Oxpens Bridge
Oxford

Accurate Visual Representations

October 2023

CITYSCAPE DIGITAL

Planning Policy Context

Requirement for Verified Views

The production of verified views is required by Oxford City Council in order to assess the impact of development proposals. This impact relates to both neighbourhood amenity and views, including to and from heritage sites and/ or Oxford's historic skyline.

The production of verified views was requested as part of pre application discussions on the 19th July 2022. This states:

'details of any lighting along with the verified views and the location of the final landing position will allow for the impact on neighbours and future development plots to be better understood by officers. Officers would suggest that the views are set further back than those detailed in the document to so that the images incorporate more of the bridge and wider setting.

- Oxpens Meadow from close to the path alongside the river looking west
- From Grandpont looking north
- From Oxpens Road looking across the Meadow

If the bridge is proposed to be lit then we as we would also expect night time verified views to be provided and in this instance we would also expect a verified lit view from the Westgate.'

The pre application response also reinforced the requirement for high quality design that enhances local distinctiveness. Concern was raised over the potential severance of the Oxpens Meadow, and the impact this has on the usability of the meadows and the openness of the water's edge.

Policy Context

The following sets out the Oxford City Council policy requirement verified views.

Policy DH1 High Quality Design and Placemaking

Planning permission will only be granted for development of high quality design that creates or enhances local distinctiveness. All developments other than changes of use without external alterations and householder applications will be expected to be supported by a constraints and opportunities plan and supporting text and/or visuals to explain their design rationale in a design statement proportionate to the proposal (which could be part of a Design and Access Statement or a Planning Statement), which should cover the relevant checklist points set out in Appendix 6.1.

Planning permission will only be granted where proposals are designed to meet the key design objectives and principles for delivering high quality development as set out in Appendix 6.1.

Policy DH2: Views and Building Heights

The City Council will seek to retain significant views both within Oxford and from outside, in particular to and from the historic skyline. Planning permission will not be granted for any building or structure that would harm the special significance of Oxford's historic skyline.

The area within a 1,200 metre radius of Carfax tower (the Historic Core Area) contains all the buildings that comprise the historic skyline, so new developments that exceed 18.2 m (60 ft) in height or ordnance datum (height above sea level) 79.3 m (260 ft) (whichever is the lower) are likely to intrude into the skyline. Development above this height should be limited in bulk and must be of the highest design quality.

Applications for proposed development that exceeds that height will be required to provide extensive information so that the full impacts of any proposals can be understood and assessed, including:

i. a Visual Impact Assessment, which includes the use of photos and verified views produced and used in a technically appropriate way, which are appropriate in size and resolution to match the perspective and detail as far as possible to that seen in the field, representing the landscape and proposed development as accurately as possible.

Policy RE7: Managing the Impact of Development

Planning permission will only be granted for development that:

a. ensures that the amenity of communities, occupiers and neighbours is protected; and

b. does not have unacceptable transport impacts affecting communities, occupiers, neighbours and the existing transport network; and

c. provides mitigation measures where necessary.

The factors the City Council will consider in determining compliance with the above elements of this policy include:

d. visual privacy, outlook;

e. sunlight, daylight and overshadowing;

f. artificial lighting levels;

g. transport impacts;

h. impacts of the construction phase, including the assessment of these impacts within the Construction Management Plans;

i. odour fumes and dust;

j. microclimate;

k. contaminated land; and

l. impact upon water and wastewater infrastructure.

Policy H14: Privacy, daylight and sunlight

Planning permission will only be granted for new development that provides reasonable privacy, daylight and sunlight for occupants of both existing and new homes. Proposals should demonstrate consideration of all of the following criteria:

a. whether the degree of overlooking to and from neighbouring properties or gardens resulting from a proposed development significantly compromises the privacy of either existing or new homes (or existing other uses where there might be a safeguarding concern, particularly schools);

Planning permission will not be granted for any development that has an overbearing effect on existing homes.

Assessment

As requested as part of Policy DH1, this application is supported by a Design and Access statement that sets out the design rationale for the bridge scheme. This includes an outline of how the bridge orientation and design has sought to minimise impact on Oxpens Meadows and be 'of Oxford', enhancing the distinctiveness of the place.

The bridge does not fall within Oxford's historic core area, defined as a 1,200 metre radius of Carfax tower, does not exceed a height of 18.2m and the site is also not a significant feature within defined view cones. Accordingly, the bridge proposal will not have an impact on the significance of the city's historic skyline as outlined as part of Policy DH2.

