Visual Representations and Methodology.

Proposed housing and existing pump house extension & change of use.

Land East of Windermere Avenue, Colne, Pendle.

Designed by **CPL ARCHITECTURE**

Views & Methodology by **Visualhorizon3D**

WINTER PANORAMIC VERIFIED VIEWS AND PHOTOMONTAGES

VIEWS 2, 5, 6, 8, 9, 10 FROM

CPL ARCHITECTURE DESIGN AND ACCESS STATEMENT

AND VIEW EDP 4 FROM

EDP LANDSCAPE AND VISUAL IMPACT ASSESSMENT

March 2023 2nd Issue

Overview.

The methodology described here follows the recommendations set out in the Guidelines for Landscape and Visual Impact Assessment 3rd edition (GLVIA3), The Landscape Institute Visual Representation of Development Proposals (Technical Guidance Note 06/19) and, where appropriate, Scottish National Heritage (Nature Scot) Visual Representation of Wind Farms.

The visual representations in this document are of the proposed new development at land east of Windermere Avenue, Colne, Pendle, designed by CPLARCHITECTURE. The views are created by Visualhorizon3D. In this instance the view locations were instructed by CPL ARCHITECTURE, presumably after consultation with the relevant local authority and Professional consultants.

We were instructed to create type 4 panoramas for these winter views. Therefore, the recommended 90° baseline cylindrical photograph and matching wireframe were produced (A1 paper width) together with the recommended 53.5° planar wireframe and matching photomontage (also A1 paper width).

It should be noted, as The Landscape Institute Technical Guidance Note 06/19 (1.2.13) states, 'Two-dimensional visualisations, however detailed and sophisticated, can never fully substitute what people would see in reality. They should, therefore, be considered an approximation of the three-dimensional visual experiences that an observer might receive in the field.'

Viewpoint panorama photography.

Photography was undertaken by Visuahorizon3d on 9th February 2023 (except view 2, which was 10th February 2023 and EDP 4 which was 27th March 2023). A Nikon D610 full frame sensor digital camera was used together with a fixed 50mm lens. All efforts were made to take the photographs in good weather conditions. Descriptions and reference photographs were used to easily find the view locations once on site.

It is important that the camera is horizontal and steady. A heavy-duty tripod was set up over the required locations at 1.5M height and a Tribrach leveller fixed on top. A tribrach leveller allows accurate placement over the location as well as allowing levelling ability in the horizontal and vertical planes.

The camera was fixed to a panoramic nodal slider with rotating indexer and adjusted to ensure the camera rotated about the no-parallax point of the lens. This eliminates parallax between successive images and enables accurate stitching of said images later on in the process. These were then fixed to the Tribrach and it was then levelled. The camera was checked again with a spirit level in the vertical and horizontal axis.

The camera was set to manual mode for consistency of focus and exposure throughout the panoramic photographs. Each rotation increment allowed for 50% overlap of images. The location of each viewpoint tripod was also photographed. The location of the camera was recorded by the accompanying surveyor.

Images were captured using the camera RAW file format. These contain the raw information captured by the camera sensor and also allow the photographs to be verified by a third party, if required.

Surveying.

A professional measured building and land surveyor accompanied the photographer and carried out the surveying work for each view.

The surveyor is supplied with an existing site survey and the surveyed points are accurately coordinated into this file using traditional and accepted surveying methods. This can then all be used later in the camera matching process, discussed later.

For each view the camera location was surveyed and static points, seen in the camera field of view (FOV), were also surveyed. These points must be fixed, for example corners of buildings, fixed street furniture, corners of windows and edges of roads and these points are used to check horizontal and vertical alignment when camera matching.

Electronic theodolite and reflectorless laser technology was used to locate each static point and is to a tolerance of +/-5mm. The static points were numbered and all Eastings, Northings and levels Above Ordnance Survey Datum (AOSD) information recorded for each. The points were marked and numbered on the final photograph to be used for camera matching for each view. The surveyor's information was supplied as a combination of CAD file, digital images and a text document, with written descriptions for each point.

Photograph stitching.

Specialist software called Hugin was used to stitch the photographs as cylindrical panoramas. Identical points in the overlapping photos can be either created manually or by the software. This allows the software to create a very accurate panoramic stitch. The images are cropped to the recommended 90°. Optical distortion was removed from the photographs to assist the camera matching process later on.

3D model and camera matching.

CAD drawings were supplied by the architect, including a 2D and 3D topographical site survey, plans, elevations and sections. These explain the construction, position and layout of the proposed development.

Using this information, an accurate 3D model was created in 3D computer graphics software (3D software) called Autodesk 3ds Max with Vray as the renderer. Positions were cross-checked against the supplied information. The 3D model was then accurately positioned over the supplied topographical plans and placed at the correct specified height. The surveyor's information was imported into the 3D software file and correctly overlaid on the topographical plans, ensuring all data was in the correct relationship.

For the wireframe images the recommended documentation requires a Digital Terrain model (DTM) to be used in the views. In this instance the DTM was downloaded from the ordnance survey website as an 'OS terrain 50' model. This was incorporated into the 3D file and was an area large enough to show the distant hills and peaks in the wireframe views. As the height accuracy of this project's 3D Topographical survey is far higher than that of the OS Terrain 50 DTM, the imported DTM file was thus moved down to sit on the 3D file.

For each camera location the relevant 90° cylindrical panorama photograph was used as a background to camera match against. These were shown on screen in the 3D software, and the virtual cameras were located in the correct location and height (using the surveyors coordinates). The real-world camera lens information was input to the corresponding virtual cameras. The output image size for each camera was set to be identical to that of each corresponding background 90° cylindrical panorama. By adjusting each of the virtual camera target points, the surveyed points and corresponding background panoramas all views were accurately lined up. The process was double checked for all cameras.

Wireframe and Photomontage creation.

For the wireframe images the model was given a material that renders out showing the scene as a wireframe. The 90° versions were thus rendered out.

For the photomontage images the scene needs to be accurately lit and textured. The 3D software has the ability to place a light representing the sun at the correct orientation and time (as recorded in the digital photograph) to the accurately placed model. This was setup for each camera location.

The architect supplied details and examples of the materials that will be used for the project. Digital materials and textures were then added to the 3D model to best match the specified finishes. 2D renderings of each location were then generated by the 3D software ready to import into Photoshop and superimpose on the base photographs.

For each photomontage view post-production work was carefully carried out to edit, adjust and blend the two images together. Any objects or parts of the photograph that will be in front/behind the proposed development were edited to show this scenario. There are different ways to achieve this but, suffice to say, the same end result is an image that shows the proposal correctly in place. The architect was consulted with regards material finishes. Any subtle amendments such as hue, saturation etc were made to finalise the image.

As the 53.5° wireframe and photomontage views are recommended to be assessed in planar projection, the 90° cylindrical renders of each view were opened in Hugin and re-projected from cylindrical to planar. They were then cropped to 53.5° and saved out to form those images.

