

140 Causewayside, Edinburgh

Verified Visualisations Package

December 2023

 **brindley**
ASSOCIATES

creative • environmental



For Balfour Beatty Investments

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Front cover visualisation created using CGI provided by Balfour Beatty Investments.

Visualisation Methodology Statement

Visualisations Introduction

A photomontage is an illustration of a proposed development that is as accurate as is feasibly possible within the limits of the equipment and software used. Although it is never possible to be completely accurate due to minor errors in survey data and photographic distortion, implementation of a robust methodology based on accurate survey and proposal information will result in a negligible degree of error.

It should be borne in mind that the visual character of the proposed development will undoubtedly appear differently when viewed in varying weather and/ or lighting conditions. It must also be noted that photomontages cannot accurately convey a view as experienced on site. They should therefore be treated as an artist's impression of the proposed development rather than as a true representation. Wireframe representations, in particular, can overemphasise the proposed development, making it appear more prominent than it would in the landscape.

Photography

Viewpoints are locations where visibility of the proposed development is theoretically available and are representative of specific conditions and/ or receptors. They are useful for assessing specific views from sensitive locations and a diverse number of receptor groups, and are selected to be representative of visibility patterns in the study area. They are also useful in illustrating indirect landscape effects. Viewpoints are, by their nature, static representations located in publicly accessible areas such as roads, tracks and footpaths, which in reality tend to be experienced by receptors moving through the landscape together with other views.

Site photography for the photomontages was undertaken in September 2023 and is representative of the typical weather conditions experienced at this time of year. All viewpoints were micro-sited, on-site, to ensure worst case visibility of the proposed development from the representative location and to avoid foreground objects, where possible.

In line with best practice guidance (Visual Representation of Development Proposals, Technical Guidance Note 06/19 Landscape Institute, September 2019), photography utilised for the preparation of images was taken with a digital SLR camera with full frame (35mm) sensor, using a 50mm focal length prime lens, mounted on a level tripod with levelled panoramic head. The centre of the camera lens was positioned at a height of 1.5m to 1.65m above ground level. Photography was taken in portrait orientation to ensure the necessary vertical extents were captured.

Survey

Verified photomontage requires precise location data for camera viewpoints and a number of reference points which are used to accurately match the digital CGI model to the photograph. The reference points are details within the view that are easily identifiable and are commonly features such as building corners, roof ridges or window frames. In locations where a sufficient spread of clear reference points cannot be identified, 'retro targets' can be attached to nearby surfaces (e.g. walls). These targets are then 'painted out' of the final images in post-production so as not to distract from the finalised visualisation. A minimum of three control points covering the view is required to verify each image, however a minimum of ten control points was used wherever possible.

The viewpoint photography was undertaken prior to a surveyor collecting the reference points and tripod location co-ordinates. Prior to the survey, location plan data, viewpoint photography and photographs of the tripod in-situ were supplied to aid accurate siting of the viewpoint location, in addition to use of survey nails placed at the time of photography.

During the surveyor's site visit a survey control point was co-ordinated to OS National Grid (OSTN15) and OS Datum – Geoid model: OSGM15, using a Trimble R10 VRS GPS unit. The Trimble S7 total station was then set up over the survey control point and photography reference points were established. The reference points were co-ordinated using the total station in reflectorless mode with the precise location of the surveyor's nail allowing the tripod location to be calculated.

Photography Post-Production

All visualisations shown have a horizontal field of view of 53.5° and are presented in planar projection, to provide binocular scaling in line with LI Visualisation Guidance. Where possible, it was ensured that the entire development was visible within the image whilst providing sufficient landscape and visual context. Some fine-tuning of the photography settings has been used during post-production to reduce distant haze or improve the lighting conditions making the image clearer, however this was kept to a minimum.

In order to produce base photography with a horizontal field of view of 53.5°, several single frame images were 'stitched' together in planar format using Kolor PTGui software. To ensure the minimum of optical distortion and parallax error, the following precautions were taken:

- When taking the photography, a tripod with a panoramic head was used. The levelling plate, set between the tripod and the tripod head, ensured that the plane of rotation of the camera was exactly horizontal. This avoids 'stepping' – the result effect of misaligned adjacent frames of photography;
- To eliminate parallax error, a sliding plate on the tripod head was used. This allowed the camera to be positioned so that the nodal point of the lens was positioned over the axis of rotation;
- The photographs were taken in 15° increments, to allow for an overlap of 50% between adjacent frames in the photography stitching software. This means that each panorama is constructed using only the central 50% of each photograph, discarding the areas with the greatest amount of lens distortion;
- The photography stitching software automatically generates control points for aligning the photographs to each other. These control points were refined manually, removing inaccurate points and adding additional ones where necessary to ensure the final image was subject to the minimum level of distortion; and
- The stitched photograph's vanishing point was adjusted to match the camera in the 3D model.