Policy RE7 and Policy H14 both seek to manage the impact of a development proposal on existing and future communities, including overlooking and privacy, lighting and noise. As can be seen from verified views and site plans, including those which include the proposed OxWED development scheme, the bridge is far removed from nearby residential dwellings and so will not result in overlooking or impacts on privacy. The bridge proposal is also unlit, so will not result in glare into neighbouring dwellings or increase the prominence of the bridge in nighttime views towards Oxpens Meadow and Grandpont Nature Park. The Planning and Design and Access Statement outlines how the bridge design has considered potential impacts of noise on neighbouring properties.

The verified views presented as part of this document respond to requests set out during the pre application response dated 19th July 2022. This includes the production of a verified view of the bridge proposal from Oxpens Meadow from close to the path alongside the river looking west, from Grandpont looking north and from Oxpens Road looking across the Meadow. As the bridge is not lit, verified views from Westgate have not been provided.

The verified views provided should be read alongside the Design and Access Statement, application drawings and Planning Statement. These documents provide a full outline of the bridge scheme, including an assessment of how the proposals comply with planning policy and will work to improve the connectivity of the area, enhance the distinctiveness of the place and minimise impacts on neighbouring dwellings and the environment.

Accurate Visual Representations

View 1 Grandpont Nature Park / Southbank **Existing** 12:56 26/09/22 24mm

View 1 | Grandpont Nature Park / Southbank | **Proposed** | 12:56 | 26/09/22 | 24mm

View 2 Oxpens Meadow **Existing** 15:32 26/09/22 24mm

View 2 Oxpens Meadow **Proposed** 15:32 26/09/22 24mm

View 3 Oxpens Road **Existing** 14:11 26/09/22 24mm

View 3 Oxpens Road **Proposed** 14:11 26/09/22 24mm

Methodology

Table of views

View	Visualisation type	Level of accuracy of location	Render / wireline	Ref	OS-E	OS-N	Height (AOD)	Height (AGL)	Heading	Lens	Lens choice	Field of view	Date	Time
1	Type 3	Better than 1m	Render	D26511	450818.861	205594.259	57.82	1.60 M	324.50°	24mm	Standard lens for open spaces	74°	26/09/22	12:56
2	Type 3	Better than 1m	Render	D26509	450887.830	205626.390	55.656	1.60 M	300.34°	24mm	Standard lens for open spaces	74°	26/09/22	15:32
3	Type 3	Better than 1m	Render	D26510	450893.011	205811.822	57.115	1.60 M	222.33°	24mm	Standard lens for open spaces	74°	26/09/22	14:11

0.0 Introduction

0.1 Methodology overview

The methodology applied by Cityscape Digital Limited to produce the *'Type 4 Photomontages survey / scale verifiable'*[1] or views contained in this document are described below. In the drafting of this methodology and the production and presentation of the images, guidance has been taken from the 'TGN 06/19 Visual Representation of development proposals' (TGN06/19) from the Landscape Institute published on 17 September 2019 in support of GLVIA3.

The disciplines employed are of the highest possible levels of accuracy and photo-realism which are achievable with today's standards of architectural photography and computer-generated models.

0.2 View selection

The viewpoints are being selected through a process of consultation with relevant statutory consultees by townscape/heritage consultants and having regard to relevant planning policy and guidance.

1 'TGN 06/19 Visual Representation of development proposals.' Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf (Accessed: March 2022).pp. 21-2

1.0 Photography

1.1 Digital photography

High quality digital full frame sensor cameras are being utilised.

1.2 Lenses

In accordance with TGN 06/19, Cityscape balances the need to include the extent of the site and sufficient context with the stated preference for 50mm lenses. For local urban views a wide angle lens of 24mm or 35mm is generally used. For more open spaces the default is 50mm, intermediate distance views are photographed with a lens between 35mm to 70mm and occasionally long range views may be required with lens options ranging from 70mm to 1200mm.

As a guide, the following approach is used:

View	Lens options
Relevant foreground, urban context or large site	24mm – 35mm
Open spaces, where proposed development can be included	50mm
800 to 5000 metres – intermediate	35mm – 70mm
5000+ metres – long	70mm – 1200mm

Examples of these views are shown in Figures 1 and 2.

1.3 TGN 06/19

States that:

"2.2 Baseline photography should: [...] include the extent of the site and sufficient context;"[2]

"1.1.7 If a 50mm FL lens cannot capture the view in landscape or portrait orientation (for example, if the highest point of the development is approaching 18° above horizontal) the use of wider-angled prime lenses should be considered, working through the following sequence of fixed lenses in this order: 35mm FL > 28mm FL > 24mm FL > 24mm FL Tilt-Shift. Tilt-Shift Lenses are considered at Appendix 13. In these unusual situations, the reasoning for the choice and the approach used should be documented, and the agreement of the competent authority should be sought (see Appendix 10 Technical Methodology)."[3] and

"Views should include the full context of the site / development and show the effect it has upon the receptor location.[...]"[4]

1.4 Digital camera

Cityscape uses high quality professional DSLR (digital single lens reflex) and DSLM (digital single lens mirrorless) cameras. The cameras utilise FFS (full frame sensors) so declared focal lengths require no conversion to be understood in line with TGN 06/19 guidelines.