View from location 2

View location

Map Data: Google Earth Pro

Camera tripod location

Baseline photograph

Extent of central 50mm frame used to construct panorama

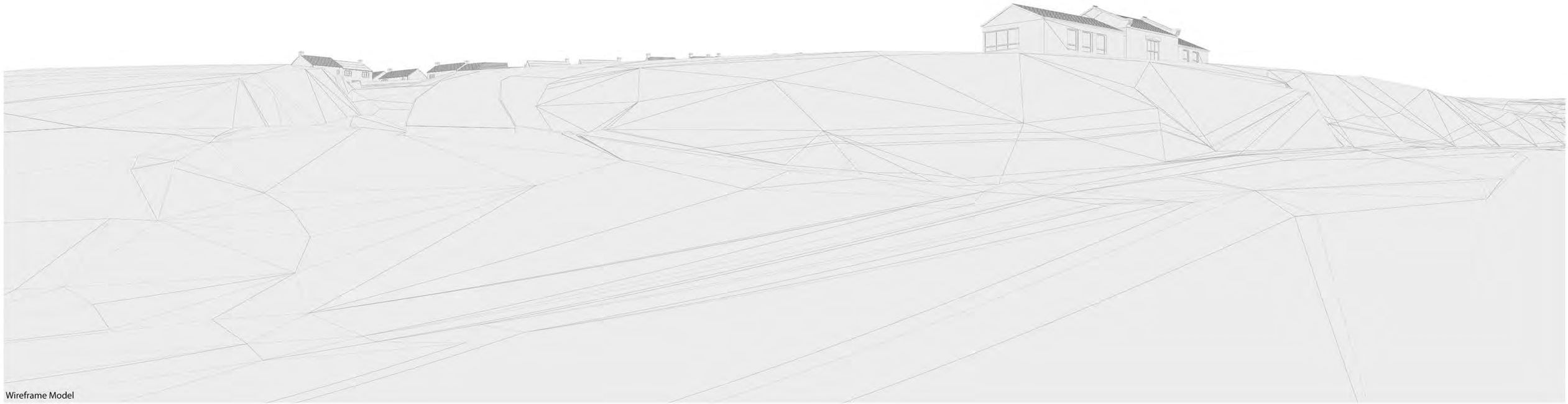
Extent of 53.5° Planar panorama

This image provides landscape and visual context only

Viewpoint 2

Visualisation Type	4	Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor	Coordinates (Easting/Northing):	390325.757 / 440507.758 M	Page size / Image size (mm):	841 x 297 (half A1) / 820 x 237
Projection	Cylindrical	Make & focal length of Lens:	Nikkor 50mm	Height Above Ordnance Datum (AOD):	188.043 M	Principal distance (mm):	522
Enlargement Factor	96% @ A1	Horizontal Filed of View (HFoV):	90 °	Distance to nearest site boundary / Feature:	15 M		
Date/Time of Photograph	10-2-2023 / 09.51	Direction of View from North (0°):	13 °	Height of Camera:	1.5 M		

Proposed Housing and Existing Pump House Extension.
Land East of Windermere Avenue, Colne, Pendle.
Designed by CPL ARCHITECTURE.
Images produced by Visualhorizon3D



Wireframe Model

Viewpoint 2

Visualisation Type	4	Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor	Coordinates (Easting/Northing):	390325.757 / 440507.758 M	Page size / Image size (mm):	841 x 297 (half A1) / 820 x 237
Projection	Cylindrical	Make & focal length of Lens:	Nikkor 50mm	Height Above Ordnance Datum (AOD):	188.043 M	Principal distance (mm):	522
Enlargement Factor	96% @ A1	Horizontal Filed of View (HFoV):	90 °	Distance to nearest site boundary / Feature:	15 M		
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Proposed Housing and Existing Pump House Extension.
Land East of Windermere Avenue, Colne, Pendle.
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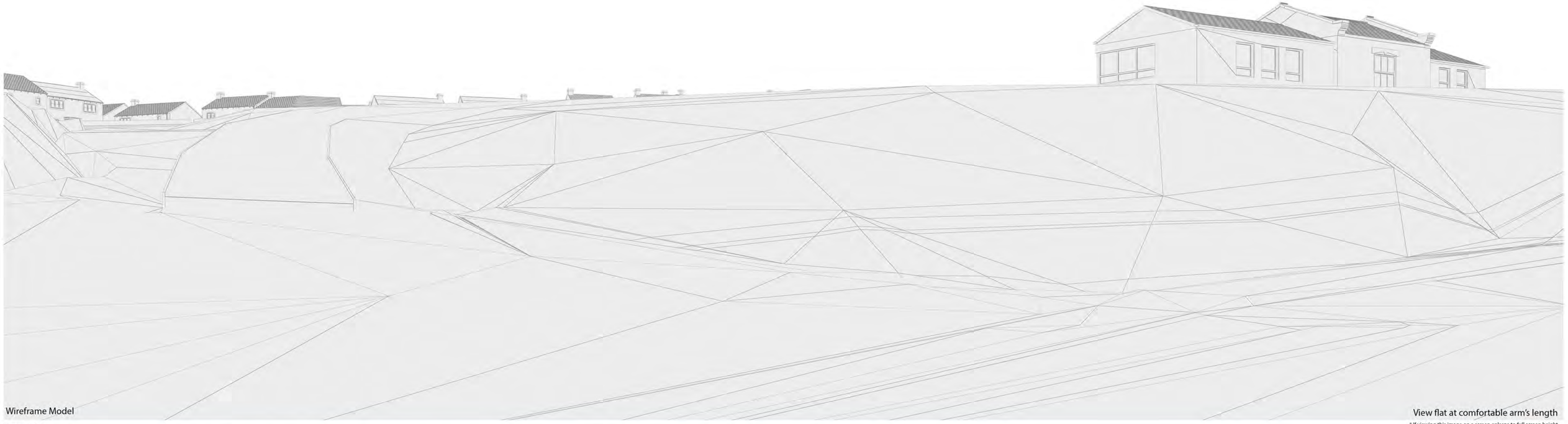


Wireframe Model

View flat at comfortable arm's length

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

Viewpoint 2

Visualisation Type	4
Projection	Planar
Enlargement Factor	150% @ A1
Date/Time of Photograph	10-2-2023 / 09.51

Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor
Make & focal length of Lens:	Nikkor 50mm
Horizontal Filed of View (HFoV):	53.5 °
Direction of View from North (0°):	13 °

Coordinates (Easting/Northing):	390325.757 / 440507.758 M
Height Above Ordnance Datum (AOD):	188.043M
Distance to nearest site boundary / Feature:	15 M
Height of Camera:	1.5 M

Page size / Image size (mm):	841 x 297 / 820 x 260
Principle Distance (mm):	812.5

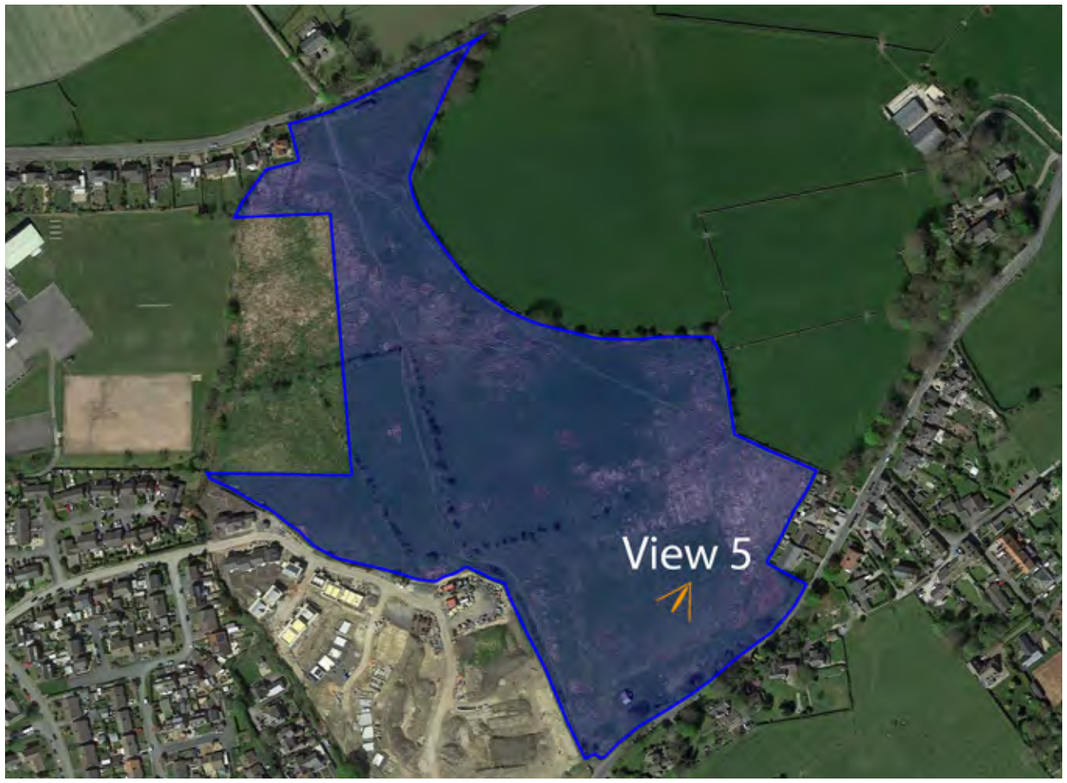
Proposed Housing and Existing Pump House Extension.
Land East of Windermere Avenue, Colne, Pendle.
Designed by CPL ARCHITECTURE.
Images produced by Visualhorizon3D

