05

Verified Views

NPA Visuals

Nicholas Pearson Associates

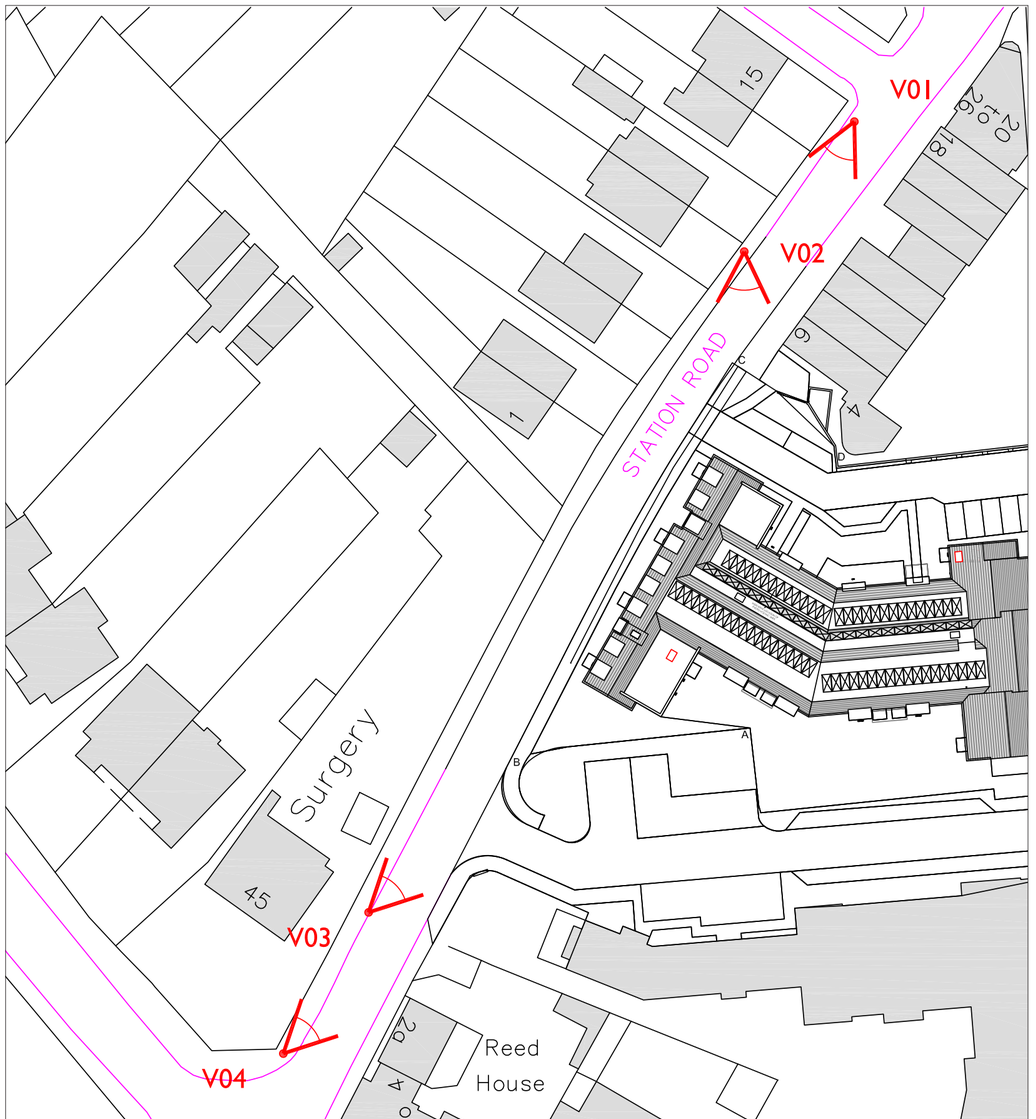
Proposed Retirement Housing, Station Road Great Shelford

Visually Verified Montages

March 2022 | 11208-007-NPA-XX-XX-RP-Y-4601 |

List of Figures

Viewpoint Location Plan



Viewpoint Information

View 1 - Station Road / Shelford Park Avenue Junction Looking South OS: 546490, 252171

Date of Photo:	25/11/2021, 13:27
Weather:	Sunny
Visualisation Type:	Type 4
AVR Level:	3
Bearing of View:	206° SW
Camera:	Canon EOS 5D MK III
Frame Type:	Composite
Projection:	Planar
Lens Focal Length:	Sigma 50mm
Horizontal FOV:	53.5°
Distance to site :	31m

