Appendix 4.5 – MS Environmental Photography and Photomontage Methodology

Appendix 1

Technical Photography,
3D Modelling and Verified Visualisations

Illustrative Masterplan and Tree Removal Proposals

Six56

Warrington

November 2021

End Barn . 58 Shaw Lane . Oxenhope . West Yorkshire . UK . BD22 9QL . www.msenvironmental.co.uk

Contents

Introduction

Mike Spence BA (Hons), MLD, CMLI, REIA, FRGS is a one of the UK's leading independent exponents of technical photography, verified photomontages and visualisations. Since 2013 Mike has been a technical advisor to the Landscape Institute on 'photography and photomontage in landscape and visual impact assessment', and has been undertaking this work for over 25 years. He is one of the main authors of the Landscape Institute's TGN 06/19 and provided technical support to Scottish Natural Heritage on their windfarm visualisation guidance. His background as a Chartered Landscape Architect, Registered EIA Practitioner and Fellow of the Royal Geographic Society working on strategic infrastructure projects has meant that the accuracy of the visualisation work is paramount, and technical photography, together with extensive surveying experience and detailed 3D modelling using real world co-ordinates ensures that the visualisations produced follow a clear and transparent methodology to ensure they are as accurate as possible.

Recent projects include the UNESCO World Heritage Sites at Kew Royal Botanic Gardens, Fountains Abbey for The National Trust, and Derwent Valley Mills for Amber Valley Borough Council. Mike has halso been working closely with Bath City Council on proposed development in the UNESCO World Heritage City of Bath. Mike's work and objective technical checks have been used at numerous Public Inquiries and Planning Hearings, on behalf of both local authorities and developers.

In September 2018 Layer contacted MSE to request Technical Photography, GNSS/RTK Surveying, 3D Modelling and Visualisation support for the proposed Six56 development. In October 2021 Langtree engaged MSE to update the original 3D modelling of the Illustrative masterplan in consultation with Stephen George & Partners LLP.

Verified Photography and 3D Modelling

The photographs were taken with a full frame camera (Canon EOS 5D Mark III) and 50mm lens combination consistent with Landscape Institute's TGN 06/19, GLVIA3 and the emerging understanding of the requirement for technical photography for visualisation work. As part of the work 24 viewpoints were identified providing views of the site and visited on 24 & 25 Septemberber 2018. The weather was excellent with clear visibility.

Night time photographs were taken 22, 23, 24 June & 2 July 2020 using (Canon EOS 5D Mark III) and 24mm lens, at 30 minute intervals from day time into deep night.

Technical Photography

The camera was mounted on a Manfrotto 303 SPH panoramic tripod head, levelled using a Manfrotto Leveller, supported on a Manfrotto Tripod. The tripod head was levelled using a spirit level, to avoid pitch and roll. The camera was set with the centre of the lens 1.60m above ground level.

Photographs were taken in Manual mode with an aperture of f/8 or f/11 and a fixed focal length throughout. The panoramic tripod head was set with increments to give approximately 50% overlap between frames. Photographs were taken in both landscape and portrait format. From each photograph location a full 360 degree field of view was taken centred around a nodal point. The nodal point was set to avoid any problems of foreground parallax. A Sigma 50mm f/1.4 lens was used for all viewpoint photographs.

The reason why different lenses were used in both landscape and portrait orientation can be understood as follows:

50mm lens in Landscape Orientation

50mm lens in Portrait Orientation

For each 360 degree panorama the images were cylindrically corrected and stitched together. This allowed an accurate cylindrical view to be extracted from the full panorama.

Technical information for the camera locations is provided in Appendix 1.1.

Surveying

The position of each camera location was surveyed using Spectra Precision GNSS equipment with Real Time KinematicCorrection (RTK) which achieves an accuracy down to 1cm in eastings, northings and height (metres Above Ordnance Datum). The equipment included Spectra Precision SP80 GNSS smart antennae with Mobile Mapper 20 data recorder. Points were saved using DigiTerra software. A photograph of the camera location was taken, and shown in Appendix 1.1.

3D Modelling

MSEnvironmental constructed a geo-referenced 3D model using Rhino 3D from a 3D surface model supplied by Cundall (for generation of a surface mesh and geo-referencing) together with Ordnance Survey Terrain 5 data. The Six56 development layout was supplied by Stephen George and Partners LLP The model was re-built and geo-referenced and placed in the Cundall model with ground heights to correspond wth the site layout. 2 stages of planting were included: 1 & 15.

