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Tite Street Development - Verified View Study

29 Tite Street, London SW3 4JX

Level 3 VVM Imagery - Full Resolution

Format - A3 Landscape
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Verified View Methodology – 29 Tite Street, London SW3 4JX

0.1 Introduction

Rendered Image Ltd was commissioned by the Tite Street Association Steering Committee to complete the verified views contained in this document.

0.2 Methodology Overview

The methodology applied by Rendered Image Ltd to produce the verified images or views contained in this document is described below. In the drafting of this methodology and the production and presentation of the images, guidance has been taken from:

- The Landscape Institute's Visual Representation of Development Proposals Technical Guidance Note 06/2019
- Third Edition of the good practice Guidelines for Landscape and Visual Impact Assessment 2013
- The GLA London View Mangement Framework: Supplementary Planning Guidance 2012

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

0.3 Lens Selection

Using a 50mm focal length prime lens offers the best match for a human eye. The verified views in this study have been created using a 50mm and 24mm to offer additional context. The Landscape Institutes Visual Representation of Development Proposals Technical Guidance Note 06/2019 (1.1.7) recommends using the 50mm FL lens unless it cannot capture the view.

0.3 continued...

Photograph: 24mm FL lens photograph with red line denoting 50mm lens alignment

Photograph: 50mm FL lens

The middle third (approx.) of any photograph is the most accurate zone and distortion increases from there to the outer edge of the image. With this it's important to note that the lower the focal length used the higher the distortion that is carried by the lens in the outer zone of the image.

0.4 View Selection

The viewpoints have been selected by the Tite Street Association Steering Committee.

CONTENTS
CAMERA MATCHING PROCESS FOR DIGITAL PHOTOGRAPHY

1.0 PHOTOGRAPHY

1.1 Digital Photography

With the latest advances in Digital Photography it is now possible to match the quality of plate photography.

1.2 Digital Camera

A Nikon Digital 610 SLR with Full Frame Sensor with 50mm focal length prime lens, 35mm focal length prime lens or 24mm T/S lens - high resolution camera for the digital photography.

1.3 Position, Time and Date Recording

The photographer is provided with (i) an Ordnance Survey(OS) map indicating the position of each viewpoint from which the required photographs were to be taken, and (ii) a digital photograph taken by Rendered Image Ltd of the desired view. For each shot the camera is positioned at a height of 1.60 meters above the ground level which closely approximates to human eye level. A point vertically beneath the centre of the lens is marked on the ground as a survey reference point and a digital reference photographs are taken of (i) the camera / tripod location and (ii) the survey reference point (as shown in Figure 1). The date and time of the photograph were recorded by the photographer.

Figure 1. Survey reference point

1.3 continued...

We take additional measures where a panoramic view is required to avoid parallax error and distortion using a sliding plate to ensure rotation occurs around the lens nodal point – this is a technique where single frames are stitched together to form a wider view. We ensure there is a 50% overlap between frames to allow for the most accurate part of the image to be used and a sliding plate is employed to allow the camera to be positioned with the nodal point of the lens is directly over the axis of rotation.

2.0 RAW FILE CONVERSION

2.1 Raw File Conversion

Nikon cameras produce a raw file format, which is then processed digitally for both high detail and colour accuracy[1]. The final image is outputed as a tiff or jpeg[2] file.

3.0 DIGITAL IMAGE CORRECTION

3.1 Digital Image Correction

The digital images were then loaded into Rendered Image Ltd's computers running Adobe Photoshop®[3] software, to prepare the digital image for the next stage of camera matching (see section 6). The digital images are saved at a total pixel[4] matrix size of 6016 pixels x 4016 pixels.

In spite of the selection of the most advanced photographic equipment, lenses are circular which results in a degree of distortion on the perimeter of images. The outer edges of an image are therefore not taken into consideration; this eliminates the risk of inaccuracy.

The adjusted or corrected digital image, known as the 'background plate', is then saved to the Rendered Image Ltd computer system, ready for the camera matching process (see section 6). In preparation for the survey (see section 4) Rendered Image Ltd marks up each background plate selecting a number of points in the view, such as corners of buildings, for survey.

3.1 continued...