View 2 - Station Road Looking South OS: 546476, 252154

Date of Photo:	25/11/2021, 13:48
Weather:	Sunny
Visualisation Type:	Type 4
AVR Level:	3
Bearing of View:	181° S
Camera:	Canon EOS 5D MK III
Frame Type:	Composite
Projection:	Planar
Lens Focal Length:	Sigma 50mm
Horizontal FOV:	53.5°
Distance to site :	14m

View 3 - Station Road looking North OS: 546427, 252068

Date of Photo:	25/11/2021, 13:35
Weather:	Sunny
Visualisation Type:	Type 4
AVR Level:	3
Bearing of View:	45 & 70° NE
Camera:	Canon EOS 5D MK III
Frame Type:	Composite
Projection:	Planar
Lens Focal Length:	Sigma 50mm
Horizontal FOV:	53.5° & 60°
Distance to site :	30m

View 4 - Station Road looking North OS: 546416, 252050

Date of Photo:	25/11/2021, 13:41
Weather:	Sunny
Visualisation Type:	Type 4
AVR Level:	3
Bearing of View:	49° NE
Camera:	Canon EOS 5D MK III
Frame Type:	Composite
Projection:	Planar
Lens Focal Length:	Sigma 50mm
Horizontal FOV:	53.5°
Distance to site :	51m

NPA *Visuals*

NICHOLAS PEARSON ASSOCIATES

0cm (Original image width 523mm) 10cm

Please note: To view this image digitally, calibrate this scale bar, on screen, for a correct scale representation and view the image at a comfortable arm's length

Project No:	11208-007	**Date:**	March 2022
Client:	Planning Issues	**Project:**	Station Road, Great Shelford
Status:	Planning	**Figure:**	Fig. 01: View 1 - Station Road / Shelford Park Avenue Junction Looking South Existing

NPA Visuals

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0cm (Original image width 523mm) 10cm

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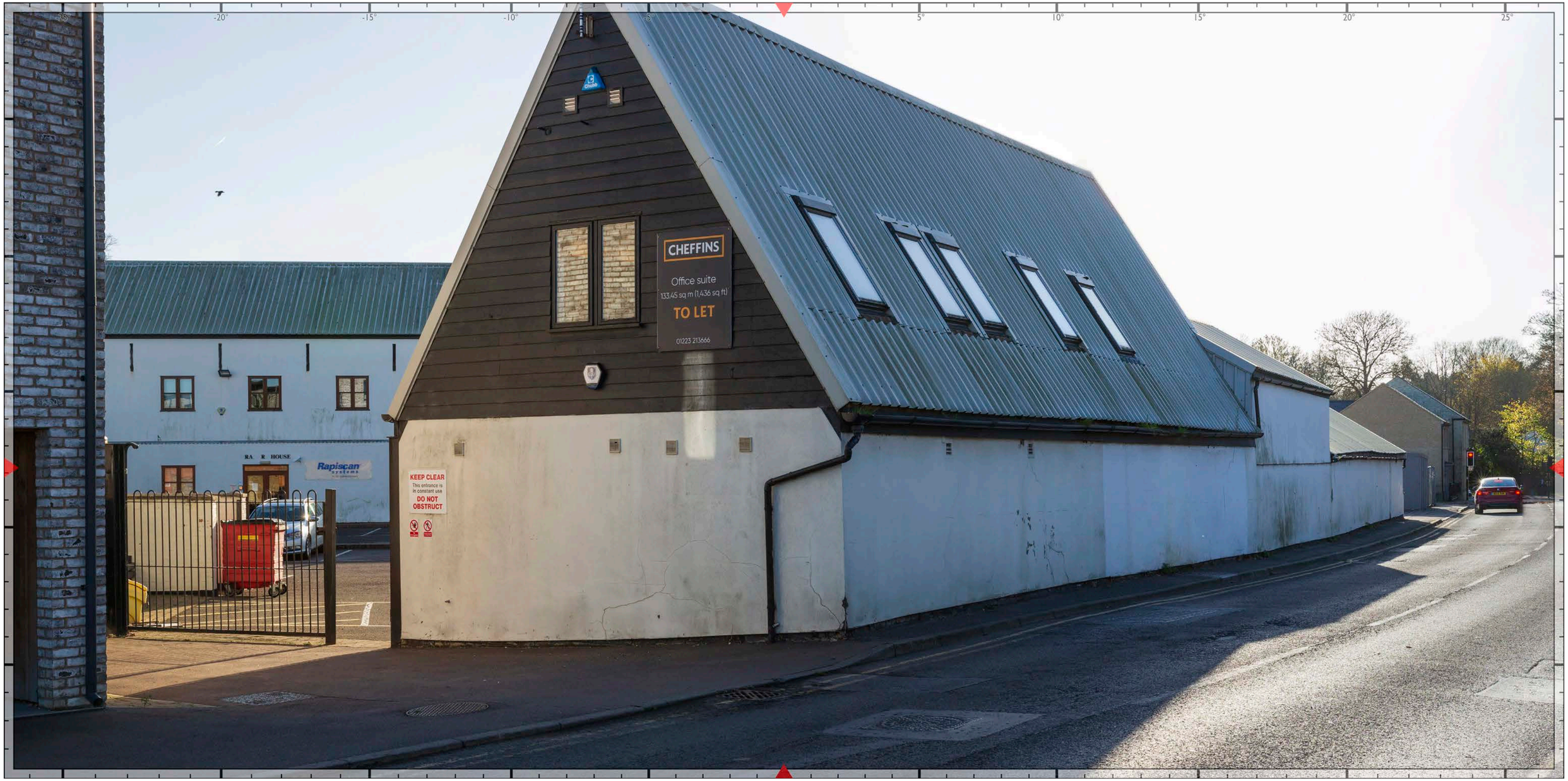
Project No:	11208-007	**Date:**	March 2022
Client:	Planning Issues	**Project:**	Station Road, Great Shelford
Status:	Planning	**Figure:**	Fig. 02: View 1 - Station Road / Shelford Park Avenue Junction Looking South Proposed