Camera locations surveyed on site were added to the geo-referenced 3D model.

Target points were taken from the existing features in the view and built into the 3D model. This allowed the horizontal and vertical alignment of the photograph and 3D model to be checked, cross-referenced and verified.

Cylindrical renders generated using VRay for Rhino were exported from the 3D modelling software and used to overlay the cylindrical panorama.

Target points from both the photograph and the model view were aligned to ensure a precise fit between the two images.

The results are presented as a sequence of visualisations as follows:

1. *Existing View*

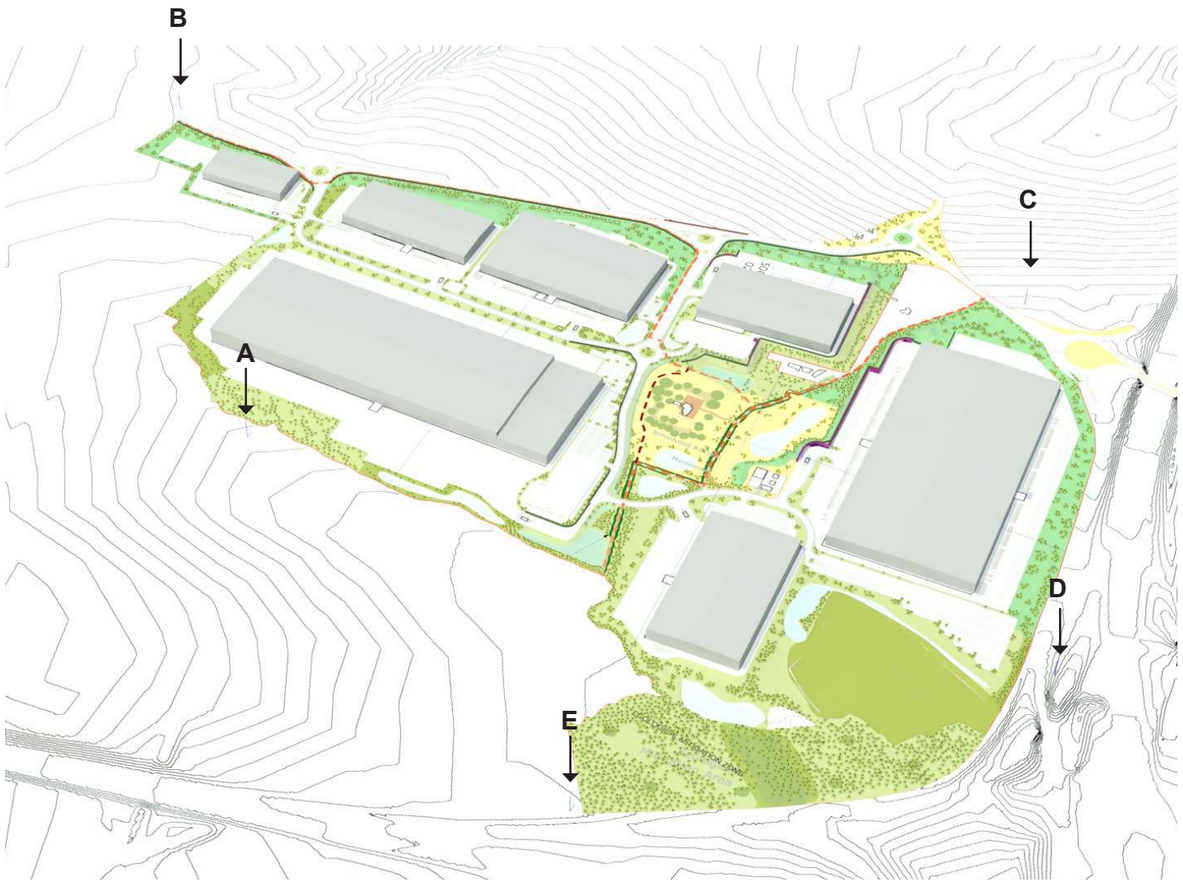
2. *3D Model View*

3. *Composite 3D Model Photo-Overlay View*

4. *Photomontage*

The topography of the site has been generated from a site topographical survey supplied by Cundall. The surrounding landform has been created using a combination of 1m LiDAR data, downloaded from the Environment Agency Opensource datasets, and Ordnance Survey Terrain 5 DTM data, with triangulated surfaces generated using Rhinoterrain.

