





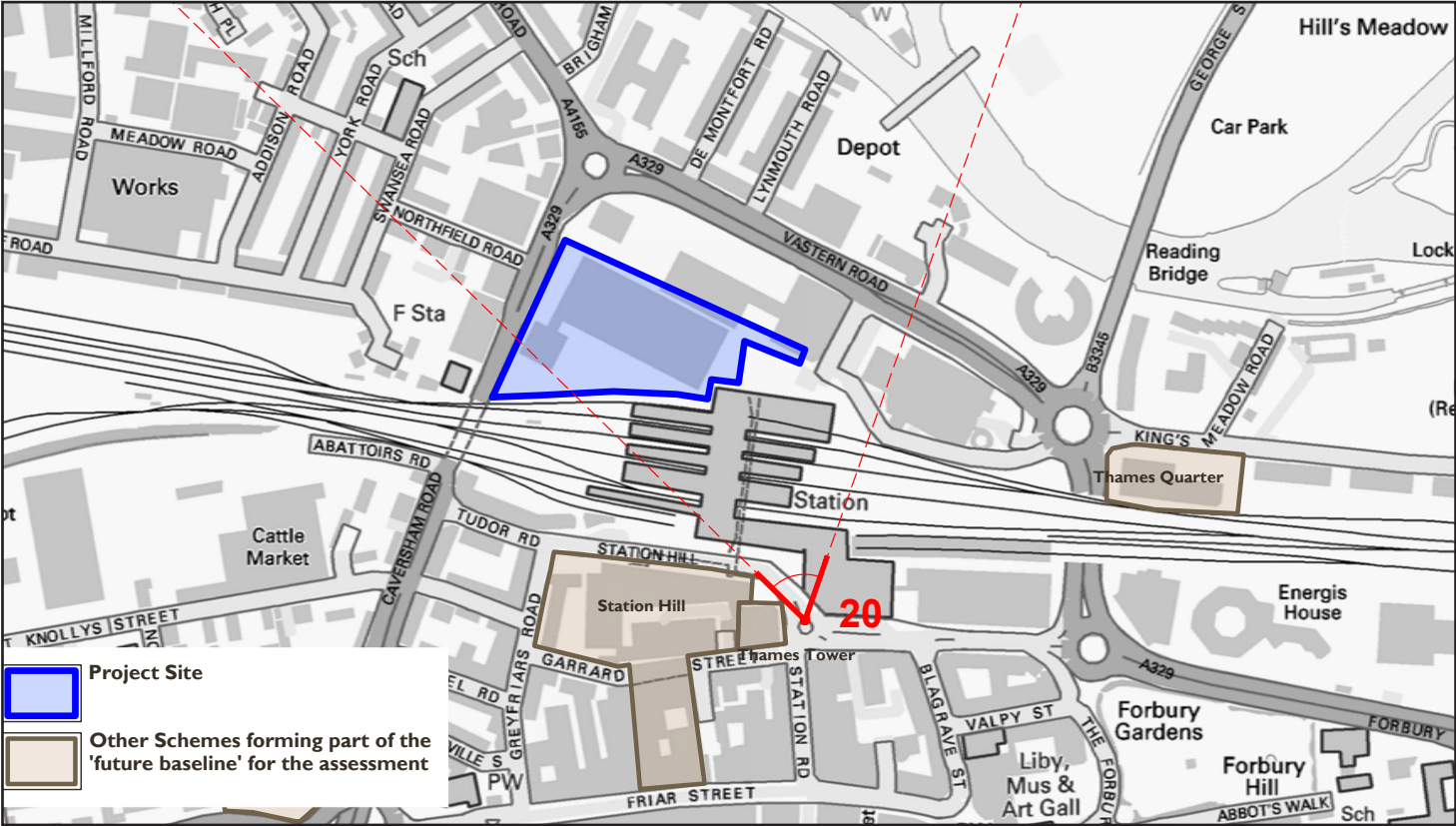
Survey reference points



|                     |                                     |
|---------------------|-------------------------------------|
| View Number         | 20                                  |
| AVR Level           | 2                                   |
| Theoretical Viewing |                                     |
| Distance *          | 260mm on A3 / 520mm on A1           |
| Location            | Station Square South looking NW     |
| Coordinates         | 471496, 173728 (to EPSG 27700)      |
| Bearing of View     | 346                                 |
| Distance            | 0.30 km (to centre of project site) |
| Eye Level           | 52.6 m AOD                          |
| Camera              | Canon EOS 5D MK III                 |
| Frame Type          | Single Frame                        |
| Focal Length        | 24mm                                |
| Horizontal FOV      | 72.2°                               |
| Vertical FOV        | 48.1°                               |
| Date of Photo       | 13/11/2018 12:34                    |
| Weather             | Sunny                               |

- Notes:
- To be viewed flat
- \*"Theoretical viewing distance" - Distance at which the observer could theoretically view the proposed and existing images to maintain proportional representation of the view as if on site.

