South East Strategic Reservoir Option

Preliminary Environmental Information Report

Appendix 9.6 - Technical methodology: photography, visualisations, and Zones of Theoretical Visibility

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Contents

1 Introduction

1.1.1 This document outlines the technical methodology used to support Chapter 9: Landscape and visual of the Preliminary Environmental Information (PEI) Report for the proposed SESRO Project (the Project, as detailed in Chapter 2: Project description). It explains the approach and technical details relevant to the production of viewpoint photography, visualisations, and the preparation of digital Zones of Theoretical Visibility (ZTVs). As well as PEI Report Chapters 2 and 9, this document should be read in conjunction with the appendices associated with Chapter 9: Landscape and visual, particularly Appendix 9.3: Visual baseline, and Appendix 9.4: Viewpoint photography and visualisations.

1.1.2 The methodology has been developed in accordance with established industry guidance, including the Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (Landscape Institute and Institute of Environmental management and Assessment (IEMA), 2013) (hereafter referred to as GLVIA3), and Visual Representation of Development Proposals, Technical Guidance Note 06/19 (Landscape Institute, 2019).

1.1.3 Professional judgement has also been applied to ensure the visual information effectively communicates the specific issues associated with the Project.

2 Technical Methodologies: photography and visualisations

2.1 Baseline photography

2.1.1 Photographic viewpoint locations have been selected and agreed to support and inform the assessment of landscape and visual effects; the rationale for their selection is explained in Chapter 9: Landscape and visual, and Appendix 9.3: Visual baseline.

2.1.2 Baseline photographs from each viewpoint are provided to show the existing 'baseline' conditions, with photography taken both in winter (when deciduous vegetation is not in leaf, therefore views across the landscape are at their most open), and summer (when deciduous vegetation is in leaf, and views across the landscape are more limited). At this PEI Report stage both winter and summer views have been provided for most viewpoints, however there are a small number of gaps in seasonal photography, which will be filled at the Environmental Statement (ES) stage (subject to land access). It is also noted that for a small number of viewpoints (40, 43-46) winter views are included but were taken in April 2025 when deciduous vegetation had already started budding / leaves emerging; these will be replaced with true winter views for the ES.

2.1.3 Night-time photography is also provided for four of the viewpoints, providing an indication of night skies within the study area.

2.1.4 Baseline photography is taken with verified locational data and accuracy, allowing direct comparison between summer, winter and night-time views, whilst also enabling creation of corresponding verified visualisations.

2.1.5 Baseline photography is presented, firstly, as full 180-degree panoramas on A1 sheets. It is acknowledged that this is beyond the extent which is recommended in Visual Representation of Development Proposals, Technical Guidance Note 06/19 (Landscape Institute, 2019) for presenting baseline photography and visualisations. Human binocular vision is limited to a horizontal field of view of approximately 120-degrees, of which only approximately 40 to 50-degrees is perceived with detailed focus. The Landscape Institute therefore recommends limiting the use of wide panoramas in the presentation of photography and visualisations, with a recommendation of a 53.5 degree horizontal field of view. Where particularly wide panoramas are required, it recommends these being presented at up to 90-degrees on an A1 sheet, with the potential for continuation on subsequent A1 sheets.

2.1.6 However, due to the particularly large scale and extents of this Project, its setting within a flat, open vale landscape, and the typically long range panoramic views involved, it was considered important to present the viewpoint photography as full 180-degree panoramas in the first instance, enabling the full extents of the Project to be represented with full landscape context on a single sheet. Additionally, 90-degree panoramas have also been provided for views where the extents of the Project can be fitted within that narrower field of view, ensuring an overall approach that balances technical compliance with the Landscape Institute's Technical Guidance Note 06/19, as well as providing wider contextual understanding.

2.2 Verifiable photomontage

2.2.1 Verified visualisations accurately add to the baseline views the locations and extents of the proposed development. Presenting both 'clean' baseline photography and photomontages reveals the likely extent of change resulting from the Project within each view, helping to convey how a proposed development could give rise to change in the character of a place, or affect the quality and nature of views, for example through introduction of new built elements or structures, changes in ground level, and loss of trees, vegetation or landscape features.