The 3D Model was built by MSEnvironmental. It is fully geo-referenced and positioned to correspond with the site layout and elevations supplied in the illustrative masterplan :



Six56 Illustrative Layout with 30m tall columns for camera/model atching

Column locations (A-E):

364704 384611 66.71 mAOD
365988 384993 56.67 mAOD
366333 384407 52.42 mAOD
365969 383892 55.77 mAOD
365262 384132 59.26 mAOD

Landscaping Proposals have been produced by Layer. Two stages of planting have been modelled: Year 1 and Year 15

Year 1 Trees 2.5m
Year 15 Trees 8m

Six56 Illustrative Layout with 30m tall columns for camera/model matching (Year 1)

Six56 Illustrative Layout with 30m tall columns for camera/model matching (Year 15)

Column locations (A-E):

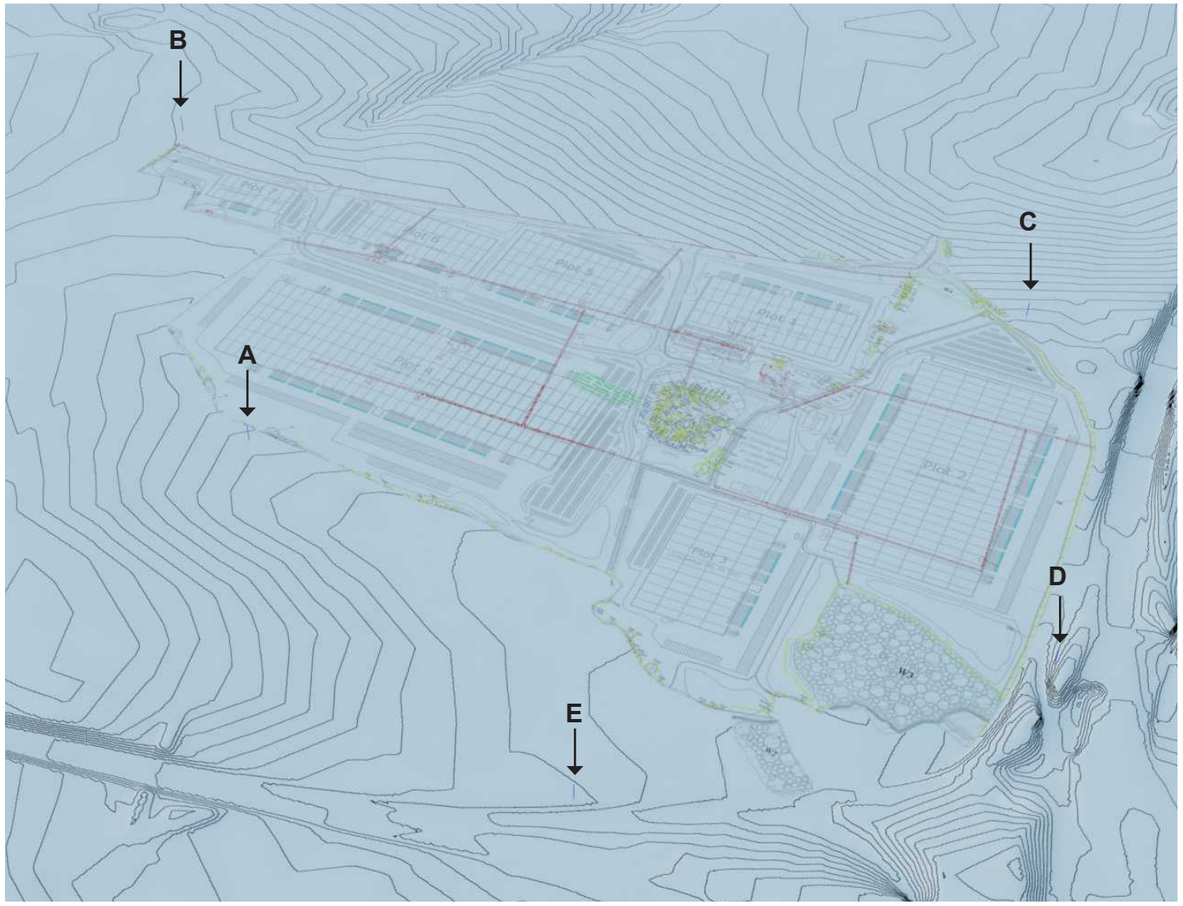
364704	384611	66.71 mAOD
365988	384993	56.67 mAOD
366333	384407	52.42 mAOD
365969	383892	55.77 mAOD
365262	384132	59.26 mAOD

The tree removal proposals were added into the model based on the trees removal plans supplied by Landscape Science Consultancy Ltd.