View Location Plan



View Verification



View Verification





View 21 Victoria Recreation Ground looking NE - Existing

Notes:

- View on a 90 degree arc at a comfortable arm's length



View 21 Victoria Recreation Ground looking NE - Proposed

Notes:

- View on a 90 degree arc at a comfortable arm's length

Survey reference points



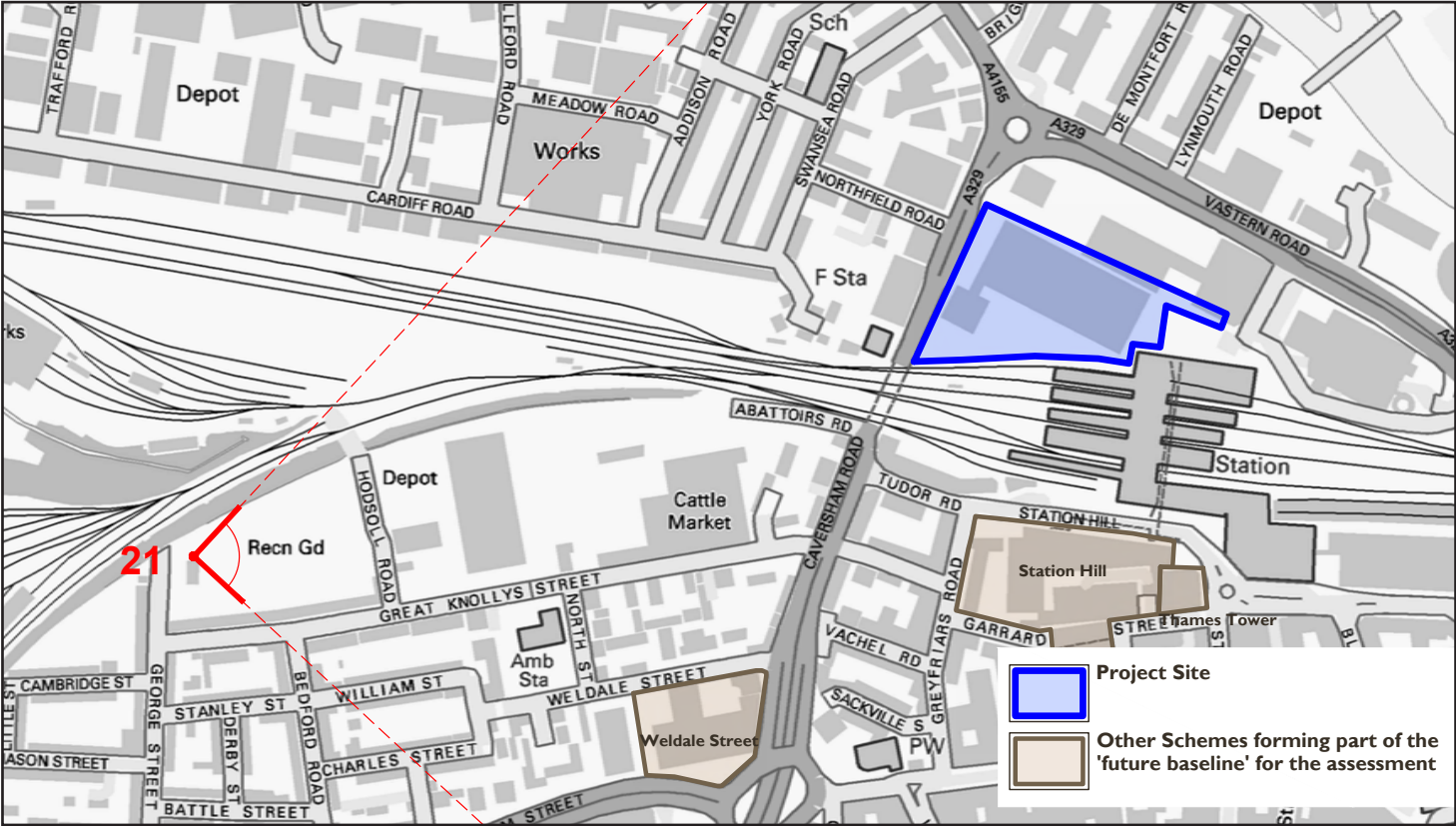
**View Number** 21  
**AVR Level** 2  
**Theoretical Viewing Distance \*** 540mm on A1 width Foldout  
  