Viewpoint 2

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

Visualisation Type	4	Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor	Coordinates (Easting/Northing):	390325.757 / 440507.758 M	Page size / Image size (mm):	841 x 297 / 820 x 260	**Proposed Housing and Existing Pump House Extension.**	
Projection	Planar	Make & focal length of Lens:	Nikkor 50mm	Height Above Ordnance Datum (AOD):	188.043M	Principle Distance (mm):	812.5	Land East of Windermere Avenue, Colne, Pendle.	
Enlargement Factor	150% @ A1	Horizontal Filed of View (HFoV):	53.5 °	Distance to nearest site boundary / Feature:	15 M	Accurate Visual		Designed by CPL ARCHITECTURE.	
Date/Time of Photograph	10-2-2023 / 09.51	Direction of View from North (0°):	13 °	Height of Camera:	1.5 M	Representation type (AVR):	AVR3	Images produced by Visualhorizon3D	

View from location 5



View location

Map Data: Google Earth Pro

Camera tripod location

Baseline photograph

Extent of central 50mm frame used to construct panorama

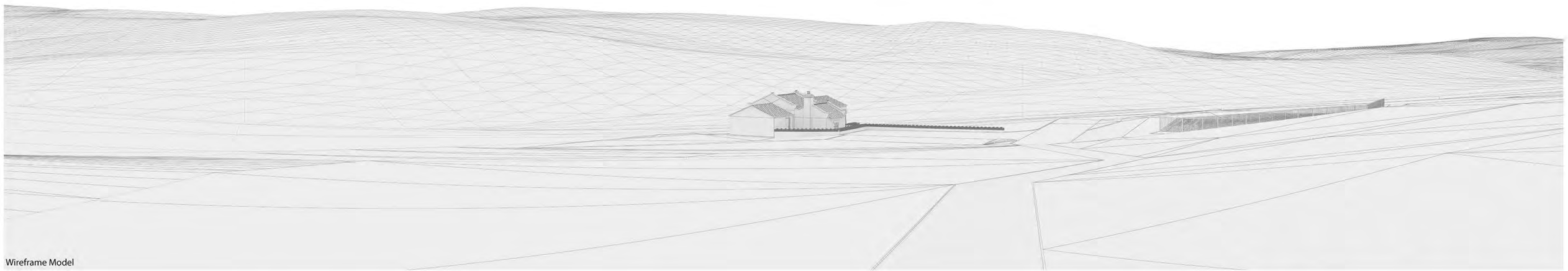
Extent of 53.5° Planar panorama

This image provides landscape and visual context only

Viewpoint 5

Visualisation Type	4	Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor	Coordinates (Easting/Northing):	390399.105 / 440649.324 M	Page size / Image size (mm):	841 x 297 (half A1) / 820 x 237
Projection	Cylindrical	Make & focal length of Lens:	Nikkor 50mm	Height Above Ordnance Datum (AOD):	203.137 M	Principal distance (mm):	522
Enlargement Factor	96% @ A1	Horizontal Filed of View (HFoV):	90 °	Distance to nearest site boundary / Feature:	0 M		
Date/Time of Photograph	9-2-2023 / 09.47	Direction of View from North (0^{0}):	214 °	Height of Camera:	1.5 M		

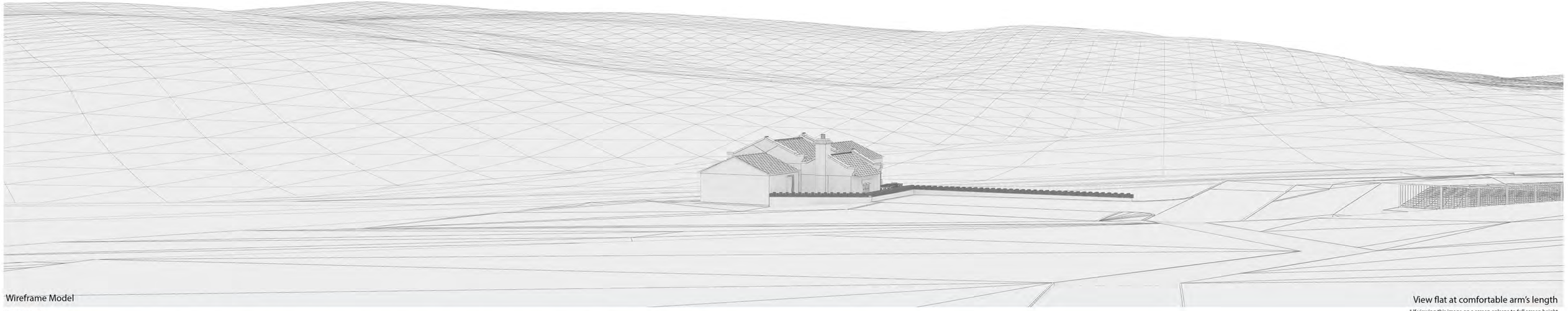
Proposed Housing and Existing Pump House Extension.
Land East of Windermere Avenue, Colne, Pendle.
Designed by CPL ARCHITECTURE.
Images produced by VisualHorizon3D



Wireframe Model

Viewpoint 5

Visualisation Type	4	Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor	Coordinates (Easting/Northing):	390399.105 / 440649.324 M	Page size / Image size (mm):	841 x 297 (half A1) / 820 x 237	**Proposed Housing and Existing Pump House Extension.**	
Projection	Cylindrical	Make & focal length of Lens:	Nikkor 50mm	Height Above Ordnance Datum (AOD):	203.137 M	Principal distance (mm):	522	Land East of Windermere Avenue, Colne, Pendle.	
Enlargement Factor	96% @ A1	Horizontal Filed of View (HFoV):	90 °	Distance to nearest site boundary / Feature:	0 M			Designed by CPL ARCHITECTURE.	
Date/Time of Photograph	9-2-2023 / 09.47	Direction of View from North (0^{0}):	214 °	Height of Camera:	1.5 M			Images produced by VisualHorizon3D	



Wireframe Model

View flat at comfortable arm's length

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

Viewpoint 5

Visualisation Type	4
Projection	Planar
Enlargement Factor	150% @ A1
Date/Time of Photograph	9-2-2023 / 09.47

Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor
Make & focal length of Lens:	Nikkor 50mm
Horizontal Filed of View (HFoV):	53.5 °
Direction of View from North (0°):	214 °

Coordinates (Easting/Northing):	390399.105 / 440649.324 M
Height Above Ordnance Datum (AOD):	203.137 M
Distance to nearest site boundary / Feature:	0 M
Height of Camera:	1.5 M

Page size / Image size (mm):	841 x 297 / 820 x 260
Principle Distance (mm):	812.5

Proposed Housing and Existing Pump House Extension.
Land East of Windermere Avenue, Colne, Pendle.
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Images produced by Visualhorizon3D

Viewpoint 5

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

Visualisation Type	4
Projection	Planar
Enlargement Factor	150% @ A1
Date/Time of Photograph	9-2-2023 / 09.47

Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor
Make & focal length of Lens:	Nikkor 50mm
Horizontal Filed of View (HFoV):	53.5 °
Direction of View from North (0°):	214 °

Coordinates (Easting/Northing):	390399.105 / 440649.324 M
Height Above Ordnance Datum (AOD):	203.137 M
Distance to nearest site boundary / Feature:	0 M
Height of Camera:	1.5 M

Page size / Image size (mm):	841 x 297 / 820 x 260
Principle Distance (mm):	812.5
Accurate Visual Representation type (AVR):	AVR3

Proposed Housing and Existing Pump House Extension.
Land East of Windermere Avenue, Colne, Pendle.
Designed by CPL ARCHITECTURE.
Images produced by Visualhorizon3D