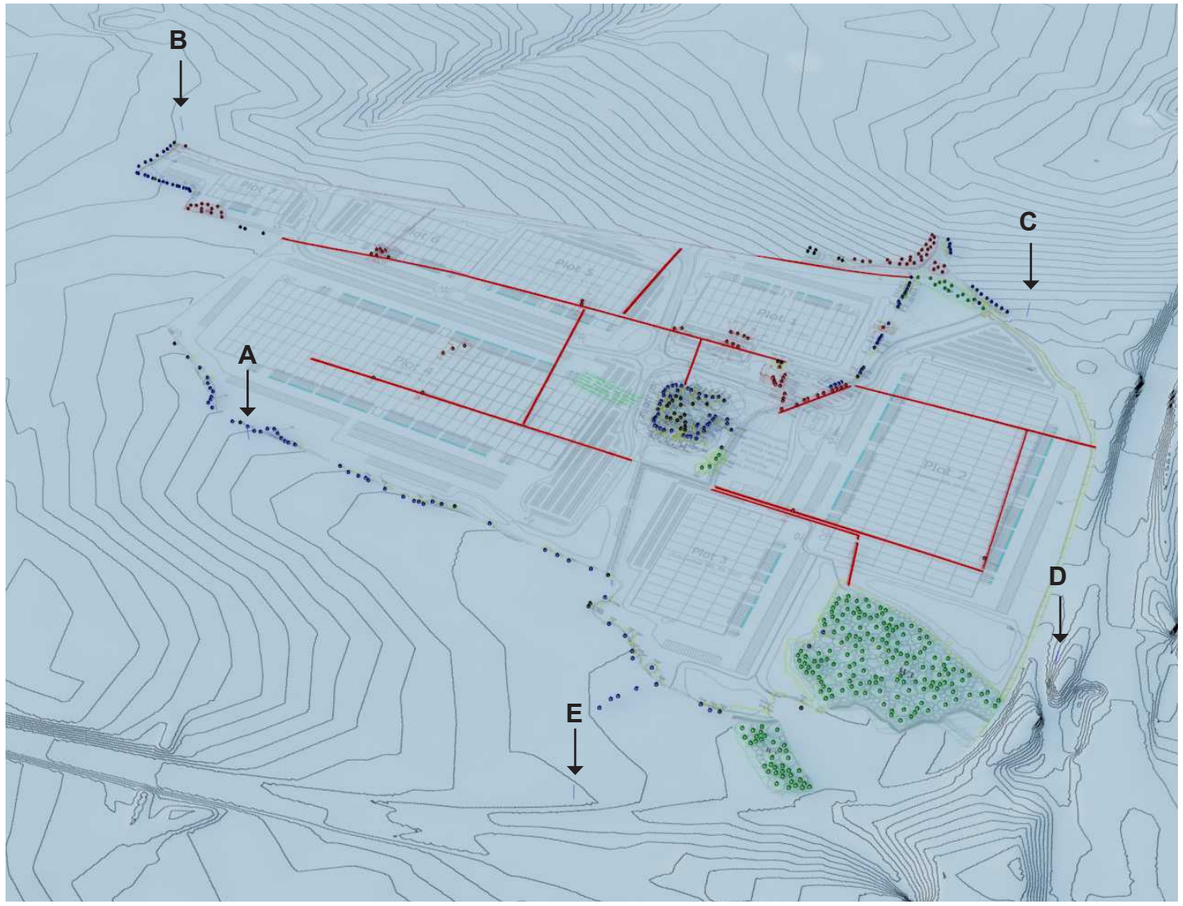
The photomontages have been edited to remove trees shown to be removed.