NPA Visuals

Nicholas Pearson Associates

0cm (Original image width 523mm) 10cm

Please note: To view this image digitally, calibrate this scale bar, on screen, for a correct scale representation and view the image at a comfortable arm's length

Project No:	11208-007	**Date:**	March 2022
Client:	Planning Issues	**Project:**	Station Road, Great Shelford
Status:	Planning	**Figure:**	Fig. 03: View 2 - Station Road Looking South Existing

NPA *Visuals*

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Project No:	11208-007	**Date:**	March 2022
Client:	Planning Issues	**Project:**	Station Road, Great Shelford
Status:	Planning	**Figure:**	Fig. 04: View 2 - Station Road Looking South Proposed

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Project No:	11208-007	**Date:**	March 2022
Client:	Planning Issues	**Project:**	Station Road, Great Shelford
Status:	Planning	**Figure:**	Fig. 05: View 3a - Station Road looking North Existing

NPA Visuals

Nicholas Pearson Associates

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Project No:	11208-007	**Date:**	March 2022
Client:	Planning Issues	**Project:**	Station Road, Great Shelford
Status:	Planning	**Figure:**	Fig. 06: View 3a - Station Road looking North Proposed

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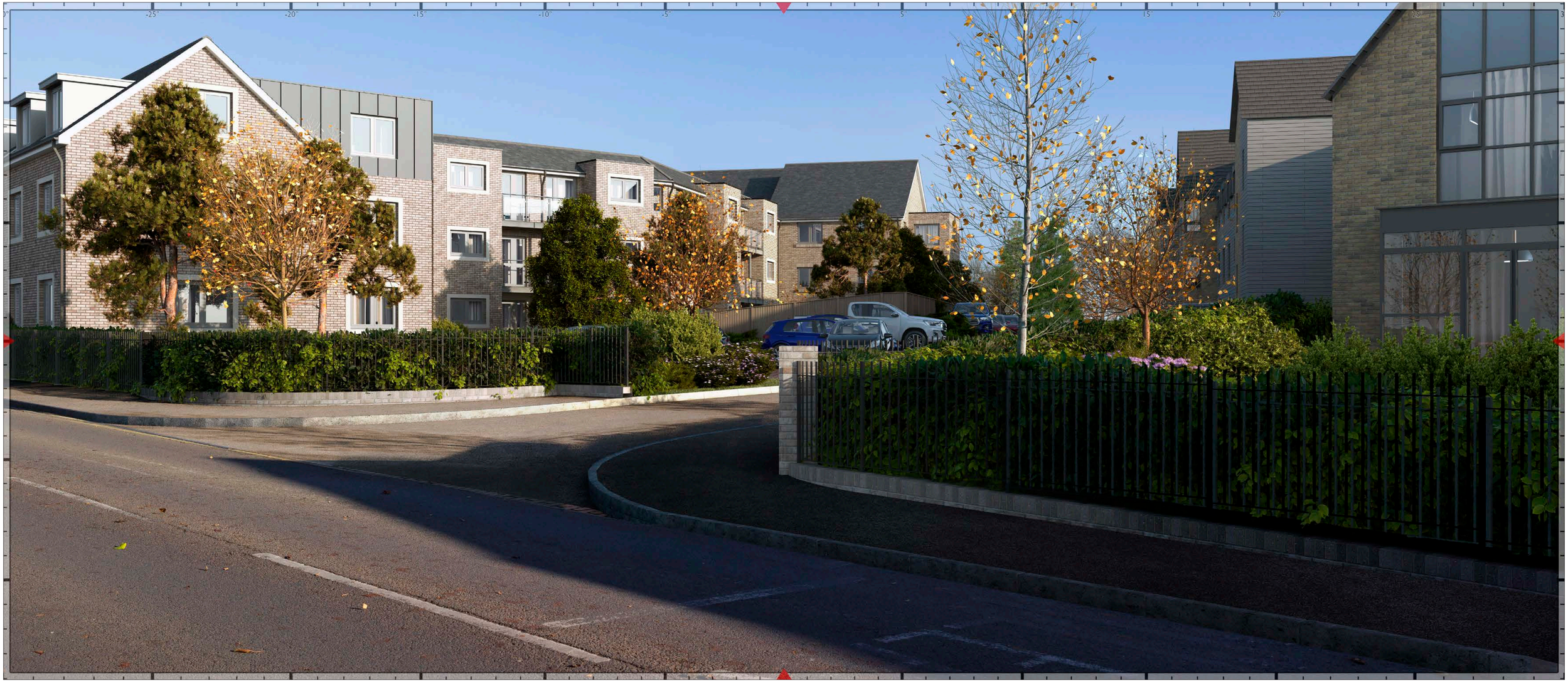
0cm (Original image width 599mm) 10cm

Please note: To view this image digitally, calibrate this scale bar, on screen, for a correct scale representation and view the image at a comfortable arm's length

Project No:	11208-007	**Date:**	March 2022
Client:	Planning Issues	**Project:**	Station Road, Great Shelford
Status:	Planning	**Figure:**	Fig. 07: View 3b - Station Road looking North Existing



NPA *Visuals*

Nicholas Pearson Associates

0cm (Original image width 599mm) 10cm

Please note: To view this image digitally, calibrate this scale bar, on screen, for a correct scale representation and view the image at a comfortable arm's length

Project No:	11208-007	**Date:**	March 2022
Client:	Planning Issues	**Project:**	Station Road, Great Shelford
