The Arena Stockley Park 2024

Accurate Visual Representations and Methodology

For Smith Jenkins
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DESIGN|3D|VISUALISATION

Contents

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1.0 Methodology Overview

Methodology Overview

1.1 The methodology applied by D3V Limited to produce accurate visual representations for the proposed development is described below. Guidance has been taken from Appendix C of the London View Management Framework: Supplementary Planning Guidance March 2012. As well as relevant sections from Guidelines for Landscape and Visual Impact assessment produced by The Landscape Institute with the Institute of Environmental Management and Assessment Second Edition London 2002.

1.2 Specific assessment point locations around the site were pre-defined by the project team and provided to D3V. This was used by D3V to carry out a preliminary study to identify the view towards the development from which an informative photograph could be taken. Once the location and view had been agreed by the project team, final photography was undertaken of the view and the camera location and various view features were recorded precisely by the surveyor, using a combination of GPS techniques and conventional observations.

1.3 Using design information provided by the project team D3V created a 3D model of the proposed development. This was used along with the data recorded by the surveyor to create a computer generated image that would exactly overlay the appropriate photograph. The photograph could then be divided into foreground and background elements in relation to the proposed development and when combined with the computer generated image, gives an accurate impression of the impact of the proposed development on the selected view in terms of scale, location and where requested the use of materials.

2.0 Photography

Reconnaissance

2.1 Smith Jenkins provided D3V with assessment point locations and the view directions indicated on an OS plan. This was used to undertake a photographic reconnaissance to identify any obstructions or problems with the proposed views. From each position, a digital photograph was taken looking in the direction of the proposed development. Its position was noted, along with field observations and a second digital photograph of a location marker. This preliminary study allowed the project team to agree the view location and direction for final photography.

Appropriate Field of View

2.2 There is no definitive camera and lens set up that can be used for all photomontage work to capture the individual perception of a scene and how we experience the view.

“A choice has to be made between showing the detail of a proposal in the greatest clarity and placing it into a meaningful context”
LVMF SPG Appendix C 2012

A built up street scene taken with a horizontal field of view of 40º (50mm focal length on a 35mm camera) is not going to be able to capture enough context to be meaningful and therefore use of only 40º lenses is not recommended.

2.3 Photographs taken with wider angle lenses such as those with a horizontal field of view in the region of 70° (24-28 mm focal length on a 35mm camera) are appropriate if usefully annotated, and can be meaningful to those assessing, adding peripheral information which portrays our actual experience of a scene more accurately.

2.4 Ideally the photomontage would be reviewed in combination with a site based assessment.

Camera and Lens Set Up

2.5 The high resolution digital photography used by D3V was captured using a full frame Canon Digital SLR 5D MkII high resolution digital camera and Canon’s ‘L’ series professional lenses which produce high quality images.

2.6 For local views a 24mm ,28mm or 24mm Tilt and Shift lens was used in order to capture as much of the proposal and its surroundings as possible. Intermediate and long distance views were photographed with a standard 35mm to 50mm focal length.

2.7 The eye and brain compensate for non-perpendicular verticals and it is desirable to try and replicate this in architectural photography. A tripod with a 3-way head, allowing a full range of adjustment and incorporating bubble levels was used. The dual-axis levels enable a photograph to be taken with horizontal line of sight and horizon which ensures vertical elements of the photographed scene remain perpendicular to the horizon which is also desirable to achieve accurate camera matching within the 3D model later in the process.

Final Photography

2.8 Each view was photographed using the aforementioned camera set up. To accurately identify the view location the centre point of the tripod and camera was marked or recorded using a plumb line to denote exactly the centre point of the viewing position on the ground. A digital photograph record showing the marker and camera tripod in situ was taken to allow the surveyor to return to its location.

2.9 Along with the photographic record, the lens used and the time and date that each photograph was taken was noted, so that lighting conditions could be recreated in the computer model.