2.2.2 Visual Representation of Development Proposals, Technical Guidance Note 06/19 (Landscape Institute, 2019) sets out two classification systems relevant to visualisations, both of which are referred to in this methodology. These are summarised below:

- The guidance primarily classifies visualisations as 'Type 1, Type 2, Type 3 and Type 4', the definitions of which are mostly to do with the degree of accuracy and sophistication in the location and scaling of a representation of the proposal.
  - 'Type 1 – Annotated Viewpoint Photograph': these simply show the extent of the site within the view, and annotate any key features within the view, overlaid onto photographic context
  - 'Type 2 – 3D Wireline / Model': includes a range of computer-generated visualisations and models, but presented without any photographic context
  - 'Type 3 – Photomontage / Photowire': visualisations overlaid onto a photographic base with a 'reasonable level of locational and photographic accuracy'; no requirement for verification data to be provided
  - 'Type 4 – Photomontage / Photowire (survey / scale verifiable)': visualisations overlaid onto a photographic base with 'the highest level of accuracy and verifiability'; quantifiable verification data and procedural transparency must be provided.
- The guidance also refers to the London View Management Framework (2012) levels of 'Accurate Visual Representations' (AVR) classification, which are based on the degree of sophistication of the graphic imagery (as opposed to the degree of accuracy and transparency of location and scaling) used to represent the development
  - 'AVR Level 0': location and size only; i.e. 'photowire', or 'wireline', showing the outline of the location and extents of a proposal overlaid onto a photograph base
  - 'AVR Level 1': location, size, and degree of visibility; i.e. the basic massing of the proposal is shown within the 3D context of the photograph base; graphic editing is undertaken so that any elements the proposal which would sit behind elements of the landscape within the photograph are masked out of view
  - 'AVR Level 2': as level 1, with additional representation of architectural form. Adds a level of detail to the representation of the proposals, such as doors, windows, floors, roofs (for buildings), and the form and shading of the development within its context.
  - 'AVR Level 3': as level 2, with additional 'photo-realistic' rendering of surface textures, colours, reflections and shading.

'Wirelines'

2.2.3 'Wireline' representations of the development are the simplest graphic form of visualisation, aligned to 'AVR Level 0'.

2.2.4 Wirelines have been provided for all baseline views indicating, with a simple red dashed line, the location and vertical and horizontal extents of the proposed reservoir embankment and key associated infrastructure (i.e. the reservoir towers, the buildings proposed to be located on the crest of the embankment, the reservoir pumping station, and the T2ST building including its water tower; and/or intake/outfall structure; and/or solar farm.

2.2.5 All wirelines have been produced in accordance with the requirements of a 'Type 4' visualisation, using quantifiable data, with procedural transparency and appropriate levels of accuracy. This involved using a defined camera/lens combination and establishing the camera location with sufficient locational accuracy to enable accurate scaling and location of the 3D model within the view.

2.2.6 No foreground masking has been carried out for wirelines, meaning the outline of the development has not been placed 'behind' any existing foreground landform, built features or vegetation in the views.

2.2.7 The wireline representations of the development have been added to the winter views for each of the viewpoints, along with annotation of key existing landmarks and features within the views. These visualisations therefore contain elements of 'Type 1' (i.e. the landmark annotation) and 'Type 4' (verifiable wireline), but with the proposed development being graphically represented at 'AVR Level 0'.

'Colour Massing'

2.2.8 In addition to wirelines, 'colour massing' visualisations have been provided for some of the viewpoints. Produced with a very similar process and level of detail as the wirelines, these show the location and vertical and horizontal extents of the proposed reservoir embankment and associated key reservoir infrastructure, and/or the intake/outfall structure. The key differences are that rather than representing the form of the development components as a single outline, they are rendered with a flat colour – i.e., green for the proposed vegetated embankment slopes, blue for water within the reservoir (if visible), and white for hard structures / built form.

2.2.9 This technique helps to convey the form and massing of the key components of the Project, but without showing architectural detail, and without the application of photo-realistic rendering of surface colours or textures. Foreground masking has been applied to these visualisations, so that any existing landform, buildings, vegetation or other intervening objects that sit between the development and the viewpoint will be shown in front of it, enabling a good understanding of the extent of the development's visibility in each view.