Cityscape use high quality lenses that are matched to the resolution of the cameras to ensure high contrast and sharp rendition of the images.

1.5 Position, time and date recording

The photographer is provided with (i) an Ordnance Survey map or equivalent indicating the position of each viewpoint from which the required photographs are to be taken, and (ii) a digital mockup rendered with a context model of the desired view. For each viewpoint the camera is positioned at a height of 1.60 metres above the ground level which closely approximates the human eye altitude, and falls into the 1.5-1.65m range provided by TGN 06/19[5].

If local conditions required a deviation to capture the view, the exact height can be found in the Table of Views. A point vertically beneath the entrance pupil of the lens is marked on the ground as a survey reference point and two digital reference photographs are taken of (i) the camera/ tripod location and (ii) the survey reference point (as shown in Figures 3 and 4). The date and time of the photograph are recorded by the camera.

2 TGN 06/19 Visual Representation of development proposals.' Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf (Accessed: March 2022).pp. 5, Paragraph 2.2

3 TGN 06/19 Visual Representation of development proposals.' Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf (Accessed: March 2022).pp. 28, Paragraph 1.1.7

4 'TGN 06/19 Visual Representation of development proposals.' Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf (Accessed: March 2022).pp. 35, Paragraph 4.1.5

5 'TGN 06/19 Visual Representation of development proposals.' Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf (Accessed: March 2022).pp. 50

1: Local view

2: Intermediate view

3: Camera location

4: Survey reference point

2.0 Digital image correction

2.1 Raw file conversion

Professional digital cameras produce a raw file format, which is then processed for both high detail and colour accuracy. The final image is saved as an 8 bit tiff[6] file.

2.2 Digital image correction

The digital photographs were prepared for the next stage of camera matching (see Sections 6 and 7).

All lenses exhibit a degree of geometric distortion. The most common types are radially symmetrical along the principal axis of the lens, and tend to grow in size towards the perimeter of the image. The outer edges of the images are therefore not taken into consideration to reduce inaccuracies. Figure 5 illustrates the 'safe' or non-distortive area of an image which is marked by a red overlay.

The adjusted or corrected digital image, known as the 'background plate', is then saved ready for the camera matching process (see Sections 6 and 7). In preparation for the survey (see Section 3.2) Cityscape indicates on each background plate the safe area and priority survey points, such as corners of buildings, retained elements and party walls for survey (see Figure 6).

5: Area of interest to be surveyed

6: Background plate highlighting critical survey points in green and secondary survey strings in red

6 TIFF is the name given to a specific format of image file stored digitally on a computer.

3.0 Type 4 visualisations

3.1 Type 4 visualisation

Unless otherwise specified visualisations are completed to TGN 06/19[7] Type 4 Photomontage / Photowire (survey / scale verifiable) standards.

3.2 Survey

An independent surveyor is contracted to undertake the survey of (i) each viewpoint as marked on the ground beneath the entrance pupil of the lens at the time the photograph is taken (and recorded by way of digital photograph (see Section 1 above) and (ii) all the required points on buildings, hard landscape features or immobile permanent objects within the safe zone. The survey is coordinated onto the Ordnance Survey National Grid (OSGB36) by using GNSS (global navigation satellite system such as GPS[8]) equipment (see, for example, Figure 7) and processing software. The Ordnance Survey National Grid (OSGB36) is chosen as it is the most widely used and because it also allows the captured data to be incorporated into other available digital products (such as Ordnance Survey maps). The height datum used is Ordnance Survey Newlyn Datum and is also derived using the GNSS.

Improvements to the real-time position of GNSS data is achieved by RTK (real time kinematic) compensation, which utilises a comparison between known base stations positions and their current position fix to produce correction data to the measurements. The required points on each building are surveyed using conventional survey techniques utilising an electronic theodolite and reflectorless laser technology (shown in Figure 8). In certain circumstances, a viewpoint may need to be surveyed using conventional survey techniques as opposed to RTK, if, for example, the viewpoint is in a position where GNSS information cannot be received.

3.3 False origin

3D modelling programs, unlike CAD/BIM programs, have inherent inaccuracies the further an object is away from the origin. Cityscape decide on and record a local, 'false origin' that is used to move the model closer to the origin. This alleviates the inaccuracies. The 3D model of the proposed development, consented scheme models, and survey data are all moved uniformly to this new false origin. When performing positioning checks (see Section 5.2) the offset between false origin and OS are added back to the coordinates.

7: Field survey being carried out, GNSS receiver

8: Field survey being carried out, total station

7 'TGN 06/19 Visual Representation of development proposals.' Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf (Accessed: March 2022).pp.11, Table2, pp 21-24.