View from location 6

View location

Map Data: Google Earth Pro

Camera tripod location

Baseline photograph

Extent of central 50mm frame used to construct panorama

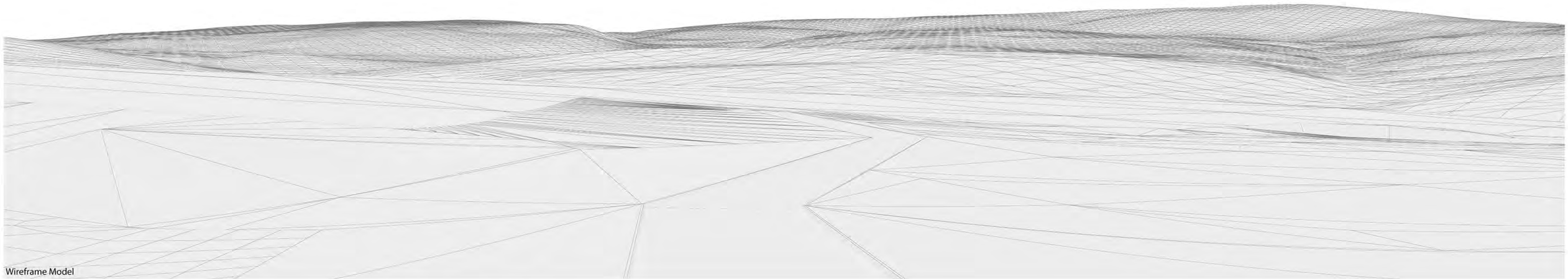
Extent of 53.5° Planar panorama

This image provides landscape and visual context only

Viewpoint 6

Visualisation Type	4	Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor	Coordinates (Easting/Northing):	390408.043 / 440764.302 M	Page size / Image size (mm):	841 x 297 (half A1) / 820 x 237
Projection	Cylindrical	Make & focal length of Lens:	Nikkor 50mm	Height Above Ordnance Datum (AOD):	212.264 M	Principal distance (mm):	522
Enlargement Factor	96% @ A1	Horizontal Filed of View (HFoV):	90°	Distance to nearest site boundary / Feature:	0 M		
Date/Time of Photograph	9-2-2023 / 12.04	Direction of View from North (0^{0}):	123 °	Height of Camera:	1.5 M		

Proposed Housing and Existing Pump House Extension.
Land East of Windermere Avenue, Colne, Pendle.
Designed by CPL ARCHITECTURE.
Images produced by Visualhorizon3D



Wireframe Model

Viewpoint 6

Visualisation Type	4	Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor	Coordinates (Easting/Northing):	390408.043 / 440764.302 M	Page size / Image size (mm):	841 x 297 (half A1) / 820 x 237
Projection	Cylindrical	Make & focal length of Lens:	Nikkor 50mm	Height Above Ordnance Datum (AOD):	212.264 M	Principal distance (mm):	522
Enlargement Factor	96% @ A1	Horizontal Filed of View (HFoV):	90°	Distance to nearest site boundary / Feature:	0 M		
Date/Time of Photograph	9-2-2023 / 12.04	Direction of View from North (0^{0}):	123 °	Height of Camera:	1.5 M		

Proposed Housing and Existing Pump House Extension.
Land East of Windermere Avenue, Colne, Pendle.
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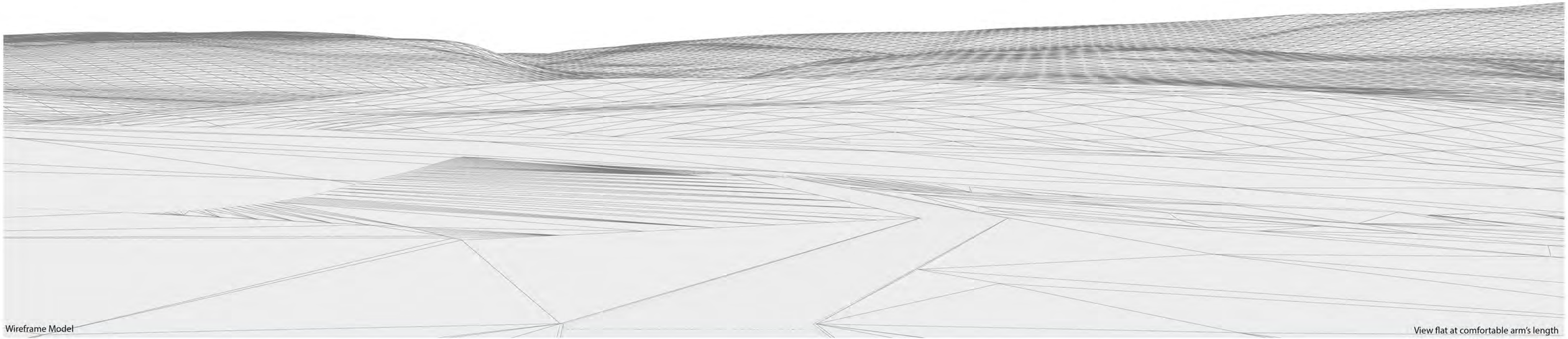

Wireframe Model

View flat at comfortable arm's length

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

Viewpoint 6

Visualisation Type	4
Projection	Planar
Enlargement Factor	150% @ A1
Date/Time of Photograph	9-2-2023 / 12.04

Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor
Make & focal length of Lens:	Nikkor 50mm
Horizontal Filed of View (HFoV):	53.5 °
Direction of View from North (0°):	123 °

Coordinates (Easting/Northing):	390408.043 / 440764.302 M
Height Above Ordnance Datum (AOD):	212.264 M
Distance to nearest site boundary / Feature:	0 M
Height of Camera:	1.5 M

Page size / Image size (mm):	841 x 297 / 820 x 260
Principle Distance (mm):	812.5

Proposed Housing and Existing Pump House Extension.
Land East of Windermere Avenue, Colne, Pendle.
Designed by CPL ARCHITECTURE.
Images produced by Visualhorizon3D

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Viewpoint 6

Visualisation Type	4
Projection	Planar
Enlargement Factor	150% @ A1
Date/Time of Photograph	9-2-2023 / 12.04

Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor
Make & focal length of Lens:	Nikkor 50mm
Horizontal Filed of View (HFoV):	53.5 °
Direction of View from North (0°):	123 °

Coordinates (Easting/Northing):	390408.043 / 440764.302 M
Height Above Ordnance Datum (AOD):	212.264 M
Distance to nearest site boundary / Feature:	0 M
Height of Camera:	1.5 M

Page size / Image size (mm):	841 x 297 / 820 x 260
Principle Distance (mm):	812.5
Accurate Visual	
Representation type (AVR):	AVR3

Proposed Housing and Existing Pump House Extension.
Land East of Windermere Avenue, Colne, Pendle.
Designed by CPL ARCHITECTURE.
Images produced by Visualhorizon3D

View from location 8

Map Data: Google Earth Pro

View location

Camera tripod location

Baseline photograph

Extent of central 50mm frame used to construct panorama

Extent of 53.5° Planar panorama

This image provides landscape and visual context only

Viewpoint 8

Visualisation Type	4
Projection	Cylindrical
Enlargement Factor	96% @ A1
Date/Time of Photograph	9-2-2023 / 12.51

Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor
Make & focal length of Lens:	Nikkor 50mm
Horizontal Filed of View (HFoV):	90°
Direction of View from North (0^{0}):	124 °

Coordinates (Easting/Northing):	390366.913 / 440801.964 M
Height Above Ordnance Datum (AOD):	214.531 M
Distance to nearest site boundary / Feature:	0 M
Height of Camera:	1.5 M

Page size / Image size (mm):	841 x 297 (half A1) / 820 x 237
Principal distance (mm):	522

