Townscape and Visual Impact Assessment

Appendix 3

Part B

Vastern Road, Reading

A: Verified Photomontages
B: Methodology and Supporting Evidence

January 2020

Contents

1.0 Overview

This document has been prepared by Realm to explain the methodology used to create accurate visual representations (AVRs) of the proposed development at Vastern Road, Reading. The visual assessment of the proposed development reflects current best practice in relation to the verification of images, a process which is constantly being refined and improved with advances in technology and industry experience.

The purpose of the photomontages is to present an accurate overview of the proposed development which enables its effect on the landscape and views to be objectively evaluated. Every image contained within this document is verified unless otherwise stated. Final images should not be used as a standalone tool to assess the suitability of a development, but should be used in conjunction with a site visit.

In this document, you will be guided through a step-by-step description of how Realm has produced an accurate representation of the maximum envelope of built form in accordance with development parameters, in pictorial form, to explain the processes used (including statements from the photographer and survey team). The methodologies described in this document are based on current best practice and follow recommendations from from The Landscape Institute's "Guidelines for Landscape and Visual Impact Assessment" (3rd Edition 2013) and their supplementary Advice Note "Photography and Photomontage in Landscape and Visual Impact Assessment" (Jan 2011).

This document includes an audit trail to demonstrate the key stages of production (see Section 3.0) that can, if required, be checked by a third party. This document sets out the methodologies used for the photography, surveying, 3D modelling and camera matching processes - all critical to ensuring the accuracy of the final photomontages.

The photomontage images represent how the built form would be perceived from locations in the public realm. These locations were established as representative viewpoints suitable for photomontage illustration, by Barton Willmore.

Photography
Arcminute Ltd
62 Grove Park Terrace
London W4 3QE
Phone: 07774 857627

Survey of existing views and camera locations
Datum Survey Services Ltd
Brickfield Business Centre, Brickfield House
High Road, Thornwood, Epping CM16 6TH
Phone: 07977 111935

Selection of viewpoints
Barton Willmore
7 Soho Square
London W1D 3QB
Phone: 020 7446 6888

Production and checking of verified images
Realm Communications
The Workshop, Old Barn Cottage, Down Lane
Compton, Guildford GU3 1DQ
Phone: 01483 813888

Supply of building CAD, spot height information and landscape
Berkeley Homes (Oxford and Chiltern) Ltd
Berkeley House
Farnham Lane, Farnham Royal
SL2 3RQ
Phone: 01753 784 400

2.0 Methodology

2.1 Photography

The professional architectural photographer employed on this project was briefed by Realm to work to a methodology which conforms to the principles specified in section 1.0 Overview.

The following methodology statement has been supplied by Arcminute:

Photography brief The following methodology applies to the production of photographic images originated in March and October 2019 that form the pictorial basis for visual impact assessment for 10 views for the proposed development at Vastern Road, Reading.

Equipment Images are captured on a 36mm x 24mm 21 megapixel digital sensor in combination with the following shift lenses:

- Focal length 24mm | Horizontal FOV 74º (for close views in built-up streetscapes)
- Focal length 35mm | Horizontal FOV 55º (for close views requiring selective framing)
- Focal length 50mm | Horizontal FOV 40º (for long distance views)

Lenses outside these parameters are also available for use in certain circumstances but these 3 lenses have been found to cover the vast majority of situations required in this type of work.

Choice of lens We prefer to replicate (as far as possible) what may have already been provided in terms of preliminary view studies as typically these would have been generated using pre-considered factors as to what each view would need to illustrate e.g. context, key visual receptors etc. In the absence of a definitive steer, we will generally use a 74º HFOV lens for medium to close views in an urban environment and a 40º HFOV lens for long distance views. However, the actual size and nature of a scheme (single building or large multibuilding development) and its location will also be considered before lens selection. The Landscape Institute's latest guidelines have been relaxed with regard to lens choice and they are no longer insistent that a 'standard' lens be used wherever possible.

Photography The camera is mounted on a tripod at eye level which on level ground is 1.65m within a +/- 100mm tolerance. The camera is then levelled in roll and pitch to a tolerance of 30mm per 100m using a precision spirit level. The point on the lens which coincides with the virtual render camera is horizontally referenced to a survey mark (nail or paint) to +/- 2mm using a survey standard procedure and the height above this is measured using a steel tape measure to the same tolerance. A photograph is taken of the tripod in its location, the survey point on the ground and the tape measure reading against a reference point on the camera mount. During image capture particular emphasis is placed on the following:

- Rendering all points in the scene as sharply as possible to avoid any sense of selective focus.
- Capturing all tonal detail in the scene and avoiding 'blown out' highlights and 'blocked up' shadows.