Location	Eastings	Northings	Height	Description
View 1	527890.175	177803.102	4.4156	50mm
View 2	527831.963	177867.539	6.3719	24mm
View 3	527741.089	177946.655	6.8825	24mm
View 4	527794.064	178006.364	6.8263	24mm
View 5	527863.714	177936.84	7.0681	24mm
View 6	527892.326	177906.903	7.0198	24mm

Figure 2. Camera location survey data

1 RGB (red green blue) is a format that maintains the full colour range of the image.
2 TIFF or JPEG is the name given to a specific format of image file stored digitally on a computer.
3 Adobe Photoshop® is the industry standard image editing software.
4 Pixel stands for picture element. It is the most basic component of any computer graphic and corresponds to the smallest thing that can be drawn on the computer screen.
5 By aliging the vanishing points.

4.0 GPS SURVEY

4.1 Survey

Blueprint Surveys Ltd were contracted to undertake the survey of (i) each viewpoint as marked on the ground beneath the camera at the time the photograph was taken (and recorded by way of digital photograph (see section 1 above)) and (ii) all the required points on the relevant buildings and other fixed points (as marked on the background plate).

The survey was co-ordinated with the Ordnance Survey National Grid by using Global Positioning System (GPS) equipment and processing software. The Ordnance Survey National Grid (OSGB36) was 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 was also derived using the GPS.

The survey team uses a baseline consisting of two semi-permanent GPS base stations. These stations are located approximately 5730 metres apart and positioned so as to optimise the results for the area of operation. The base stations are tied into the National GPS Network and are constantly receiving and storing data which allows their position to be monitored and evaluated over long periods of operation. By using the same base stations throughout the survey the team ensure the consistency of the results obtained.

Using the Real Time Kinematic method a real time correction is supplied by each base station to the rover (over the GSM[6] network) physically undertaking the field survey. This enables the rover to determine the co-ordinates of its location instantaneously (i.e. in 'real time'). The rover receives a 'corrected' fix (co-ordinates) from each base station. If the two independent fixes are each within a certain preset tolerance, the rover then averages the two fixes received. The viewpoints are, with a few exceptions, surveyed using this technique. This method of GPS survey (Real Time Kinematic) produces results to an accuracy in plan and height of between 15mm-50mm as outlined in the "Guidelines for the use of GPS in Land Surveying" produced by the Royal Institute of Chartered Surveyors.

The particular points on each building as marked up on the background plate are surveyed with conventional survey techniques using an electronic theodolite and reflectorless laser technology. There are two methods used to fix the building details, namely polar observations[7] and intersection observations[8]. The position of the theodolite is fixed by the rover as described above. In certain circumstances, a viewpoint may need to be surveyed using conventional survey techniques as opposed to Real Time Kinematic - if, for example, the viewpoint is in a position where GPS information cannot be received.

6 GSM network: the mobile phone network.
7 Polar observation is the measurement of a distance and direction to a point from a known baseline in order to obtain co-ordinates for the point. The baseline is a line between two known stations.
8 Intersection observation is the co-ordination of a point using directions only from two ends of a baseline.

5.0 MODEL POSITIONING

5.1 Height and Position Check

The model is positioned using a site plan by the architects - all design drawings obtained from the RBKC Planning Portal Application PP/25/04989. This is then overlaid onto an OS positioned survey drawing. Once the building has been positioned in 3ds max confirmation of height and position is checked against the architect's drawings.

6.0 CAMERA MATCHING

6.1 Creation of the Scheme Model

A wireframe[11] 3D model of the proposed scheme was created by the Rendered Image Ltd using the drawings and model provided by the architects.

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 GPS surveyed viewpoint co-ordinates (see section 3);
- The GPS surveyed co-ordinates of particular points on the buildings within the photograph (the background plate) (see section 3);
- The GPS surveyed co-ordinates of the site of the proposed scheme (see section 4);
- A 3D model of the proposed scheme (see section 5).

A background plate (the corrected digital image) is opened on computer screen. The information listed above is then used to situate Rendered Image Ltd's virtual camera such that the 3D model aligns exactly over the background plate. This means a 'virtual viewer' within the 3D model would therefore be standing exactly at the same viewpoint from which the original photograph was taken. This is the camera matching process.