**Location** Victoria Recreation Ground looking NE  
**Coordinates** 470600, 173767 (to EPSG 27700)  
**Bearing of View** 62  
**Distance** 0.82 km (to centre of project site)  
**Eye Level** 42.6 m AOD

**Camera** Canon EOS 5D MK III  
**Frame Type** Composite, Cylindrical Panorama  
**Focal Length** 50mm  
**Horizontal FOV** 90.0°  
**Vertical FOV** 25.8°

**Date of Photo** 13/11/2018 13:08  
**Weather** Sunny

- Notes:
- This view should be viewed 90 degrees.
- \*"Theoretical viewing distance" - Distance at which the observer could theoretically view the proposed and existing images to maintain proportional representation of the view as if on site.

View Location Plan



View Verification



View Verification



# Visually Verifiable Montage Methodology

## Introduction

A Verified View is an image that combines a photographic view with an accurate CAD 3-D representation of a proposed development, displayed to an agreed level of detail. Its purpose is to impartially and realistically represent the proposal, using a baseline of verifiable visual data and information. By using verifiable visual data this image can then be used by others (if required) to scrutinise the work, without its accuracy being questioned.

“Neither photographs nor visualisations can replicate a view as seen in reality and they should only be considered a tool for assessment” find where this is

Verified Views are also referred to as:

- Visually Verifiable Montages (VVMs)
- Verified Visual Image (VVI)
- Accurate Visual Representation (AVR)

When producing verified views, a series of options are available to aid design and planning decisions according to the level of detail required. To assist agreement between all parties prior to AVR preparation, the following classification types are presented to broadly define the purpose of an AVR in terms of the visual properties it represents.

This classification is a cumulative scale in which each level incorporates all the properties of the previous level.

- AVR Level 0 Location and size of proposal
- AVR Level 1 As level 0 + degree of visibility of proposal
- AVR Level 2 As level 1 + visual architectural form and details
- AVR Level 3 As level 2 + use of realistic materials

Nicholas Pearson Associates has an established reputation within the environmental and landscape consultancy field for the production of Verified Views for urban and rural developments and has successfully presented these for planning applications and as expert witnesses at public inquiry.

The methodology used by Nicholas Pearson Associates accords with the following guidance documents where appropriate:

- The Third Edition of the good practice ‘Guidelines for Landscape and Visual Impact Assessment’ 2013; produced by the Landscape Institute and Institute of Environmental Management & Assessment.
- Photography and photomontage in landscape and visual impact assessment, March 2011. Landscape Institute Advice Note 01/11.
- Visual representation of development proposals (31 March 2017) Landscape Institute Technical Guidance Note 02/17
- London View Management Framework Supplementary Planning Guidance: Appendix C: Accurate Visual Representations. March 2012.
- Visual Representation of Wind Farms Version 2.2, February 2017, Scottish Natural Heritage
- Assessing the impact of small-scale wind energy proposals on the natural heritage, March 2016 Version

3, Scottish Natural Heritage Guidance

- ‘Visualisation Standards for Wind Energy Developments’ (July 2016) Highland Council

Appendix A includes a project specific methodology pro-forma detailing which principles from this methodology have been applied.

## Photography

Suitable weather conditions are sought so that the proposals may be clearly visible in the context of the view. It should be noted that taking photographs looking south during the winter due to the low angle of the sun can be problematic. We therefore endeavor to take the photographs at an appropriate time of day to reduce the chance of the site being in shadow or backlit. The photograph(s) correctly portray the view which is obtained at each representative viewpoint whilst avoiding obvious obstructions.

Using detailed topographic survey and Ordnance Survey mapping, the camera is mounted on tripod at a height of 1.6m above existing ground level, which best represents the average human eye level. Where possible the tripod is positioned over a pre-surveyed feature which can be identified on the 3D model. A built-in spirit level is used to ensure that the camera is horizontal.

Photographs are taken in a RAW format using manual settings to enable the best quality results. The photographer takes note of the weather conditions and direction of view. All other details relating to the photograph are stored in the image EXIF data. If necessary, the original RAW file can be submitted as part of the verification process.