Status:	Planning	**Figure:**	Fig. 08: View 3b - Station Road looking North Proposed

NPA *Visuals*

NICHOLAS PEARSON ASSOCIATES

0cm (Original image width 523mm) 10cm

Please note: To view this image digitally, calibrate this scale bar, on screen, for a correct scale representation and view the image at a comfortable arm's length

Project No:	11208-007	**Date:**	March 2022
Client:	Planning Issues	**Project:**	Station Road, Great Shelford
Status:	Planning	**Figure:**	Fig. 09: View 4 - Station Road looking North Existing

NPA *Visuals*

NICHOLAS PEARSON ASSOCIATES

0cm (Original image width 523mm) 10cm

Please note: To view this image digitally, calibrate this scale bar, on screen, for a correct scale representation and view the image at a comfortable arm's length

Project No:	11208-007	**Date:**	March 2022
Client:	Planning Issues	**Project:**	Station Road, Great Shelford
Status:	Planning	**Figure:**	Fig. 10: View 3a - Station Road looking North Proposed

Visually Verifiable Montage Methodology

Introduction

A Verified View is an image that combines a photographic view with an accurate 3d CAD representation of a proposed development, displayed to an agreed level of detail. Using a baseline of verifiable visual data and information, its purpose is to impartially and if required, realistically represent the proposal. Not just the appearance and context, but also its scale. By using verifiable visual data this image can then be used by others (if required) to scrutinise the work, without its accuracy being questioned.

“Photographs can have an important role to play in communicating information about the landscape and the visual effects of a proposed development, although they cannot convey exactly the way that the effects would appear on site.” (GLVIA, Third Edition)

Verified Views are also referred to as:

Visually Verifiable Montages (VVM)

Verified Visual Image (VVI)

Accurate Visual Representation (AVR)

We have an established reputation for the production of Verified Views for both urban and rural developments and have successfully presented these for planning applications and as expert witnesses at public inquiry.