2.10 For each view, a range of photographs were taken in RAW file format. These were reviewed and a photograph selected for each view that was to be developed as an AVR. This was processed and adjusted digitally for both high detail and colour accuracy. The adjusted digital image was then ready to be used in the camera matching process and a JPEG version of the image formed part of the brief sent to the surveyor.

3.0 GPS Survey

3.1 A survey brief was prepared, consisting of each views photograph to be surveyed, an assessment point location map and location reference photographs.

3.2 Cadmap Survey Services were contracted as the surveyor. They undertook the survey of each views camera location, as marked on the ground beneath the camera, along with a spread of 10-15 alignment points in the view. The alignment points being features of the built environment visible in the views photograph such as the corner of a window opening or the top of a lamppost. These included points close to the camera as well as those close to the target.

3.3 Using differential GPS techniques, the surveyor established the location of at least two intervisible stations in the vicinity of the camera location. From these the local survey stations, the alignment points were surveyed using conventional observation.

3.4 The resulting survey points were amalgamated into a single point set by the surveyor. This data set was transformed and re-projected into OSGB36 (National Grid) coordinates and height data using the OS Newlyn Datum.

3.5 The data set was supplied to D3V as written descriptions, coordinates and height level data in Excel format and as 3D data in DWG file format. The surveyed view information was also supplied as PDF/Image files, detailing the observed alignment points overlaid on to each views photograph.

3.6 The Surveying equipment used by the surveyor was a Leica 1205+ R400 Total station and Leica Viva GPS Rover.

4.0 Creation of Computer Generated Images

4.1 The process of how a CGI (Computer Generated Image) of the proposed development was created is explained below.

3D Model

4.2 All plans, elevations and design information regarding the proposed development were supplied to D3V in digital format by JWA Architects. D3V created a 3D computer model of the proposed development based on the information supplied.

4.3 The 3D model was aligned with the OS Site plan provided by JWA Architects. By using a transformation between the 3D model and the OSGB36 National grid and vertical datum based on the OS Newlyn Datum, the model, the survey data and other data sets were combined into a consistent spatial reference framework.

Camera Matching Process

4.5 A virtual camera based on the real camera and lens combination used to photograph each view was created within the 3D software. This was positioned in the 3D model using the surveyed camera location and height.

4.6 From the point set supplied by the surveyor, D3V created 3D alignment points in the 3D software by placing inverted cones at the co-ordinates of each views surveyed alignment points.

4.7 The photograph of the view to be matched was attached to the virtual camera as a background plate. This was used to adjust the virtual camera so that the 3D alignment points would align with the surveyed alignment points of features on the background plate photograph, therefore verifying a match between the virtual camera and the photograph.

4.8 Where a Tilt and Shift lens was used to Photograph a view perspective lines of view features were marked on the Photograph to ascertain vanishing points and allow the horizon to be identified . This allowed the background plate size to be recalculated and allow the virtual camera to be adjusted to the 3D Alignment points as described above.

4.9 The virtual camera was then configured to render the 3D model at the same resolution as the photograph of the original view. This was then composited with the photograph in post-production.

Rendering

4.9 Rendering is the process by which the 3D software calculates the effect of the camera view, the lighting and the applied materials on the 3D model and creates a rendered perspective image. In the production of AVR's, this rendered image can then be composited with a photograph in post-production to create a CGI of the proposed development. The complexity of the rendering configuration is determined by the level of visual properties needed to represent the level of the AVR required. This could be a wireline render suitable for AVR1 to 'photorealistic' rendering for AVR3 standard.

4.10 D3V obtained details from the architect regarding the proposed materials to be used prior to the rendering process. This information was used to produce material definitions that were applied to the 3D model to best approximate the representation of proposed materials, transparency, and reflection of the surrounding environment in the CGI.

4.11 The same detailed 3D model and applied material definitions was used for all views of the proposed development, giving a consistent level of detail for all rendered views.

4.12 A lighting simulation was used based on latitude, longitude, building orientation and date and time, to determine the correct location of the sun within the 3D computer model for each individual view.