## Baseline Photograph

A common-sense approach is applied to our photography and image composition with no one format or lens being suitable for all situations. As a rule, rural and coastal sites may generally require a “panoramic” format, whilst urban sites may require a more considered approach using alternative formats where appropriate.

Invariably the photographic format can often be dictated by the reproduction size. Most imagery is viewed electronically on screen or printed at A3 with the occasional use of A1 wide by A4 high (840 x 297mm) for panoramic views. Therefore, a sensible balance must be struck to place the proposal within meaningful context whilst providing clarity for the viewer.

Each view of the proposal is represented so that an informed decision can be made by balancing the needs of the assessor or viewer on site. Wherever possible, consultation with the relevant planning professional takes place on the matter and our final methodology is based on the most appropriate agreed set of professional guidelines.

## Lenses

No ‘one size fits all’, and we will use the most appropriate set of lenses / formats to convey the view. Only prime lenses are used; in the following order of preference: 50mm, 28mm, 24mm, 24mm/Shift. Both landscape and portrait orientations are considered when planning the photography. The 50mm lens has always been regarded as the “standard” lens on a full frame 35mm camera and closest to the human eye when image printed at A3 and viewed at arm’s length. 50mm lenses are not always appropriate for all situations and so when viewing Verified Views based on other lenses, the observer must be aware of the limitations of the printed format. Alternative lenses are only selected when the viewpoint is close to the site. This means that even at a reduced printed scale, the observer is still able to identify all the features visible by the naked eye.

Full Frame Sensor lenses are quoted as having the following Horizontal Fields of View. Canon EF 50mm: 39.6 Degrees / Canon EF 28mm: 65.5 Degrees / Canon TS-E 24mm: 74 Degrees. However, the exact field

# Visually Verifiable Montage Methodology

of view cannot be assumed, and the actual field of view may vary +/- 2 or 3 degrees depending on the lens. When matching these lenses in our 3D software we have calculated the exact field of view of our own lenses.

## Photography Equipment Used

- Canon 5D Mk3 full frame digital SLR camera (Full frame sensor)
- Canon EF 50mm f/1.4 STM lens
- Canon EF 28mm f/1.8 USM Lens
- Canon TS-E 24mm f/3.5 L II
- Manfrotto Tripod
- NN4-D16-Nodal Ninja NN4 Panorama head with RD-16 rotator base
- NN-EZ-Nodal Ninja EZ Leveler MKII
- Plumb bob
- Compass

## Image Composition

A practical aesthetic approach is applied to our viewpoint photography, where good composition is important. We approach each viewpoint with the intention of capturing the view as perceived and experienced by the observer.

When the proposed development is at a distance, whilst the observer is aware of the wider area within their peripheral vision they tend to focus on the area in question. In these circumstances it is important to consider the limitations of printed technology. When representing proposals at a distance, the verified view is presented on a baseline photograph with a smaller field of view so that it can be reproduced at a scale suitable for viewing at a reasonable distance. To ensure that the viewer is provided with a representation of the wider context, a “representative” view with a larger field of view is presented alongside to demonstrate this. This may be a single frame photograph or panorama and “provides landscape and visual context only”

In most cases viewpoint photographs are taken so that the camera is level to the horizon, the verticals are not then distorted, and the proposals are in the center of the view. However, there are exceptions to this rule, such as:

- 1) Viewpoints from the top or bottom of a hill where the viewer naturally directs their line of site towards the focal point/s of the view. We may adjust the angle to ensure that we create a natural looking composition.
- 2) Slight rises vertically may also be necessary to pick up vital “tops” of features.
- 3) To allow the proposal to be assessed in context, a view may be adjusted to incorporate important features on the left or right-hand side meaning that the proposal may not always be in the center of the view.
- 4) The view is restricted (through an archway or along an avenue for example) where looking directly at the proposal is unnatural.
- 5) A famous view where composition is key (i.e.: a famous painting or photograph).
- 6) Shift/tilt lenses. Although the camera remains level the lens is “shifted” just enough to include the proposed development, or other features required, without including excessive sky. Due to the lens type the vertical elements of the photograph remain straight.

The original Canon RAW files are processed in Adobe Photoshop to adjust white balance, colour accuracy and sharpness. The images undergo further correction procedures to ensure the horizon is precisely horizontal and any barrel distortion is compensated for.