The methodology used by us accords with the following guidance documents where appropriate:

The Third Edition of the good practice ‘Guidelines for Landscape and Visual Impact Assessment’ 2013; produced by the Landscape Institute and Institute of Environmental Management & Assessment.

Visual Representation of Development Proposals, September 2019. Landscape Institute Technical Guidance Note 06/19

London View Management Framework Supplementary Planning Guidance: Appendix C: Accurate Visual Representations. March 2012.

Visual Representation of Wind Farms Version 2.2, February 2017, Scottish Natural Heritage

Assessing the impact of small-scale wind energy proposals on the natural heritage, March 2016 Version 3, Scottish Natural Heritage

‘Visualisation Standards for Wind Energy Developments’ (July 2016), The Highland Council

When producing verified views, a series of options are available to aid design and planning decisions according to the level of detail required. To assist agreement between all parties prior to (AVR) preparation, the following classification types are presented to broadly define the purpose of an AVR in terms of the visual properties it represents.

This classification is a cumulative scale in which each level incorporates all the properties of the previous level.

AVR Level 0 Location and size of proposal

AVR Level 1 As level 0 + degree of visibility of proposal

AVR Level 2 As level 1 + visual architectural form and details

AVR Level 3 As level 2 + use of realistic materials and lighting

Visulisations ‘Types’ according to the Landscape Institute guidance note 06/19 refer to the following

Type 4: visualisations where the highest level of locational accuracy. Image scaleing may be required.

Type 3: Visulialisations where a verifiable process and printed scale representation is not required

Appendix A includes a project specific methodology pro-forma detailing which principles from this methodology have been applied.

Preparation

Each view of the proposal is represented so that an informed decision can be made by balancing the needs of the assessor or viewer on site. Wherever possible, consultation with the relevant planning professional takes place on the matter and our final methodology is based on the most appropriate agreed set of professional Guidance.

Initially all baseline and proposal data is compiled so we can plan and agree the viewpoint locations with the client and relevant authorities. If the information is available we will also “pre-visualise” the viewpoints showing both the existing and proposed. This can also be used as an accurate guide on site and discuss all options with the client to ensure that our site photography covers all the potential locations and captures the full extent of the proposed scene correctly.

Prior to the site visit we prepare a “site pack” containing all the drawings and information we require on site. Pre-planning also includes a review of transport options so that public transport is utilised wherever possible. Route planning and time estimates are considered and a site risk assessment is completed for record.

Photography

Equipment available:

Canon 5D MkIII full frame digital SLR camera (Full frame sensor)

Canon EF 50mm f/1.4 STM lens

Sigma 50mm f/1.4 EX DG HSM

Canon EF 28mm f/1.8 USM Lens

Canon TS-E 24mm f/3.5 L II

Manfrotto Tripod 190

Nodal Ninja Ultimate M2 Panorama Head with Advanced Rotator RD16-II

NN4-D16-Nodal Ninja NN4 Panorama head with RD-16 rotator base

Arca-Swiss Style Standard Camera Plate

NN-EZ-Nodal Ninja EZ Leveler MKII (Tribrach)

Hand held spirit level

Canon RS-80N3 Remote Switch

UV, Polarising, Graduation & neutral density filters

Batteries & chargers

SD cards

Plumb bob, tape measure, spray paint & Hilti nails

Compass

Suitable weather conditions are sought so that the proposals may be clearly visible in the context of the view. We endeavor to take the photographs at an appropriate time of day to reduce the chance of the site being in shadow or back-lit. Therefore, when planning a site visit, detailed consideration is given to weather forecasts and sunrise/set times, particularly during the winter when the low angle of the sun can be problematic. The photograph(s) correctly portray the view which is obtained at each representative viewpoint whilst avoiding obvious obstructions.

At each viewpoint the camera is mounted on a tripod at a height of 1.65m above existing ground level, which best represents the average human eye level. The height of the lens “nodal point” is checked by using a tape measure.

The Tribrach and hand held spirit level is used to ensure that the camera is horizontal/vertical. The cameras on board spirit level may also be used. Using the plumb bob, where possible, the “nodal point” is positioned over a pre-surveyed feature which can be identified on the 3D model. Where a pre-existing surveyed feature is not available, spray paint or Hilti nails are used to locate the point for future surveying if required.