2.2.10 Colour massing visualisations have been provided selectively for a limited number of viewpoints. They conform to 'Type 4' in terms of their level of accuracy and verifiability, and to 'AVR Level 1' in terms of their graphic representation of the development.

'Photo-realistic photomontages'

2.2.11 Photo-realistically rendered photomontages have been provided for three of the viewpoints at this PEI Report stage.

2.2.12 These photomontages include a more comprehensive representation of the various components of the design, rather than being limited only to the largest, key components. They also include an indicative representation of soft landscape elements such as tree planting. The buildings however remain white, without rendering of materials, colours, or textures, due to a lack of availability of this architectural design detail. The representation of proposed planting / vegetation assumes at least 5 years' establishment and growth, up to approximately 10 years in peripheral areas beyond the footprints of main engineering works where there may be opportunity for earlier planting.

2.2.13 The representation of the key Project components (i.e. the reservoir embankment and the associated major reservoir infrastructure), as represented in the wireline and colour massing visualisations, is no less accurately represented in these visualisations in terms of their location and scale. However, the addition of other more detailed elements, including landscape planting, habitat creation areas, footpaths, fencing etc, must be considered indicative only. This is because, at this PEI Report stage, there remains a little more fluidity in the design status of these detailed elements compared to the location, size and form of the major infrastructure. The representation of these elements does however allow a more realistic view of the likely overall appearance, look and feel of the Project, including the character of the proposed reservoir embankment in the context of the associated mitigation planting.

2.2.14 All three photo-realistic photomontages align with 'AVR Level 3' in terms of their graphic representation of the development. Two of the photo-realistic photomontages (for viewpoints 19 and 50) conform to 'Type 4' due to the locational accuracy of the baseline photography and subsequent accuracy of camera matching with the virtual model of the Project.

2.2.15 The third photo-realistic photomontage (for viewpoint 59) has been provided to indicate the likely nature of views looking south from an elevated location corresponding to a proposed footpath along the crest of the reservoir embankment. To achieve this elevated location, it was necessary to use drone-based photography. Whilst a good level of locational and camera matching accuracy was still be achieved using this approach, the level of locational accuracy is not quite as precise as it would be using conventional ground mounted camera equipment, and consequently this photomontage may not strictly comply with the requirements of 'Type 4'. The vertical elevation achieved accurately reflects eye level above the proposed height of the embankment crest; the alignment is not quite on the line of the embankment crest, and is offset slightly; nevertheless, the image is considered to represent a good indication of the likely visual experience from this elevated position. (See section 2.3 below for more technical detail on the drone-based photography technique).

2.2.16 At the ES stage, reflecting an anticipated greater level of design detail and certainty, and a more detailed level of assessment, there is expected to be more extensive provision of 'Type 4' / 'AVR Level 3' photo-realistic photomontages which will also be aligned with the specific Project stages used for assessment (i.e. construction, operation winter year 1 and operation summer year 15).

2.3 Viewpoint photography specification

2.3.1 All baseline photographs have been taken by specialist professional photographers. Each viewpoint location was accurately surveyed and identified using Ordnance Survey co-ordinates.

2.3.2 The heights and distances of significant points within each view that are easily distinguishable were recorded as an Ordnance Survey grid and level datum and their geospatial accuracy was checked relative to the fixed camera position.

2.3.3 The survey points for each view provided an effective check for ensuring that the 3D model and existing views were accurately merged.

2.3.4 A Panoramic ('Pano') Head, mounted on top of a tripod, controlled the angle between adjacent photographs. With a 50mm lens of approximately 39.6° view angle and a setting of 15° interval between each photo. This minimised edge distortion and helps guide the view angle of any given panoramic shots.

2.3.5 Night-time photography was captured at least one hour after sunset to ensure that the images demonstrate full dark conditions, in order to optimally capture dark sky quality, skyglow, and any obtrusive light effects.

2.3.6 Exposure bracketing, whereby multiple shots of the same scene are taken at different exposure settings, was used for night-time photography in order to capture detail of both the brightest and darkest areas of the scene.