8 https://www.rics.org/globalassets/rics-website/media/upholding-professional-standards/sector-standards/land/guidelines-for-the-use-of-gnss-in-surveying-and-mapping-2nd-edition-rics.pdf

4.0 Type 3 visualisations

4.1 Type 3 visualisation

These visualisations are as described in TGN 06/19[9] Type 3 Photomontage / Photowire (not survey / scale verifiable) standards. In contrast to Type 4, Type 3 visualisations rely on good quality data for camera matching, but are not relying on surveys as described in Section 3.2. Data sources such as GPS, OS Maps, 3D City models, geo-referenced aerial photography, LiDAR or 3D models can be used.

The individual data source used is declared in an accompanying table. The possible angular shift of a 1m lateral displacement of the camera against its actual coordinate depends on the distance of the object from the camera[10]:

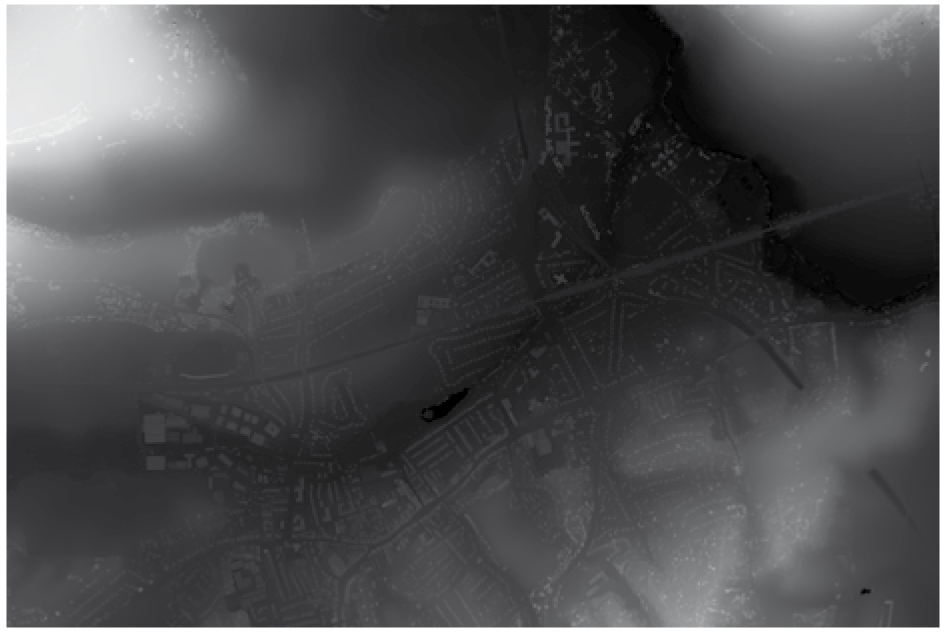
Distance from camera	Apparent shift
10m	5.7°
100m	0.57°
1,000m	0.057°
10,000m	0.006°

Cityscape also create 3D DSM (Digital Surface Model) models from publicly available data sources, such as Defra LiDAR scans from the Defra Data Services Platform. We always choose the newest data available at the highest possible resolution, typically at 1m resolution. The data is processed to coordinate onto Ordnance Survey National Grid (OSGB36), and converted to a Square Grid DSM. The square grid is then optimised into a TIN (Triangulated Irregular Network). The optimisation has been validated to produce no loss in usable information of the geometric mesh. This process follows the guidelines set out in 'Guidance - Visual representation of wind farms - Feb 2017'[11].

DSM source is typically the Defra LiDAR Composite DSM, 2020, resolution 1m.

4.2 False origin

3D modelling programs, unlike CAD/BIM programs, have inherent inaccuracies the further an object is away from the origin. Cityscape decide on and record a local, 'false origin' that is used to move the model closer to the origin. This alleviates the inaccuracies. The 3D model of the proposed development, consented scheme models, and survey data are all moved uniformly to this new false origin. When performing positioning checks (see Section 5.2) the offset between false origin and OS are added back to the coordinates.



11: 1m resolution LiDAR GeoTIFF

12: Resulting 3D TIN mesh

9 'TGN 06/19 Visual Representation of development proposals.' Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf (Accessed: March 2022).pp.11, Table2, pp 19-20.

10 'TGN 06/19 Visual Representation of development proposals.' Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf (Accessed: March 2022).pp 56-57

11 'Guidance - Visual representation of wind farms - Feb 2017' Available at: https://www.nature.scot/sites/default/files/2019-09/Guidance%20-%20Visual%20representation%20of%20wind%20farms%20-%20Feb%202017.pdf (Accessed at March 2022). pp 8-9

5.0 Model positioning

Applies to Type 3 and Type 4 visualisation.

