A7 – Townscape and Visual Effects

A7.1 – Visual Impact Study (Independently Verified Views by Miller Hare)

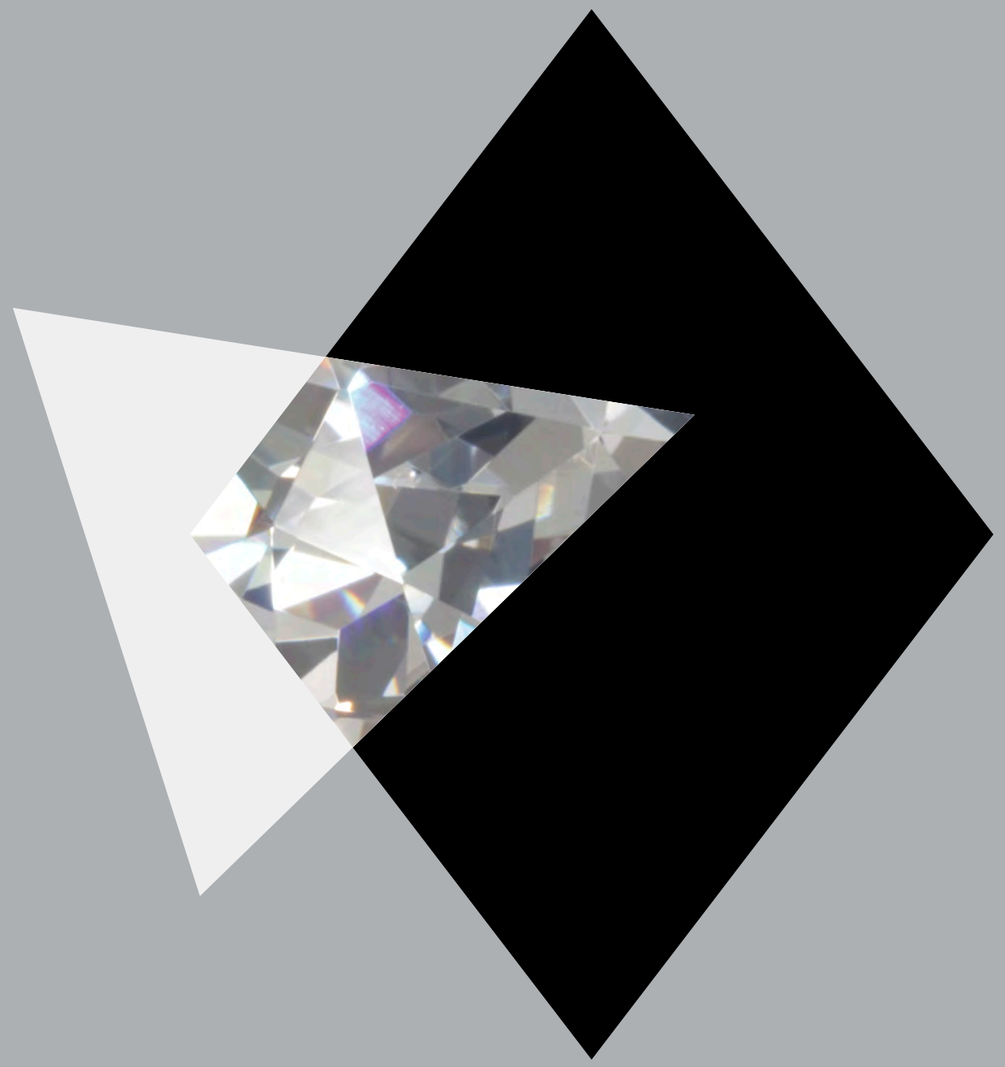
A7.2 – Indicative 3D Illustrations of Arthur Street (URS)

A7.1 – Visual Impact Study (Independently Verified Views by Miller Hare)

Bank Station Capacity Upgrade

Visual Impact Study

September 2014



millerhare

Miller Hare Limited
Middlesex House
34-42 Cleveland St
London W1T 4JE

+44 20 7691 1000
info@millerhare.com

Bank Station Capacity Upgrade
Visual Impact Study

September 2014

Client
London Underground Limited

Architect
Wilkinson Eyre Architects

Planning Consultant
URS

Townscape Consultant
URS

Visualisation
Millerhare

Contents

millerhare

1 Introduction

Scope

1.1 This study tests the visual impact of the proposed development by London Underground Limited at the Whole Block site bounded by King William Street, Abchurch Lane, Cannon Street and Nicholas Lane, London EC4N. It consists of a series of accurately prepared photomontage images or Accurate Visual Representations (AVR) which are designed to show the visibility and appearance of the proposed development from a range of publicly accessible locations around the site. The views have been prepared by Miller Hare Limited.

1.2 The ten views included in the study were selected by the project team in consultation with the City of London Corporation. The same views were used for the Over Site Development (OSD) planning application approved in June 2014. AVRs have been produced for the four views which best illustrate the Station Entrance Hall. The red lines on the AVRs define the extent of the new Bank Station Capacity Upgrade Station Entrance and above ground infrastructure which is the subject of the Transport and Works Act Order application. The OSD has been included in the AVRs for information only and to provide context. The full list of views is shown in thumbnail table on page 4, together with a map showing their location on page 7.

1.3 In preparing each AVR a consistent methodology and approach to rendering has been followed. General notes on the AVRs are given in Appendix A2 "Accurate Visual Representations", and the detailed methodology used is described in Appendix A3 "Methodology for the production of Accurate Visual Representations".

1.4 From each viewpoint a large format photograph has been taken as the basis of the study image. The composition of this photograph has been selected to allow the proposed development to be assessed in a meaningful way in relation to relevant elements of the surrounding context. Typically, photographs have been composed with a horizontal axis of view in order to allow vertical elements of the proposals to be shown vertically in the resulting image. If required in order to show the full extent of the proposals in a natural way the horizon line of the image has been allowed to fall above or below the centre of the image. This has been achieved by applying vertical rise at source using a large format camera or by subsequent cropping of the image. In a limited number of cases the source photograph has been extended vertically to ensure that the full height of the proposals are shown in the images of the future condition. In all cases the horizon line and location of the optical axis are clearly shown by red arrow markers at the edges of the image.

1.5 The lenses chosen for the source photography have been selected to provide a useful Field of View given the distance of the viewpoint from the site location. The lenses used for each view are listed in the Camera Table on page 6.

1.6 In this study the following groups of views have been defined:

- **Local views** – horizontal Field of View approximately 74 degrees (equivalent to a 24mm lens on 35mm film camera)

1.7 For each AVR image, the precise Field of View, after any cropping or extension has been applied is shown clearly using indexed markings running around the edges of the image. These indicate increments of 1, 5 and 10 degrees marked away from the Optical Axis. Using this peripheral annotation it is possible to detect optical distortions in parts of the image Axis . It is also possible to simulate a different field of view by masking off an appropriate area of the image. More detailed information on the border annotation is contained in Appendix A2 "Accurate Visual Representations".

Conditions

1.8 From each selected viewpoint a set of accurate images have been created comparing the future view with the current conditions represented by a carefully taken large format photograph. In this study the following conditions are compared:

- Existing – the appearance today as recorded on the specified date and time
- Proposed – the future appearance were the proposed development to be constructed

Presentation

1.9 For each view the AVRs have been presented using a double page layout to facilitate desktop study. The first page shows the baseline condition, the second page the proposed condition all at the same size and scale on the page.

Styles

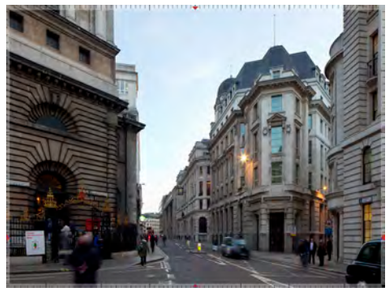
1.10 For each viewpoint, the proposed development is shown in a defined graphical style. These styles comply with the definitions of AVR style defined by the London View Management Framework. The styles used in this study are:

- AVR 3 – a fully rendered representation of the building showing the likely appearance of the proposed materials under the lighting conditions obtaining in the selected photograph.

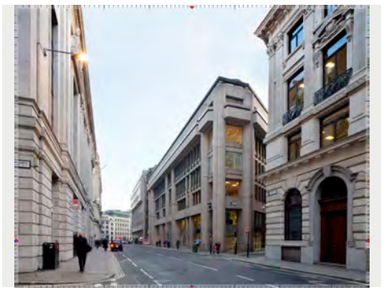
Schemes

1.11 The proposed development shown in the study has been defined by drawings and specifications prepared by the client's design team issued to Millerhare in June 2014. Computer models reflecting the proposed development have been assembled and refined by Millerhare and images from these models have been supplied to the project team to be checked for accuracy against the design intent. An overview of the study model annotated with key height is illustrated in Appendix A1 "Details of scheme".

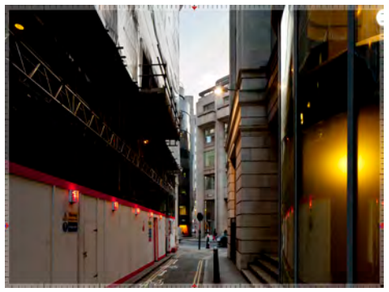
The Views



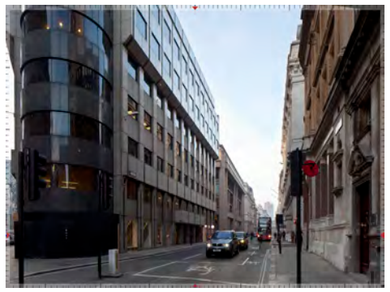
1 I Looking south-east along King William Street from its junction with Lombard Street



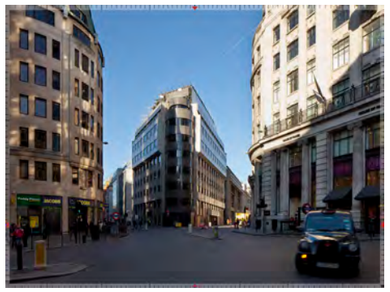
2 I Looking south-east along King William Street from its junction with Abchurch Lane



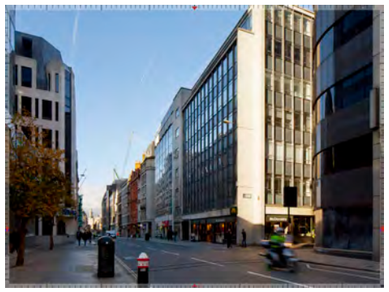
3 I Looking south-west along the northern section of Nicholas Lane



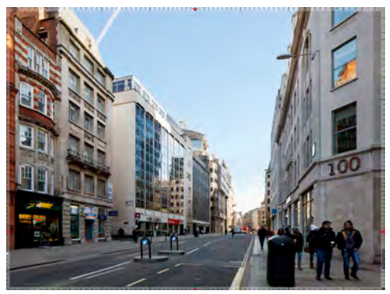
4 I Looking north-west along King William Street (from No. 68) at its junction with Cannon Street