Where a scene's brightness range exceeds that of the sensors dynamic capture range it may be necessary to combine two or more different exposures to create a final image to overcome this limitation and to maintain a realistic tonal rendering closer to that of the human eye.

Post production The camera images are captured using a native camera or 'RAW' format and a software application is used to turn these into universally accessible RGB raster images. At this conversion stage colour and tonal adjustments are made to recreate as honestly as possible the scene as was presented to the photographer at the time of capture. RGB images are corrected using specialist software to remove non-perspectival optical distortion in order to create a geometrically accurate 2D projection which can be precisely aligned with CGI renderings and survey data. The image is then placed in a standard sized image template and the calibrated lens axis position is aligned with the documents centre. This accounts for both deliberate offset through lens shift and manufacturing tolerances in lens to camera body alignment. A text file in the image document records camera height above the survey point, lens focal length, film gate, date and time, nominal lens offset and document pixel dimensions. All images are also accompanied with photographic evidence of camera location, survey point location and height above survey point.

2.2 Survey

All of the baseline photographs were taken by a professional architectural photographer. Each viewpoint location is surveyed and identified by Ordnance Survey co-ordinates. The heights and distances of significant points within each view that are easily distinguishable have also been recorded as Ordnance Survey grid and level datum and their accuracy has been checked relative to the fixed camera position. The survey points for each view provide an effective check for ensuring that the 3D model and existing views are accurately merged together.

The following methodology statement has been supplied by Datum Survey Services:

Survey brief We were commissioned to survey and record co-ordinates (Eastings, Northings and AOD Height) of known points of detail located around the proposed development at Vastern Road, Reading. Digital files of the 10 views together with camera point locations were provided by the photographer.

Date of surveys March and October 2019

Camera point positioning Network RTK solutions were established using a Leica GPS + GLONASS SmartRover receiver. The equipment was set-up directly over the camera position (survey nail) and multiple observations were recorded. A second (reference) point was taken approximately 100m away from the camera position using the same method.

Data capture Traditional survey techniques were employed to record the points of detail within each view. A Leica TCRA TS15 Total Station with long range reflector-less distance measurement capabilities was set-up directly over the camera point and orientated to Ordnance Survey National Grid using the two sets of co-ordinates determined by the SmartRover receiver.

Deliverables The completed survey data was issued as follows:

- Microsoft Excel Spreadsheet comprising point numbers, coordinate data and descriptions
- PDF copies of each photo with point locations and view specific point numbers clearly marked
- AutoCAD DWG file containing 3D survey points with view specific point numbers.

2.3 3D building model

The building was modelled by Realm based on CAD supplied by the architect. The 2D drawings of the proposed development were supplied by Berkeley and were initially imported into 3DS Max. The drawings were then traced over using snap tools within this program to create an accurate 1:1 scale model of the proposed development. A manual crosscheck of heights was then carried out by Realm across all buildings, working with the finished floor information as supplied in the CAD. We also created a terrain model as an additional proof tool to ensure that the photomontages accurately reflect the proposed development within the view context.

2.4 3D landscape

The landscape and planting information was supplied by Berkeley.

2.5 Camera matching

The verification process confirms the accuracy of the 3D model in relation to each view. The camera matching process involves accurately matching the position of the virtual camera with the real world camera in OS space, and the location of the 3D model of the proposed development within each (existing) view. This is achieved through aligning the imported 3D cloud of survey points within the base photo and 3D environment, creating a virtual camera that replicates the exact position and height of the real world camera to produce an image where the rendered survey points match in visual location those recorded by the survey team and photographer.

The specifications of the lens type relating to each existing view is also entered into 3DS Max to help guide with alignment. An alignment is deemed correct only when all survey points sit exactly over the pixel in the photo that corresponds with the marked-up survey photo. If all points match, the virtual camera must therefore be correctly aligned.

For each view we measure the distance from camera to target and apply respective equations to establish the potential adjustment necessary to compensate for both curvature of the earth and light refraction. Typically, when the real world camera is positioned within 1.5km from the target, the effects of curvature of the earth and light refraction are deemed to be negligible in terms of their visual impact and therefore no adjustment is made to the Z axis of the building model within the view.

2.6 Lighting and rendering

To accurately light the 3D model, 3DS Max's 'daylight system' is set to replicate the solar time, date and geographic location (longitude and latitude) as recorded in the base photograph. The settings used for each base photograph (F stop, shutter speed etc) are replicated in both this 'daylight system' and the virtual camera set-up. This process mimics the virtual sun so that the lighting falls upon the 3D model as it would in real life at the point when the photograph was captured. Fine tuning is sometimes necessary to better match the resultant lighting and shadows to the base photograph.

