Project Otter
Cambridge
June 2023

AVR_14_Winter

CUMULATIVE

Project Otter
Cambridge
June 2023

AVR_14_Winter

Project Otter
Cambridge
June 2023

AVR_14B

AVR LONDON

PROPOSED MAX PARAMETER

Project Otter
Cambridge
June 2023

AVR_14B

PROPOSED MAX PARAMETER + CUMULATIVE

Project Otter
Cambridge
June 2023

© AVR LONDON 1.6 m above ground 08:50 27 March 2023

AVR_14B

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PROPOSED

Project Otter
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AVR_14B

AVR LONDON

Project: Project Otter
Date: May 2023

AVR London were commissioned to produce a number of verified views of the proposals for Project Otter, AVR positions were identified by the planning consultant.

2D plans, Ordnance Survey Mapping, local survey data, and the 3D model for the proposed development were provided by the architect.

Photography

Equipment
Canon 5DSR
Canon TS-E 24mm f/3.5L II
Canon 50mm f/1.4

1.1 All photography is undertaken by AVR London's in-house professional photographers.

1.2 In professional architectural photography, having the camera level with the horizon is desirable in order to prevent three point perspective being introduced to the image and to ensure the verticals within the photographed scene remain parallel. This is standard practice and more realistically reflects the viewing experience.

1.3 The lens used by the photographer has the ability, where necessary, to shift up or down while remaining parallel to the sensor, allowing for the horizon in the image to be above, below or central within the image whilst maintaining two point perspective. This allows the photographer to capture the top of a taller proposed development which would usually be cropped, without introducing three point perspective.

When the shift capability of the lens is not used the image FOV and dimensions are the same as a prime lens of equal focal length.

1.4 Once the view positions are confirmed by the townscape consultant, AVR London takes professional photography from each location. At each location the camera is set up over a defined ground point using a plumb line to ensure the position can be identified later.

1.5 The centre of the camera lens is positioned at a height of 1.60 metres above the ground to simulate average viewing height. For standard verified photography, each view is taken with a lens that gives a 68 degree field of view, approximately, a standard which has emerged for verified architectural photography. The nature of digital photography means that a record of the time and date of each photograph is embedded within the photo file; this metadata allows accurate lighting timings to be recreated within the computer model.

1.6 Once the image is taken, the photographer records the tripod location by photographing it in position to ensure the position can be accurately located for surveying (Fig 02).

1.7 Each image is processed by the photographer to ensure it visually matches the conditions on site when the photograph is taken.

Regarding 24mm focal length in an urban environment

1.8 *The Landscape Institute Technical Guidance Note [2]* states:

1.5.5 When regulatory authorities specify their own photographic and photomontage requirements, the landscape professional should follow them unless there is a good reason not to do so.

1.9 *The London View Management Framework: Supplementary Planning Guidance (2012) Appendix C: Accurate Visual Representation [1]* sets out a well-defined and verifiable procedure for preparing Accurate Visual Representations as part of the assessment of the visual impacts of proposed developments. As the LVMF aims to protect the most significant views in London, the guidance set out in Appendix C is considered best practice within the industry in an urban setting.

	EASTING	NORTHING	HEIGHT
AVR8	546446.139	257756.322	20.687
801	546418.800	257864.729	36.478
802	546438.808	257855.653	36.484
803	546451.726	257887.946	33.504
804	546480.933	257959.877	28.853
805	546480.936	257857.895	23.806
806	546561.332	258143.515	26.776
807	546653.864	258196.788	35.546
808	546435.852	257819.278	17.211
809	546441.537	257783.130	16.754
810	546450.817	257806.652	15.629
811	546487.747	257946.941	16.801
812	546498.491	257884.274	18.412
813	546472.957	257783.586	22.419
814	546473.322	257782.589	20.547

Table 1: Example surveying data

Fig 01: 24mm photograph with 50mm photograph overlaid

The LVMF guidance indicates that creators of AVRs should use the appropriate lens for each study, which could include wide angle lenses (wider than 50mm) or telephoto lenses (more zoomed than 50mm), where necessary.

Over time the 24mm lens has become the industry standard in urban visualisation due to its ability to capture context with limited distortion.

1.10 When we observe a scene, we can focus on 6-10 degrees. However, without moving our head, the scene beyond is observed using our peripheral vision. Once we move our eyes we can observe almost 180 degrees without moving our head. In reality we do not view the world through one fixed position, we move our eyes around a scene and observe, height, width and depth.

1.11 This is acknowledged by the *Landscape Institute's Technical Guidance Note [2].* The appreciation of the wider context seen through peripheral vision or by moving our eyes (changing the focal point) is key to our experience of a scene.