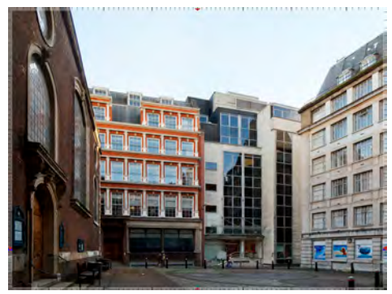
5 I Looking north-west from the Monument junction of King William Street, Cannon Street and Gracechurch Street



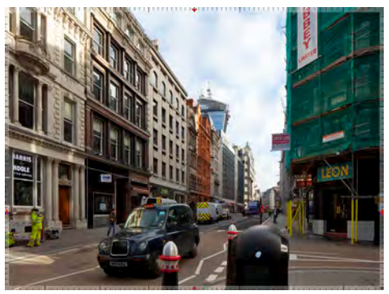
6 I Looking west along Cannon Street from its junction with Martin Lane



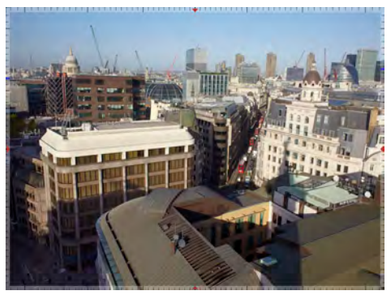
7 I Looking east along Cannon Street from its junction with Laurence Pountney Hill



8 I Looking out of Abchurch Yard towards the application site

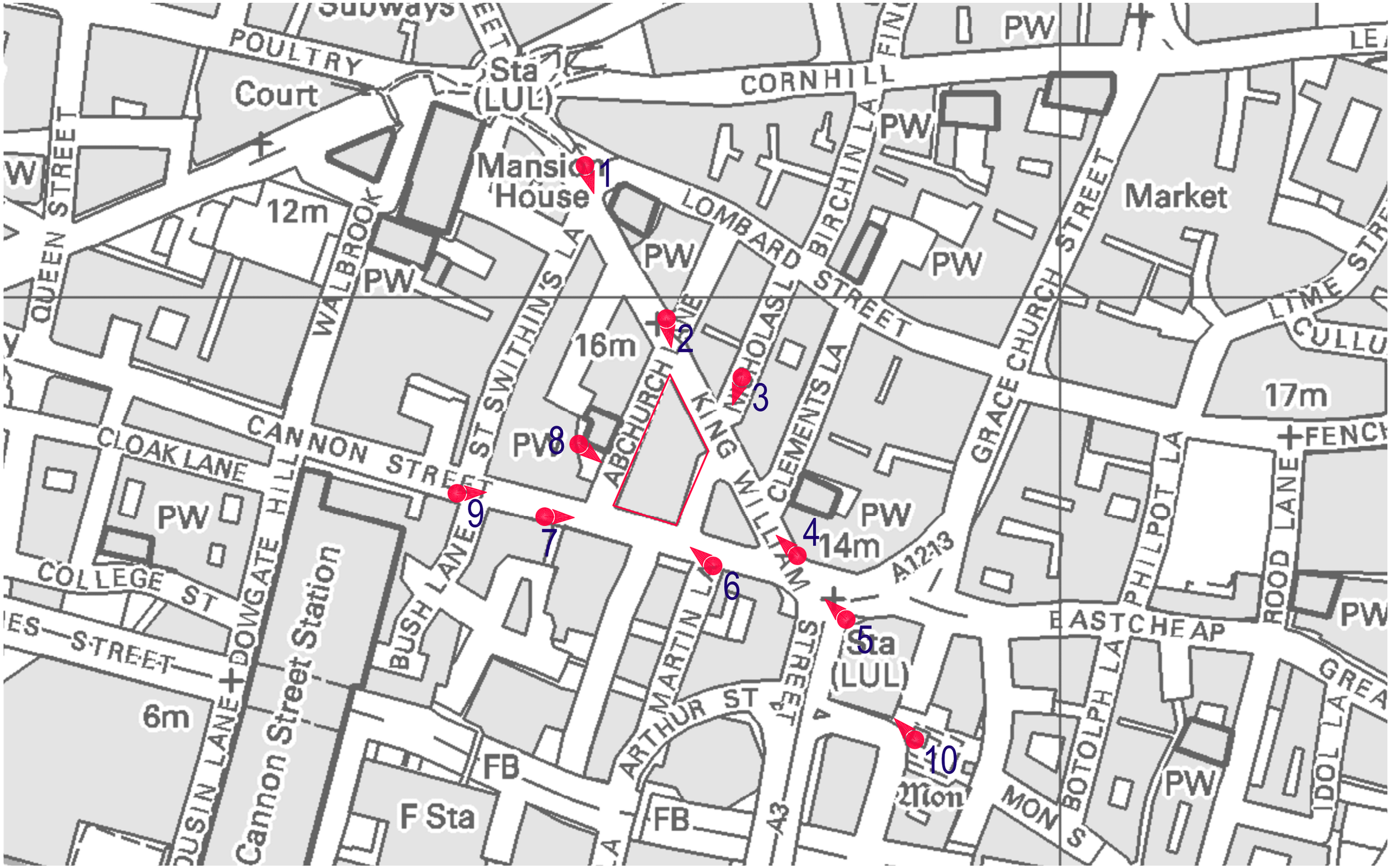


9 I Looking east along Cannon Street from its junction with Bush Lane



10 I Looking north-west from the Monument viewing gallery

View	Description	MH Reference	Type	Method	Camera Easting	Northing	Height	Camera	Lens	HFOV Photo	Image	Photo date/time	Bearing	distance (km)
1	Bank Station Exit 6: Outside St Mary's Woolnoth	1100	AVR1	Verified	532744.1	181069.9	16.09	Canon EOS 5D Mark II DSLR	24mm	72.6	72.6	11/12/2013 15:36	165.2	0.2
2	King William Street at Abchurch Line	1200	AVR3	Verified	532787.8	180987.8	17.26	Canon EOS 5D Mark II DSLR	24mm	72.7	72.7	11/12/2013 15:27	181.4	0.1
3	Nicholas Lane	1300	AVR3	Verified	532828.3	180956.3	17.54	Canon EOS 5D Mark II DSLR	24mm	72.1	72.1	11/12/2013 15:19	223.1	0.1
4	King William Street outside number 68	1400	AVR1	Verified	532858.1	180860.5	16.38	Canon EOS 5D Mark II DSLR	24mm	72.3	72.3	11/12/2013 15:08	305.0	0.1
5	Monument Station	1500	AVR1	Verified	532884.3	180826.3	15.38	Canon EOS 5D Mark II DSLR	24mm	73.0	73.0	23/11/2013 10:30	310.8	0.1
6	Cannon Street at Martin Lane	1600	AVR3	Verified	532812.9	180855.1	16.30	Canon EOS 5D Mark II DSLR	24mm	73.0	73.0	23/11/2013 11:17	334.3	0.1
7	Cannon Street at Laurence Pountney Lane	1700	AVR3	Verified	532722.5	180881.5	15.49	Canon EOS 5D Mark II DSLR	24mm	73.0	73.0	23/11/2013 11:32	65.0	0.1
8	Abchurch Yard option 1	1800	AVR3	Verified	532740.8	180920.4	17.14	Canon EOS 5D Mark II DSLR	24mm	72.6	72.6	23/11/2013 12:33	101.8	0.1
9	Cannon Street Station	1900	AVR1	Verified	532675.4	180894.0	14.82	Canon EOS 5D Mark II DSLR	24mm	72.5	72.5	23/11/2013 11:55	81.2	0.1
10	The Monument looking NorthWest	2000	AVR3	Verified	532921.1	180761.7	60.84	Canon EOS 5D Mark II DSLR	28mm	65.4	65.4	15/11/2013 10:01	317.8	0.2



View location map

1 Looking south-east along King William Street from its junction with Lombard Street

Existing

Looking south-east along King William Street from its junction with Lombard Street 1

2 Looking south-east along King William Street from its junction with Abchurch Lane

2446_1201

Existing

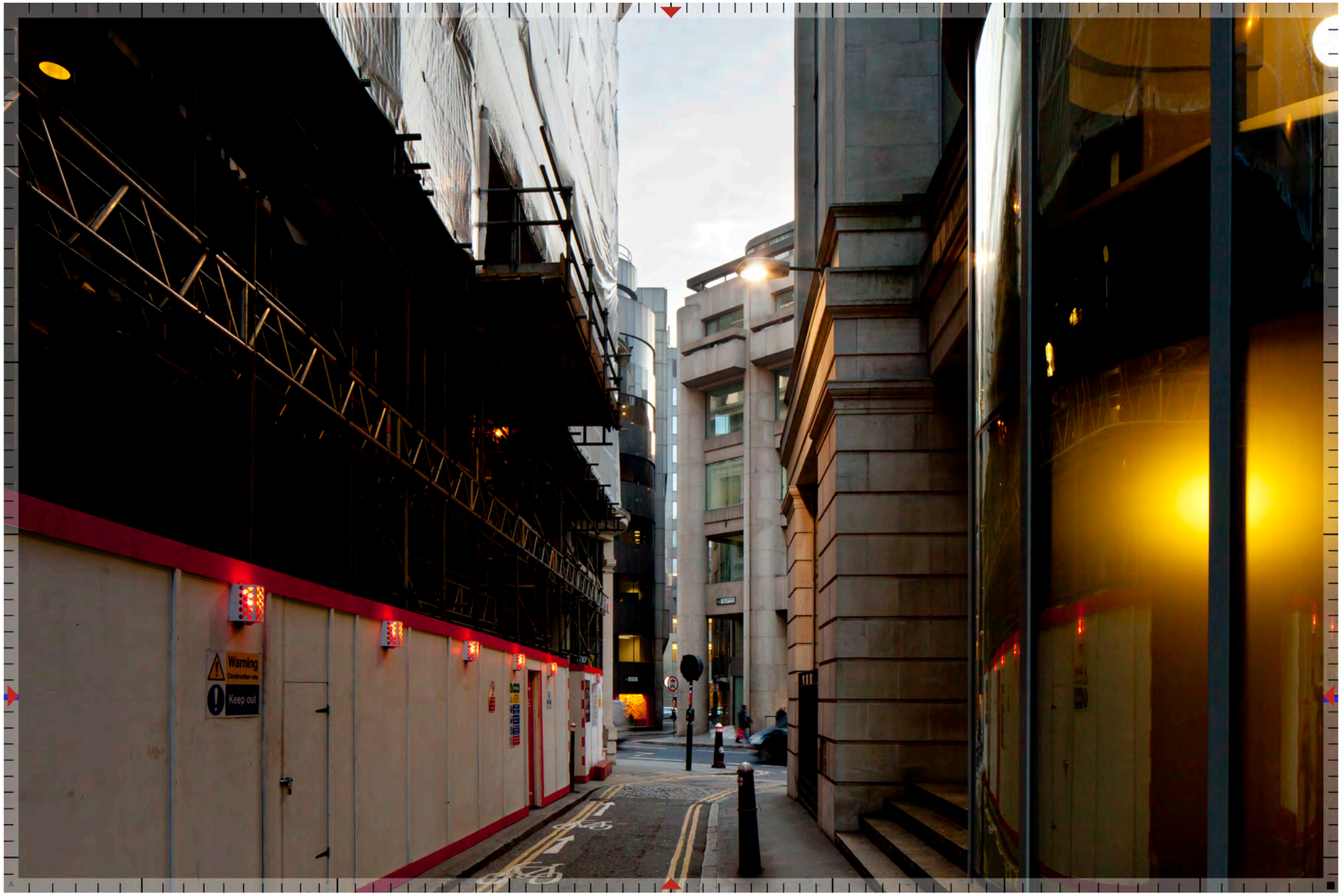

2446_1207
ICBC
Visualisation of Proposed Over Site
Development for Information Only