Once the camera matching and lighting processes are complete, the render of the 3D model is output to the same pixel resolution as per each respective base photograph.

2.7 Post production

The render of the three-dimensional model is superimposed on the existing still views in Adobe Photoshop. The foreground of the existing views is then copied and placed over the rendered model in order to ensure that the depth is accurate within the photomontage view between the foreground, background and the rendered model. At this stage, for the fully rendered photomontages, the textured model can be further adjusted to match the resolution, colouring and saturation of the photograph taken to create a close impression of what the textures of the buildings and structures would look like. This is a qualitative exercise and requires interpretation by the designer on how the structure will look. A final qualitative check of all of the photomontage images has been carried out to ensure that they provide objectively accurate views of the proposed development.

2.8 Recommended viewing distances

It is recommended that final images are viewed at an optimum viewing distance (in relation to the size of printed photomontage) to give a correct sense of scale. We recommend that images are printed to a size that creates a comfortable viewing distance of between 300 to 500mm. The recommended viewing distance for each image is specified within Section 4.0 of this document.

We recommend that all 40 degree cropped images are printed as presented in this document in A3 landscape format. The correct 'to scale' viewing distance for all images printed to this format is 467mm.

2.9 Caveats

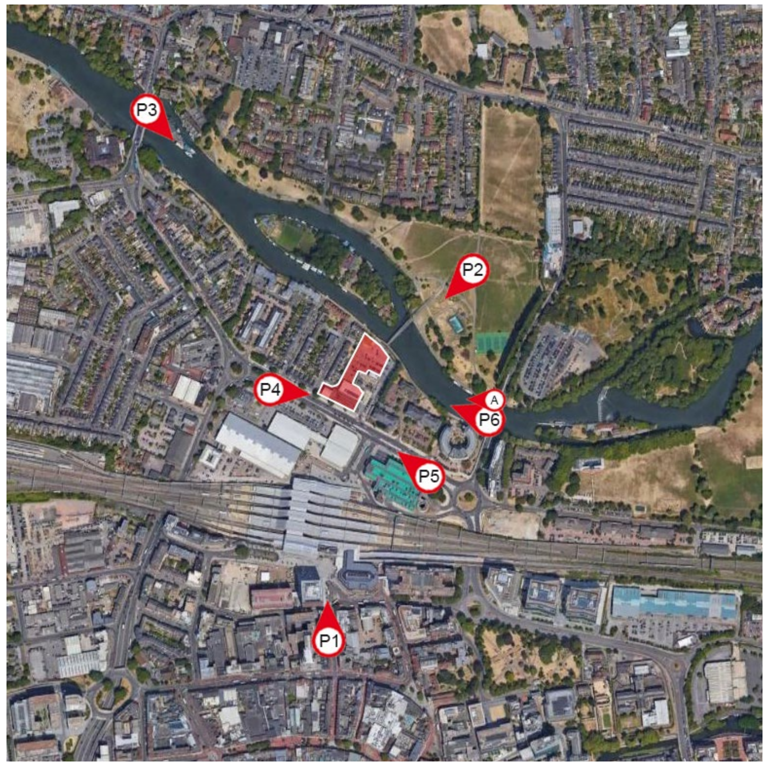
None.

3.0 Supporting evidence

Ordance survey co-ordinates			
View Ref	Eastings	Northings	AOD Height
P1	471501.461	173652.495	44.702
P2	471757.331	174330.210	38.234
P3	471160.300	174608.438	43.638
P4	471395.451	174107.509	39.591
P5	471679.057	173951.646	39.688
P6	471800.316	174076.725	44.342
P6A	471800.317	174076.724	44.342
P7	471647.357	175009.713	46.991
P8	472152.946	175858.771	73.068
P9	471416.014	175374.154	60.902
P10	471972.327	172401.245	62.774