2.3.7 For viewpoint 59, which represents panoramic views from an elevated location corresponding to future ground levels at the reservoir crest, a drone equipped with a suitable camera was deployed. The drone was programmed to fly to the calculated future ground height, with an additional 1.6 metres added to account for the typical eye-level viewing height. From this airborne position, a sequence of levelled photographs was captured to provide a 360° perspective corresponding to the landscape. The precise drone location was determined using latitude and longitude data referenced directly from the master plan, ensuring accurate spatial alignment with the proposed site features. The resulting aerial photographs were stitched together to create a 360° panoramic image. The land surveyor's control points were captured in features visible in the view for camera matching purposes. Extracts of the field of view were taken out of the baseline photography.

2.4 Data requirements

2.4.1 For all photographs, the following data was recorded:

- EXIF data is provided in the file properties
- Focal length
- Aperture, shutter speed, ISO
- Lens and camera body
- Date and time
- Other data (marked on each file in a separate layer):
  - Focal length (to three decimal places where applicable)
  - The lens axis
  - The details of height over survey point (between 1.55m and 1.70m high)
  - Field of view
  - Image dimensions
  - Film gate size
  - Date and time

2.5 Viewpoint survey specification

2.5.1 Each individual observation set-up achieved an accuracy of + or – 45mm to Ordnance Survey grid / datum. All superimposed elements are positioned accurately within each image by using the data supplied by the surveyors. Each image has a minimum of 10-12 clearly defined detail points taken across the width of the image and at near, mid and far distance (i.e. a balance of points in the photograph). Any clearly defined point can be used (e.g., corners of road markings, features on road signs, corners of building tops or roofs, window corners etc.). Point numbers are unique and relate to the viewpoint number. All final panoramic images have a minimum vertical FOV of 27 degrees.

2.5.2 A DWG file was provided by the surveyors containing the detail points and camera positions as vertical lines. A spreadsheet of the coordinated points was provided (including the camera locations) with annotated descriptions.

Field survey equipment is as follows:

- Total Station Electronic Theodolite
- TCR1205BT R1000 (1205+) equipped with Bluetooth Tripods
- (x3) Wooden GST20-09 Traverse
- Forced centring tribrach GDF122 – Pro
- Spigots GRT144
- Prism Carriers GPH1
- Circular Prisms GPR1
- GPS Antenna: ATX1230 Glonass equipped and enabled
- GPS handheld controller: RX1250XC
- Carbon Fibre Prism Pole and GPS controller mount for SmartRover Operation

The GPS equipment is connected to the Leica Smartnet software on the Internet via an onboard mobile phone. This enables a real-time solution to following accuracy:

- The horizontal accuracy is 10mm+ 1ppm
- The vertical accuracy is 20mm + 1ppm

2.5.3 The mobile phone uses a Vodaphone SIM card that is connected to a private IP network for reliability of the 3D model.

2.6 Model quality and accuracy

2.6.1 The landscape and visual assessment, and hence the supporting visualisations, is based on the assumption that all development would be built out to the full extent of the maximum parameters / limits of deviation of design, to represent the 'worst-case scenario' at this stage.

2.6.2 Three-dimensional (3D) models developed by the Project design teams have been used representing the current design stage. The model topography is based on a digital terrain model of the site, incorporating additional features such as designed earthworks, proposed building massing, and, where appropriate for Level 4 photomontages, detailed trees and vegetation. The verification process confirms the accuracy of the 3D model in relation to each existing views. The details of the Ordnance Survey co-ordinates for each viewpoint and the angle of each view were checked.

2.6.3 The process involved accurately positioning the 3D model of the proposed development 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 on the existing photographs. The central horizon line in each of the existing views was then calculated and imported into 3DS Max as a backdrop to the 3D model.

2.6.4 The survey points and specifications of the lens type relating to each existing view were entered into 3DS Max. The survey points of the camera position and those relating to specified objects within each baseline image were then highlighted on the digitised image.

2.6.5 This additional check ensured that the survey points matched precisely. Once the process of camera matching was complete, the 3D model of the proposed development was accurately positioned within each of the existing views. This was achieved by rendering the camera matched 3D of the proposed development within 3DS Max at the same size as the digitised existing view.

2.6.6 In lieu of a full 3D model being made available for the solar farm reprovision an indicative model was generated, by applying an assumed (‘worst case’) height for the solar arrays of 4.5m above ground levels to their proposed footprint. This was used to generate the wirelines representing the maximum extents of this component.