Proposed

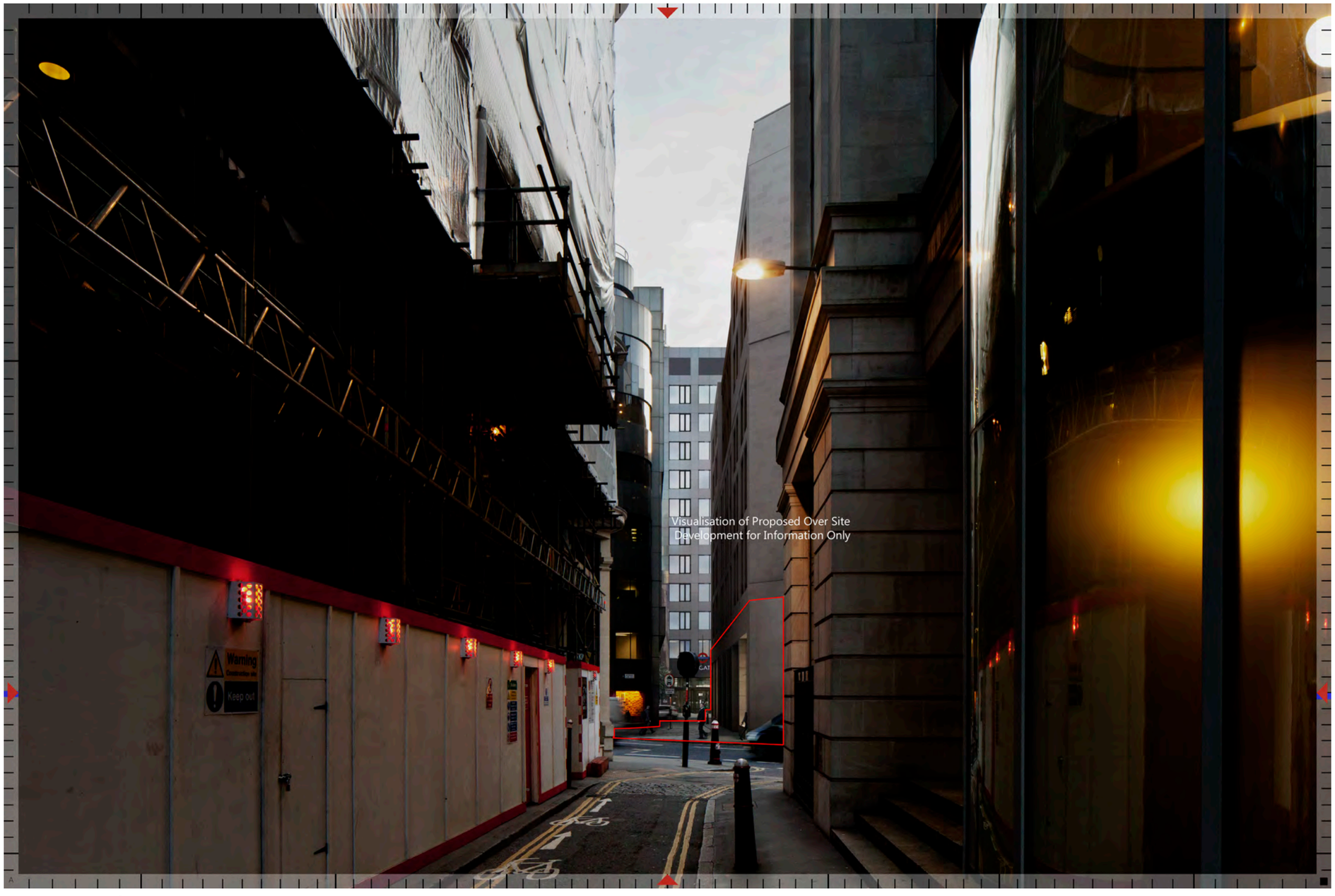
2 Looking south-east along King William Street from its junction with Abchurch Lane

Proposed

3 Looking south-west along the northern section of Nicholas Lane

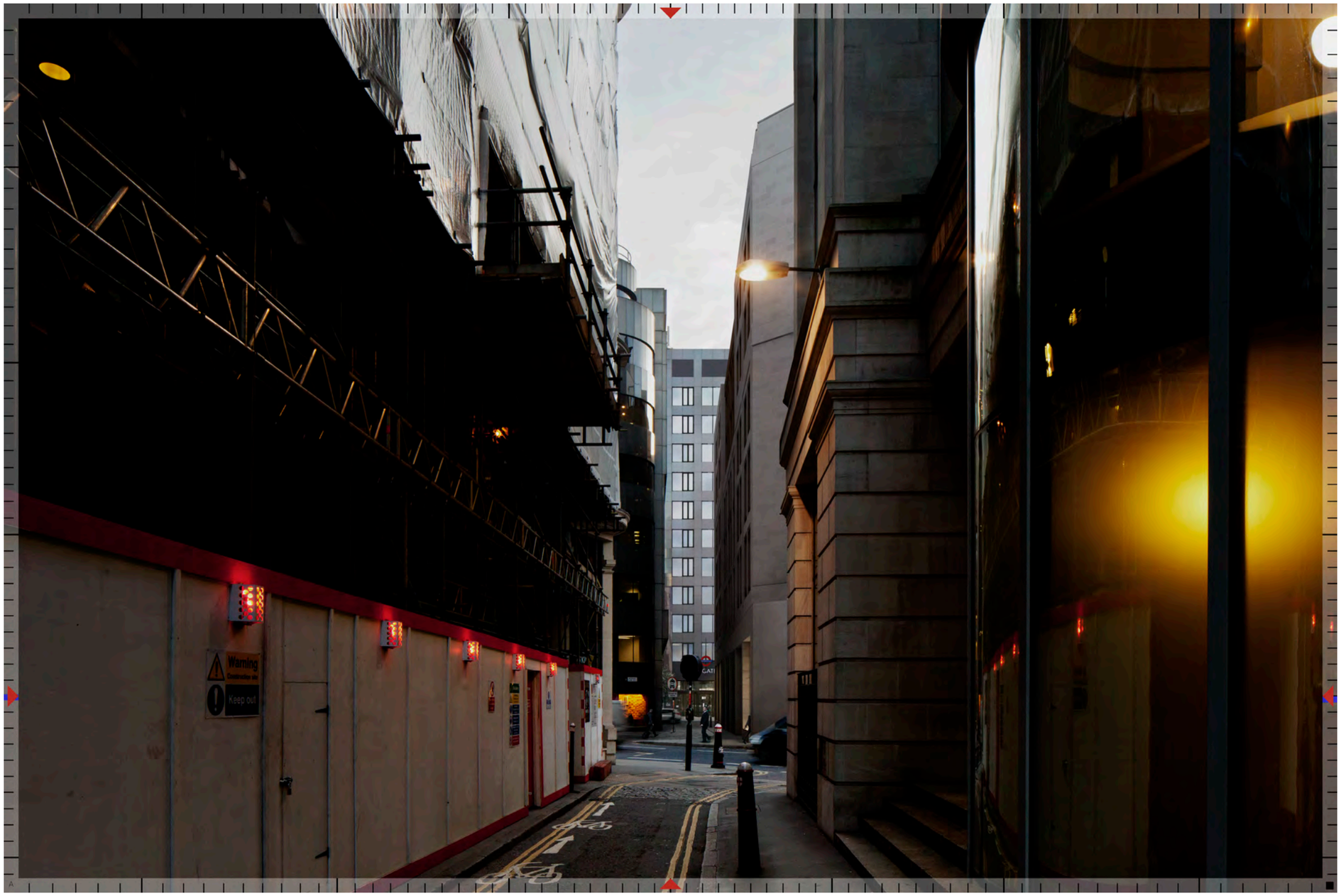


Existing


2446_1307
Visualisation of Proposed Over Site Development for Information Only
Warning
Keep out