Proposed Housing and Existing Pump House Extension.
Land East of Windermere Avenue, Colne, Pendle.
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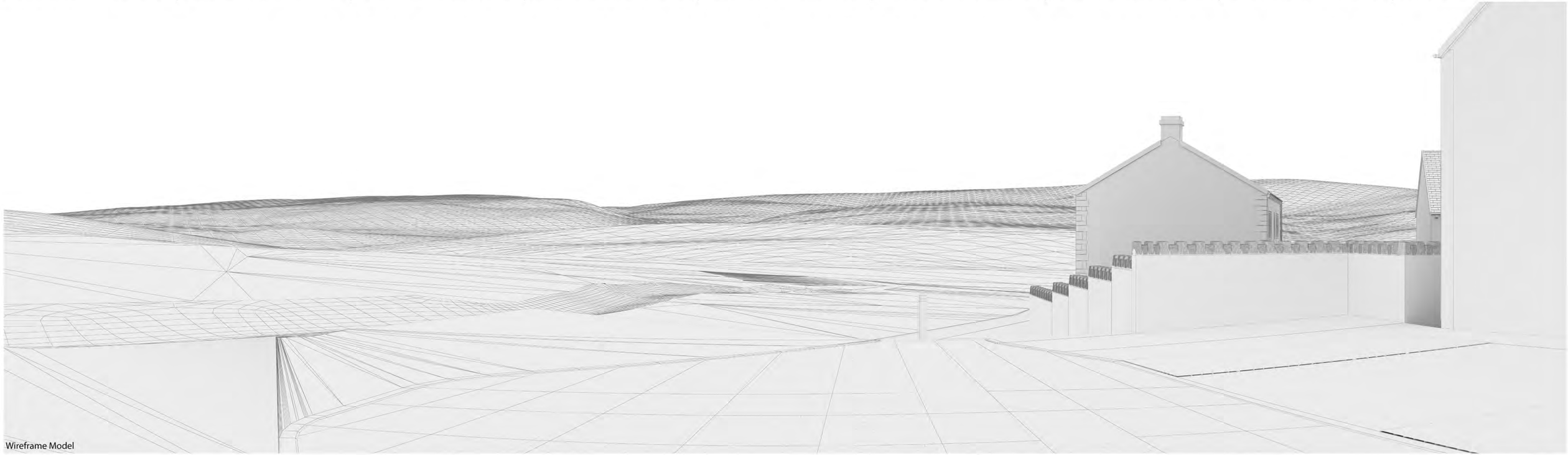
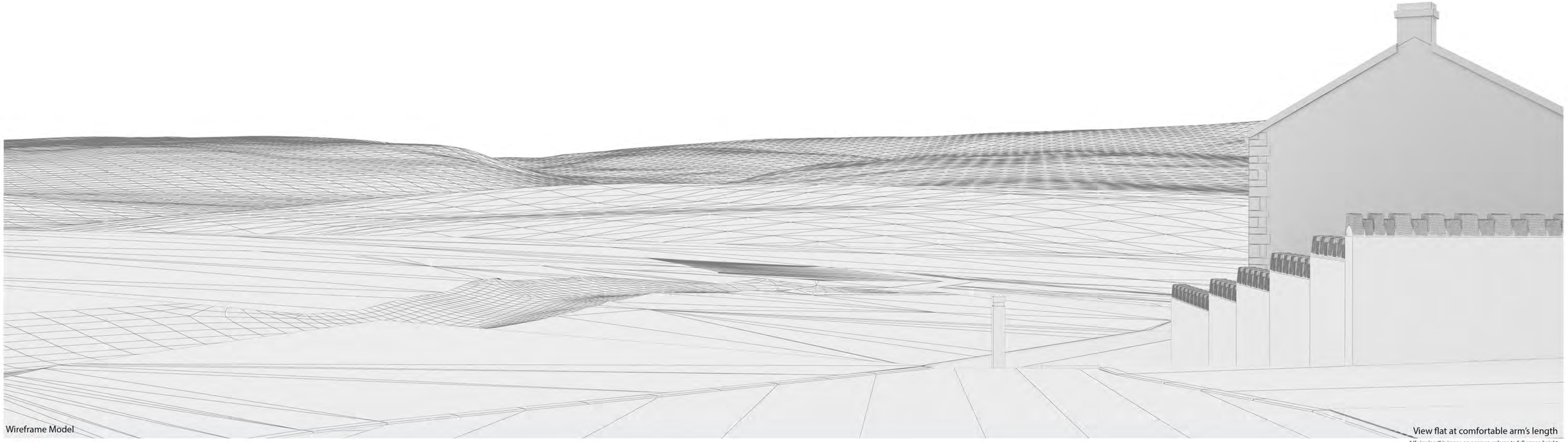
Images produced by VisualHorizon3D



Viewpoint 8

Visualisation Type	4	Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor	Coordinates (Easting/Northing):	390366.913 / 440801.964 M	Page size / Image size (mm):	841 x 297 (half A1) / 820 x 237	**Proposed Housing and Existing Pump House Extension.**	
Projection	Cylindrical	Make & focal length of Lens:	Nikkor 50mm	Height Above Ordnance Datum (AOD):	214.531 M	Principal distance (mm):	522	Land East of Windermere Avenue, Colne, Pendle.	
Enlargement Factor	96% @ A1	Horizontal Filed of View (HFoV):	90°	Distance to nearest site boundary / Feature:	0 M			Designed by CPL ARCHITECTURE.	
Date/Time of Photograph	9-2-2023 / 12.51	Direction of View from North (0^{0}):	124 °	Height of Camera:	1.5 M			Images produced by Visualhorizon3D	



Wireframe Model

View flat at comfortable arm's length

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

Viewpoint 8

Visualisation Type	4
Projection	Planar
Enlargement Factor	150% @ A1
Date/Time of Photograph	9-2-2023 / 12.51

Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor
Make & focal length of Lens:	Nikkor 50mm
Horizontal Filed of View (HFoV):	53.5 °
Direction of View from North (0°):	124 °

Coordinates (Easting/Northing):	390366.913 / 440801.964 M
Height Above Ordnance Datum (AOD):	214.531 M
Distance to nearest site boundary / Feature:	0 M
Height of Camera:	1.5 M

Page size / Image size (mm):	841 x 297 / 820 x 260
Principle Distance (mm):	812.5

Proposed Housing and Existing Pump House Extension.
Land East of Windermere Avenue, Colne, Pendle.
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Images produced by Visualhorizon3D

Viewpoint 8

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Visualisation Type	4	Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor	Coordinates (Easting/Northing):	390366.913 / 440801.964 M	Page size / Image size (mm):	841 x 297 / 820 x 260	**Proposed Housing and Existing Pump House Extension.**	
Projection	Planar	Make & focal length of Lens:	Nikkor 50mm	Height Above Ordnance Datum (AOD):	214.531 M	Principle Distance (mm):	812.5	Land East of Windermere Avenue, Colne, Pendle.	
Enlargement Factor	150% @ A1	Horizontal Filed of View (HFoV):	53.5 °	Distance to nearest site boundary / Feature:	0 M	Accurate Visual		Designed by CPL ARCHITECTURE.	
Date/Time of Photograph	9-2-2023 / 12.51	Direction of View from North (0°):	124 °	Height of Camera:	1.5 M	Representation type (AVR):	AVR3	Images produced by Visualhorizon3D	

View from location 9

View location

Map Data: Google Earth Pro

Camera tripod location

Baseline photograph

Extent of central 50mm frame used to construct panorama

Extent of 53.5° Planar panorama

This image provides landscape and visual context only

Viewpoint 9

Visualisation Type	4	Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor	Coordinates (Easting/Northing):	390261.280 / 440677.445 M	Page size / Image size (mm):	841 x 297 (half A1) / 820 x 237
Projection	Cylindrical	Make & focal length of Lens:	Nikkor 50mm	Height Above Ordnance Datum (AOD):	204.039 M	Principal distance (mm):	522
Enlargement Factor	96% @ A1	Horizontal Filed of View (HFoV):	90°	Distance to nearest site boundary / Feature:	0 M		
Date/Time of Photograph	9-2-2023 / 15.03	Direction of View from North (0°):	141 °	Height of Camera:	1.5 M		