As part of the verification procedure, photographs of the tripod and survey point, in situ, are taken using a second camera, so that the surveyor can identify the location. These images are also reproduced in the document to aid on site assessment by third parties if required.

All baseline photographs are taken using the manual settings with a target ISO of 100. A medium aperture with a minimum shutter speed of 1/125 sec ensures that all images are sharp and have a good depth of field. Evaluative metering mode and Auto White Balance is all selected as standard. It should be noted that these settings are preferred but may need to be adjusted according to the climatic or physical conditions.

Photographs are taken in a RAW format using manual settings to enable the best quality results. If necessary, the original RAW file can be submitted as part of the verification process

The photographer takes note of the weather conditions and direction of view. All other details relating to the photograph are stored in the image EXIF data.

Lenses

No ‘one size fits all’, and we will use the most appropriate set of lenses / formats to convey the view. Only prime lenses are used; in the following order of preference: 50mm, 28mm, 24mm, 24mm/Shift. Both landscape and portrait orientations are considered when planning the photography. The 50mm lens has always been regarded as the “standard” lens on a full frame 35mm camera and closest to the human eye when image printed at A3 and viewed at arm’s length. 50mm lenses are not always appropriate for all situations and so when viewing Verified Views based on other lenses, the observer must be aware of the limitations of the printed format. Alternative lenses are only selected when the viewpoint is close to the site. This means that even at a reduced printed scale, the observer is still able to identify all the features visible by the naked eye. (Ref: LI TGN 06/19 Appendix 1.1 & 13.1)

Full Frame Sensor lenses are quoted as having the following Horizontal Fields of View. Canon EF 50mm: 39.6 Degrees / Canon EF 28mm: 65.5 Degrees / Canon TS-E 24mm: 74 Degrees. However, the exact field of view cannot be assumed, and the actual field of view may vary +/- 2 or 3 degrees depending on the lens.

The Effective Focal Lengths (EFL) shown below represent the calculated field of view for our lenses based on known measurements.

Canon EF 50mm f/1.4 STM lens – EFL51.4mm (38.6° HFoV / 26.3° VFoV)

Sigma 50mm f/1.4 EX DG HSM – EFL 47.8mm (41.2° HFoV / 28.2° VFoV)

Canon EF 28mm f/1.8 USM Lens – EFL 28.2mm (65.1° HFoV / 46.1° VFoV)

Canon TS-E 24mm f/3.5 L II - EFL 24.7mm (73.7° HFoV / 51.8° VFoV)

Image composition and Presentation

Each viewpoint is intended to capture the view as perceived and experienced by the observer.

A practical and aesthetic approach is applied to our viewpoint photography where good composition is important. No one format or lens is suitable for all situations; as a rule of thumb, rural and coastal sites tend to require a 50mm based “panoramic” format (in line with SNH & LI TGN 06/19 guidelines), whilst urban sites can require a more considered approach where alternative lenses and formats may be required.

Viewpoint photographs are taken so that the camera is level to the horizon, so that converging verticals and perspective distortion is avoided. Proposals are in the central portion of the view.

The final baseline viewpoint photographs are single frame planar or composite panoramic images.

Planar or Cylindrical? Most technical guidance advises that the final verified views should be presented in Planar format. Therefore, cylindrical “panoramic” views will be re-projected back to planar (53.5° or 60° HFoV) for presentation. Occasionally linear sites or panoramic urban views (such as city scapes, power lines, roads and solar farms for example), may be best presented cylindrically.

Visually Verifiable Montage Methodology

When a proposed development is at distance, whilst the observer is aware of the wider area within their peripheral vision they tend to focus on the area in question. In these circumstances it is important to consider the limitations of printed technology and electronic viewing methods and the verified view may presented on a baseline photograph with a smaller field to be reproduced at a scale suitable for viewing at a comfortable arm's length (This can be up to 75mm EFL in accordance with SNH & or 150% according to LI TGN 06/19 guidance). To ensure that the viewer is provided with a representation of the wider context, a "representative" view with a wider horizontal field of view may be presented alongside. This may be a single frame photograph or panorama of either 60° or 90° HFoV and "provides landscape and visual context only"

Most imagery is viewed electronically on screen or printed at A3 with the occasional use of A1 wide by A4 high (840 x 297mm) for panoramic views. Therefore, a sensible balance must be struck to place the proposal within meaningful context whilst providing clarity for the viewer.