4.13 The 3D software was then configured to create a high resolution rendering based on the detailed model and its applied materials, the virtual camera specification, and the lighting simulation indicative of the proposed buildings appearance when viewed under the lighting conditions of the selected views photograph.

Post-Production

4.14 The photomontage of the rendered image and the original photograph was conducted using imaging software, Adobe Photoshop®.

4.15 The camera-matched rendered image of the 3D model was inserted and overlaid on to the views photograph and carefully studied to identify background and foreground elements to the proposed development.

4.16 The different elements of the photograph and the rendered image were then appropriately masked or extracted to different layers so that they could be combined together to create the final CGI for use as an accurate visual representation.

5.0 Documentation

5.1 The remainder of this document shows the existing and proposed AVR images for each assessment point view. Additionally on each existing view page, the location plans, camera location reference photographs and camera and photograph data are also included for the view.

5.2 For each existing and proposed AVR image, markings have been applied to perimeter of the image. The triangular markings indicate the centre of the image by marking the horizontal and vertical optical axis of the original photograph The graduations marked away from the optical axis indicate increments of 1 and 10 degrees of the field of view.

5.3 Tilt and Shift lens Photographs can be identified as the horizontal axis is marked in blue and lies below the centre horizontal axis of the photograph.

5.4 Any exceptions to the methodology as described previously are clearly identified on the appropriate views page.

Assessment Point Locations

View	Description of View	AVR	Photo Reference	Easting	Northing	Elevation (AOD)	Camera Height	Lens Focal Length	HFOV	Date	Time
V01	View from Stockley quayside carpark	AVR3	STOCK24-V01-IMG_1071	507949.097	180474.759	38.035	1.6m	24mm	73.7°	27/03/24	13:08
V02	View from Site entrance road	AVR3	STOCK24-V02-IMG_1024	507871.896	180452.819	36.322	1.6m	24mm	73.7°	27/03/24	12:55
V03	View from Bennetsfield Road	AVR3	STOCK24-V03-IMG_1010	507945.045	180328.743	35.37	1.6m	24mm	73.7°	27/03/24	12:45
V04	View from Roundwood Avenue	AVR3	STOCK24-V04-IMG_0974	508054.209	180303.295	35.311	1.6m	24mm	73.7°	27/03/24	12:36