Trees have been included at a height of 8metres. Hedgerows are set at 1.5m
The colours used in the 3D model correspond with the LSC Ltd key

Red	To be Removed
Green	High Value retained
Blue	Moderate Value retained
Grey	Low Value retained
Black	Negligible Value retained



Six56 Tree Removal Plan with 30m tall columns for camera/model matching



Six56 Tree Removal Plan 3D Model with 30m tall columns for camera/model matching

Column locations (A-E):

364704 384611 66.71 mAOD
365988 384993 56.67 mAOD
366333 384407 52.42 mAOD
365969 383892 55.77 mAOD
365262 384132 59.26 mAOD

Planar vs Cylindrical Projection

All photographs are taken as a series of single frame planar images. A planar image is a single frame image which has a single point of perspective lying centrally in the image. The limitation of single frame images is that they have a limited horizontal field of view. To allow a wider field of view we stitch the individual planar images using software, such as PTGUI which automatically corrects the geometrically to give a cylindrical panoramic image. To undertake this accurately the use of a levelled tripod and panoramic tripod head set up to avoid forground parallax is necessary.

A full 360 degree panorama is taken with overlapping images. These images are stitched together and cylndrically projected, as if the panorama was being located in the inner face of a cylinder.

The 3D model renders are rendered out in cylindrical perspective to allow the image re-mapping to match the photograph.

3D Modelling software

The work has largely been undertaken using Rhino 3D. All 3D modelling has been undertaken in metres and geo-referenced to align with OSGB36. RESOFT Windfarm was also used which is a 3D modelling package which we use to check on vertical alignment of the 3D model. This is also set up to OSGB36 and the alignment of the 30metre tall columns between the two 3D modelling packages ensures that we have complete understanding of the positioning and vertical extent of the proposed building. RESOFT Windfarm has been used to generate the geometric grid from LiDAR DTM data present in all 3D model visualisations.

VRay for Rhino has been used for rendering. The use of a sunlight sytem adds a 3 dimensional effect with shadow, to understand the form and materials of the proposed building.

Viewing Printed Images

The visualisations have been prepared to be printed at A1 wide by A4 high (841mm x 297mm).

The existing view and all visualisations have been produced in cylindrical projection.

Summary

This work has been undertaken in accordance with the the Landscape Instute TGN 06/19 and the developing understanding of visualisation work. The accuracy of camera locations and 3D modelling conforms with Type 4 (the highest level of accuracy). The 3D modelling has been produced to AVR2.

The photography has been undertaken in a robust manner, using professional full frame sensor DSLR and 50mm lens with panoramic head and tripod. The camera position has been surveyed using highly accurate GNSS equipment, giving high levels of accuracy of camera location. The 3D model has been built in Rhino 3D. An additional check on the vertical scaling has been undertaken using RESOFT Windfarm. The resultant visualisations are highly accurate

The existing photographic panoramas have been edited to remove those trees and hedges identified as being removed as part of the construction works.

The photography, surveying and 3D modelling have followed a transparent methodology, and the resultant visualisations are considered robust and fit for purpose to illustrate the positioning, and scale and massing of the proposed illustrative layout in its local context.

M.A.Spence BA(Hons), MLD, CMLI, REIA, FRGS 12 November 2021
Principal, MSEnvironmental

The following photographs with accompanying maps and grid co-ordinates illustrate precisely where the photographs were taken from. This would allow anyone to visit the camera location and gain the same view as that used for the visualisations:

VIEWPOINT 1

Camera Location:

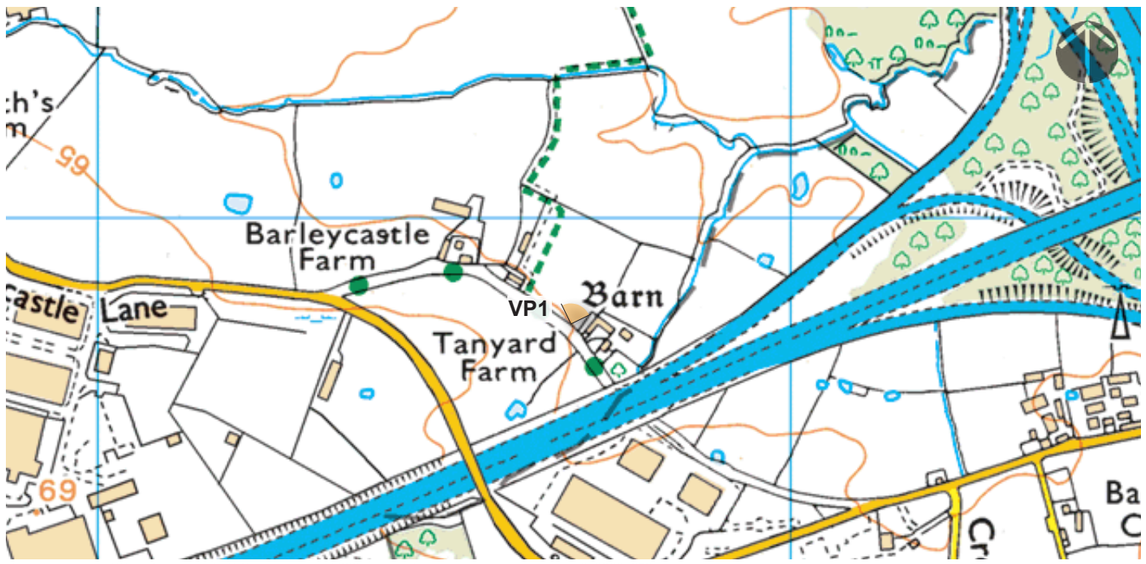
Camera Location:

365687.78 (E) 383840.08(N)
61.07 mAOD(Sensor Height)

Date/Time of Photography:
25 September **2018/12:40**

Camera Equipment:
Canon EOS 5D Mark III
50mm f1,4 Lens

Survey Equipment:
SP80 GNSS/RTK
Mobilemapper 20
DigiTerra



Panorama:

No visualisations produced

VIEWPOINT 2

Camera Location:

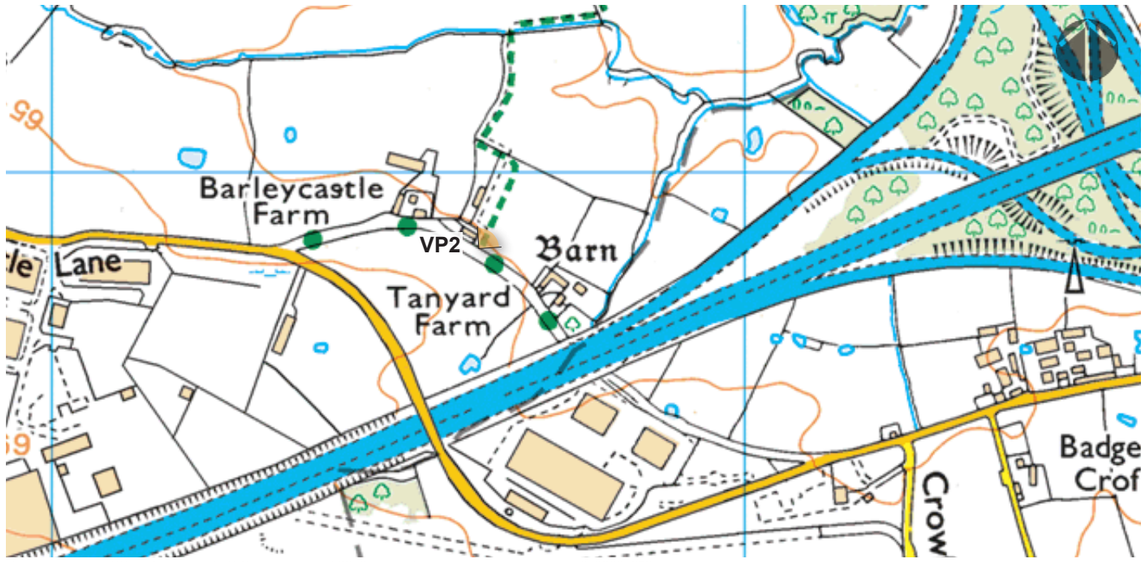
Camera Location:

365613.79 (E) 383892.48(N)
61.94 mAOD(Sensor Height)

Date/Time of Photography:
25 September **2018/12:50**

Camera Equipment:
Canon EOS 5D Mark III
50mm f1,4 Lens

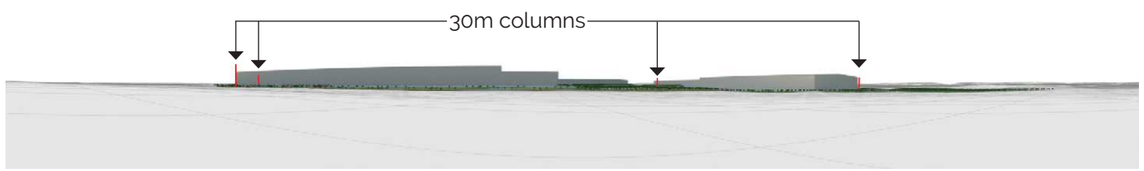
Survey Equipment:
SP80 GNSS/RTK
Mobilemapper 20
DigiTerra