Fig 02: Tripod location as documented by photographer

While photography cannot replicate the human experience entirely, it is widely acknowledged that the use of a 24mm lens in an urban environment provides the viewer with a more realistic experience than a 50mm lens. For these reasons the 24mm lens is industry standard in the creation of urban photo montages. It should also be noted that using a consistent focal length is favourable so as not to confuse the viewer's sense of scale.

50mm Lens/Crop

1.12 It should also be stressed that if you were to centrally crop into an image taken with a 24mm lens to the same HFOV (Horizontal Field Of View) as a 50mm lens, the resulting image is identical to that produced by taking it directly with a 50mm lens. An image with a 70 degree HFOV (24mm lens) is geometrically and perspectively identical to an image showing a HFOV of 40 degrees (50mm

Fig 03: Survey points as highlighted by surveyor

lens), the 24mm lens purely gives more context to all sides *(Fig 01)*. Further, all of our images allow this 50mm equivalent HFOV to be seen, read and understood on the image itself.

The benefit of using images taken with a 24mm lens is that the observer and in particular an experienced inspector, is able to analyse the image with the benefit of both fields of view.

Survey

Equipment

- Leica Total Station Electronic Theodolite which has 1" angle measuring accuracy and 2mm + 2ppm distance accuracy.
- Leica Smart Rover RTK Global Positioning System.
- Wild/Leica NAK2 automatic level which a standard deviation of +/- 0.7mm/km

2.1 The photographer briefs the surveyor, sending across the prepared photographs, ground positions and appropriate data.

2.2 The surveyor establishes a line of sight, two station baseline, coordinated and levelled by real time kinetic GPS observations, usually with one of the stations being the camera location. The eastings and northings are aligned to the Ordnance Survey National Grid (OSGB36) and elevation to Ordnance Survey Datum (OSD) using the OSTN15 GPS transformation program.

2.3 Once the baseline is established, a bearing is determined and a series of clearly identifiable static points across the photograph are observed using the total station. These observations are taken throughout the depth of field of the photograph and at differing heights within the image.

2.4 The survey control stations are extracted from the OS base mapping and wherever possible, linked together to form a survey network. This means that survey information is accurate to tolerances quoted by GPS survey methods in plan and commensurate with this in level.

2.5 Horizontal and vertical angle observations from the control stations allow the previously identified points within the view to be surveyed using line of sight surveying and the accurate coordination of these points determined using an intersection program. These points are then related back to the Ordnance Survey grid and provided in a spreadsheet format showing point number, easting, northing and level of each point surveyed, together with a reference file showing each marked up image (Fig 03 and Table 1).

2.6 The required horizon line within the image is established using the horizontal collimation of the theodolite (set to approximately above the ground) to identify 3 or 4 features that fall along the horizon line. The theodolite more generally is used for measuring angles and distances.

2.7 Using the surveyed horizon points as a guide, each photograph is checked and rotated, if necessary, in proprietary digital image manipulation software to ensure that the horizon line on the photograph is level and consistent with the information received from the surveyor.

Fig 04: Example AVR London graticule

Accurate Visual Representation Production

Process

3.1 The 3D computer model is precisely aligned to a site plan on the OS coordinate grid system.

3.2 Within the 3D software a virtual camera is set up using the coordinates provided by the surveyor along with the previously identified points within the scene. The virtual camera is verified by matching the contextual surveyed points with matching points within the overlaid photograph. As the surveyed data points, virtual camera and 3D model all relate to the same 3-dimensional coordinate system, there is only one position, viewing direction and field of view where all these points coincide with the actual photograph from site. The virtual camera is now verified against the site photograph.

3.3 For fully-rendered views a lighting simulation (using accurate latitude, longitude and time) is established within the proprietary 3D modelling software matching that of the actual site photograph. Along with the virtual sunlight, virtual materials are applied to the 3D model to match those advised by the architects. The proprietary 3D modelling software then uses the verified virtual camera, 3D digital model, lighting and material setup to produce a computer generated render of the proposed building.

3.4 The proposal is masked where it is obscured behind built form or street furniture.

3.5 Using the surveyed information and verification process described above, the scale and position of a proposal within a scene can be objectively calculated. However, using the proprietary software currently available the exact response of proposed materials to their environment is subjective so the exact portrayal of a proposal is a collaboration between illustrator and architect. The final computer generated image of the proposed building is achieved by combining the computer-generated render and the site photography within proprietary digital compositing software.

Presentation

Graticule

4.1 Each Accurate Visual Representation is framed by a graticule which provides further information including time and date of photography, horizon markers and field of view of the lens (Fig 04).