Proposed Housing and Existing Pump House Extension.
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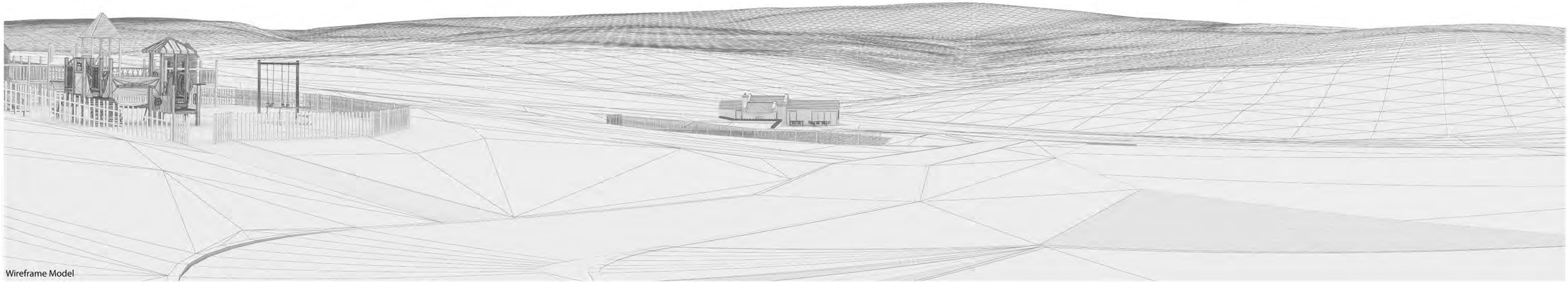
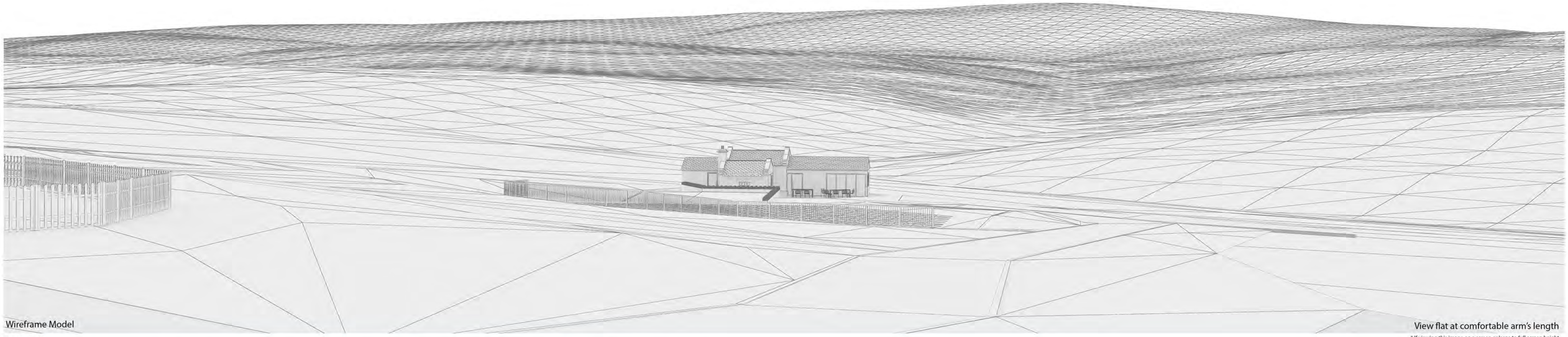
Designed by CPL ARCHITECTURE.
Images produced by VisualHorizon3D



Wireframe Model

Viewpoint 9

Visualisation Type	4	Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor	Coordinates (Easting/Northing):	390261.280 / 440677.445 M	Page size / Image size (mm):	841 x 297 (half A1) / 820 x 237	**Proposed Housing and Existing Pump House Extension.**	
Projection	Cylindrical	Make & focal length of Lens:	Nikkor 50mm	Height Above Ordnance Datum (AOD):	204.039 M	Principal distance (mm):	522	Land East of Windermere Avenue, Colne, Pendle.	
Enlargement Factor	96% @ A1	Horizontal Filed of View (HFoV):	90°	Distance to nearest site boundary / Feature:	0 M			Designed by CPL ARCHITECTURE.	
Date/Time of Photograph	9-2-2023 / 15.03	Direction of View from North (0^{o}):	141 °	Height of Camera:	1.5 M			Images produced by Visualvaigen3D	



Wireframe Model

View flat at comfortable arm's length

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

Viewpoint 9

Visualisation Type	4
Projection	Planar
Enlargement Factor	150% @ A1
Date/Time of Photograph	9-2-2023 / 15.03

Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor
Make & focal length of Lens:	Nikkor 50mm
Horizontal Filed of View (HFoV):	53.5 °
Direction of View from North (0°):	141 °

Coordinates (Easting/Northing):	390261.280 / 440677.445 M
Height Above Ordnance Datum (AOD):	204.039 M
Distance to nearest site boundary / Feature:	0 M
Height of Camera:	1.5 M

Page size / Image size (mm):	841 x 297 / 820 x 260
Principle Distance (mm):	812.5

Proposed Housing and Existing Pump House Extension.
Land East of Windermere Avenue, Colne, Pendle.
Designed by CPL ARCHITECTURE.
Images produced by Visualhorizon3D

Viewpoint 9

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

Visualisation Type	4
Projection	Planar
Enlargement Factor	150% @ A1
Date/Time of Photograph	9-2-2023 / 15.03

Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor
Make & focal length of Lens:	Nikkor 50mm
Horizontal Filed of View (HFoV):	53.5 °
Direction of View from North (0°):	141 °

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Height Above Ordnance Datum (AOD):	204.039 M
Distance to nearest site boundary / Feature:	0 M
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Page size / Image size (mm):	841 x 297 / 820 x 260
Principle Distance (mm):	812.5
Accurate Visual	
Representation type (AVR):	AVR3

Proposed Housing and Existing Pump House Extension.
Land East of Windermere Avenue, Colne, Pendle.
Designed by CPL ARCHITECTURE.
Images produced by Visualhorizon3D

View from location 10

View location

Map Data: Google Earth Pro

Camera tripod location

Baseline photograph

Extent of central 50mm frame used to construct panorama

Extent of 53.5° Planar panorama

This image provides landscape and visual context only

Viewpoint 10

Visualisation Type	4	Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor	Coordinates (Easting/Northing):	390562.321 / 440562.652 M	Page size / Image size (mm):	841 x 297 (half A1) / 820 x 237
Projection	Cylindrical	Make & focal length of Lens:	Nikkor 50mm	Height Above Ordnance Datum (AOD):	204.911 M	Principal distance (mm):	522
Enlargement Factor	96% @ A1	Horizontal Filed of View (HFoV):	90 °	Distance to nearest site boundary / Feature:	110 M		
Date/Time of Photograph	9-2-2023 / 11 .00	Direction of View from North (0°):	312 °	Height of Camera:	1.5 M		

Proposed Housing and Existing Pump House Extension.
Land East of Windermere Avenue, Colne, Pendle.
Designed by CPL ARCHITECTURE.
Images produced by VisualHorizon3D

Wireframe Model

Viewpoint 10

Visualisation Type	4	Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor	Coordinates (Easting/Northing):	390562.321 / 440562.652 M	Page size / Image size (mm):	841 x 297 (half A1) / 820 x 237	**Proposed Housing and Existing Pump House Extension.**	
Projection	Cylindrical	Make & focal length of Lens:	Nikkor 50mm	Height Above Ordnance Datum (AOD):	204.911 M	Principal distance (mm):	522	Land East of Windermere Avenue, Colne, Pendle.	
Enlargement Factor	96% @ A1	Horizontal Filed of View (HFoV):	90 °	Distance to nearest site boundary / Feature:	110 M			Designed by CPL ARCHITECTURE.	
Date/Time of Photograph	9-2-2023 / 11 .00	Direction of View from North (0°):	312 °	Height of Camera:	1.5 M			Images produced by Visualvantages3D	

Wireframe Model

View flat at comfortable arm's length

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

Viewpoint 10

Visualisation Type	4
Projection	Planar
Enlargement Factor	150% @ A1
Date/Time of Photograph	9-2-2023 / 11.00

Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor
Make & focal length of Lens:	Nikkor 50mm
Horizontal Filed of View (HFoV):	53.5 °
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Land East of Windermere Avenue, Colne, Pendle.
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Viewpoint 10

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Visualisation Type	4
Projection	Planar
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Accurate Visual	
Representation type (AVR):	AVR3

Proposed Housing and Existing Pump House Extension.
Land East of Windermere Avenue, Colne, Pendle.
Designed by CPL ARCHITECTURE.
Images produced by Visualhorizon3D