View P1 - Station Road next to RBS, looking north

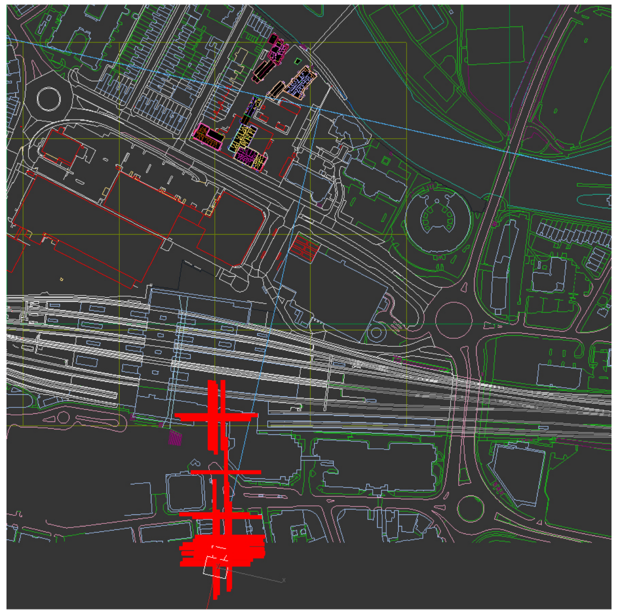
3.1 Ordinance survey co-ordinates			
Point Ref	Eastings	Northings	AOD height
9701	471500.599	173656.916	47.140
9702	471500.577	173655.561	46.408
9703	471499.558	173672.753	47.735
9704	471501.765	173667.295	44.543
9705	471503.222	173660.589	44.553
9706	471503.070	173676.549	47.438
9707	471500.994	173807.015	51.684
9708	471499.354	173708.109	47.038
9709	471494.924	173811.486	59.414
9710	471499.157	173810.979	59.418
9711	471515.985	173684.790	59.328
9712	471515.495	173666.593	47.554
9713	471515.303	173676.652	45.561
9714	471513.774	173680.073	51.214
9715	471515.101	173671.518	54.075
9716	471512.697	173705.055	55.410
9717	471514.667	173664.180	49.972
9718	471516.015	173667.764	57.185
9719	471508.464	173811.601	55.528
9720	471511.547	173752.119	53.696



01.2 OS survey points marked on photograph

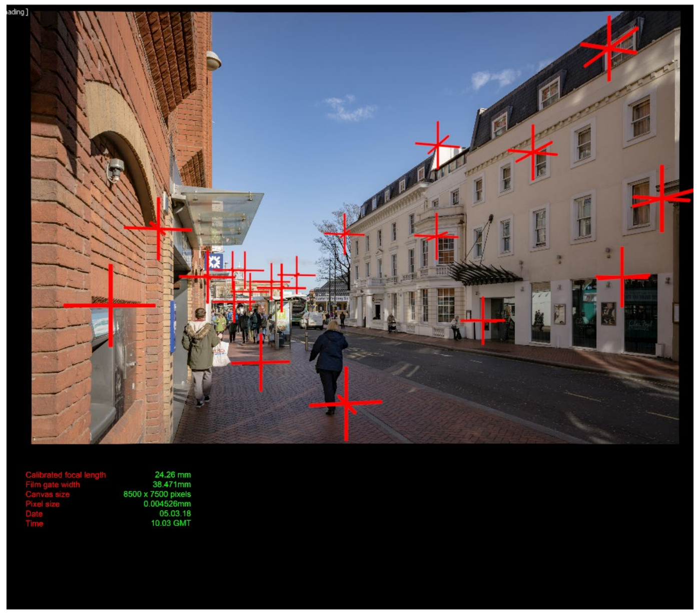
01.3 View P1 camera location

Eastings	471501.461m
Northings	173652.495m
AOD height	44.702m
Distance to centre of site	450m
Bearing from North	13°