4.2 The Field of View is represented along the top of the image in the form of markers with degrees written at the correct intervals.

4.3 The horizon markers indicate where the horizontal plane of view from the camera lies. (section 2 above explains how the surveyor establishes these horizon points).

4.4 The date and time stamp documents exactly when the photograph was taken. This data is recorded in every digital camera file, known as EXIF data.

References:
[1] GLA - London View Management Framework: Supplementary Planning Guidance (2012) Appendix C: Accurate Visual Representations
[2] Landscape Institute - Visual Representation of Development Proposals - Technical Guidance Note (September 2019)
[3] Landscape Institute - Guidelines for Landscape and Visual Impact Assessment: 3rd edition (April 2013)

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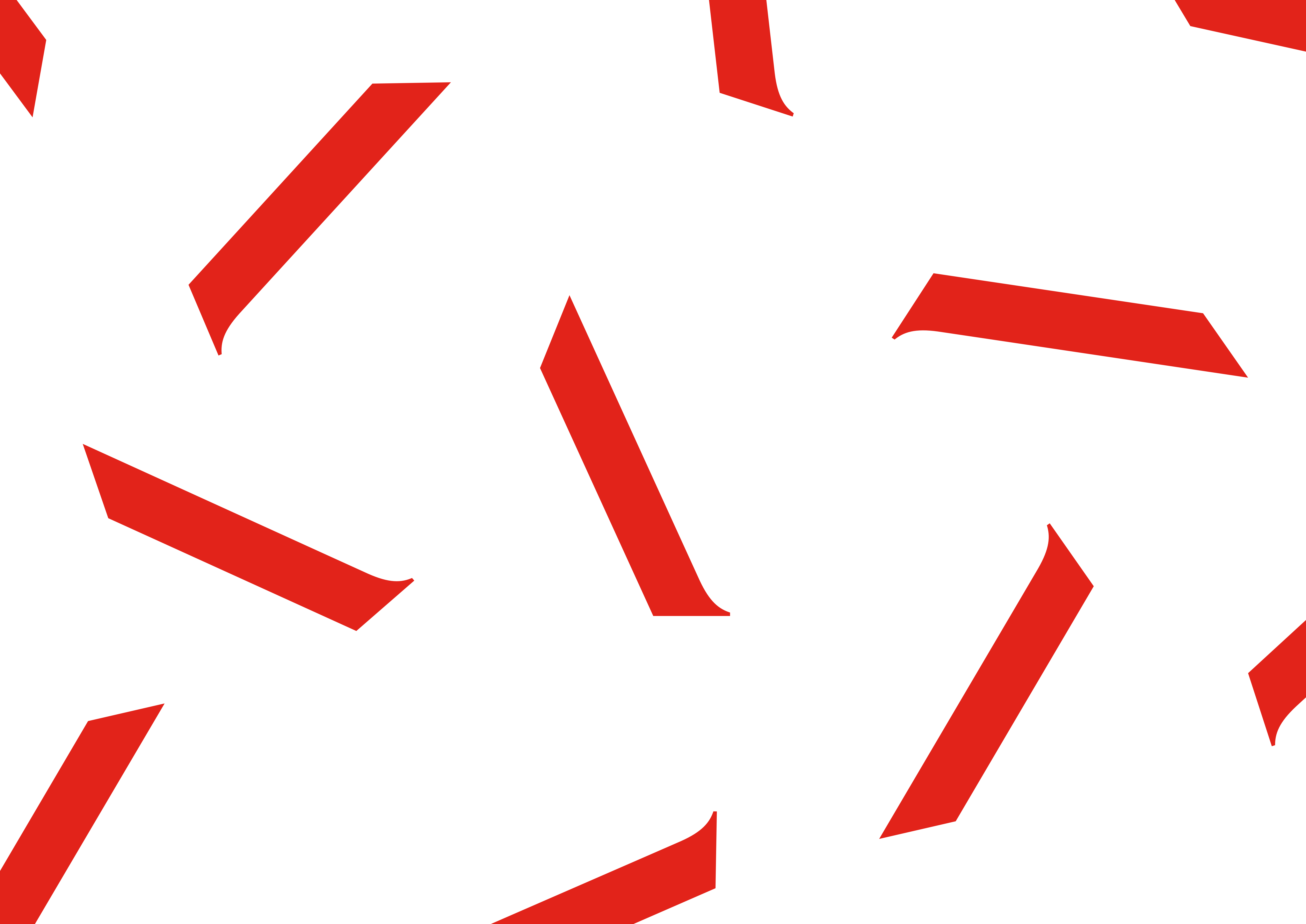

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