View from location EDP 4

View location

Map Data: Google Earth Pro

Camera tripod location

Baseline photograph

Extent of central 50mm frame used to construct panorama

Extent of 53.5° Planar panorama

This image provides landscape and visual context only

Viewpoint EDP 4

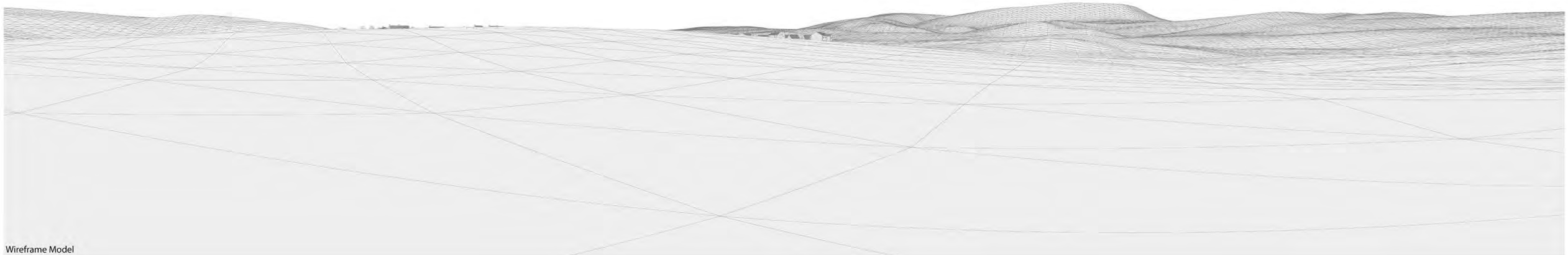
Visualisation Type	4
Projection	Cylindrical
Enlargement Factor	96% @ A1
Date/Time of Photograph	27-3-2023 / 09.22

Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor
Make & focal length of Lens:	Nikkor 50mm
Horizontal Filed of View (HFoV):	90 °
Direction of View from North (0°):	253 °

Coordinates (Easting/Northing):	390836.043 / 441162.713 M
Height Above Ordnance Datum (AOD):	216.954 M
Distance to nearest site boundary / Feature:	530 M
Height of Camera:	1.5 M

Page size / Image size (mm):	841 x 297 (half A1) / 820 x 237
Principal distance (mm):	522

Proposed Housing and Existing Pump House Extension.
Land East of Windermere Avenue, Colne, Pendle.
Designed by CPL ARCHITECTURE.
Images produced by Visualhorizon3D



Wireframe Model

Viewpoint EDP 4

Visualisation Type	4	Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor	Coordinates (Easting/Northing):	390836.043 / 441162.713 M	Page size / Image size (mm):	841 x 297 (half A1) / 820 x 237
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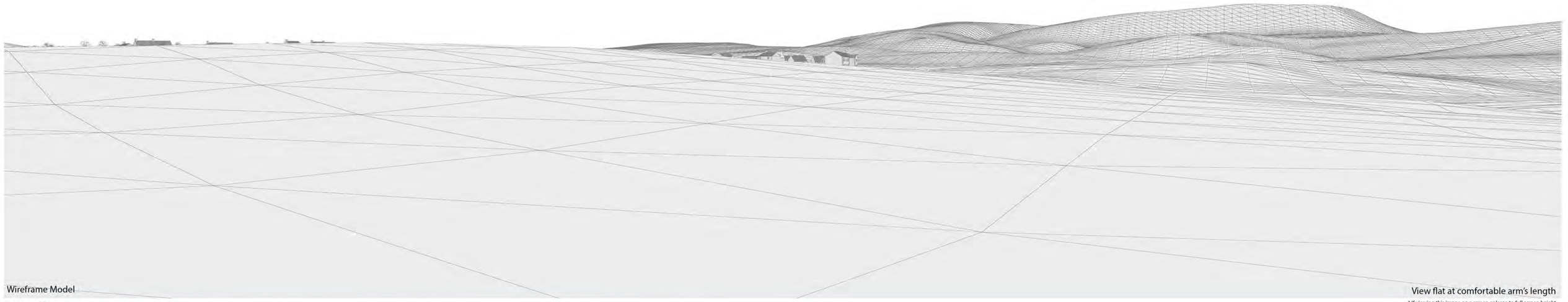
Proposed Housing and Existing Pump House Extension.
Land East of Windermere Avenue, Colne, Pendle.
Designed by CPL ARCHITECTURE.
Images produced by Visualhorizon3D



Wireframe Model

View flat at comfortable arm's length

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Viewpoint EDP 4

Visualisation Type	4
Projection	Planar
Enlargement Factor	150% @ A1
Date/Time of Photograph	27-3-2023 / 09.22

Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor
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Land East of Windermere Avenue, Colne, Pendle.
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Viewpoint EDP 4

Visualisation Type	4
Projection	Planar
Enlargement Factor	150% @ A1
Date/Time of Photograph	27-3-2023 / 09.22

Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor
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Principle Distance (mm):	812.5
Accurate Visual	
Representation type (AVR):	AVR3

Proposed Housing and Existing Pump House Extension.
Land East of Windermere Avenue, Colne, Pendle.
Designed by CPL ARCHITECTURE.
Images produced by Visual**horizon**3D

Visual Representations and Methodology.

Proposed housing and existing pump house extension & change of use.

Land East of Windermere Avenue, Colne, Pendle.

Designed by **CPL ARCHITECTURE**

Views & Methodology by **Visualhorizon3D**

WINTER PANORAMIC VIEW AND PHOTOMONTAGE
TAKEN FROM EDP VIEWPOINT 4
(WITHIN EDP LANDSCAPE AND VISUAL IMPACT ASSESSMENT)

March 2023 2nd Issue

Overview.

The methodology described here follows the recommendations set out in the Guidelines for Landscape and Visual Impact Assessment 3rd edition (GLVIA3), The Landscape Institute Visual Representation of Development Proposals (Technical Guidance Note 06/19) and, where appropriate, Scottish National Heritage (Nature Scot) Visual Representation of Wind Farms.

The visual representations in this document are of the proposed new development at land east of Windermere Avenue, Colne, Pendle, designed by CPLARCHITECTURE. The views are created by Visualhorizon3D. In this instance the view locations were instructed by CPL ARCHITECTURE, presumably after consultation with the relevant local authority and Professional consultants.

We were instructed to create type 4 panoramas for these winter views. Therefore, the recommended 90° baseline cylindrical photograph and matching wireframe were produced (A1 paper width) together with the recommended 53.5° planar wireframe and matching photomontage (also A1 paper width).

It should be noted, as The Landscape Institute Technical Guidance Note 06/19 (1.2.13) states, 'Two-dimensional visualisations, however detailed and sophisticated, can never fully substitute what people would see in reality. They should, therefore, be considered an approximation of the three-dimensional visual experiences that an observer might receive in the field.'

Viewpoint panorama photography.

Photography was undertaken by Visuahorizon3d on 9th February 2023 (except view 2, which was 10th February 2023 and EDP 4 which was 27th March 2023). A Nikon D610 full frame sensor digital camera was used together with a fixed 50mm lens. All efforts were made to take the photographs in good weather conditions. Descriptions and reference photographs were used to easily find the view locations once on site.

It is important that the camera is horizontal and steady. A heavy-duty tripod was set up over the required locations at 1.5M height and a Tribrach leveller fixed on top. A tribrach leveller allows accurate placement over the location as well as allowing levelling ability in the horizontal and vertical planes.

The camera was fixed to a panoramic nodal slider with rotating indexer and adjusted to ensure the camera rotated about the no-parallax point of the lens. This eliminates parallax between successive images and enables accurate stitching of said images later on in the process. These were then fixed to the Tribrach and it was then levelled. The camera was checked again with a spirit level in the vertical and horizontal axis.

The camera was set to manual mode for consistency of focus and exposure throughout the panoramic photographs. Each rotation increment allowed for 50% overlap of images. The location of each viewpoint tripod was also photographed. The location of the camera was recorded by the accompanying surveyor.

Images were captured using the camera RAW file format. These contain the raw information captured by the camera sensor and also allow the photographs to be verified by a third party, if required.

Surveying.

A professional measured building and land surveyor accompanied the photographer and carried out the surveying work for each view.

The surveyor is supplied with an existing site survey and the surveyed points are accurately coordinated into this file using traditional and accepted surveying methods. This can then all be used later in the camera matching process, discussed later.