6.3 Wireline Image

With the camera matching complete, Rendered Image Ltd is then able to insert the wireframe 3D model of the proposed scheme into the view and at the correct location and scale to produce a verified wireline image of the proposal.

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.

9 The field of view or focal length depends on the type of lens used.
10 A polygon mesh representing elevation data of a land surface.
11 A wireframe is a 3D model, a wireline is a single line representing the outline of the building.

7.0 RENDERING (Level 2 & 3 Only)

7.1 Rendering

Rendering is a technical term referring to the process of creating a two-dimensional output image from the 3D model.

7.2 Texturing

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. The process of transforming the wireframe 3D scheme model (see Section 4) into one that can be used to create a photo-realistic image is called texturing[12].

Prior to rendering, Rendered Image Ltd requires details from the architect regarding the proposed materials (e.g. type of glass, steel, aluminium etc.) to be used. This information is necessary to produce the appearance and qualities in the image that most closely relates to the real materials employed.

7.3 Lighting and Sun Direction

The next stage is to light the model. Rendered Image Ltd utilises High Dynamic Range (HDR) Imaging[13] for its environmental lighting. The date (including the year) and time of the photograph and the latitude and longitude of the location are input into the HDR program. Rendered Image Ltd selects a 'sky'. This can be a clear blue, grey, overcast, varying cloud density and varying weather conditions chosen from the selection of 'skies' held within the HDR database. This is done 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 and using the material properties also entered, the computer calculates the effects of the sky conditions (including the angle of the sun) on the appearance of the proposed scheme.

An image of the proposed scheme is produced showing the effect of light and sun. The selection of the matching sky is the only subjective input at this stage.

8.0 POST PRODUCTION

8.1 Post Production

Finally the rendered image of the scheme model is inserted and positioned against the camera matched background plate. Once in position the rendered images are 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 buildings. The result is a verified image or view of the proposed scheme.

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.
13 An industry standard technique for rendering images with a high dynamic range (HDR); e.g. sky images. HDR images capture a greater exposure latitude than standard images. Using HDR, a light probe image can record the colour and brightness of every light source.

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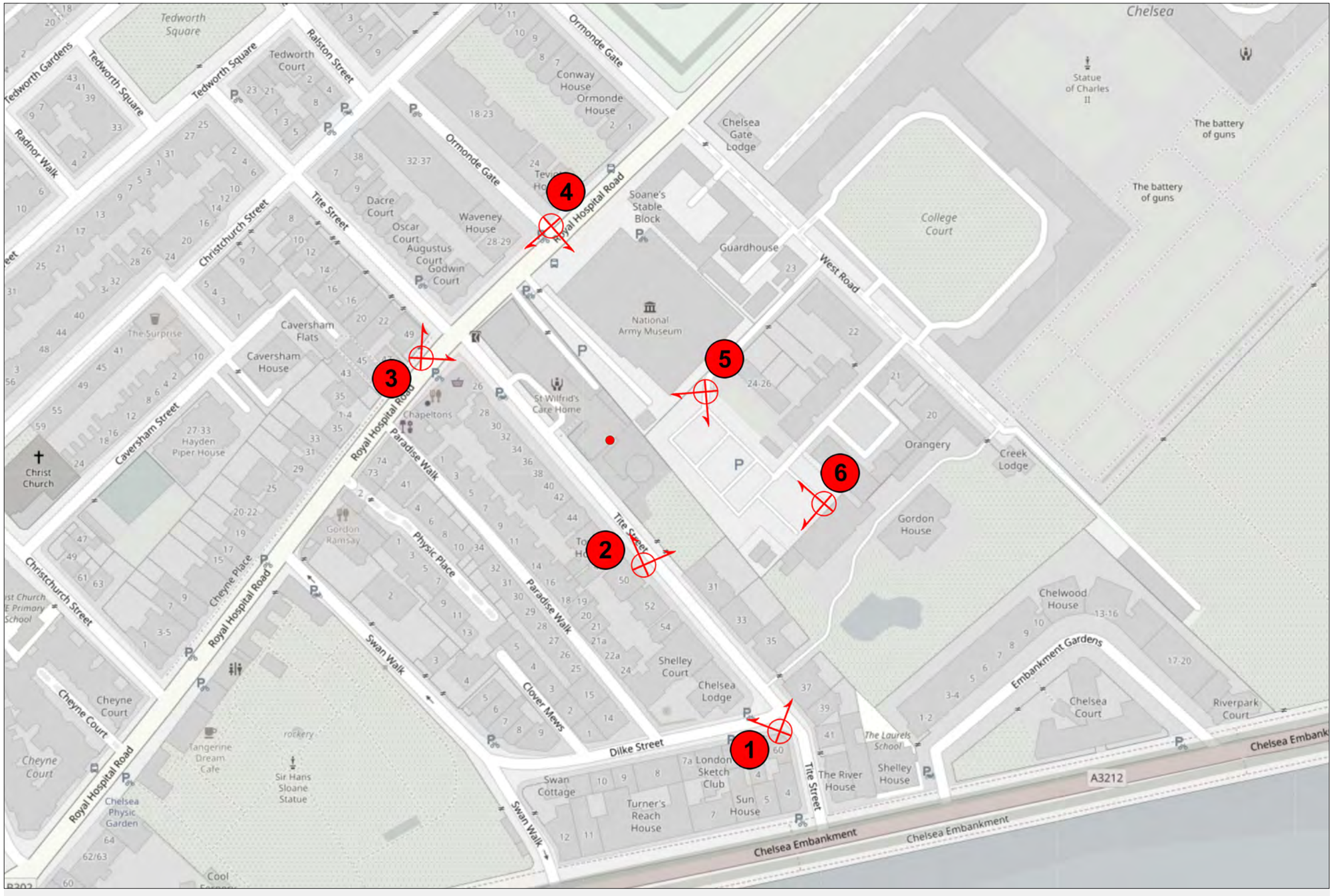
View Location Plan



