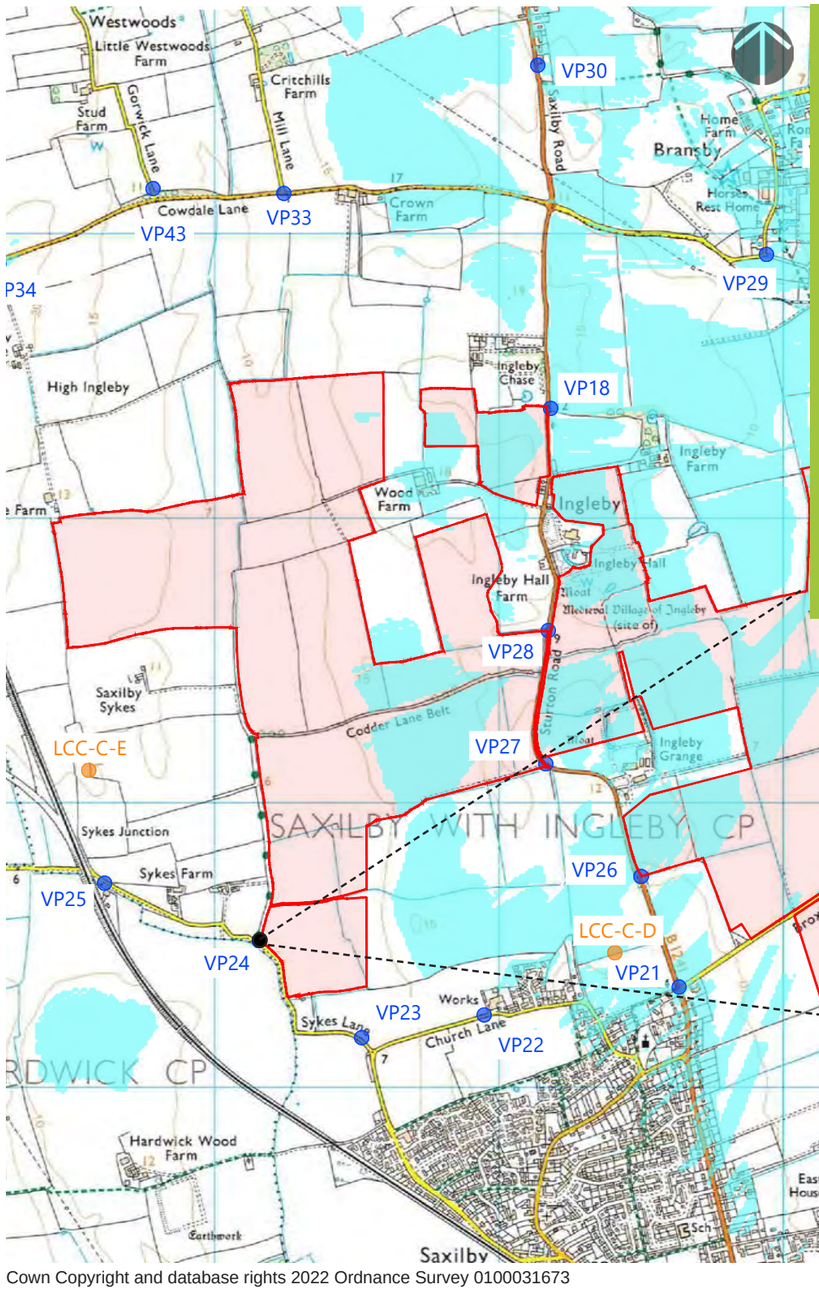
Point of Perspective

Viewpoint 24 Single Frame 50mm image (Winter)

West Burton Solar Project

Viewpoint 24 (Summer)

Camera Location:



Camera Spec/Location:

- Canon EOS 5D Mark IV, FFS
- Sigma 50mm, f/1.4
- 08/07/2022 @ 15:28
- 488153.531 376514.64 7.956mAOD

Survey Equipment:

SP80 GNSS & RTK correction
Panasonic FZ-G1
Digiterra

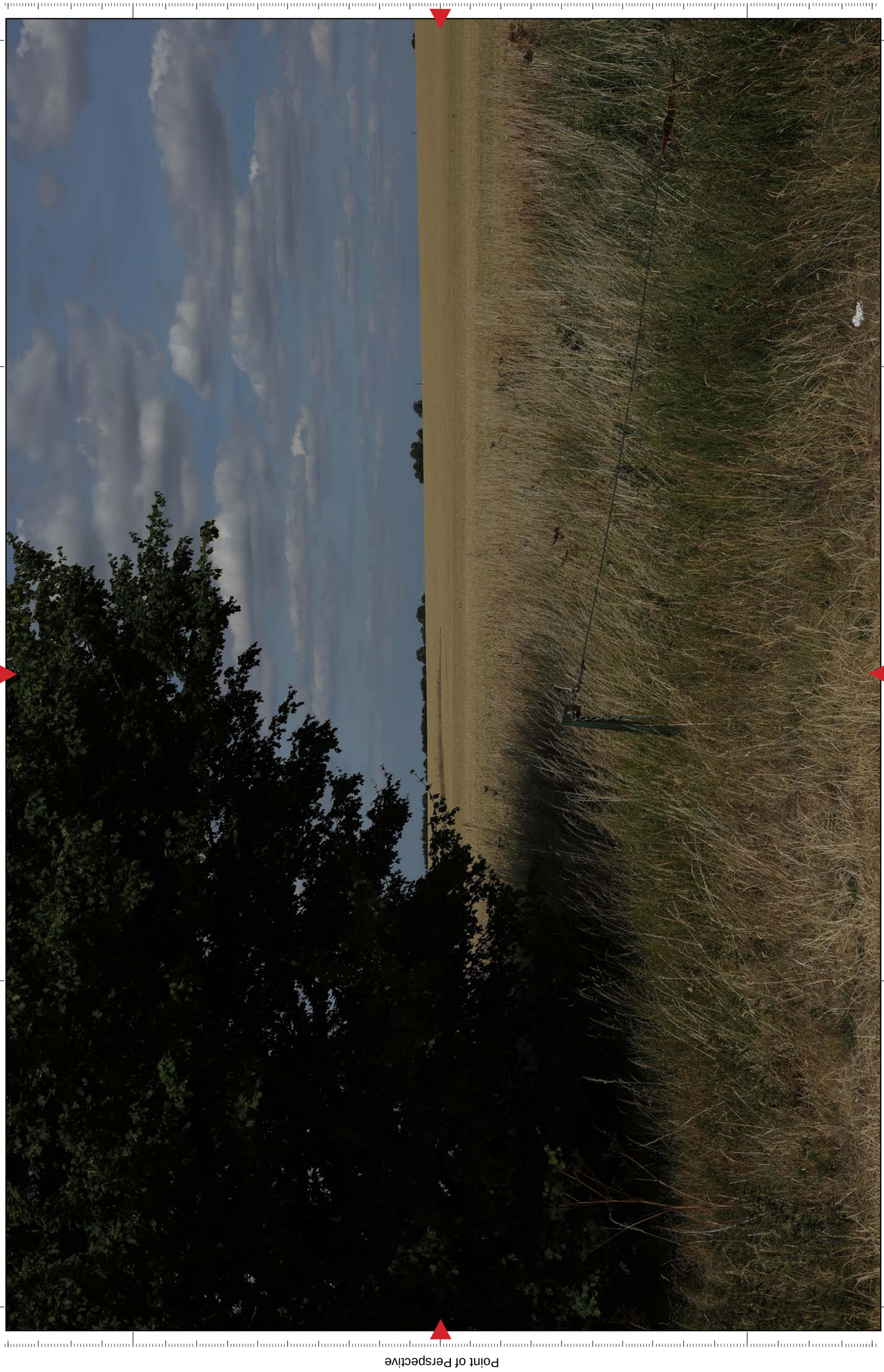
Data used for 3D Model:

EA LIDAR DTM & DSM
Planning Application drawings

Tripod:

50mm Lens Planar Projection (actual 49.7mm; 39.9 deg HFoV)

Point of Perspective



Point of Perspective

Point of Perspective

Point of Perspective

Viewpoint 24 Single Frame 50mm image (Summer)

West Burton Solar Project