2.6.7 The 3D model for the T2ST development was produced and provided externally by Southern Water and remains in development. Similar to the process followed for the solar farm reprovision, where data was incomplete (such as missing or superseded proposed building heights, or exact locations of proposed infrastructure), this was modelled indicatively following guidance from Southern Water to enable indicative consideration within Appendix 9.4: Viewpoint photography and visualisations as accurately as practicable at the time of writing.

2.7 Rendering

2.7.1 ‘Vray Rendering Engine’ was chosen to execute the visualisations as it is the most used in the Architectural/Engineering visualisation Industry. It utilises the ‘physical Sun and Sky and Compass System’ and provides physically accurate full global illumination solutions. This was used to produce accurate render of the 3D elements which are used to produce the verified photowire visualisations.

2.8 Recommended viewing

2.8.1 As outlined in section 2.1, panoramic views have been provided with a horizontal field of view of 180-degrees, as well as 90-degrees. These wide 180 panoramas have been used to give the viewer an understanding on the large scale of the Project within its landscape context. 90-degree panoramas are used because they strike a practical balance between realism, technical precision, and viewer comprehension. The Landscape Institute’s guidance (Landscape Institute's Technical Guidance Note 06/19: Visual Representation of Development Proposals) suggests this angle closely matches the horizontal field of view of human vision when looking ahead, making it effective for assessing potential visual changes in the landscape. 90 degree panoramas reduce distortion while still capturing context helping to judge the scale and visual prominence of the Project.

2.8.2 A vertical FOV (VFOV) of 38 degrees has also been used for these scaled panoramas which emulates the VFOV of a 50mm lens (which is widely regarded to approximate the standard FOV of the human eye).

2.8.3 In accordance with the Landscape Institute's Technical Guidance Note 06/19, viewing distances of approximately arm's length (typically between 500-550mm) are the most practical and widely used for printed visualisations. According to NatureScot's guidance "Visual Representation of Wind Farms" (Version 2.2, February 2017) similarly advises that images should be viewed at a comfortable arm's length. When viewed digitally, it is recommended that the image is enlarged so that it fills the full height of the screen to replicate the intended scale and perspective. These approaches ensure that visualisations provide a reasonable impression of the scale of the development and the distance to the development and are fit for purpose in supporting landscape and visual impact assessments.

3 Zones of Theoretical Visibility (ZTV)

3.1 General approach

3.1.0 ZTVs were generated using the ‘Viewshed’ analysis tool within ESRI ArcMap GIS software, also using the Digital Terrain Model (DTM) / Digital Surface Model (DSM) rasters as the input raster and the respective viewpoints point layer as the input point observer features.

3.1.1 The resolution of topographical data utilised was the same across the entire study area. Lidar data from 2022 was used for both DTM and DSM obtained from LIDAR Composite Digital Terrain Model (DTM) 2m.

3.1.2 For all ZTV analyses, a standard observer height of 1.6 metres above ground level was applied, simulating the average eye level of a person, in accordance with guidance set out in paragraph 6.11 of GLVIA3.

3.1.3 All ZTV scenarios take into account the curvature of the earth.

3.1.4 Two basic ZTV scenarios, one worst-case and one more realistic (see below for details), were modelled to assess the theoretical visibility of the Project.

3.1.5 In addition, ‘heat mapping’ of the relative amount of visibility of the proposed reservoir was undertaken (see below for details).

3.2 Digital Terrain Model (DTM) ZTV (Bare Earth Scenario)

3.2.0 ZTVs were prepared for the reservoir, the intake/outfall structure, and the proposed solar farm, using 2m resolution DTM baseline data, representing a worst-case visibility scenario. A DTM raster is a bare earth scenario whereby any vegetation, buildings and infrastructure are excluded, this is then used to calculate the Proposed Developments theoretical visibility assuming unobstructed lines of sight. Outputs are presented in the following figures:

- Figure 9.4: Reservoir ZTV (bare earth / DTM)
- Figure 9.7: Intake/outfall ZTV (bare earth / DTM)
- Figure 9.9: Solar site ZTV (bare earth / DTM)

3.3 Digital Surface Model (DSM) ZTV (Realistic Scenario)

3.3.0 ZTVs were also created using a 2m resolution first return LiDAR DSM data set, which produces a more realistic scenario of visibility by accounting for potential screening or filtering of views from surface features including trees / woodland, hedgerows, buildings and other structures.