Construction of digital model

The proposed building was digitally modelled in 3D by the project architects (JM Architects) using Revit. The proposed seating and planting containers to the front of the built form was designed and modelled by the project landscape architects (Re-form Ltd), who also advised on design ideas & plant types. The proposed models were then imported to 3Ds Max and accurately positioned using specific coordinates and finished floor levels as a reference.

Photorealistic textures were then applied to the proposed development model using a CGI provided as a reference. Due to different software packages, render settings and textures being used to produce the CGI and verified photomontages, some slight differences between the images may be apparent. Where possible, and where thought to be realistic considering the lighting of the baseline photography, a close likeness of textures was implemented in the final model. Daylight systems were also applied to ensure accurate shading in the renders used in the photomontages.

Construction of visualisations

Once the model of the development was completed, the survey reference point information was imported into the model along with the camera locations. A wireframe image that included the survey verified coordinates was exported for each viewpoint location. The wireframes were then accurately matched to each photograph using the reference points to determine the scale and position of the wireframe within the photograph. The wireframe was never distorted to fit the photograph. As all the above survey and photography methodology had been undertaken, a good fit between photograph and wireframe was possible by simply scaling and positioning the wireframe, together with some minor rotation of the panoramic photograph to correct slight levelling errors and adjustment of the vanishing point of the photograph. Illustrations demonstrating the locations of the reference points used to align the renders to the photograph can be seen on figures 01c and 02c.

Once the wireframe had been aligned satisfactorily, CGI renders of the model were exported at the calculated image size. These images are based upon viewpoint and camera details recorded during site work and have been rendered to match the time of day and lighting conditions in the photograph to provide a realistic image.

Finally, the photomontage was completed by masking those parts of the CGI image which would be hidden by foreground objects. This aspect of the work was undertaken using Photoshop CC software, with reference made to the digital model in instances where there was any uncertainty regarding which elements of the photograph screen the proposals. The render was then further adjusted to ensure proposed materials shown match the surroundings in terms of lighting; however, some photographic elements may be carefully added for enhanced realism for select views.