5.1 Model source

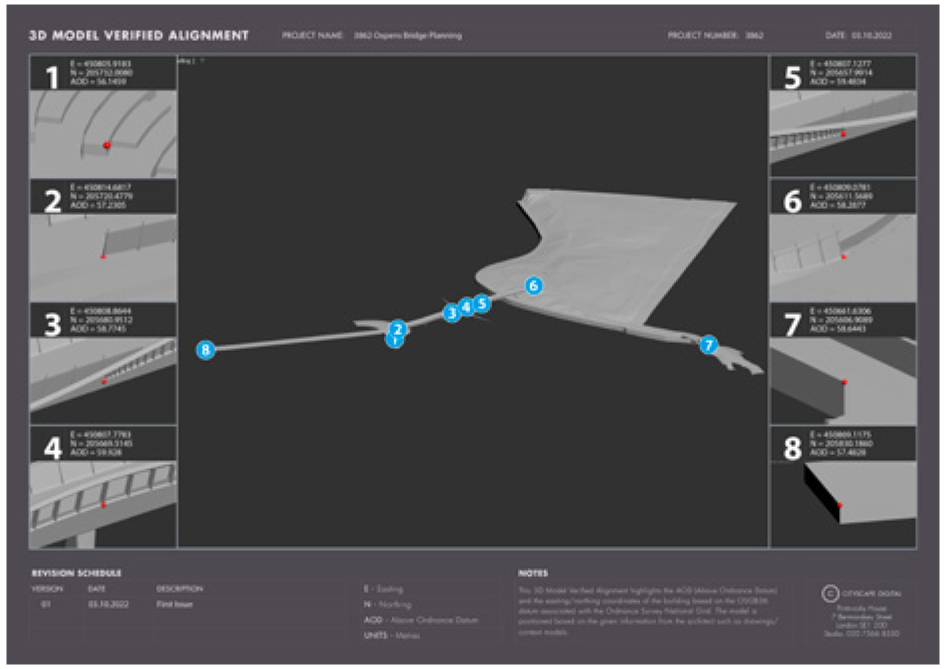
A wireframe 3D model of the proposed scheme if not provided is created by Cityscape from plans and elevations provided by the architects and from survey information of the ground levels on site and various other points on and around the site, such as the edge of adjacent roads and pavements etc. provided by the surveyor.

5.2 Proposed model position check

The architect supplies a 3D model in OS coordinates that can be used 'as is' for position checks as described below (utilising the false origin as described in Section 3.3). Alternatively, a non OS located model can be provided together with a floor plan that is positioned in an OS map. The model can then be positioned by way of setting it on the floor plan. Heights are either preserved from the original model if supplied in AOD, or taken from supplied elevations.

Once the model is positioned, confirmation of height and Easting/ Northing Coordinates is requested from the architect.

At least two clear reference points are agreed and used to confirm the placement of the model.



13: Proposed model position check

6.0 Camera matching – Type 4 visualisations

6.1 Cityscape's database

Cityscape has built up a comprehensive database of survey information on buildings and locations in central London; the database contains both GNSS survey information and information regarding the dimensions and elevations of buildings gathered from architects and other sources.

The outlines of buildings are created by connecting the surveyed points or from the information obtained from architects' drawings of particular buildings. By way of example of the high level of detail and accuracy, approximately 300 points have been GNSS surveyed on the dome of St. Paul's.

The database 'view' (as shown in Figure 14) is 'verified' as each building is positioned using coordinates acquired from GNSS surveys. In many instances, the various coordinates of a particular building featured in one of the background plates are already held by Cityscape as part of their database of London. In such cases the survey information of buildings and locations provided by the surveyor (see Section 3.2 above) is used to cross-check and confirm the accuracy of these buildings. Where such information is not held by Cityscape, it is, where appropriate, used to add detail to Cityscape's database.

The survey information provided by the surveyor is in all cases used in the verification process of camera matching.