3.3.1 The first return DSM is produced from the first laser pulse returned to the sensor which means it captures the heights of buildings, trees, vehicles, infrastructure as well as the terrain surface. The LiDAR data has a vertical accuracy of +/- 15cm however due to potentially capturing non fixed objects such as vehicles, there is still a level of inaccuracy.

3.3.2 The outputs are presented in the following figures:

- Figure 9.5: Reservoir ZTV (screening / DSM)

- Figure 9.6: Reservoir ZTV heatmap (screening / DSM) (see below for explanation of heatmapping the amount of visibility)
- Figure 9.8: Intake / outfall ZTV (screening / DSM)
- Figure 9.10: Solar site ZTV (screening / DSM)

3.4 Heatmapping the amount of visibility

3.4.0 Figure 9.6: Reservoir ZTV heatmap (screening / DSM), whilst focused on the reservoir and based on DSM data, therefore allowing for the screening effect of surface vegetation and structures, also applies a technique to represent the relative amount of visibility of the Project, rather than simply indicating is there is, or is not, any theoretical visibility. The heat map is generated by calculating what proportion of the total number of points which were added along the line of the proposed reservoir crest may be seen at every point within the ZTV and rendering the output accordingly.

3.5 Modelling the heights of the Project

3.5.0 To represent the location and height of the key components of the Project within the ZTVs, points and lines were manually entered into the GIS software, corresponding to the limits of deviation used for the landscape and visual assessment – i.e. the maximum physical parameters for each of the components.

3.5.1 To represent the reservoir, a series of points was added at a regular frequency along the line of the proposed reservoir embankment crest. The height of the proposed reservoir embankment crest is 81.7m AOD. In addition to the embankment, points were added to represent large associated reservoir infrastructure, as summarised below:

- The primary reservoir tower: 105.4 m AOD
- The secondary reservoir towers: 99.4m AOD
- The reservoir pumping station: 23m height from adjacent ground
- The watersports centre buildings on the crest of embankment vary from 8m to 16m above embankment crest height
- The café on the crest: 93.7m AOD

3.5.2 To represent the proposed solar farm, lines were added in the model to represent the area of the site and the assumed height for the infrastructure of 4.5m above ground level.

3.5.3 To represent the intake/ outfall structure, points and lines representing the highest points of the structure were added, ranging from 4.5m to 10.4m above existing ground levels.

Glossary

- **Aperture**: Controls the size of the camera lens opening and affects depth of field, which is the area of sharpness within the photo.
- **Baseline:** The existing conditions of the landscape and visual environment prior to the introduction of a proposed development. It serves as the reference point for assessment.
- **Camera Matching:** The process of aligning a virtual camera within a 3D software environment to match the position, orientation, and settings of a real-world camera used in baseline photography.
- **Circular Prisms:** A light reflector used in surveying to calculate precise distances and angles, for accurate land surveying measurements.
- **Crest:** The top of the reservoir embankment.
- **Digital Surface Model (DSM):** A digital representation in the form of a raster of the Earth's surface which includes objects on the surface such as buildings and vegetation.
- **Digital Terrain Model (DTM):** A digital representation in the form of a raster of the Earth's surface which excludes objects on the surface such as buildings and vegetation.
- **EXIF Data:** Exchangeable Image File Format data embedded in image files, recording metadata such as date, time, GPS location, focal length, aperture, shutter speed, and ISO. Crucial for ensuring accuracy in photomontage alignment and documentation.
- **Focal Length:** The distance (in millimetres) between the camera sensor and the lens' point of convergence. Affects the field of view and perspective in a photograph. Critical for camera matching in visualisations.
- **Forced centring tribrach:** A surveying instrument used to mount and level equipment
- **Geospatial**: Refers to data or technologies that are associated with specific locations on the Earth's surface. Includes coordinates, mapping, GPS data, and GIS systems that underpin spatial accuracy in LVIA workstreams.
- **GLONASS:** Global Navigation Satellite System. A satellite-based navigation system used in surveying to determine the coordinates (latitude, longitude, and elevation) of points on the Earth's surface, enabling accurate mapping and measurement.
- **GPS**: Global Positioning System. A satellite-based navigation system that provides location and time information to GPS receivers. It is used in surveying to determine the coordinates (latitude, longitude, and elevation) of points on the Earth's surface, enabling accurate mapping and measurement.
- **GST20-09 Traverse:** A heavy-duty tripod used to mount and level surveying equipment.
- **Horizon Line:** The visual boundary between land (or sea) and sky within a photograph or rendering. Used as a key alignment reference in photomontages and wirelines for camera matching.
- **IP network:** A computer network that uses Internet Protocol, a set of rules defining how data is sent and received over the internet, to facilitate communication among interconnected devices.