For each view the camera location was surveyed and static points, seen in the camera field of view (FOV), were also surveyed. These points must be fixed, for example corners of buildings, fixed street furniture, corners of windows and edges of roads and these points are used to check horizontal and vertical alignment when camera matching.

Electronic theodolite and reflectorless laser technology was used to locate each static point and is to a tolerance of +/-5mm. The static points were numbered and all Eastings, Northings and levels Above Ordnance Survey Datum (AOSD) information recorded for each. The points were marked and numbered on the final photograph to be used for camera matching for each view. The surveyor's information was supplied as a combination of CAD file, digital images and a text document, with written descriptions for each point.

Photograph stitching.

Specialist software called Hugin was used to stitch the photographs as cylindrical panoramas. Identical points in the overlapping photos can be either created manually or by the software. This allows the software to create a very accurate panoramic stitch. The images are cropped to the recommended 90°. Optical distortion was removed from the photographs to assist the camera matching process later on.

3D model and camera matching.

CAD drawings were supplied by the architect, including a 2D and 3D topographical site survey, plans, elevations and sections. These explain the construction, position and layout of the proposed development.

Using this information, an accurate 3D model was created in 3D computer graphics software (3D software) called Autodesk 3ds Max with Vray as the renderer. Positions were cross-checked against the supplied information. The 3D model was then accurately positioned over the supplied topographical plans and placed at the correct specified height. The surveyor's information was imported into the 3D software file and correctly overlaid on the topographical plans, ensuring all data was in the correct relationship.

For the wireframe images the recommended documentation requires a Digital Terrain model (DTM) to be used in the views. In this instance the DTM was downloaded from the ordnance survey website as an 'OS terrain 50' model. This was incorporated into the 3D file and was an area large enough to show the distant hills and peaks in the wireframe views. As the height accuracy of this project's 3D Topographical survey is far higher than that of the OS Terrain 50 DTM, the imported DTM file was thus moved down to sit on the 3D file.

For each camera location the relevant 90° cylindrical panorama photograph was used as a background to camera match against. These were shown on screen in the 3D software, and the virtual cameras were located in the correct location and height (using the surveyors coordinates). The real-world camera lens information was input to the corresponding virtual cameras. The output image size for each camera was set to be identical to that of each corresponding background 90° cylindrical panorama. By adjusting each of the virtual camera target points, the surveyed points and corresponding background panoramas all views were accurately lined up. The process was double checked for all cameras.

Wireframe and Photomontage creation.

For the wireframe images the model was given a material that renders out showing the scene as a wireframe. The 90° versions were thus rendered out.

For the photomontage images the scene needs to be accurately lit and textured. The 3D software has the ability to place a light representing the sun at the correct orientation and time (as recorded in the digital photograph) to the accurately placed model. This was setup for each camera location.

The architect supplied details and examples of the materials that will be used for the project. Digital materials and textures were then added to the 3D model to best match the specified finishes. 2D renderings of each location were then generated by the 3D software ready to import into Photoshop and superimpose on the base photographs.

For each photomontage view post-production work was carefully carried out to edit, adjust and blend the two images together. Any objects or parts of the photograph that will be in front/behind the proposed development were edited to show this scenario. There are different ways to achieve this but, suffice to say, the same end result is an image that shows the proposal correctly in place. The architect was consulted with regards material finishes. Any subtle amendments such as hue, saturation etc were made to finalise the image.

As the 53.5° wireframe and photomontage views are recommended to be assessed in planar projection, the 90° cylindrical renders of each view were opened in Hugin and re-projected from cylindrical to planar. They were then cropped to 53.5° and saved out to form those images.

Baseline photograph

Extent of central 50mm frame used to construct panorama

Extent of 53.5° Planar panorama

This image provides landscape and visual context only

Viewpoint EDP 4

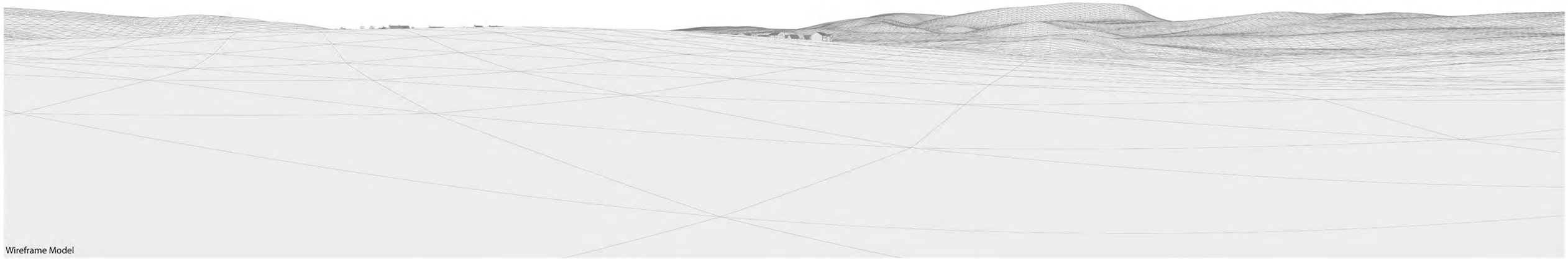
Visualisation Type	4
Projection	Cylindrical
Enlargement Factor	96% @ A1
Date/Time of Photograph	27-3-2023 / 09.22

Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor
Make & focal length of Lens:	Nikkor 50mm
Horizontal Filed of View (HFoV):	90 °
Direction of View from North (0°):	253 °

Coordinates (Easting/Northing):	390836.043 / 441162.713 M
Height Above Ordnance Datum (AOD):	216.954 M
Distance to nearest site boundary / Feature:	530 M
Height of Camera:	1.5 M

Page size / Image size (mm):	841 x 297 (half A1) / 820 x 237
Principal distance (mm):	522

Proposed Housing and Existing Pump House Extension.
Land East of Windermere Avenue, Colne, Pendle.
Designed by CPL ARCHITECTURE.
Images produced by Visualhorizon3D



Wireframe Model

Viewpoint EDP 4

Visualisation Type	4	Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor	Coordinates (Easting/Northing):	390836.043 / 441162.713 M	Page size / Image size (mm):	841 x 297 (half A1) / 820 x 237
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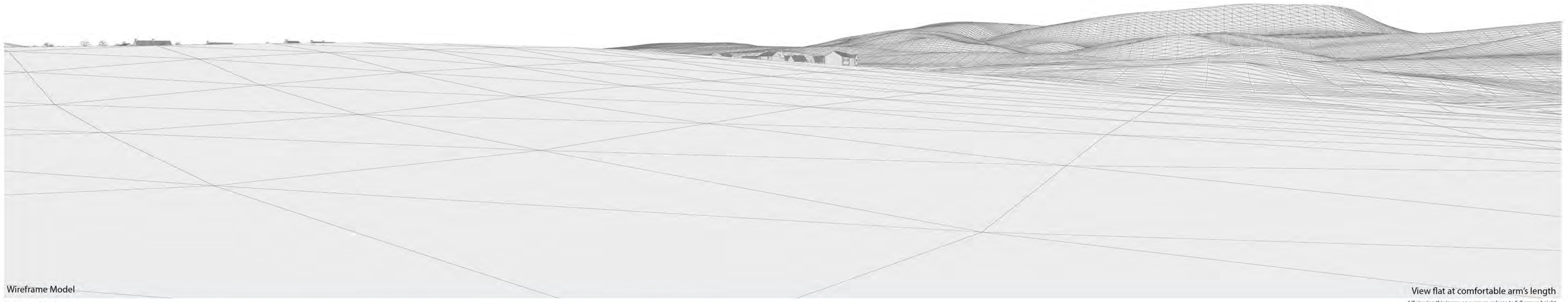

Wireframe Model

View flat at comfortable arm's length

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Viewpoint EDP 4

Visualisation Type	4
Projection	Planar
Enlargement Factor	150% @ A1
Date/Time of Photograph	27-3-2023 / 09.22

Camera Make, Model & sensor format:	Nikon, D610 & Full Frame Sensor
Make & focal length of Lens:	Nikkor 50mm
Horizontal Filed of View (HFoV):	53.5 °
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Enlargement Factor	150% @ A1
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Representation type (AVR):	AVR3

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