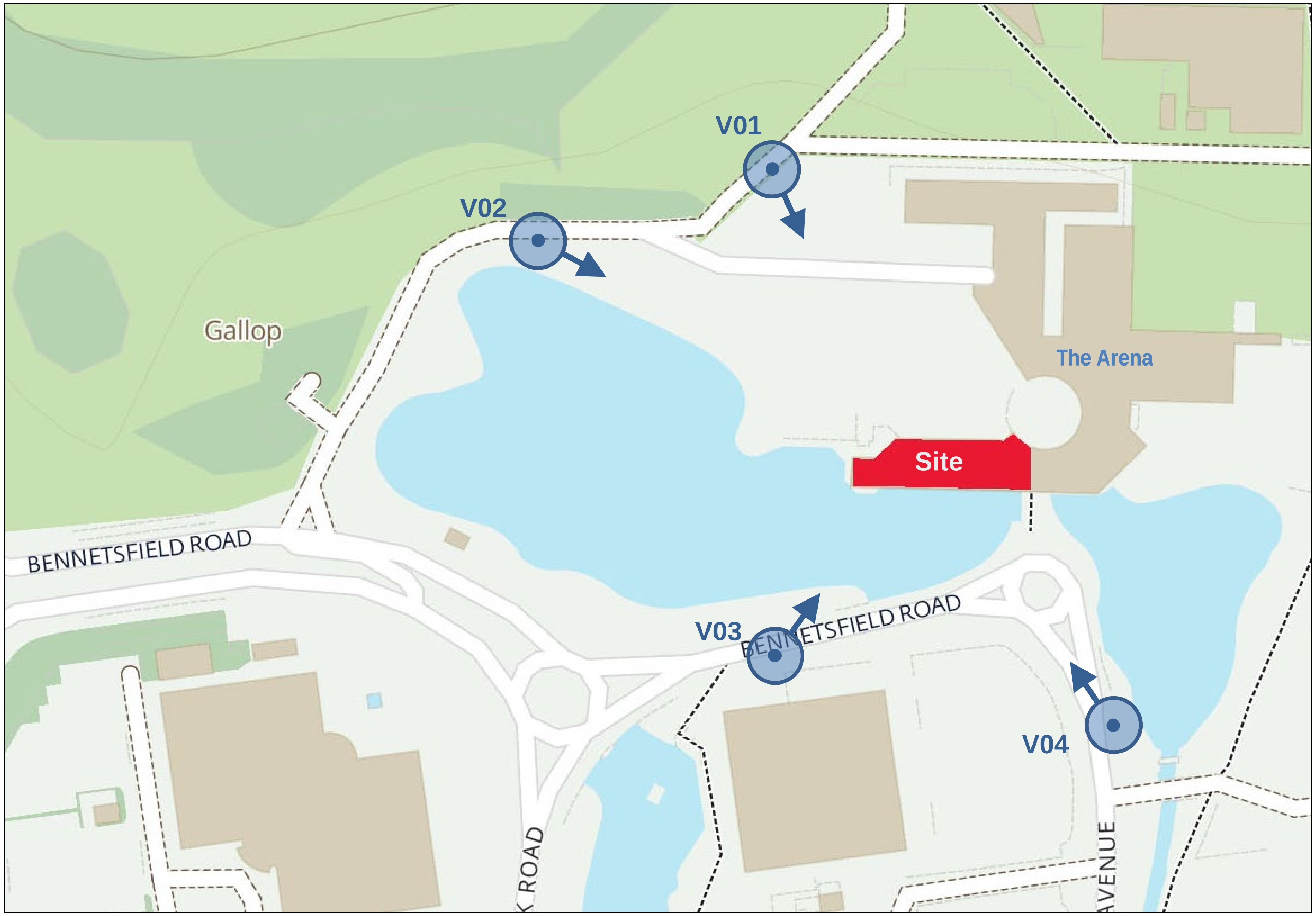
View Thumbnail Reference


View01


View02


View03


View04



D3V DESIGN 3D VISUALISATION

View 01 View from carpark

View as existing

View Location map

Photo Ref : STOCK-V01-IMG1071
Easting : 507949.097
Northing : 180474.759
Elevation : 38.035m AOD
Camera Ht : 1.6 m
Lens : 24 mm
HFOV : 73.7°
Date : 27/03/24
Time : 13:08

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View as proposed

STOCK24Nov-AVR-V01-A01

The Arena, Stockley Park AVR 2024

View 02 View from site entrance road

View as existing

View Location map

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Photo Ref  : STOCK-V02-IMG1024
Easting    : 507871.896
Northing   : 180452.819
Elevation  : 36.322m AOD
Camera Ht  : 1.6 m
Lens       : 24 mm
HFOV       : 73.7°
Date       : 27/03/24
Time       : 12:55
```

View 02 View from site entrance road

View as proposed

STOCK24Nov-AVR-V02-A01

View as existing

View Location map

```
Photo Ref  : STOCK-V03-IMG1010
Easting    : 507945.045
Northing   : 180328.743
Elevation  : 35.37m AOD
Camera Ht  : 1.6 m
Lens       : 24 mm
HFOV       : 73.7°
Date       : 27/03/24
Time       : 12:45
```

View 03 View from Bennetsfield road

View as proposed

STOCK24Nov-AVR-V03-A01

View as existing

View Location map

Photo Ref : STOCK-V04-IMG0974
Easting : 508054.209
Northing : 180303.295
Elevation : 35.311m AOD
Camera Ht : 1.6 m
Lens : 24 mm
HFOV : 73.7°
Date : 27/03/24
Time : 12:36

View 04 View Roundwood Avenue

View as proposed

STOCK24Nov-AVR-V04-A01