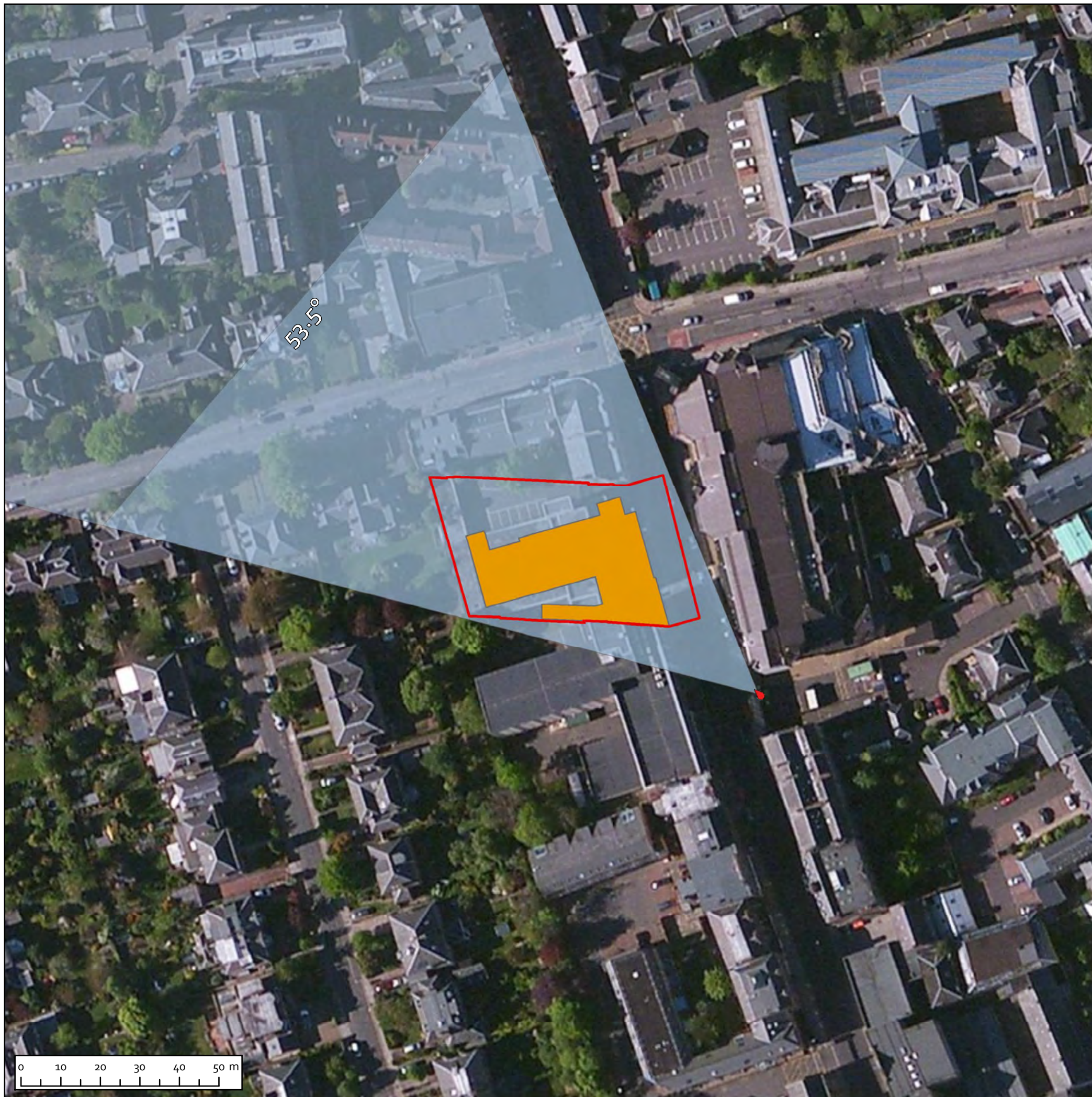
AVR Level 0 visualisations were also produced in order to display the full extents of the built form in conjunction with any screening elements which would block the development in the AVR level 3 visualisation.

Construction of the visualisations package




All visualisations included in the package comprise panoramic images with a 53.5° horizontal angle of view, utilising planar projection. These images must be viewed at a certain distance and image size, as indicated on each Individual visualisation, in order to obtain an accurate representation of the proposed development within the baseline view. The viewpoint has been centred on the proposed development to ensure the full extents of the proposed development are displayed in all visualisations.

Summary Tables

Photography	Response	
Method used to establish the camera location	Survey verified coordinates	
Likely level of accuracy of location	Survey verified coordinates accurate to 0.001m	
Coordinate system used	OS Grid	
Camera make and model	Canon 6D	
Lens make and model	Canon EF 50mm	
Panoramic head make and model	Manfrotto panoramic head and leveller	
Photography orientation	Portrait	
3D Model	Response	
Source of topographic height data	LiDAR DTM in combination with Context model of existing surrounding built form	
How have the model and the camera locations been placed in the software?	Survey verified coordinates	
Elements in the view used as target points to check the horizontal alignment	Survey verified coordinates were used as reference points (shown on figure and 01c)	
Elements in the view used as target points to check the vertical alignment	Survey verified coordinates were used as reference points (shown on figure and 01c)	
3D modelling and rendering software	3DS Max and Vray Next	
External Information Utilised in Preparation of Supporting Photomontages		
Drawing Reference and Title	Drawing Date/ Date Received	Provided By
7051-JMA-01-ZZ-DR-A-00-2001_General Arrangement - Elevations	26th July 2023	Balfour Beatty
Survey Verified Reference Points	28th September 2023	Landform Surveys
7051-JMA-01-ZZ-M3-A-00-0001_231121 (Architectural Model)	22 nd November 2023	JM Architects
Updated Model	27 th November 2023	Re-form
As per email received containing planting information	19th October 2023	Re-form