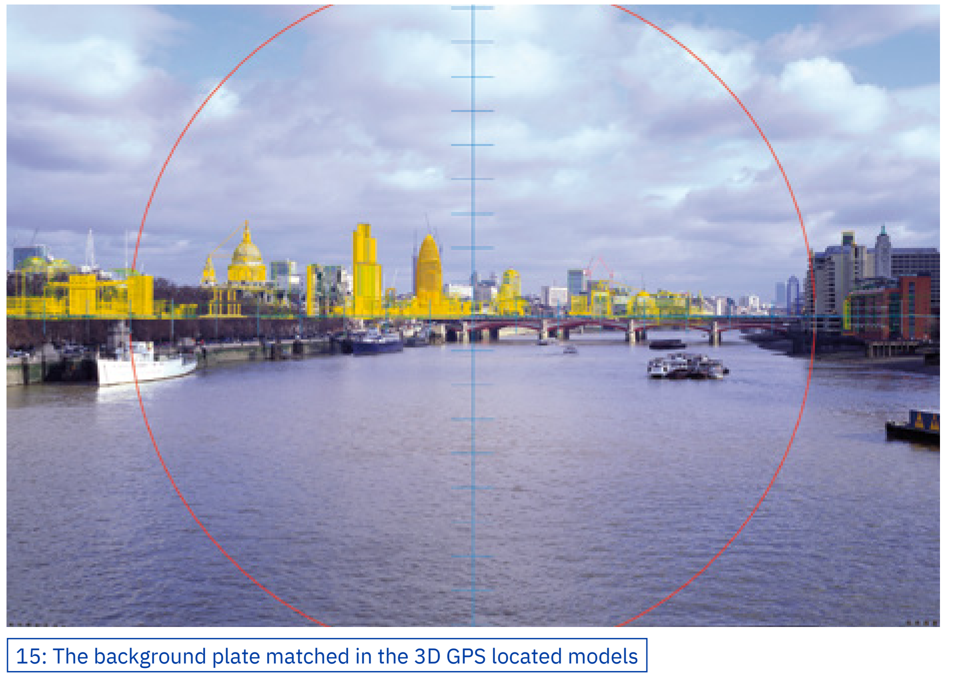
14: Selected GPS located models (yellow) from Cityscape's database, situated on Cityscape's London digital terrain model

6.2 Camera matching process

The following information is required for the camera matching process:

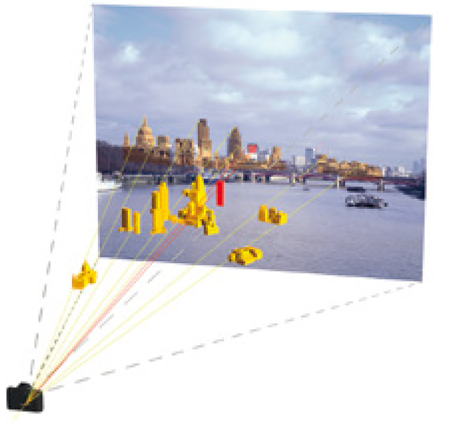
- Specific details of the camera and lens used to take the photograph and therefore the field of view (see Section 1);
- The adjusted or corrected digital image i.e. the 'background plate' (see Section 2);
- The GNSS surveyed viewpoint coordinates (see Section 3.2);
- The GNSS surveyed coordinates of points within the the background plate (see Section 3.2);
- Selected models from Cityscape's database (see Section 6.1);
- The GNSS surveyed coordinates of the site of the proposed scheme (see Section 3.2);

The data is combined in a 3D software package and is then used to situate Cityscape's virtual camera such that the 3D model aligns exactly over the background plate (as shown in Figures 15, 16 and 17) (i.e. a 'virtual viewer' within the 3D model would therefore be standing exactly on the same viewpoint from which the original photograph was taken (Figure 3). This is the camera matching process.



15: The background plate matched in the 3D GPS located models

16: Background plate matched to the 3D GPS located models



17: The camera matched background plate with an example of a proposed scheme included in red

7.0 Camera matching – Type 3 visualisations

7.1 Cityscape's context models

Cityscape have purchased available 3D city models of large parts of London and other parts of the UK that are modelled to within 25cm accuracy. Where available this data is used to create camera matches for Type 3 visualisations, or additional data is purchased.

In addition, or where 3D city models are not available, DSM data is used for camera matching (see Section 4).

7.2 Camera matching process

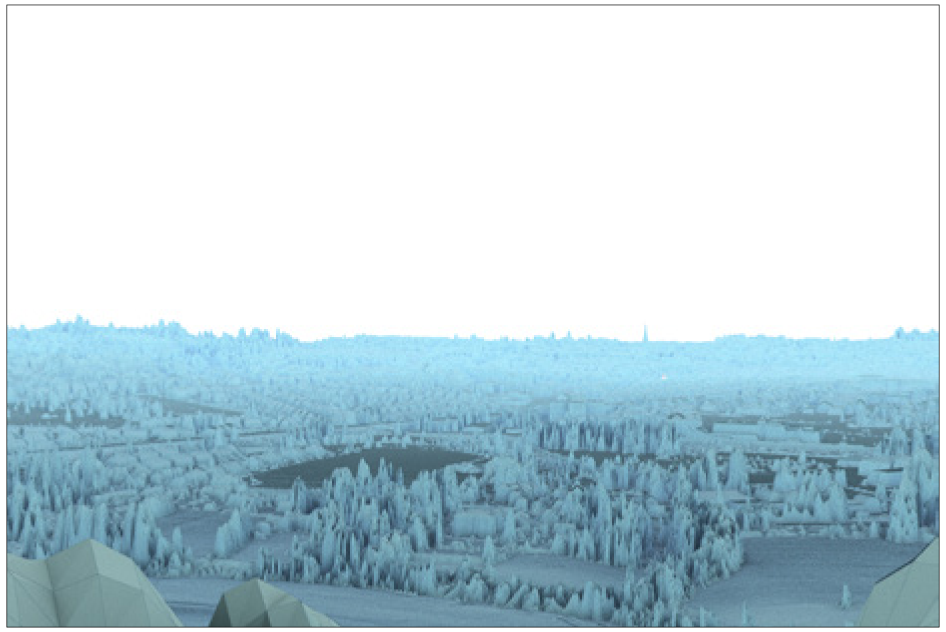
The following information is required for the camera matching process:

- Specific details of the camera and lens used to take the photograph and therefore the field of view (see Section 1);
- The adjusted or corrected digital image i.e. the 'background plate' (see Section 2);
- 3D city model and/or DSM context model (see Section 4);
- Selected models from Cityscape's database (see Section 6.1);
- A 3D model of the proposed scheme (see Section 5)

The data is combined in a 3D software package and is then used to situate Cityscape's virtual camera such that the 3D model/DSM aligns exactly over the background plate (as shown in Figure 20) (i.e. a 'virtual viewer' within the 3D model would therefore be standing very close to the same viewpoint from which the original photograph was taken (Figure 3). This is the camera matching process.

18: Background plate: digital photograph, size and bank corrected as described in Section 2

20: Camera matching: the background plate matched in DSM TIN mesh



19: Render: DSM model render, camera matched

8.0 Rendering

8.1 Wireline image (AVR 0/1)

The proposed developments are shown using a constant thickness wireline. The line is generated from a computer rendering of the 3D model and follows an 'inside stroke' principle.

Rendering is a technical term referring to the process of creating a two dimensional output image from the 3D model. The 'inside stroke' principle is followed so that the outer edge of the line touches the outline of the render from the inside, fairly representing the maximum visibility.

The camera matching process is repeated for each view and a wireline image of the proposal from each viewpoint is then produced. The wireline image enables a quantitative analysis of the impact of the proposed scheme on views.

8.2 Rendered image (AVR 3)

In order to assist a more qualitative assessment of the proposals, the output image needs to be a photo-realistic reflection of what the proposed scheme would look like once constructed. This is called an AVR3.

8.3 Texturing

The process of transforming the wireframe 3D scheme model into one that can be used to create a photorealistic image is called texturing[12].

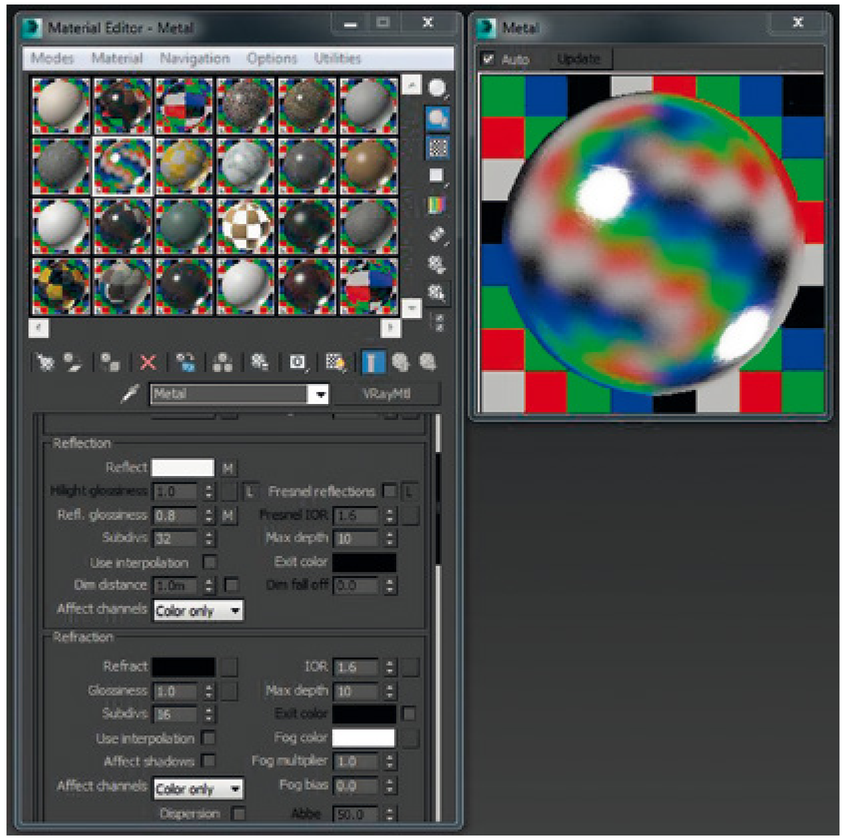
Prior to rendering, Cityscape requires details from the architect regarding the proposed materials (e.g. type of glass, steel, aluminium etc.) to be utilised.