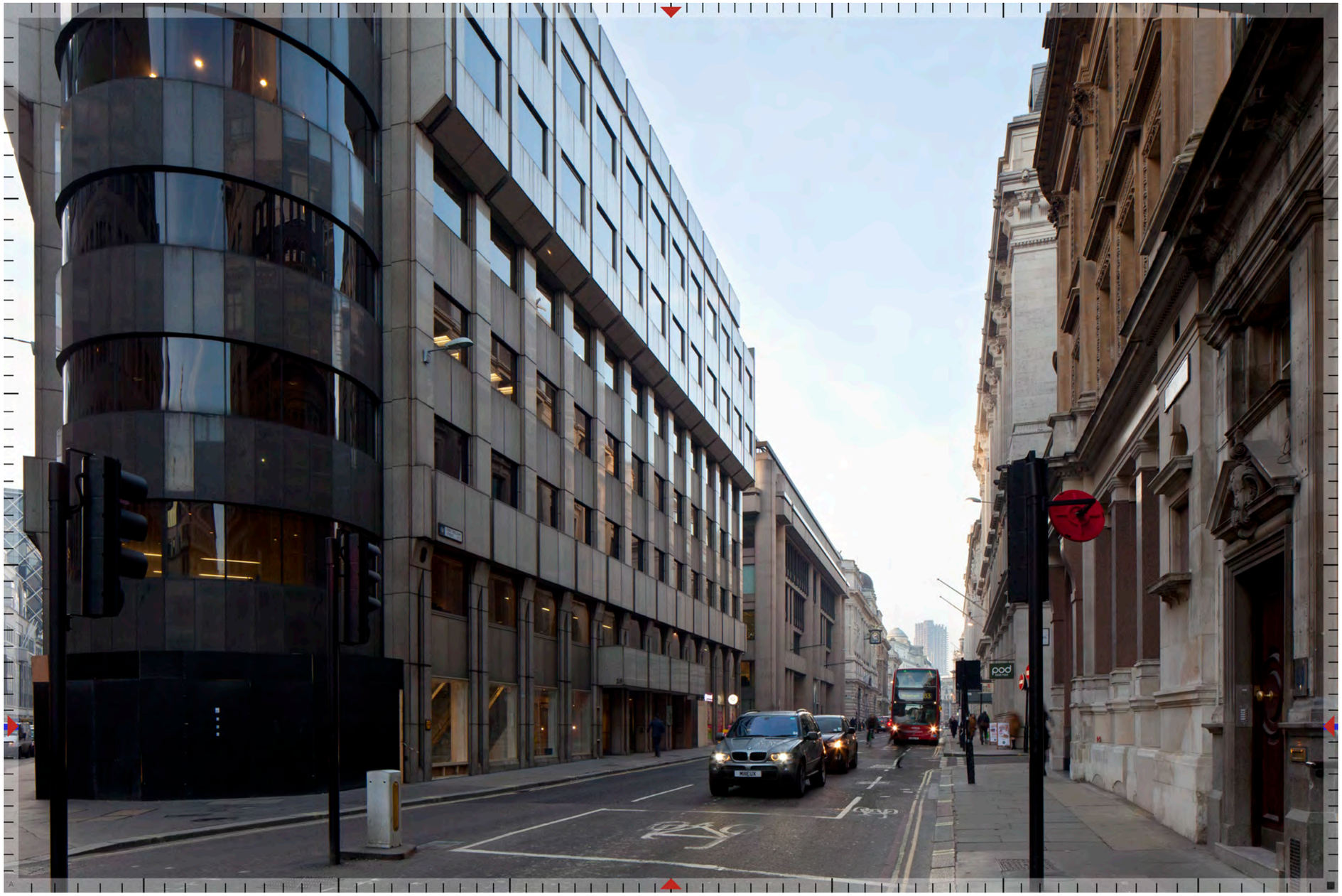
Proposed

3 Looking south-west along the northern section of Nicholas Lane



Proposed

4 Looking north-west along King William Street (from No. 68) at its junction with Cannon Street



Existing

Looking north-west along King William Street (from No. 68) at its junction with Cannon Street 4

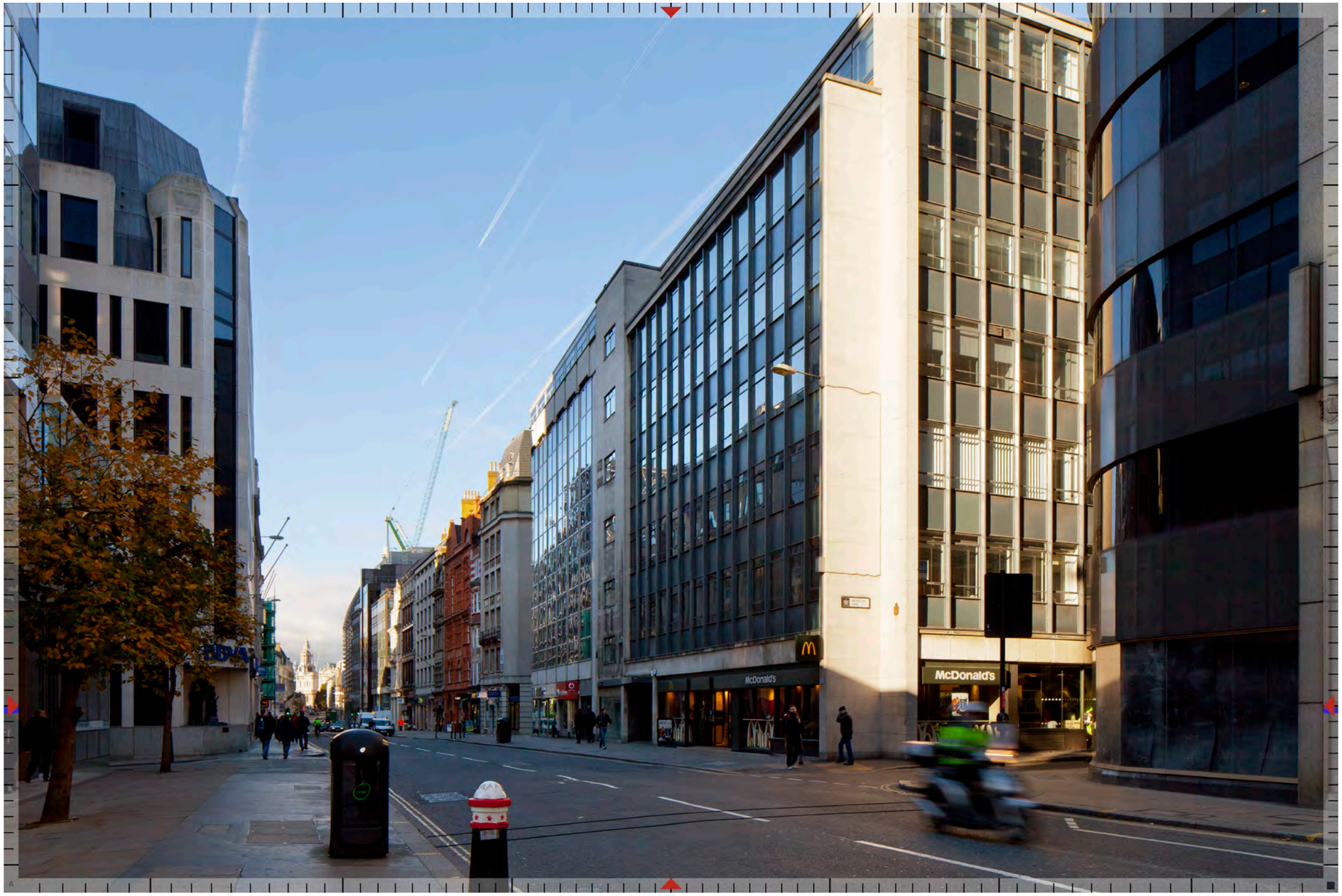
5 Looking north-west from the Monument junction of King William Street, Cannon Street and Gracechurch Street

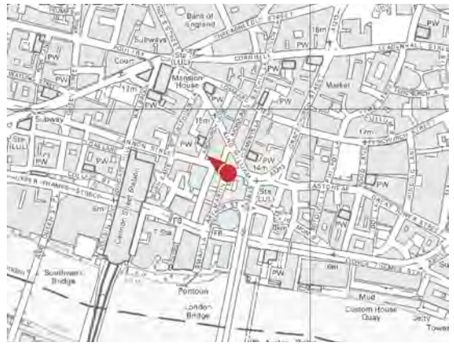
2446_1501

Existing

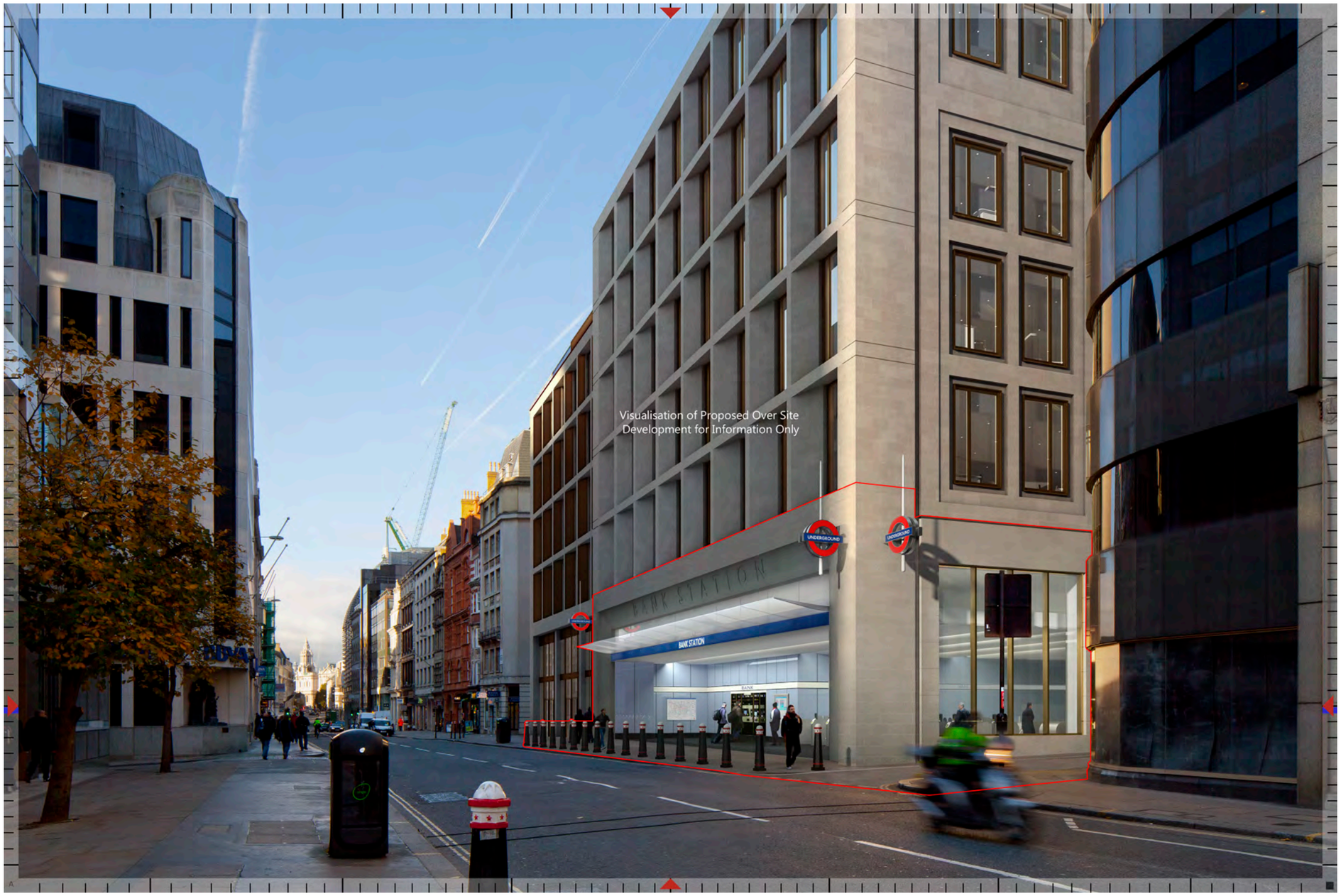
Looking north-west from the Monument junction of King William Street, Cannon Street and Gracechurch Street 5