Legend

-  Viewpoint location
-  Site boundary
-  Proposed building footprint

VP02: Entrance to the service yard of the National Library of Scotland

Viewpoint OS reference: 326385.225, 672085.220
 Viewpoint elevation: 75.376m
 Direction of view: 311°
 Distance to site boundary: 24m

Tripod Location Photograph



Project: 140 Causewayside	Client: Balfour Beatty Investments
Drawing Title: VP02: Viewpoint Location Plan	
Scale: 1:1,000 @ A3	Date: 06 / 12 / 2023
Figure No: 01a	Status: Planning
Drawn by: R Moore	Checked by: S Hyde



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Baseline Photograph

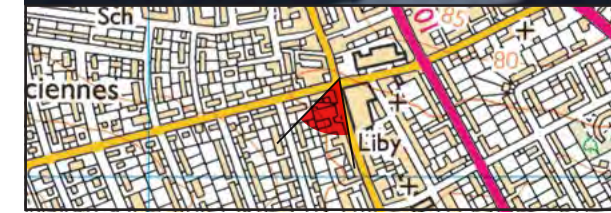


Figure Number: 01b
VPO2: Entrance to the service yard of the National Library of Scotland
 Drawn by: R Moore - Checked by: S Hyde
 Date: 06 / 12 / 2023

Viewpoint OS reference: 326385.225, 672085.220
 Viewpoint elevation: 75.376m AOD
 Direction of view: 311°
 Distance to site boundary: 24m
 Enlargement factor: 150%

Horizontal field of view: 53.5° (Planar Projection)
 Vertical field of view: 38° (Approx)
 Principle distance: 812.5mm
 Paper size: 841 x 594mm
 Correct printed images size: 820 x 556mm

Camera: Canon EOS 6D (full frame)
 Lens: Canon EF 50mm
 Camera height: 1.5m AGL
 Date: 06 / 09 / 2023
 Time: 10:46 am

Project: 140 Causewayside
 Client: Balfour Beatty Investments
 Document: Verified Visualisations Package

View flat at a comfortable arm's length
 If viewing this image on a screen, enlarge to full screen height



Photowire (Type 4 - AVR Level 0)



Figure Number: 01c
VPO2: Entrance to the service yard of the National Library of Scotland
 Drawn by: R Moore - Checked by: S Hyde
 Date: 06 / 12 / 2023

Viewpoint OS reference: 326385.225, 672085.220
 Viewpoint elevation: 75.376m AOD
 Direction of view: 311°
 Distance to site boundary: 24m
 Enlargement factor: 150%

Horizontal field of view: 53.5° (Planar Projection)
 Vertical field of view: 38° (Approx)
 Principle distance: 812.5mm
 Paper size: 841 x 594mm
 Correct printed images size: 820 x 556mm

Camera: Canon EOS 6D (full frame)
 Lens: Canon EF 50mm
 Camera height: 1.5m AGL
 Date: 06 / 09 / 2023
 Time: 10:46 am

Project: 140 Causewayside
 Client: Balfour Beatty Investments
 Document: Verified Visualisations Package

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 If viewing this image on a screen, enlarge to full screen height





Photomontage (Type 4 - AVR Level 3)

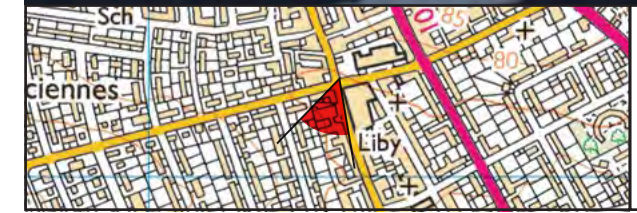


Figure Number: 01.d
VPO2: Entrance to the service yard of the National Library of Scotland
 Drawn by: R Moore - Checked by: S Hyde
 Date: 06 / 12 / 2023