See Appendix A for project specific exceptions which may apply to any of the above

Baseline Imagery Processing

Following review in Adobe Bridge, the original Canon RAW files are selected and processed in Adobe Photoshop to adjust white balance, colour accuracy and sharpness. The images undergo further correction procedures to ensure the horizon is precisely horizontal and any lens/barrel distortion is compensated for. The images are then saved as uncompressed Photoshop files for future compositing. Separate .jpg images are saved for use in the camera matching process.

Surveying

The level of accuracy necessary for the individual viewpoints or project as a whole is agreed in advance by the client and planning authority. There are 3 main options;

Option 1: Surveyed Camera Data (±0.1m accuracy)

For each agreed photo viewpoint, a location plan is provided to the surveyor along with marked up referenced photographs showing the camera in situ and the preferred survey reference points. The surveyor then establishes the location of each viewpoint using a Leica Global Positioning System (GPS). Where GPS positioning was not possible near to the required survey point, the surveyor works back from an established GPS location.

The surveyor records a range of reference points, using a reflector-less Total Station. Viewpoint marker points are in the foreground and background, high level and low level. These can include existing building ridges, lighting columns, bollards or similar such details. The reference points are individually numbered and referenced on screen-shots or marked up photographs. All reference points must be within the central zone of the photograph where least distortion occurs.

Data processing is conducted and referenced back to Ordnance Survey Grid (OSGB36 / EPSG 2770)

Data is presented in Spreadsheet form 3d .dwg plus a photograph marked with the reference points.

Option 2: Using Existing Topographic Survey Data (± 0.1m accuracy)

Where the camera has been taken on or at pre-existing surveyed point, this and the rest of the survey can be used to identify features in the viewpoint. In many cases these include street furniture, manholes, kerbs, buildings, ridge and eave levels or similar. Data is usually provided in a geo-referenced 3d .dwg format, or converted to a 3d format based on stated levels in the survey.

Data processing is conducted and referenced back to Ordnance Survey Grid (OSGB36 / EPSG 2770)

Option 3: Using Publicly available Geographic data (±1.5m accuracy)

Digital Surface Models (DSM) / Digital Terrain Models (DTM) / Ordnance Survey / City (Z) Model / Aerial photography can be used to identify 3D point locations. In many cases these may include existing building ridge-lines & Parapets, Street furniture, kerbs or similar such details. Data includes Camera locations and specific 3D points to assist in the camera matching process.

Data processing is conducted and referenced back to Ordnance Survey Grid (OSGB36 / EPSG 2770)

Note: While in most cases this method will be within the ±1.5m accuracy tolerance, depending on the site location and the available data, only ±3-5m accuracy may be achievable in some areas

3d Modeling

The proposals supplied by the architects and landscape architects are combined with the site survey and mapping data so that they correspond with each other. A geo-referencing system is used when doing this so that information regarding viewpoints can be accurately located. The model(s) supplied or constructed by us are cross-checked with the site plan and elevations to ensure they accurately match the design drawings, including floor levels, roof heights and footprint.

Camera Matching & Verification:

Irrespective of whether the final VVM is output as a single or composite panoramic image, each Verified View is based upon a single rendered image.

Viewpoint markers are used to tie the photograph to the CAD Camera view. These are surveyed features and points such as lamp posts, walls, boundaries and buildings; anything that has a known location. These markers are required to be as accurate as possible and should ideally be positioned within the central portion of the image. They should be at both varying heights, distances and breadth within the view. The background plate photograph is imported into 3ds Max to verify the accuracy of the match.

The location accuracy and angle of view can also be checked by triangulating the position and preparing view line sections. This is a reliable method successfully used for location finding in the field.

There are two ways of camera matching;

For planar baseline photography:

This can be achieved within the 3D modeling program by aligning a virtual camera with the reference survey points to obtain an accurate match. The survey is rendered out and, if necessary, this can be adjusted to align correctly to detailed or distant elements that may have been difficult to get pixel perfect precision in 3ds max. The rendered Survey points can then be replaced by the final render to ensure accuracy.

For cylindrical baseline photography:

This can be achieved within the 3D modeling program by aligning virtual planar camera and survey points with a version of the cylindrical image re-projected to a planar perspective. The reference points are then rendered out cylindrically to the required horizontal and vertical FoV, and this is aligned in Photoshop to the cylindrical baseline image. The survey image is then replaced with the rendered model output, based upon the same camera and render settings.

Texturing, Rendering & Post Production

3ds Max is used for applying photo-realistic surfaces and materials to the 3D model. Material references and planting sizes are based upon information provided by the Architects / Landscape Architect

The exact resolution of the photograph is noted and used as the size for the final rendered output of the 3D Model view so that the two overlay each other precisely.