6 Looking west along Cannon Street from its junction with Martin Lane



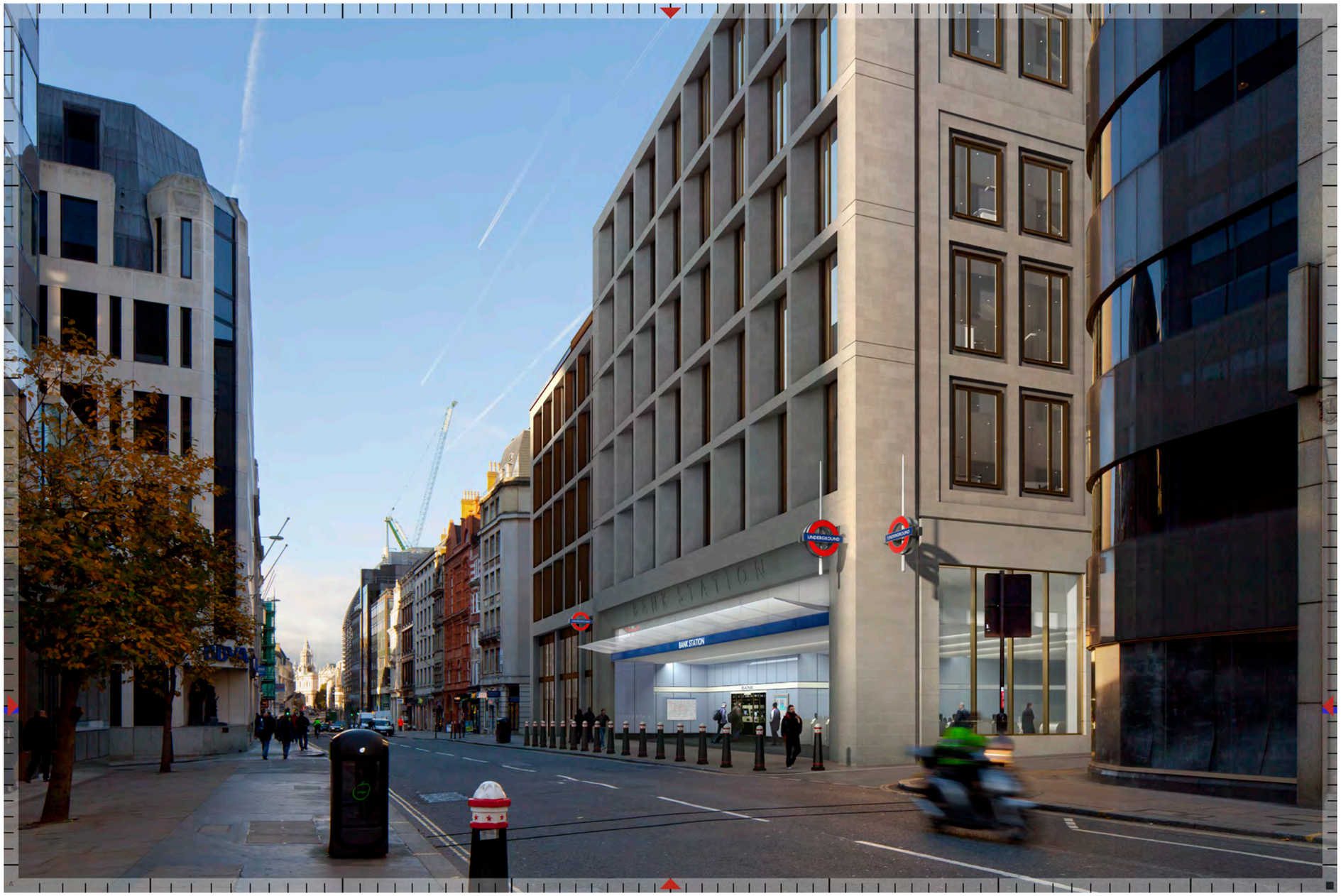


Existing


2446_1607
Visualisation of Proposed Over Site Development for Information Only
BANK STATION
UNDERGROUND