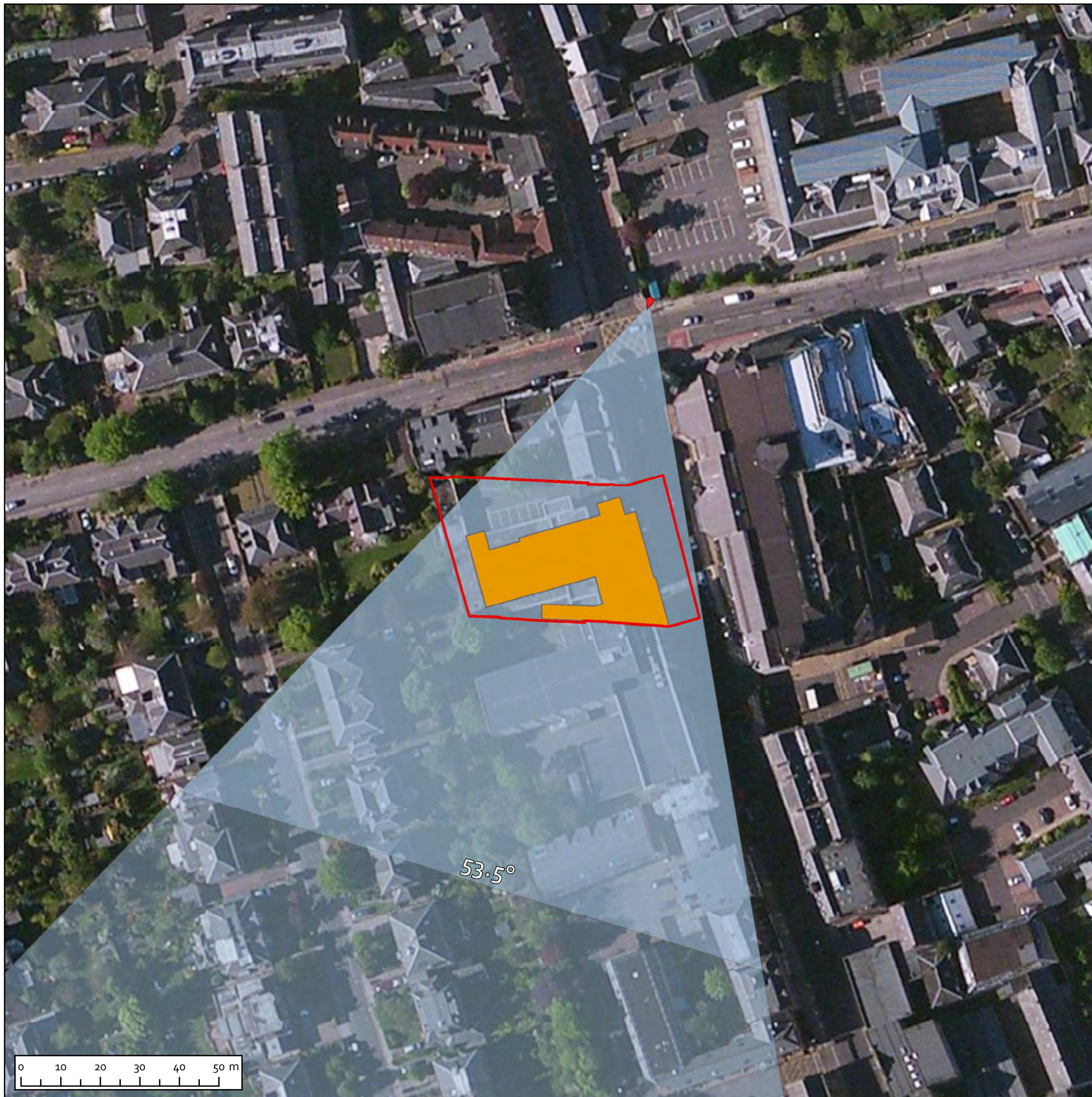
Viewpoint OS reference: 326385.225, 672085.220
 Viewpoint elevation: 75.376m AOD
 Direction of view: 311°
 Distance to site boundary: 24m
 Enlargement factor: 150%

Horizontal field of view: 53.5° (Planar Projection)
 Vertical field of view: 38° (Approx)
 Principle distance: 812.5mm
 Paper size: 841 x 594mm
 Correct printed images size: 820 x 556mm




Camera: Canon EOS 6D (full frame)
 Lens: Canon EF 50mm
 Camera height: 1.5m AGL
 Date: 06 / 09 / 2023
 Time: 10:46 am

Project: 140 Causewayside
 Client: Balfour Beatty Investments
 Document: Verified Visualisations Package

View flat at a comfortable arm's length
 If viewing this image on a screen, enlarge to full screen height