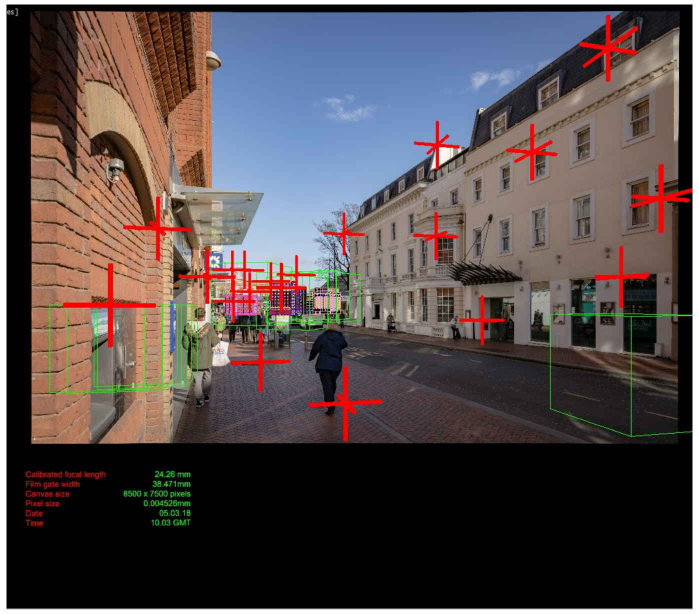


3.4 Screen grab of camera location in 3DS Max software

3.5 Screen grab of calculated horizon line



3.6 Screen grab of camera matching to survey data



3.7 Screen grab of model matched to photograph

3.8 Final camera matched photomontage

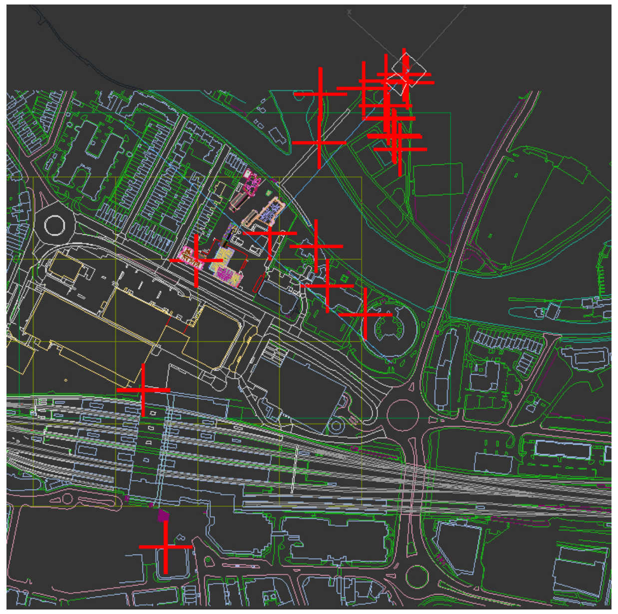
View P2 Winter - Christchurch Meadows, approach to Christchurch Bridge, looking south-west

3.1 Ordinance survey co-ordinates			
Point Ref	Eastings	Northings	AOD height
2201	471750.973	174323.961	36.669
2202	471745.609	174232.727	39.439
2203	471740.387	174248.530	40.813
2204	471657.593	174068.705	56.913
2205	471728.713	174286.957	41.490
2206	471664.129	174218.840	40.075
2207	471733.729	174269.876	37.443
2208	471646.073	174115.090	40.549
2209	471647.855	174242.235	75.514
2210	471484.780	174105.357	51.422
2211	471702.247	174307.795	39.579
2212	471652.771	174293.468	38.142
2213	471656.764	174303.431	37.935
2214	471729.191	174316.731	38.158
2215	471701.491	174027.304	54.805

01.2 OS survey points marked on photograph

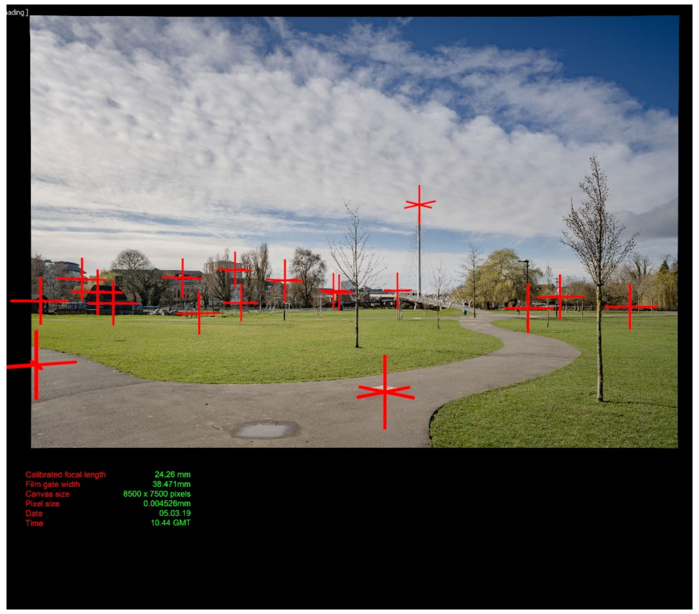
01.3 View P2 winter camera location

Eastings	471794.699m
Northings	174060.109m
AOD height	43.135m
Distance to centre of site	319m
Bearing from North	222°