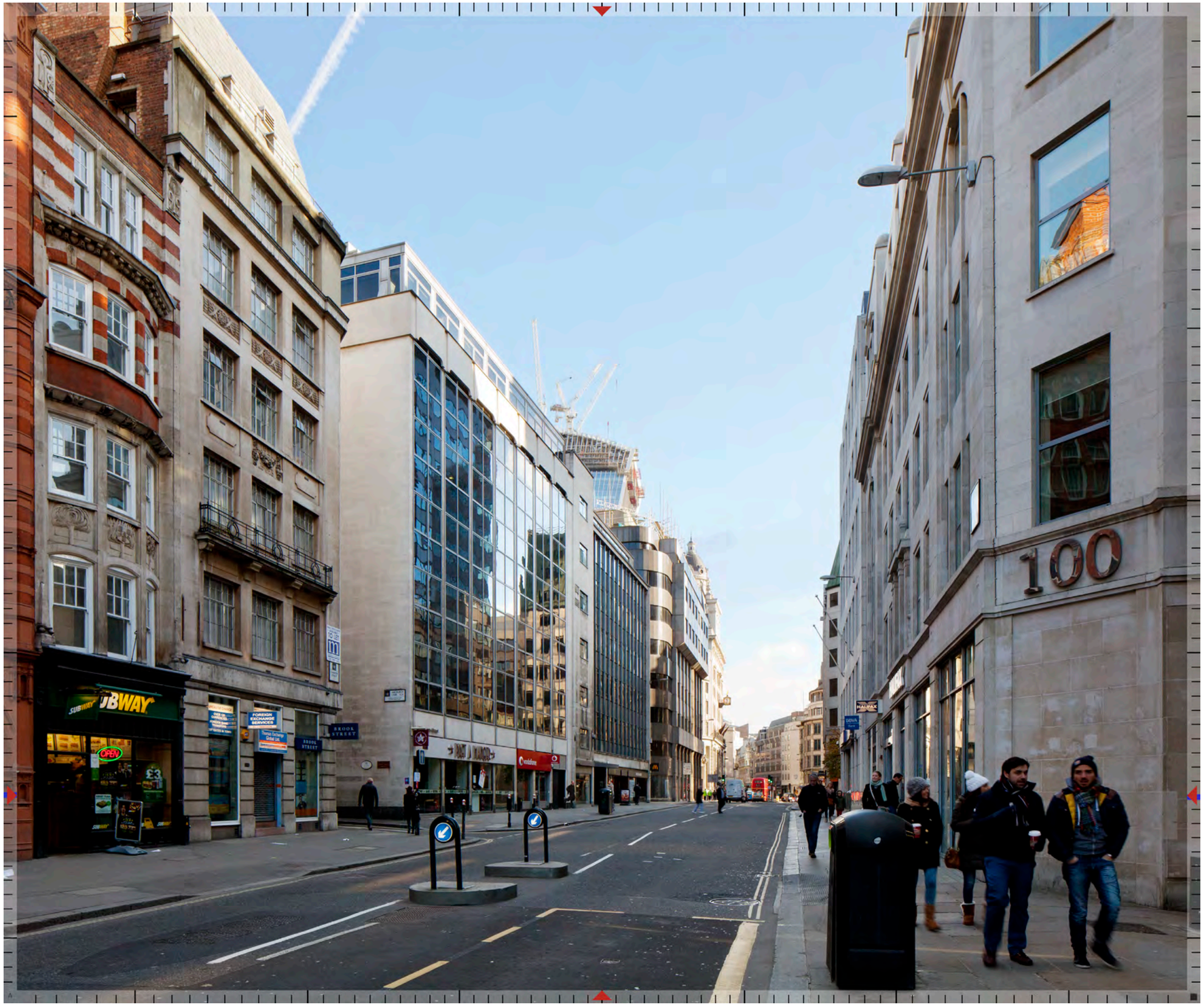
Proposed

6 Looking west along Cannon Street from its junction with Martin Lane

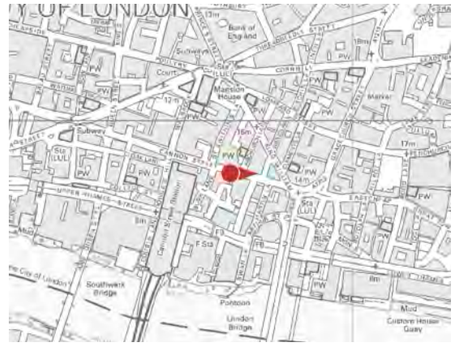


Proposed

7 Looking east along Cannon Street from its junction with Laurence Pountney Hill



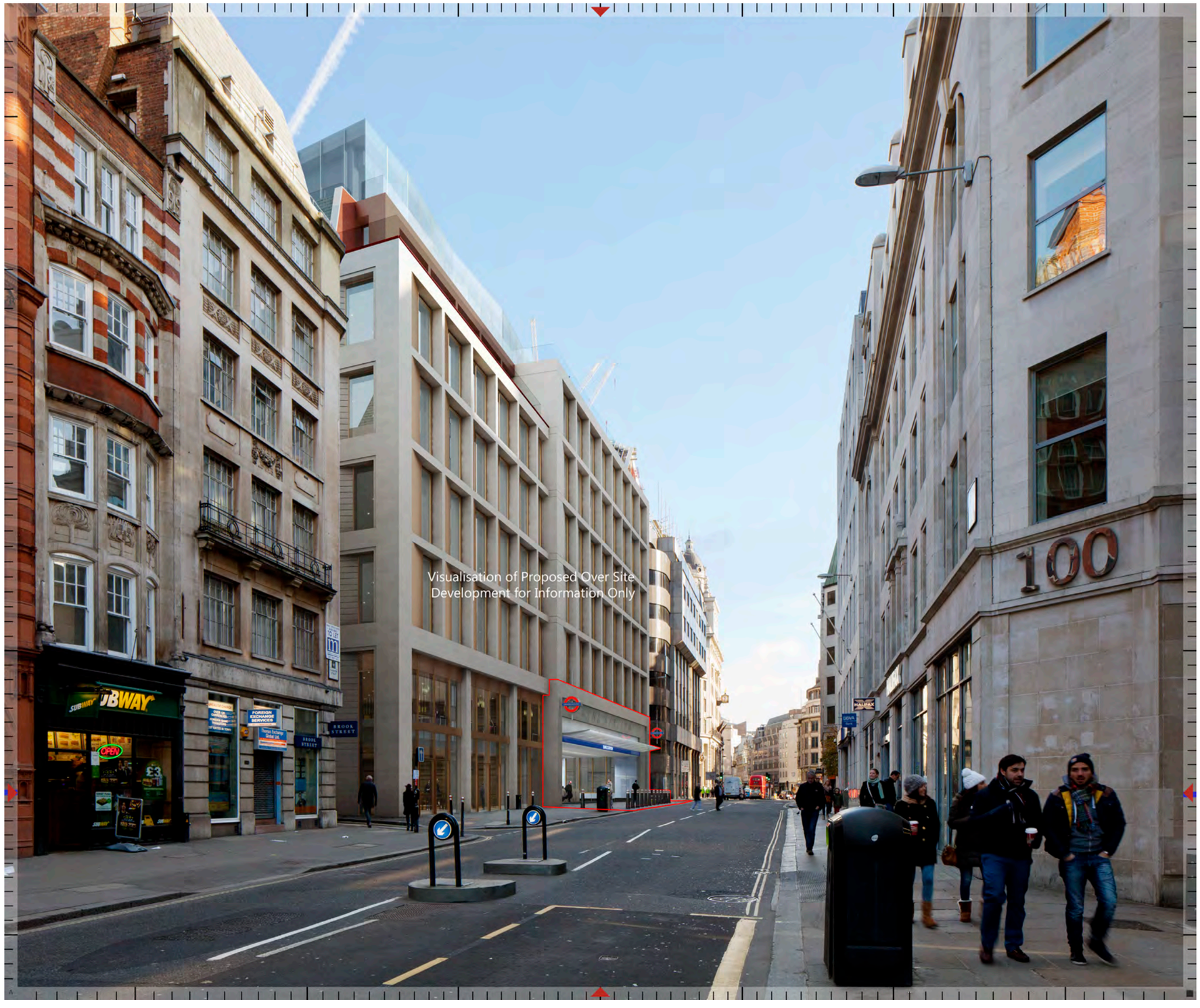
2446_1701



Existing

Looking east along Cannon Street from its junction with Laurence Pountney Hill

7

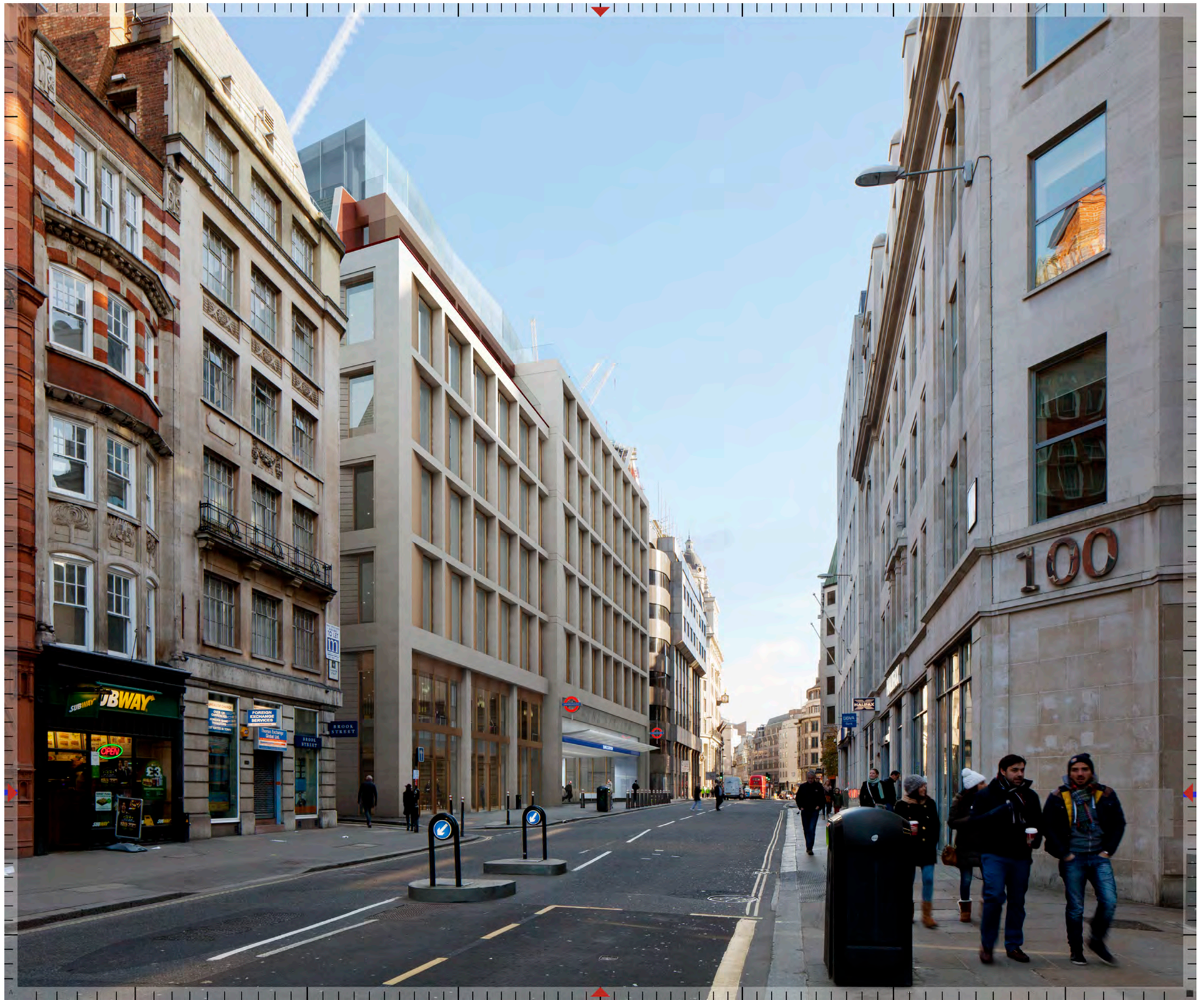


Proposed

7 Looking east along Cannon Street from its junction with Laurence Pountney Hill

Looking east along Cannon Street from its junction with Laurence Pountney Hill

7



Proposed

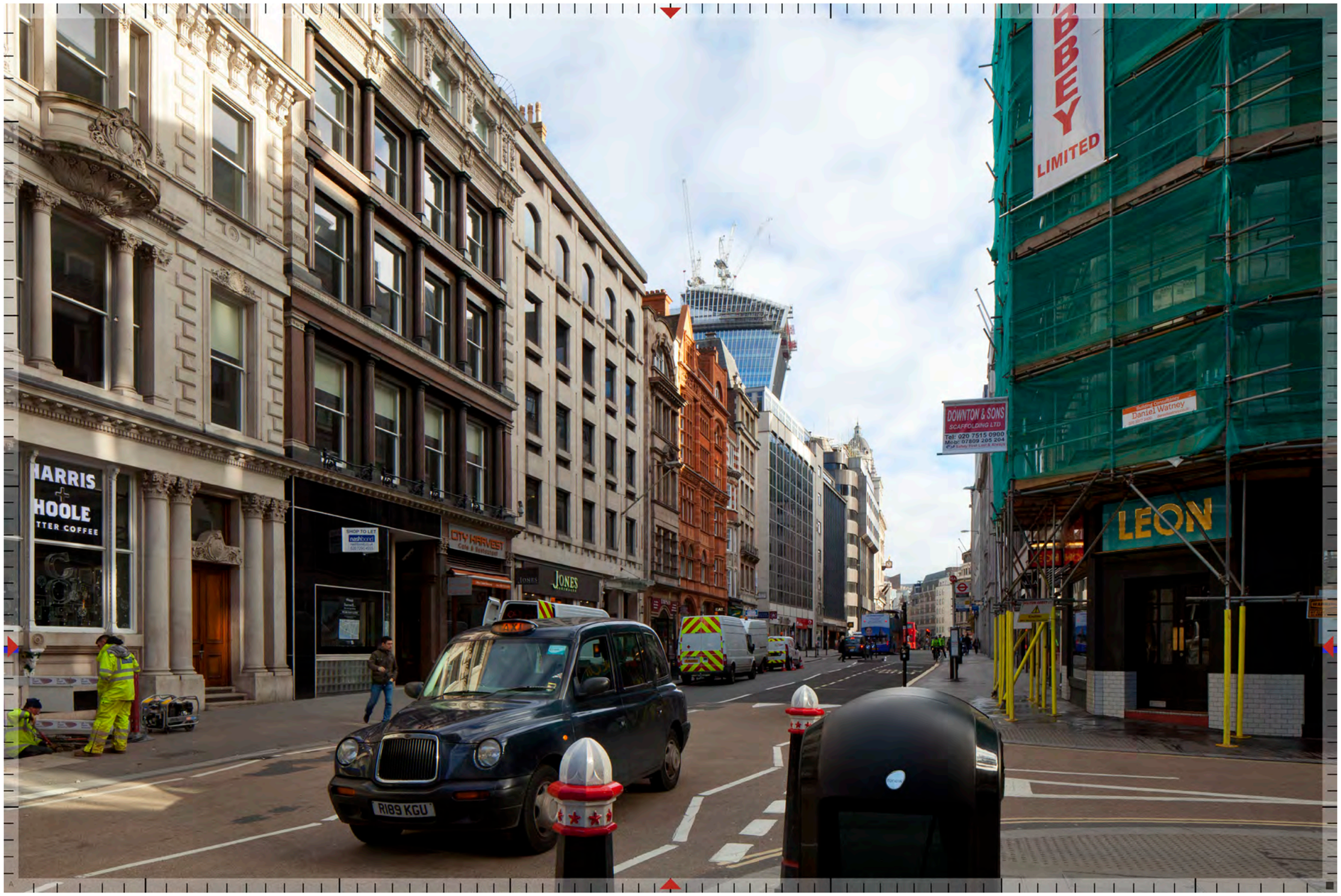
8 Looking out of Abchurch Yard towards the application site

2446_1801

Existing

Looking out of Abchurch Yard towards the application site **8**

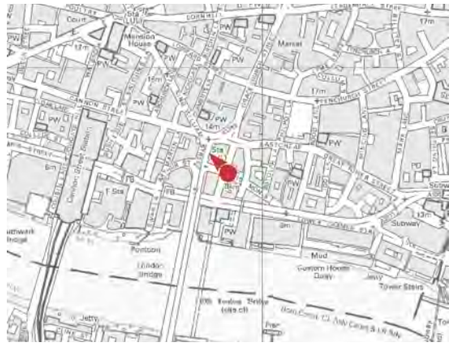
9 Looking east along Cannon Street from its junction with Bush Lane