Legend

-  Viewpoint location
-  Site boundary
-  Proposed building footprint

VP03: North-east corner of the junction of Causewayside and Salisbury Place

Viewpoint OS reference: 326357.731, 672183.812
 Viewpoint elevation: 76.141m
 Direction of view: 197°
 Distance to site boundary: 42m

Tripod Location Photograph



Project: 140 Causewayside	Client: Balfour Beatty Investments
Drawing Title: VP03: Viewpoint Location Plan	
Scale: 1:1,000 @ A3	Date: 06 / 12 / 2023
Figure No: 02a	Status: Planning
Drawn by: R Moore	Checked by: S Hyde



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Baseline Photograph

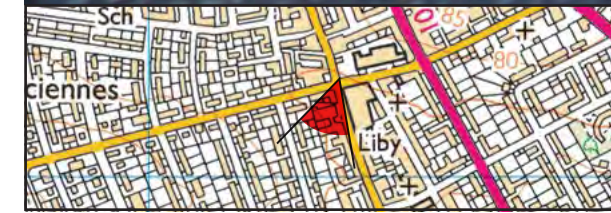


Figure Number: o2b
VPO3: North-east corner of the junction of Causewayside and Salisbury Place
 Drawn by: R Moore - Checked by: S Hyde
 Date: 06 / 12 / 2023

Viewpoint OS reference: 326357.733, 672183.812
 Viewpoint elevation: 76.443m AOD
 Direction of view: 197°
 Distance to site boundary: 42m
 Enlargement factor: 150%

Horizontal field of view: 53.5° (Planar Projection)
 Vertical field of view: 38° (Approx)
 Principle distance: 812.5mm
 Paper size: 841 x 594mm
 Correct printed images size: 820 x 556mm

Camera: Canon EOS 6D (full frame)
 Lens: Canon EF 50mm
 Camera height: 1.5m AGL
 Date: 06 / 09 / 2023
 Time: 10:46 am

Project: 140 Causewayside
 Client: Balfour Beatty Investments
 Document: Verified Visualisations Package

View flat at a comfortable arm's length
 If viewing this image on a screen, enlarge to full screen height





Photowire (Type 4 - AVR Level 0)



Figure Number: 02 c
VPO3: North-east corner of the junction of Causewayside and Salisbury Place
 Drawn by: R Moore - Checked by: S Hyde
 Date: 06 / 12 / 2023

Viewpoint OS reference: 326357.733, 672183.812
 Viewpoint elevation: 76.443m AOD
 Direction of view: 197°
 Distance to site boundary: 42m
 Enlargement factor: 150%

Horizontal field of view: 53.5° (Planar Projection)
 Vertical field of view: 38° (Approx)
 Principle distance: 812.5mm
 Paper size: 841 x 594mm
 Correct printed images size: 820 x 556mm

Camera: Canon EOS 6D (full frame)
 Lens: Canon EF 50mm
 Camera height: 1.5m AGL
 Date: 06 / 09 / 2023
 Time: 10:46 am

Project: 140 Causewayside
 Client: Balfour Beatty Investments
 Document: Verified Visualisations Package

View flat at a comfortable arm's length
 If viewing this image on a screen, enlarge to full screen height





Photomontage (Type 4 - AVR Level 3)

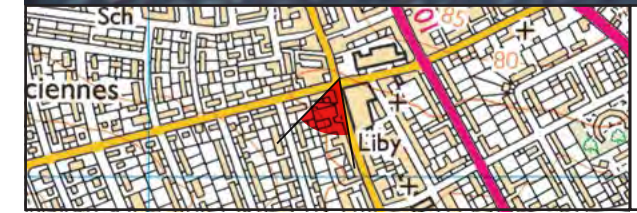


Figure Number: 02.d
VPO3: North-east corner of the junction of Causewayside and Salisbury Place
 Drawn by: R Moore - Checked by: S Hyde
 Date: 06 / 12 / 2023

Viewpoint OS reference: 326357.733, 672183.812
 Viewpoint elevation: 76.443m AOD
 Direction of view: 197°
 Distance to site boundary: 42m
 Enlargement factor: 150%

Horizontal field of view: 53.5° (Planar Projection)
 Vertical field of view: 38° (Approx)
 Principle distance: 812.5mm
 Paper size: 841 x 594mm
 Correct printed images size: 820 x 556mm

Camera: Canon EOS 6D (full frame)
 Lens: Canon EF 50mm
 Camera height: 1.5m AGL
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