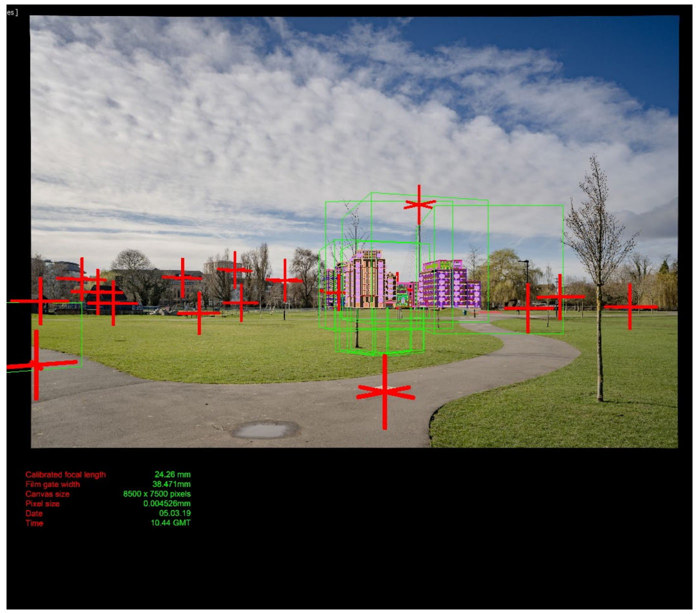


3.4 Screen grab of camera location in 3DS Max software

3.5 Screen grab of calculated horizon line



3.6 Screen grab of camera matching to survey data



3.7 Screen grab of model matched to photograph

3.8 Final camera matched photomontage

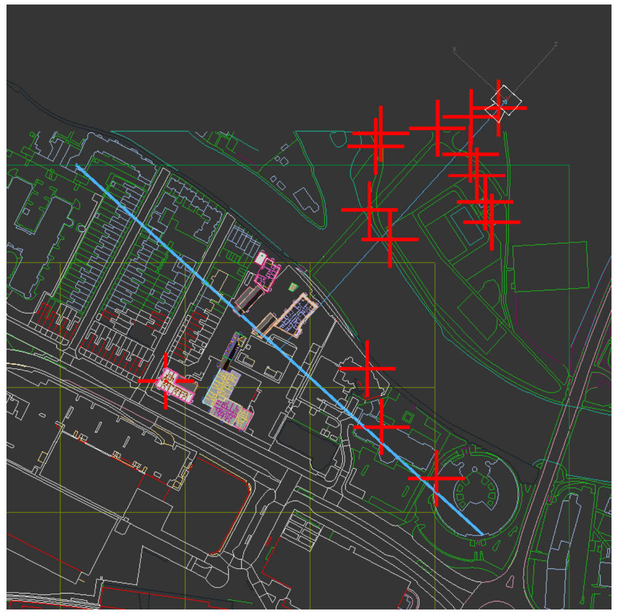
View P2 Summer - Christchurch Meadows, approach to Christchurch Bridge, looking south-west

3.1 Ordinance survey co-ordinates			
Point Ref	Eastings	Northings	AOD height
2201	471750.973	174323.961	36.669
2202	471745.609	174232.727	39.439
2203	471740.387	174248.530	40.813
2204	471657.593	174068.705	56.913
2205	471728.713	174286.957	41.490
2206	471664.129	174218.840	40.075
2207	471733.729	174269.876	37.443
2208	471646.073	174115.090	40.549
2209	471647.855	174242.235	75.514
2210	471484.780	174105.357	51.422
2211	471702.247	174307.795	39.579
2212	471652.771	174293.468	38.142
2213	471656.764	174303.431	37.935
2214	471729.191	174316.731	38.158
2215	471701.491	174027.304	54.805

01.2 OS survey points marked on photograph

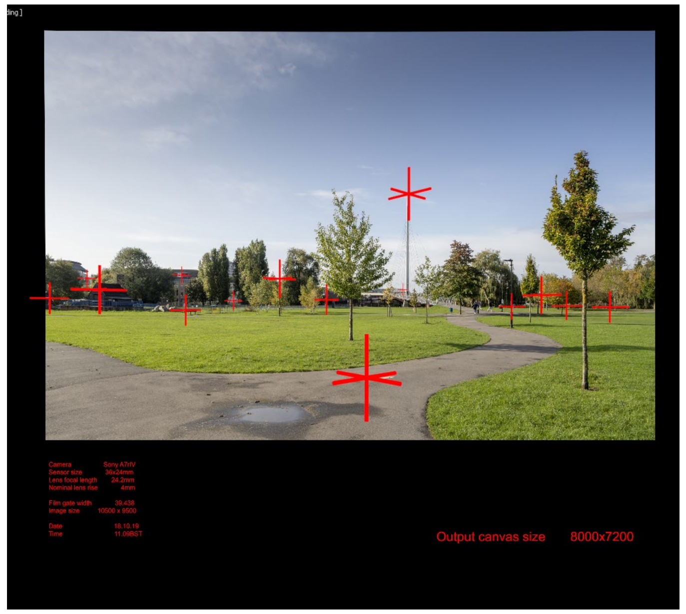
01.3 View P2 summer camera location

Eastings	471757.3308m
Northings	174330.2104m
AOD height	38.2337m
Distance to centre of site	279m
Bearing from North	222°