2446_1901

Existing

Looking east along Cannon Street from its junction with Bush Lane 9

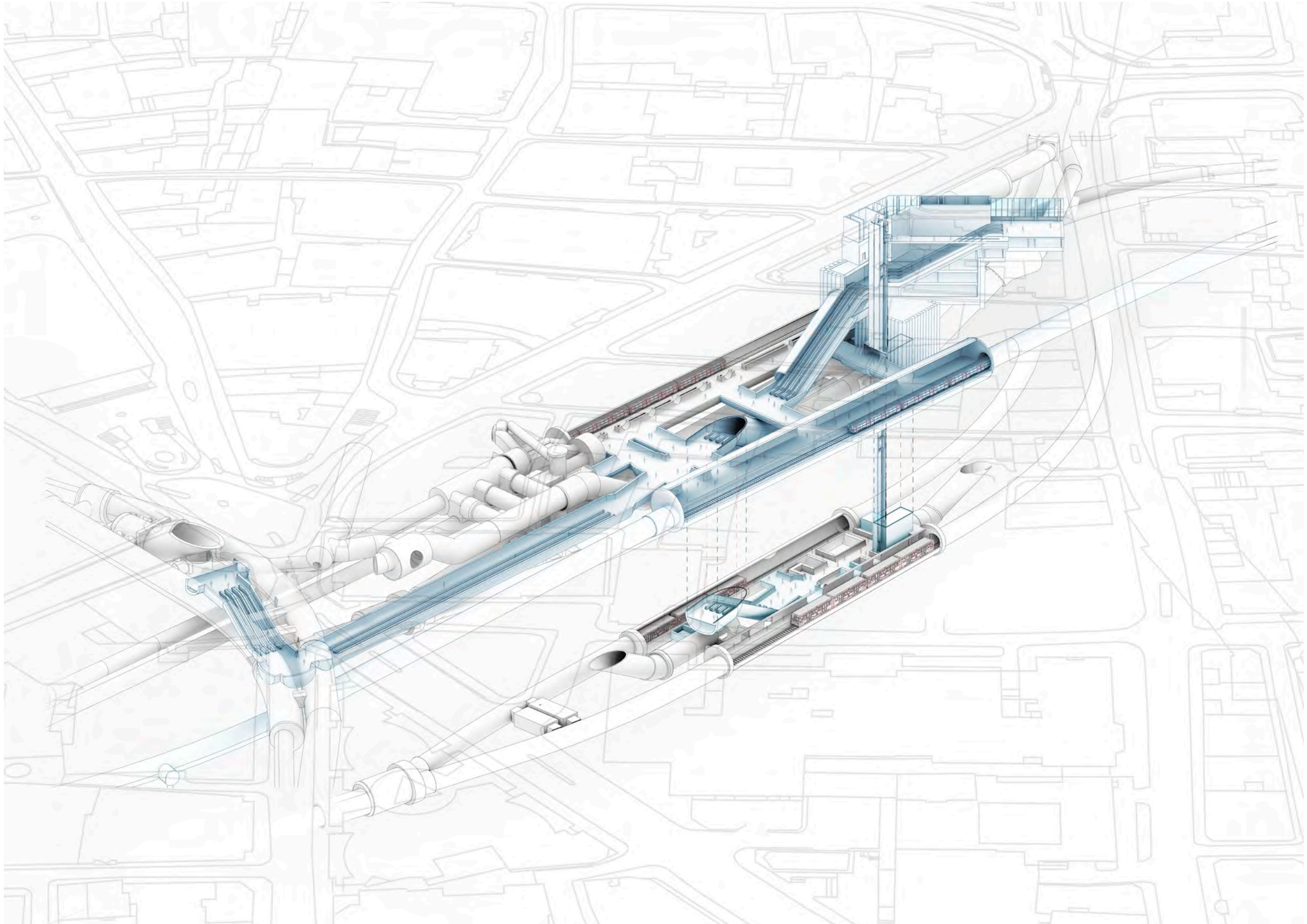


Existing

Looking north-west from the Monument viewing gallery 10

Appendices

A1 Proposed Bank Station Capacity Upgrade Works



Appendices (continued)

A2 Accurate Visual Representations

A2.1 Each of the views in this study has been prepared as an Accurate Visual Representation (AVR) following a consistent methodology and approach to rendering. Appendix C of the London View Management Framework: Supplementary Planning Guidance (March 2012) defines an AVR as:

> *"An AVR is a static or moving image which shows the location of a proposed development as accurately as possible; it may also illustrate the degree to which the development will be visible, its detailed form or the proposed use of materials. An AVR must be prepared following a well-defined and verifiable procedure and can therefore be relied upon by assessors to represent fairly the selected visual properties of a proposed development. AVRs are produced by accurately combining images of the proposed building (typically created from a three-dimensional computer model) with a representation of its context; this usually being a photograph, a video sequence, or an image created from a second computer model built from survey data. AVRs can be presented in a number of different ways, as either still or moving images, in a variety of digital or printed formats."*

A2.2 In this study the baseline condition is provided by carefully taken large format photography. The proposed condition is represented as an accurate photomontage, which combines a computer generated image with the photographic context. In preparing AVRs of this type certain several key attributes need to be determined, including:

- the Field of View
- the representation of the proposed development
- documentation accompanying the AVR

Selection of Field of View

A2.3 The choice of telephoto, standard or wide-angle lens, and consequently the Field of View, is made on the basis of the requirements for assessment which will vary from view to view.

A2.4 In the simple case the lens selection will be that which provides a comfortable Viewing Distance. This would normally entail the use of what most photographers would refer to as a "standard" or "normal" lens, which in practice means the use of a lens with a 35mm equivalent focal length of between about 40 and 58 mm.

A2.5 However in a visual assessment there are three scenarios where constraining the study to this single fixed lens combination would not provide the assessor with the relevant information to properly assess the proposed development in its context.

Field Of View

The term 'Field Of View' (FOV) or more specifically Horizontal Field of View (HFOV), refers to the horizontal angle of view visible in a photograph or printed image and is expressed in degrees. It is often generally referred to as 'angle of view', 'included angle' or 'view cone angle'.

Using this measure it becomes practical to make a comparison between photographs taken using lens of various focal lengths captured on to photographic film or digital camera sensors of various size and proportions. It is also possible to compare computer renderings with photographic images.

Studies of this type use a range of camera equipment; in recent times digital cameras have largely superseded the traditional film formats of 35mm, medium format (6cm x 6cm) and large format (5in x 4in). Comparing digital and film formats may be achieved using either the HFOV or the 35mm equivalent lens calculation, however quoting the lens focal length (in mm) is not as consistently applicable as using the HFOV when comparing AVRs.

		Lens focal length (mm)		
Add	**HFOV degrees**	**Large format**	**High res digital**	**35mm format**
Digital wide angle lens	69.9	–	35	–
Large format wide angle lens	67.6	90	–	–
35mm wide angle lens	65.5	–	–	28
35mm medium wide lens	54.4	–	–	35
Large format telephoto lens	42.9	150	–	–
50mm standard lens	39.6	–	–	50
35mm telephoto lens	16.4	–	–	125
Digital telephoto lens	13.2	–	210	–

The FOV of digital cameras is dependent on the physical dimensions of the CCD used in the camera. These depend on the make and model of the camera. The comparison table uses the specifications for a Phase One P45 digital back which has CCD dimensions of 48.9mm x 36.7mm.

A2.6 Firstly, where the relationship being assessed is distant, the observer would tend naturally to focus closely on it. At this point the observer might be studying as little as 5 to 10 degrees in plan. The printing technology and image resolution of a print limit the amount of detail that can be resolved on paper when compared to the real world, hence in this situation it is appropriate to make use of a telephoto lens.

A2.7 Secondly, where the wider context of the view must be considered and in making the assessment a viewer would naturally make use of peripheral vision in order to understand the whole. A print has a fixed extent which constrains the angle of view available to the viewer and hence it is logical to use a wide angle lens in these situations in order to include additional context in the print.

A2.8 Thirdly where the viewing point is studied at rest and the eye is free to roam over a very wide field of view and the whole setting of the view can be examined by turning the head. In these situations it is appropriate to provide a panorama comprising of a number of photographs placed side by side.

A2.9 For some views two of these scenarios might be appropriate, and hence the study will include two versions of the same view with different fields of view.

Representation of the proposed development and cumulative schemes

Classification of AVRs

A2.10 AVRs are classified according to their purpose using Levels 0 to 4. These are defined in detail in Appendix C of the London View Management Framework: Supplementary Planning Guidance (March 2012). The following table is a summary.

AVR level	showing	purpose
AVR 0	Location and size of proposal	Showing Location and size
AVR 1	Location, size and degree of visibility of proposal	Confirming degree of visibility
AVR 2	As level 1 + description of architectural form	Explaining form
AVR 3	As level 2 + use of materials	Confirming the use of materials

A2.11 In practice the majority of photography based AVRs are either AVR 3 (commonly referred to as "fully rendered" or "photoreal") or AVR 1 (commonly referred to as "wire-line"). Model based AVRs are generally AVR 1.

AVR 3 – Photoreal

Example of AVR 3 – confirming the use of materials (in this case using a 'photo-realistic' rendering technique)

A2.12 The purpose of a Level 3 AVR is to represent the likely appearance of the proposed development under the lighting conditions found in the photograph. All aspects of the images that are able to be objectively defined have been created directly from a single detailed description of the building. These include the geometry of the building and the size and shape of shadows cast by the sun.

A2.13 Beyond this it is necessary to move into a somewhat more subjective arena where the judgement of the delineator must be used in order to define the final appearance of the building under the specific conditions captured by the photographic and subsequent printing processes. In this area the delineator is primarily guided by the appearance of similar types of buildings at similar distances in the selected photograph. In large scope studies photography is necessarily executed over a long period of time and sometimes at short notice. This will produce a range of lighting conditions and photographic exposures. The treatment of lighting and materials within these images will respond according to those in the photograph.

AVR 1 – Outline

Example of AVR 1 confirming degree of visibility (in this case as an occluded 'wire-line' image)

A2.14 The purpose of a wire-line view is to accurately indicate the location and degree of visibility of the proposed development in the context of the existing condition and potentially in the context of other proposed schemes.

A2.15 In AVR1 representation each scheme is represented by a single line profile, sometimes with key edges lines to help understand the massing. The width of the profile line is selected to ensure that the diagram is clear, and is always drawn inside the true profile. The colour of the line is selected to contrast with the background. Different coloured lines may be used in order to distinguish between proposed and consented status, or between different schemes.

A2.16 Where more than one scheme is represented in outline form the outlines will obscure each other as if the schemes where opaque. Trees or other foliage will not obscure the outline of schemes behind them. This is because the transparency of trees varies with the seasons, and the practical difficulties of representing a solid line behind a filigree of branches. Elements of a temporary nature (e.g. cars, tower cranes, people) will similarly not obscure the outlines.

Framing the view

A2.17 Typically AVRs are composed with the camera looking horizontally i.e. with a horizontal Optical Axis. This is in order to avoid converging verticals which, although perspectively correct, appear to many viewers as unnatural in print form. The camera is levelled using mechanical levelling devices to ensure the verticality of the Picture Plane, being the plane on to which the image is projected; the film in the case of large format photography or the CCD in the case of digital photography.

A2.18 For a typical townscape view, a Landscape camera format is usually the most appropriate, giving the maximum horizontal angle of view. Vertical rise may be used in order to reduce the proportion of immediate foreground visible in the photograph. Horizontal shift will not be used. Where the prospect is framed by existing buildings, portrait format photographs may be used if this will result in the proposal being wholly visible in the AVR, and will not entirely exclude any relevant existing buildings.

A2.19 Where the proposed development would extend off the top of the photograph, the image may be extended vertically to ensure that the full height of the proposed development is show. Typically images will be extended only where this can be achieved by the addition of sky and no built structures are amended. Where it is necessary to extend built elements of the view, the method used to check the accuracy of this will be noted in the text.

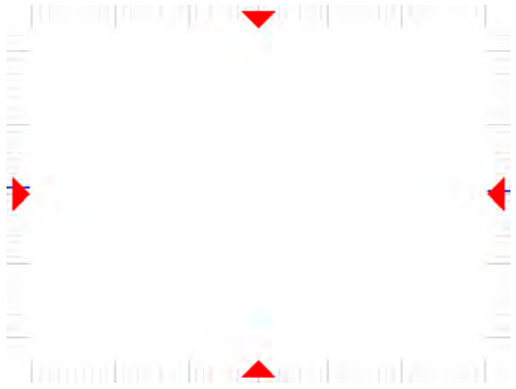
Documenting the AVR

Border annotation

A2.20 A Millerhare AVR image has an annotated border or 'graticule' which indicates the field of view, the optical axis and the horizon line. This annotation helps the user to understand the characteristics of the lens used for the source photograph, whether the photographer applied tilt, vertical rise or horizontal shift during the taking of the shot and if the final image has been cropped on one or more sides.