Adobe Photoshop is used to blend the render(s) of the model(s) with the existing baseline / base plate photograph. Where elements are removed from the baseline photograph, reference photography and/ or models of the existing site are used to accurately place elements that were not seen in the original photography

Reproduction

To assist the viewer in understanding the characteristics of the lenses used baseline photographs and verified views can be annotated around the border, to indicate the field of view and optical axis of the lens used. This border is divided up into degree increments indicating the field of view. The position of the optical axis indicates whether the photograph was taken with vertical shift. The above added graphic is simply an alternative way of quickly knowing the lens used. This is particularly useful when a number of viewpoints of a proposal are taken with varying lens types.

It is important to reproduce each document and view at the correct size for both practicality and to ensure view accuracy when combined with the listed recommended viewing distance (as detailed on each view)

Each verified view is accompanied by a viewpoint location plan and photographs of camera locations together with the verification data and camera matching reference imagery. A Technical Methodology is included.

Viewing Procedures

The purpose is to reproduce the Verified View so that it correctly reconstructs the perspective seen from the location from which the photograph was taken.

We aim to reproduce all wire frames and photomontages so that they can be viewed at a comfortable arm's length. When comparing the view in the field, the viewer must keep their head motionless and fix their eyes on the centre of the view. This ensures that the represented view falls within the human field of view. If requested an acetate print can be provided for viewing on site. This can help the viewer align the key features on the image with those in real life.

Cylindrical views are only intended for viewing as a printed image or in an appropriate electronic viewing application. The printed image should be viewed on an arc that matches the images field of view, at a comfortable arms-length.

Where it is not possible to represent the proposed site with suitable context in the standard document frame, a larger field of view is necessary. Irrespective of reproduction size all verified views are accurate representation, and the advisory viewing distance (also referred to as Principle Distance by the SNH guidance) is included on all images to allow technical comparison if required.

Visually Verifiable Montage Methodology

Appendix A

Project Title	Proposed Retirement Housing
Site Location	Station Road, Great Shelford
Status	Planning
Architect	Planning Issues
Landscape Architect	James Blake Associates
Coordinate System	OSGB36 (EPSG 277000)
Accuracy of Viewpoint Location	±0.1m
Method used to locate camera horizontally	Ordnance Survey / DSM & DTM / Topographic Survey
Method used to locate camera vertically	DSM & DTM / Topographic Survey
Camera Matching Technique	Planar (Model Camera Aligned)
Details used for camera matching - Horizontally	Ordnance Survey / DSM & DTM / Topographic Survey
Details used for camera matching - Vertically	DSM & DTM / Topographic Survey
Modeling Software	3ds Max
Compositing Software	Photoshop / PT GUI
Other applications	InDesign
Height and Age of Proposed Planting	Year 5 (7-8m)
Season(s)	Autumn / Winter
LI Visualisation Type	Type 4
AVR Level	AVR 3
Design Data Provided	2d CAD Plans
Photography Equipment Used	Canon 5D full frame digital SLR camera (Full frame sensor) Sigma 50mm f/1.4 EX DG HSM Manfrotto Tripod 190 NNodal Ninja Ultimate M2 Panorama Head with Advanced Rotator RD16-II NN-EZ-Nodal Ninja EZ Leveler MKII

Lens and format

50mm

50mm 100% @ A1 wide 53.5° and 60°- Avoiding converging verticals

The baseline photographs for all Viewpoints were taken using the Sigma 50mm f/1.4 lens at intervals of 15 degrees (portrait orientation). The individual photographs were stitched to form an original baseline image of 53.5 and 60 (view 3b only) degrees. This method was necessary to produce a geometrically accurate image, to avoid converging verticals, whilst keeping the camera horizontal. The final image was then cropped to a VFoV of 27 degrees to remove any excessive foreground/sky. In all cases the red arrows indicate the vertical and horizontal points of perspective (Optical Axis) whilst the 'graticules' represents the horizontal and vertical fields of view.

Each viewpoint within the document may be supplied with all or some of the following information:

Figure Number
Viewpoint Number
Viewpoint Details
OS Coordinates (12 digit)
Eye level (A.O.D)
Direction of View (Bearing)
Camera Height (AGL)
Date & Time
Viewing distance (Advisory)
Single Frame or Composite
Horizontal Field of View
Vertical Field of View
Weather / Lighting Conditions
Camera Type
Lens / Focal Length