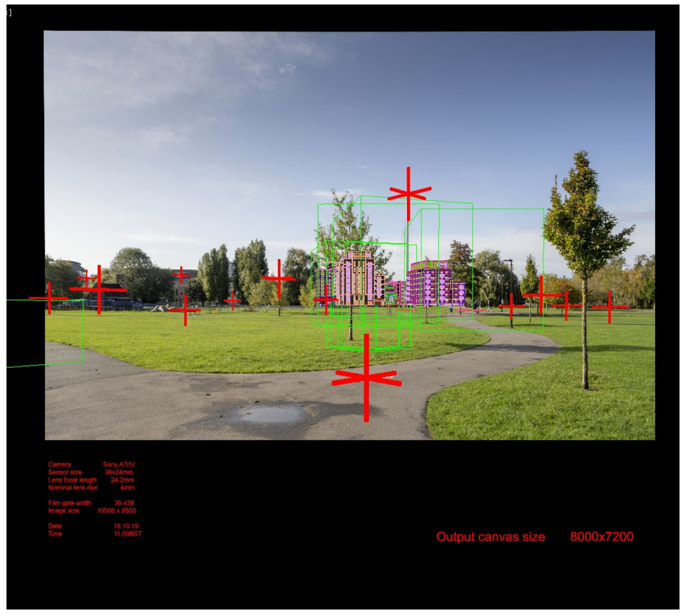


3.4 Screen grab of camera location in 3DS Max software

3.5 Screen grab of calculated horizon line



3.6 Screen grab of camera matching to survey data

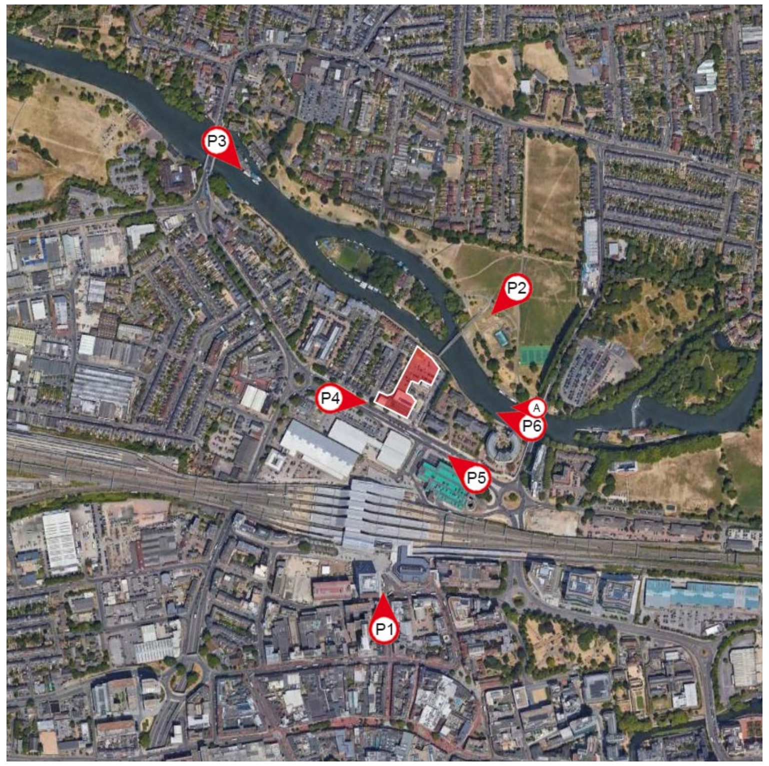


3.7 Screen grab of model matched to photograph

3.8 Final camera matched photomontage

View P3 Winter - Caversham Bridge, looking south-east

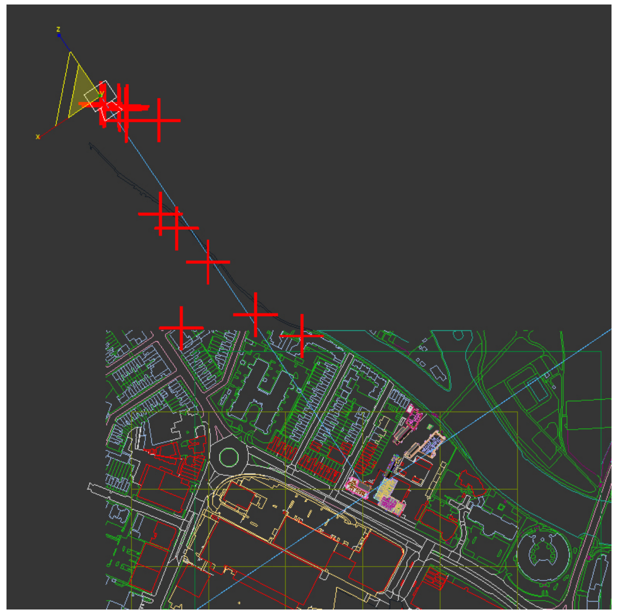
3.1 Ordinance survey co-ordinates			
Point Ref	Eastings	Northings	AOD height
9201	471160.644	174599.272	41.706
9202	471166.342	174596.366	37.463
9203	471164.399	174595.598	42.578
9204	471185.215	174590.676	40.475
9205	471192.849	174591.291	45.888
9206	471193.641	174576.990	45.946
9207	471183.932	174596.285	37.215
9208	471360.949	174325.599	48.949
9209	471258.841	174437.487	49.225
9210	471237.925	174455.990	49.233
9211	471265.124	174308.209	48.872
9212	471420.850	174298.061	48.995
9213	471235.677	174577.120	46.335
9214	471194.979	174595.138	40.501
9215	471299.530	174393.587	49.211
9216	471160.455	174599.225	44.669
9217	471172.824	174596.184	38.816



01.2 OS survey points marked on photograph

01.3 View P3 winter camera location

Eastings	471160.354m
Northings	174608.56m
AOD height	41.987m