Local Views

VP 1 - Looking north west on Tite Street

VP 2 - Looking north east on Tite Street (towards gardens)

VP 3 - Looking north east from west Royal Hospital Road

VP 4 - Looking east from corner of Ormonde Gate & Royal Hospital Road

VP 5 - Looking south west from Royal Hospital car park

VP 6 - Looking west from Royal Hospital car park

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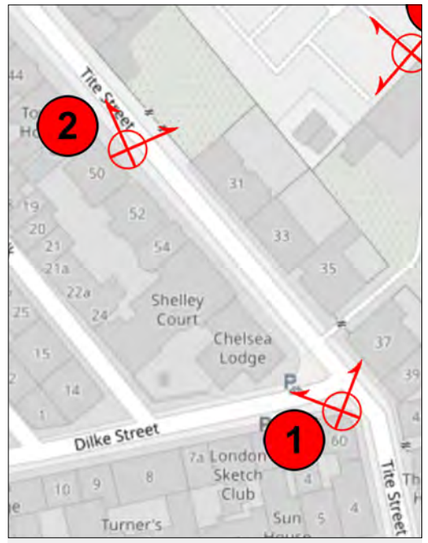
Existing View 1

Camera Level 1.6m | 50mm lens | 13:41 | 2024/07/23



VP 1 - Looking north west on Tite Street

Camera Location Photograph

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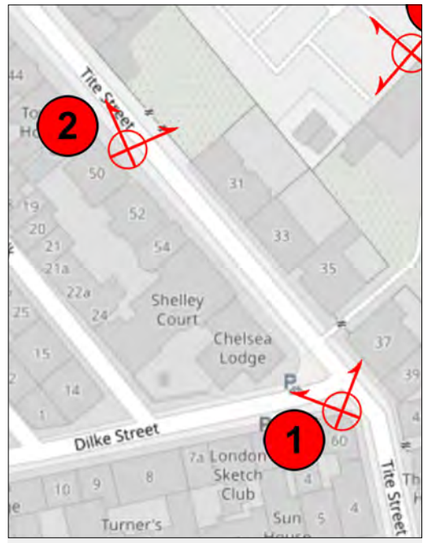
Proposed View 1