A2.21 The four red arrows mark the horizontal and vertical location of the 'optical axis'. The optical axis is a line passing through the eye point normal to the projection plane. In photography this line passes through the centre of the lens, assuming that the film plane has not been tilted relative to the lens mount. In computer rendering it is the viewing vector, i.e the line from the eye point to the target point.

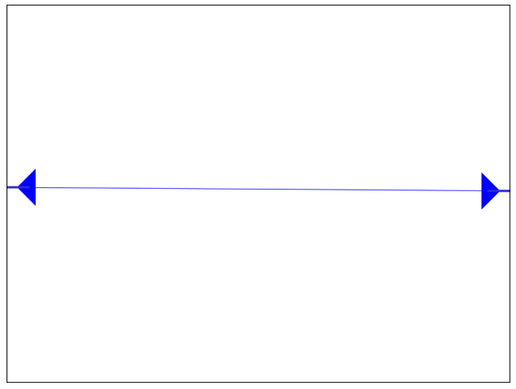
A2.22 If the point indicated by these marks lies above or below the centre of the image, this indicates either that vertical rise was used when taking the photograph or that the image has subsequently been cropped from the top or bottom edge. If it lies to the left or right of the centre of the image then cropping has been applied to one side or the other, or more unusually that horizontal shift was applied to the photograph.



Sample graticule showing optical axis markers

A2.23 The vertical and horizontal field of view of the final image is declared using a graticule consisting of thick lines at ten degree increments and intermediate lines every degree, measured away from the optical axis. Using this graticule it is possible to read off the resultant horizontal and vertical field of view, and thereby to compare the image with others taken using specific lens and camera combinations. Alternatively it can be used to apply precise crops during subsequent analysis.

A2.24 The blue marks on the left and right indicate the calculated location of the horizon line i.e. a plane running horizontally from the location of the camera. Where this line is above or below the optical axis, this indicates that the camera has been tilted; where it is not parallel with the horizontal marking of the optical axis, this indicates that the camera was not exactly horizontal, i.e. that "roll" is present. Note that a small amount of tilt and roll is nearly always present in a photograph, due to the practical limitations of the levelling devices used to align the camera in the field.



Sample graticule showing horizon line markers

Comparing AVRs with different FOVs

A2.25 A key benefit of the index markings is that it becomes practical to crop out a rectangle in order to simulate the effect of an image with a narrower field of view. In order to understand the effect of using a longer lens it is simply necessary to cover up portions of the images using the graticule as a guide.

A3 Methodology for the production of Accurate Visual Representations

Overview of Methodology

A3.1 The study was carried out by Millerhare (the Visualiser) by combining computer generated images of the proposed development with large format photographs at key strategic locations around the site as agreed with the project team. Surveying was executed by Marshall Survey Associates (the Surveyor).

A3.2 The methodology employed by Millerhare is compliant with Appendix C of the London View Management Framework: Supplementary Planning Guidance (March 2012).

A3.3 The project team defined a series of locations in London where the proposed buildings might have a significant visual effect. At each of these locations Millerhare carried out a preliminary study to identify specific Assessment Points from which a representative and informative view could be taken. Once the exact location had been agreed by the project team, a photograph was taken which formed the basis of the study. The precise location of the camera was established by the Surveyor using a combination of differential GPS techniques and conventional observations.

A3.4 For views where a photographic context was to be used additional surveying was carried out. A number of features on existing structures visible from the camera location were surveyed. Using these points, Millerhare has determined the appropriate parameters to permit a view of the computer model to be generated which exactly overlays the appropriate photograph. Each photograph has then been divided into foreground and background elements to determine which parts of the current context should be shown in front of the proposed development and which behind. When combined with the computer-generated image these give an accurate impression of the impact of the proposed development on the selected view in terms of scale, location and use of materials (AVR Level 3).

Spatial framework and reference database

A3.5 All data was assembled into a consistent spatial framework, expressed in a grid coordinate system with a local plan origin. The vertical datum of this framework is equivalent to Ordnance Survey (OS) Newlyn Datum.

A3.6 By using a transformation between this framework and the OSGB36 (National Grid) reference framework, Millerhare have been able to use other data sets (such as OS land line maps and ortho-corrected aerial photography) to test and document the resulting photomontages.

A3.7 In addition, surveyed observation points and line work from Millerhare's London Model database are used in conjunction with new data in order to ensure consistency and reliability.

Process – photographic context

Reconnaissance

A3.8 At each Study Location the Visualiser conducted a photographic reconnaissance to identify potential Assessment Points. From each candidate position, a digital photograph was taken looking in the direction of the proposed development using a wide angle lens. Its position was noted with field observations onto an OS map and recorded by a second digital photograph looking at a marker placed at the Assessment Point.

A3.9 The Visualiser assigned a unique reference to each Assessment Point and Photograph.

Final Photography

A3.10 From each selected Assessment Point a series of large format photographs were taken with a camera height of approximately 1.6m. The camera, lens, format and direction of view are determined in accordance with the policies set out above

A3.11 The centre point of the tripod was marked and a digital photograph showing the camera and tripod in situ was taken to allow the Surveyor to return to its location. Measurements and field notes were also taken to record the camera location, lens used, target point and time of day.

Surveying the Assessment Points

A3.12 For each selected Assessment Point a survey brief was prepared, consisting of the Assessment Point study sheet and a marked up photograph indicating alignment points to be surveyed. Care was taken to ensure that a good spread of alignment points was selected, including points close to the camera and close to the target.

A3.13 Using differential GPS techniques the Surveyor established the location of at least two intervisible stations in the vicinity of the camera location. A photograph of the GPS antenna in situ was taken as confirmation of the position.

A3.14 From these the local survey stations, the requested alignment points were surveyed using conventional observation.

A3.15 The resulting survey points were amalgamated into a single data set by the Surveyor. This data set was supplied as a spreadsheet with a set of coordinates transformed and re-projected into OSGB36 (National Grid) coordinates, and with additional interpreted lines to improve the clarity of the surveyed data.

A3.16 From the point set, the Visualiser created a three dimensional alignment model in the visualisation system by placing inverted cones at each surveyed point.

Photo preparation

A3.17 From the set of photographs taken from each Assessment Point, one single photograph was selected for use in the study. This choice was made on the combination of sharpness, exposure and appropriate lighting.

A3.18 The selected photograph was copied into a template image file of predetermined dimensions. The resulting image was then examined and any artefacts related to the digital image capture process were rectified.

A3.19 Where vertical rise has been used the image is analysed and compensation is applied to ensure that the centre of the image corresponds to the location of the camera's optical axis.

Calculating the photographic alignment

A3.20 A preliminary view definition was created within the visualisation system using the surveyed camera location, recorded target point and FOV based on the camera and lens combination selected for the shot

A3.21 A lower resolution version of the annotated photograph was attached as a background to this view, to assist the operator to interpret on-screen displays of the alignment model and other relevant datasets.

A3.22 Using this preliminary view definition, a rendering was created of the alignment model at a resolution to match the scanned photograph. This was overlaid onto the background image to compare the image created by the actual camera and its computer equivalent. Based on the results of this process adjustments were made to the camera definition. When using a wide angle lens observations outside the circle of distortion are given less weighting.

A3.23 This process was iterated until a match had been achieved between the photograph and alignment model. At this stage, a second member of staff verified the judgements made. An A3 print was made of the resulting photograph overlaid with the alignment model as a record of the match. This was annotated to show the extents of the final views to be used in the study.

Example of alignment model overlaid on the photograph

Preparing models of the proposed development

A3.24 A CAD model of the proposed development was supplied by the Architect. The level of detail applied to the model is appropriate to the AVR type of the final images.

A3.25 Models of the proposed development and other schemes are located within the spatial framework using reference information supplied by the Architect or, when not available, by best fit to other data from the spatial framework reference database . Study renders of the model are supplied back to the Architect for confirmation of the form and the overall height of the proposed development. The method used to locate each model is recorded. Each distinct model is assigned a unique reference code by the Visualiser.

Determining occlusion and creating simple renderings

A3.26 A further rendering was created using the aligned camera, which combined the proposed development with a computer-generated context. This was used to assist the operator to determine which parts of the source image should appear in front of the proposed development and which behind it. Using this image and additional site photography for information, the source file is divided into layers representing foreground and background elements.

A3.27 In cases where the proposed development is to be represented in silhouette or massing form (AVR1 or AVR2), final renderings of an accurate massing model were generated and inserted into the background image file between the foreground and background layers.

A3.28 Final graphical treatments were applied to the resulting image as agreed with the Architect and environmental and planning consultants. These included the application of coloured outlines to clarify the reading of the images or the addition of tones to indicate occluded areas.

Creating more sophisticated renderings

A3.29 Where more sophisticated representations of the proposed developments were required (AVR3) the initial model is developed to show the building envelope in greater detail. In addition, definitions were applied to the model to illustrate transparency, indicative material properties and inter-reflection with the surrounding buildings.

A3.30 For each final view, lighting was set in the visualisation system to match the theoretical sunlight conditions at the time the source photograph was taken, and additional model lighting placed as required to best approximate the recorded lighting conditions and the representation of its proposed materials.

A3.31 By creating high resolution renderings of the detailed model, using the calculated camera specification and approximated lighting scenario, the operator prepared an image of the building that was indicative of its likely appearance when viewed under the conditions of the study photograph. This rendering was combined with the background and foreground components of the source image to create the final study images.

A3.32 A single CAD model of the proposed development has been used for all views, in which the architectural detail is therefore

consistently shown. Similarly a single palette of materials has been applied. In each case the sun angles used for each view are transferred directly from the photography records.

A3.33 Material definitions have been applied to the models assembled as described. The definitions of these materials have been informed by technical notes on the planning drawings and other available visual material, primarily renderings created by others. These resulting models have then been rendered using the lighting conditions of the photographs.

Documenting the study

A3.34 For each Assessment Point a CAD location plan was prepared, onto which a symbol was placed using the coordinates of the camera supplied by the Surveyor. Two images of this symbol were created cross-referencing background mapping supplied by Ordnance Survey.

A3.35 The final report on the Study Location was created which shows side by side, the existing and proposed prospect. These were supplemented by images of the location map, a record of the camera location and descriptive text. The AVR level is described.

A3.36 Peripheral annotation was added to the image to clearly indicate the final FOV used in the image, any tilt or rise, and whether any cropping has been applied.

A3.37 Any exceptions to the applied policies or deviations from the methodology were clearly described.

millerhare