Distance to centre of site	630m
Bearing from North	146°



3.4 Screen grab of camera location in 3DS Max software

3.5 Screen grab of calculated horizon line

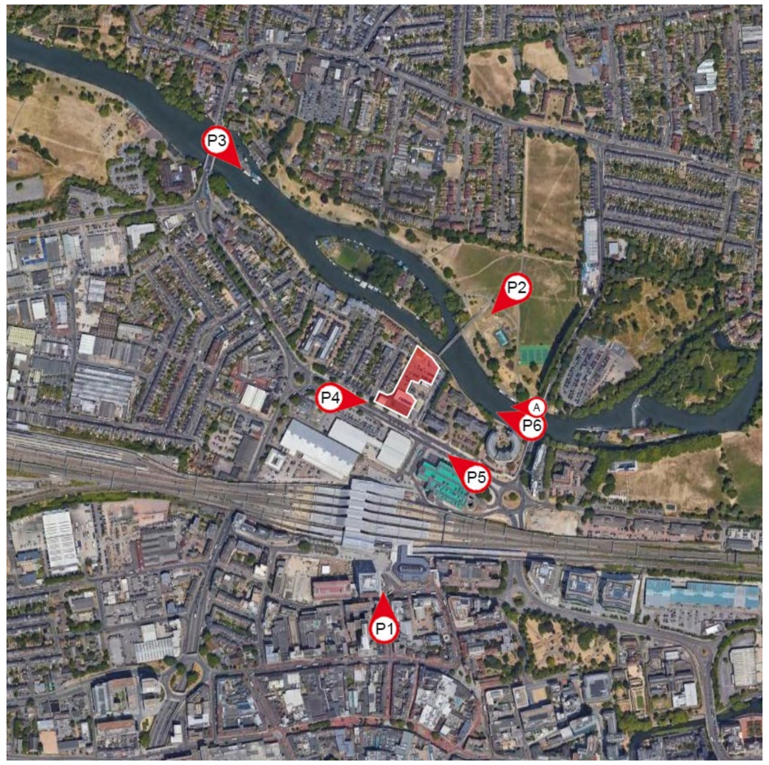
3.6 Screen grab of camera matching to survey data

3.7 Screen grab of model matched to photograph

3.8 Final camera matched photomontage

View P3 Summer - Caversham Bridge, looking south-east

3.1 Ordinance survey co-ordinates			
Point Ref	Eastings	Northings	AOD height
9201	471162.108	174598.384	41.207
9202	471162.794	174593.117	43.307
9203	471165.516	174594.852	39.971
9204	471172.779	174596.187	38.467
9205	471186.645	174598.906	37.944
9206	471192.804	174591.262	45.918
9207	471235.541	174577.391	46.259
9208	471252.761	174569.733	51.722
9209	471195.470	174572.810	44.075
9210	471185.182	174590.653	40.501
9211	471419.767	174295.970	51.687
9212	471360.192	174324.055	48.952
9213	471258.814	174437.475	49.318
9214	471234.354	174460.404	45.608
9215	471229.649	174470.364	39.262
9216	471190.690	174576.983	37.227



01.2 OS survey points marked on photograph

01.3 View P3 summer camera location

Eastings	471160.2998m
Northings	174608.4376m
AOD height	43.6383m
Distance to centre of site	620m
Bearing from North	145°