Camera Level 1.6m | 24mm lens | 13:41 | 2024/07/23



VP 1 - Looking north west on Tite Street

Camera Location Photograph

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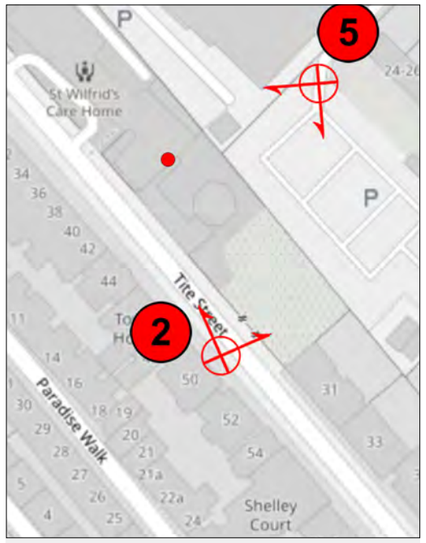
Existing View 2

Camera Level 1.6m | 24mm TS lens | 14:29 | 2024/07/23



VP 2 - Looking north east on Tite Street (towards gardens)

Camera Location Photograph

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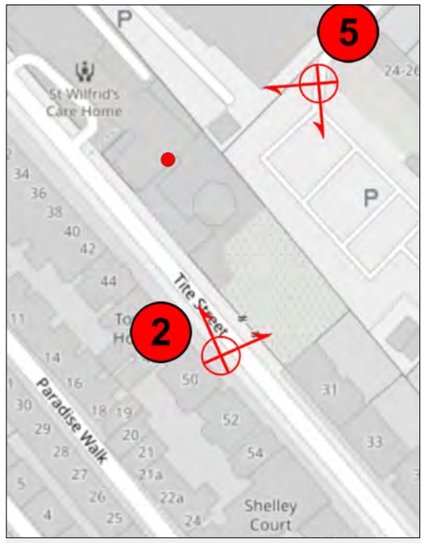
Proposed View 2

Camera Level 1.6m | 24mm TS lens | 14:29 | 2024/07/23

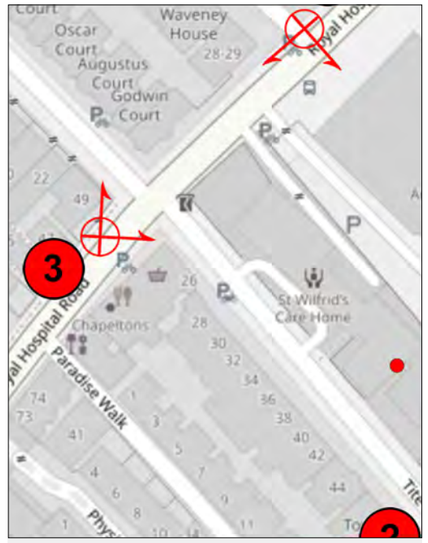


VP 2 - Looking north east on Tite Street (towards gardens)