Cityscape also use high resolution photographic imagery of real world material samples, supplied by the client or the manufacturer, to create accurate photorealistic textures for use in all our images. This information is used to produce the appearance and qualities in the image that most closely relates to the real materials to be used (as shown in Figure 21).

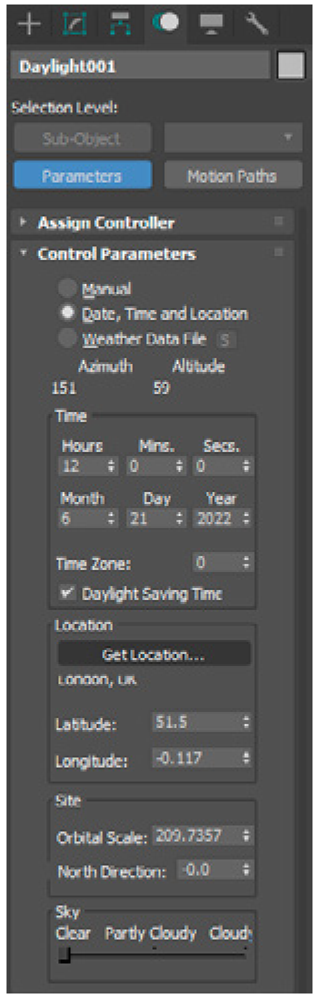
8.4 Lighting and sun direction

The next stage is to light the 3D model to match the photographic environment. The date, time of the photograph and the latitude and longitude of the city are input (see Figure 22) into the unbiased physically accurate render engine. Cityscape selects a 'sky' (e.g. clear blue, grey, overcast, varying cloud density, varying weather conditions) from the hundreds of 'skies' held within its database to resemble as closely as possible the sky in the background plate.

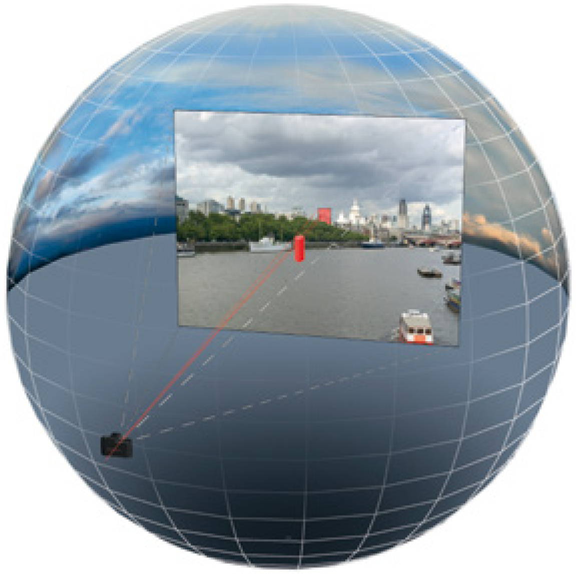
The 3D model of the proposed scheme is placed within the selected sky (see Figure 23) and using the material properties also entered, the computer calculates the effects of the sky conditions (including the sun) on the appearance of the proposed scheme.



21: Screenshot of some materials in the 3D rendering package.



22: Screenshot of environment information (time, date and year) entered to locate the sun correctly (see Section 7.



23: Example of a proposed scheme highlighted in red within the selected sky and rendered onto the background plate

12 Texturing is often referred to as part of the rendering process, however, in the industry, it is a process that occurs prior to the rendering process.

9.0 Post production

9.1 Post production

Finally, the rendered image of the scheme model is inserted and positioned against the camera matched background plate (Figure 24).

Once in position, the rendered image is edited using Adobe Photoshop®. Masks are created in Photoshop where the line of sight to the rendered image of the proposed scheme is interrupted by foreground context or buildings (as shown in Figure 25).

Where the proposed development results in a removal of existing structures or context, or the proposed development is smaller than an existing structure, then parts of the context would be revealed that are not visible in the background plate. To replace these parts of the background plate, photographs are taken with the same heading of the background plate, but situated behind the proposed development. Elements from these photographs are positioned in Photoshop by way of placing against renders of a contextual 3D model, or, where possible, by visually matching elements against corresponding elements in the background plate (as shown in figures 26 and 27).

The result is a verified image or view of the proposed scheme (as shown in Figure 28).

25: Foreground mask

27: Proposed development with rebuilt background elements

24: Process red area highlights the Photoshop mask that hides the unseen portion of the render

26: Proposed development with rebuilt background elements

28: A photo-realistic verified image

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