## Camera Matching & Verification:

Irrespective of whether the final VVM is output as a single or composite panoramic image, each Verified View is based upon a single rendered frame.

Viewpoint markers are used to tie the photograph to the CAD Camera view. These are surveyed features and points such as lamp posts, walls, boundaries and buildings; anything that has a known location. These markers are required to be as accurate as possible and should ideally be positioned within the central portion of the image. They should be at both varying heights, distances and breadth within the view. The background plate photograph is imported into 3D Studio Max to verify the accuracy of the match.

The location accuracy and angle of view can also be checked by triangulating the position and preparing view line sections. This is a reliable method successfully used for location finding in the field.

## Texturing, Rendering & Post Production

3D Studio Max was used for applying the photorealistic surfaces and materials to the 3D model. Material references and planting sizes are based upon information provided by the Architects / Landscape Architect

The exact resolution of the photograph is noted and used as the size for the final rendered output of the 3D Model view so that the two overlay each other precisely. Adobe Photoshop CC is used to blend the modelled information with the existing base line / base plate photograph.

## Reproduction

To assist the viewer in understanding the characteristics of the lenses used baseline photographs and verified views can be annotated around the border, to indicate the field of view and optical axis of the lens used. This border is divided up into degree increments indicating the field of view. The position of the optical axis indicates whether the photograph was taken with horizontal shift or vertical rise. The above added graphic is simply an alternative way of quickly knowing the lens used. This is particularly useful when a number of viewpoints of a proposal are taken with varying lens types.

It is important to reproduce each document and view at the correct size for both practicality and to ensure view accuracy when combined with the listed recommended viewing distance (as detailed on each view)

Each viewpoint within the document is supplied with all or some of the following information:

- Figure Number
- Viewpoint Number
- Viewpoint Details
- OS Coordinates (12 digit)
- Eye level (A.O.D)
- Direction of View (Bearing)
- Camera Height (AGL)
- Date & Time

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- Viewing distance (Advisory)
- Single Frame or Composite
- Horizontal Field of View
- Vertical Field of View
- Weather / Lighting Conditions
- Camera Type
- Lens / Focal Length
- Model and camera location accuracy

The Verified views in this document may also contain other information such as:

- Illustrative bar indicating compass bearing
- Extent of central 50mm frame used to construct panorama
- Extent of which Proposed development occupy – (Degrees noted)
- Number of buildings visible
- Distance to site
- Note on A3 versions: “This image provides landscape and visual context only.”
- Annotation of key features
- Note: “View flat at a comfortable arm’s length”
- Building ID numbers

## Viewpoint Pack

- Note: This image is intended only for use at the viewpoint.

Wirelines views are colour coded as follows:

- DTM – Grey/Black
- Waterbodies – Light Blue
- Proposed structures – Brown
- Existing structures - Blue

Each verified view is accompanied by a viewpoint location plan and photographs of camera locations together with a version of this methodology.

## Viewing Procedures

The purpose is to reproduce the Verified View so that it correctly reconstructs the perspective seen from the location from which the photograph was taken.

We aim to reproduce all wireframes and photomontages so that they can be viewed at a comfortable arm’s length. When comparing the view in the field, the viewer must also keep their head motionless. This ensures

that the represented view falls within the human field of view. The viewer must keep their head motionless and fix their eyes on the centre of the view. If requested an acetate print can be provided for viewing on site. This can help the viewer align the key features on the image with those in real life.

Cylindrical views are only intended for viewing as a printed image. The printed image should be viewed on an arc that matches the images field of view, at a comfortable arms-length.

Where it is not possible to represent the proposed site with suitable context in the standard document frame, a larger field of view is necessary. Irrespective of reproduction size all verified views are accurate representation, and the advisory viewing distance (also referred to as Principle Distance by the SNH guidance) is included on all images to allow technical comparison if required.