Camera Location Photograph

Existing View 3

Camera Level 1.6m | 24mm TS lens | 15:50 | 2025/09/23

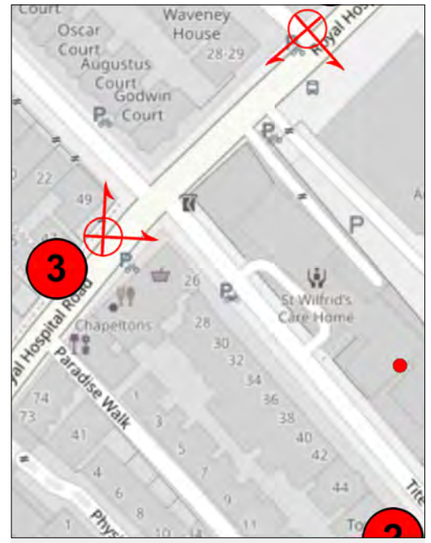


VP 3 - Looking north east from west Royal Hospital Road

Camera Location Photograph

Proposed View 3

Camera Level 1.6m | 24mm TS lens | 15:50 | 2025/09/23



VP 3 - Looking north east from west Royal Hospital Road

Camera Location Photograph

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Existing View 4

Camera Level 1.6m | 24mm TS lens | 15:42 | 2024/07/23

VP 4 - Looking east from corner of Ormonde Gate & Royal Hospital Road

Camera Location Photograph

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Proposed View 4

Camera Level 1.6m | 24mm TS lens | 15:42 | 2024/07/23

VP 4 - Looking east from corner of Ormonde Gate & Royal Hospital Road

Camera Location Photograph

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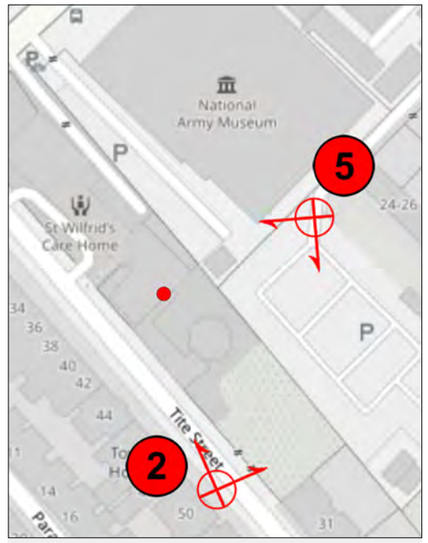
Existing View 5

Camera Level 1.6m | 24mm TS lens | 09:15 | 2024/07/24



VP 5 - Looking south west from Royal Hospital car park

Camera Location Photograph

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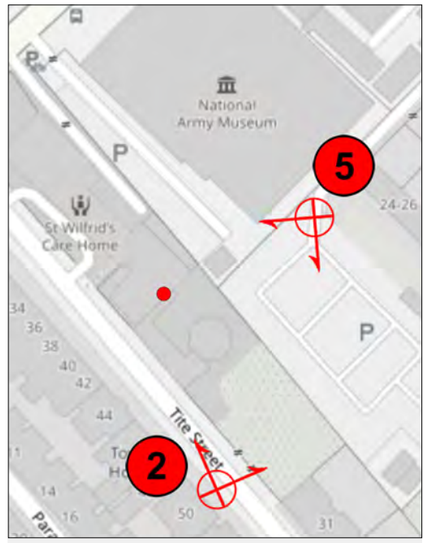
Proposed View 5

Camera Level 1.6m | 24mm TS lens | 09:15 | 2024/07/24



VP 5 - Looking south west from Royal Hospital car park

Camera Location Photograph

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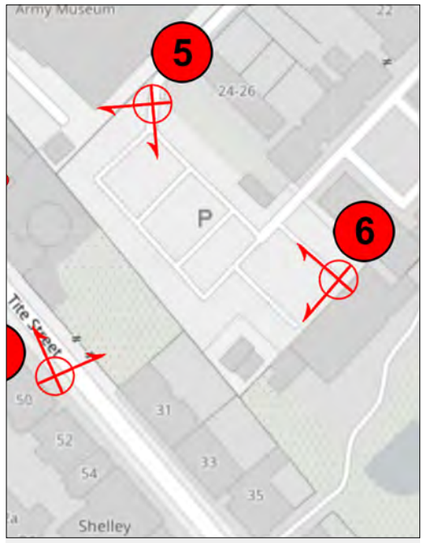
www.renderedimage.uk

Existing View 6

Camera Level 1.6m | 24mm lens | 09:36| 2024/07/24



VP 6 - Looking west from Royal Hospital car park

Camera Location Photograph

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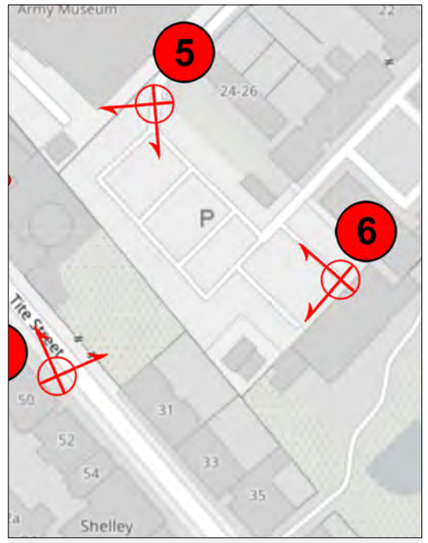
+44(0)20 3808 8234 enquiry@renderedimage.uk
www.renderedimage.uk

Proposed View 6

Camera Level 1.6m | 24mm lens | 09:36| 2024/07/24



VP 6 - Looking west from Royal Hospital car park

Camera Location Photograph

Thank You