- **ISO:** Controls the sensitivity of the camera sensor to light.
  Together, they influence image quality, exposure, and clarity, impacting the suitability of photographs for accurate visualisation.
- **Leica :** A manufacturer of cameras, lenses, and other optical equipment.
- **Level Datum:** A fixed reference point or elevation (usually above sea level) from which all other vertical measurements are taken. Ensures consistency across models, drawings, and survey data.
- **LiDAR (Light Detection and Ranging):** A remote sensing technology that provides high-resolution elevation data to accurately model terrain and surface features for visibility analysis.
- **Observer features:** Digital points or lines used to represent observer locations to determine whether the proposed development would be visible from the observer location.
- **Panoramic:** A wide-format image (often 360° or partial panoramas) stitched together from multiple photographs taken from a single viewpoint. Commonly used in site photography to provide a broader context for visual impact analysis.
- **Photomontage:** A composite image that combines a photograph of an existing view with a rendered 3D model of a proposed development. Used to illustrate the likely visual impact of the development from specific viewpoints.
- **Prism Carriers:** A tool used in land surveying to help measure exact locations on the ground. It holds a small mirror-like object called a prism, which reflects signals back to a surveying instrument.
- **Prism Pole:** A tall, straight stick used by surveyors to hold a reflective prism at a specific height and location. The prism reflects signals back to a surveying instrument so the surveyor can measure exactly where that spot is on the ground.
- **Raster:** A digital image represented as a grid of pixels.
- **Rendering:** The process of generating a realistic or stylised image from a 3D model, incorporating lighting, materials, shadows, and atmospheric effects.
- **Seed File:** A file containing initial data or settings used to initialize a program, application, or database. It serves as a template for creating new files or populating databases with pre-defined information.
- **Shutter Speed:** Determines the duration of light exposure.
- **SIM card:** A small, removable smart card that enables mobile phones and other devices to connect to a cellular network. It stores information that identifies the user to the network, allowing for calls, texts, and data usage.
- **SmartRover:** A tool for quickly surveying or staking out points.
- **Spigots:** An attachment/mounting device.
- **Theodolite:** An instrument used for surveying distance, horizontal and vertical angles, and slope distance.
- **V-Ray Rendering Engine:** A high-performance rendering plugin used with 3D software (e.g., 3D Studio Max) to produce photorealistic images. Supports advanced lighting, material, and atmospheric effects, making it ideal for high-fidelity visualisations.
- **Viewshed:** The view of an area from a vantage point.
- **Visualisation:** A general term encompassing all forms of visual representation used to communicate the appearance of a proposed development, including photomontages, wirelines, 3D renders, and animations.

- Wireline: A simplified 3D visualisation showing only the outline or 'wireframe' of a proposed development, typically overlaid on a photograph or terrain model. Useful for showing scale, massing, and position with minimal visual intrusion.
- Zone of Theoretical Visibility (ZTV): Computer generated analysis used to map the potential visibility of a proposed development.
- 2D Drawing: A flat, two-dimensional representation of elements such as site plans, elevations, or sections. Used to convey layout, dimensions, and spatial relationships.
- 3D Model: A digital representation of a physical object or environment in three dimensions.
- 3D S Max: A professional 3D modelling, animation, and rendering software developed by Autodesk. Widely used in LVIA for camera matching, model preparation, and producing high-quality renderings and animations.

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Thames Water

It's everyone's water