## Further Reading

Further summaries of our approach, verified view methods plus examples of our work can be found on our website:

<http://npavisuals.co.uk/approach/>

<http://npavisuals.co.uk/verified-view>

# Visually Verifiable Montage Methodology

## Appendix A: Project Specific Information

**Project:** Reading Metropolitan

**Site Location:** Caversham Road, Reading

**Status:** Planning

### Photography Equipment Used

- Canon 5D full frame digital SLR camera (Full frame sensor)
- Canon EF 50mm f/1.4 STM lens
- Canon EF 28mm f/1.8 USM Lens
- Canon TS-E 24mm f/3.5 L II
- Manfrotto Tripod
- NN4-D16-Nodal Ninja NN4 Panorama head with RD-16 rotator base
- NN-EZ-Nodal Ninja EZ Leveler MKII
- Plumb bob
- Compass

### The Following format/s were deemed appropriate for this project

- The baseline photograph(s) for Viewpoints 1,2,3,6,8,9,11,15 and 18 were single photographs taken using the Canon 50mm f/1.8 lens with a 39.6-degree field of view, reproduced suitable to be viewed at arm's length (540mm @ A3). This format is selected as suitable to assess architecture and site layout which occupies a key portion of the viewpoint requiring a greater level detail to represent in print what may be visible with the naked eye. The verified view can often be presented with a panoramic view which represents the wider context.
- The baseline photograph(s) for Representative viewpoints 1,2,3,6,8,9,11,15 and 18 were single photographs taken using the Canon 28mm f/1.8 lens with a 65-degree angle of view, reproduced suitable to be viewed at 300mm @ A3. This format is selected as suitable to assess architecture and site layout within its local setting. The use of this lens is supported by the Landscape Institute in situations where the whole development cannot be contained within the Field of View of a 50mm standard lens.
- The baseline photograph(s) for Viewpoints 7,19 & 20 were single photographs taken using the Canon TS-E 24mm f/3.5 L II with a 74-degree field of view, reproduced suitable to be viewed at 260mm @ A3 or 520mm @A1. This format is selected as suitable to assess larger architectural form and site layout within a restricted local setting. This lens removes parallax distortion and converging verticals, particularly on high buildings and more closely matches what the brain interprets. It The use of this lens derives from the London View Management Framework Supplementary Planning Guidance: Appendix C: Accurate Visual Representations. March 2012.
- The baseline photograph(s) for Viewpoints 4,6,10,12,13,14,16,17 & 21 were taken using the Canon 50mm f/1.4 lens at intervals of 20 degrees (When taken in landscape) or 15 degrees (When taken portrait). The individual photographs were stitched cylindrically to form original baseline images with either a 180-degree or 360-degree field of view. Using a predefined template, the images were reformatted to form baseline images with a horizontal field of view of 90 degrees and vertical field of view of 27 degrees.

These baseline images were resampled to a resolution of 300ppi suitable for printing at a size of 820mm x 245mm (A4 height x A1 width). The revised image resolution does not affect the quality of the final output and the down-sampling is necessary to ensure that the working files are of a manageable size. This format was selected as being suitable for assessing sites which sit within a panoramic landscape setting and is a method derived from the SNH Visual representation of wind farms, approved by the landscape institute. The finished images should be viewed as a curve at comfortable arm's length (Approx. 500mm)

### Mapping & Survey Data

- 2D/3D Topographic site survey
- OS Vector Mastermap data
- Z Map / City Model
- Digital Terrain Mapping (Commercial 3D height data)
- Aerial Photography
- GPS readings

To assist in the verification process the topographic survey, Lidar Data, Ordnance Survey was used to identify 3D point locations. In many cases these can include existing building ridgelines, tree canopies, lighting columns or similar such details. Data includes Camera locations and specific 3D points to assist in the camera matching process.

### Viewpoint Surveying

For each agreed photo viewpoint, a location plan is provided to the surveyor along with marked up a referenced photograph showing the camera in situ. The surveyor then establishes the location of each viewpoint using a Leica Global Positioning System (GPS). Where GPS positioning was not possible near to the required survey point, the surveyor works back from an established GPS location.

The surveyor records a range of reference points, using a reflectorless Total Station. These viewpoint marker points were in the foreground and background, high level and low level. These can include existing building ridges, lighting columns, bollards or similar such details

Data processing is conducted and referenced back to Ordnance Survey.

Data is presented in an Excel Spreadsheet, 3D DWG plus a photograph marked with the reference points.

### Applications Used

- AutoCAD
- Autodesk Civil 3D
- 3D Studio MAX
- Adobe Photoshop
- Adobe InDesign
- LSS McCarthy Taylor Systems

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## Proposals Supplied

- AutoCAD model
- External Levels

The proposals supplied by the architects (tp bennett) were combined with the site survey and mapping data so that they correspond with each other. A geo-referencing system is used when doing this so that information regarding viewpoints can be accurately located. The model(s) supplied were cross-checked with the site plan and elevations to ensure they accurately match the design drawings, including FFLs, ridge heights and footprint.

## AVR Level:

All views are shown to AVR Level 1