Photograph - 3D Model Mapping:

Existing View

3D Model with columns



Composite View

Photomontage View

VIEWPOINT 3

Camera Location:

Camera Location:

365655.85 (E) 384197.31N)
57.51 mAOD(Sensor Height)

Date/Time of Photography:
25 September **2018/13:00**

Camera Equipment:
Canon EOS 5D Mark III
50mm f1,4 Lens

Survey Equipment:
SP80 GNSS/RTK
Mobilemapper 20
DigiTerra

Panorama:

No visualisations produced

VIEWPOINT 4

Camera Location:

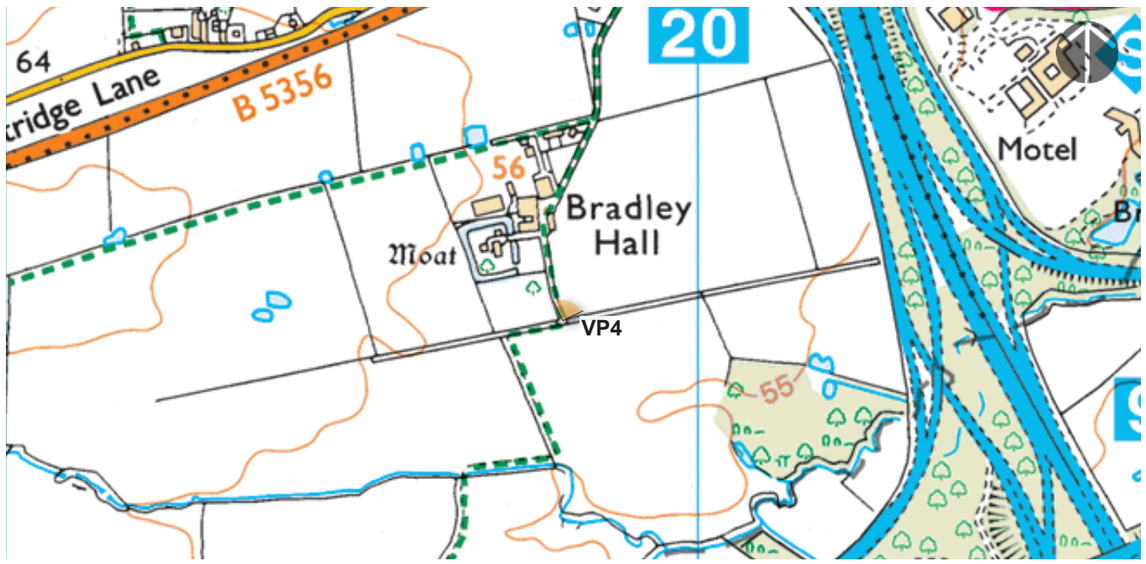
Camera Location:

365811.56 (E) 384421.09N)
58.70 mAOD(Sensor Height)

Date/Time of Photography:
25 September 2018/13:15

Camera Equipment:
Canon EOS 5D Mark III
50mm f1,4 Lens

Survey Equipment:
SP80 GNSS/RTK
Mobilemapper 20
DigiTerra

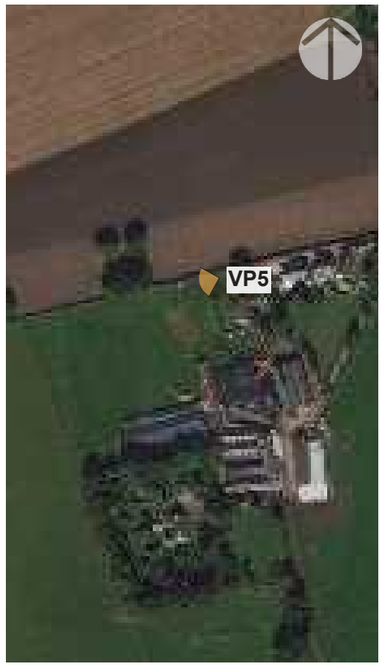


Panorama:

No visualisations produced

VIEWPOINT 5

Camera Location:



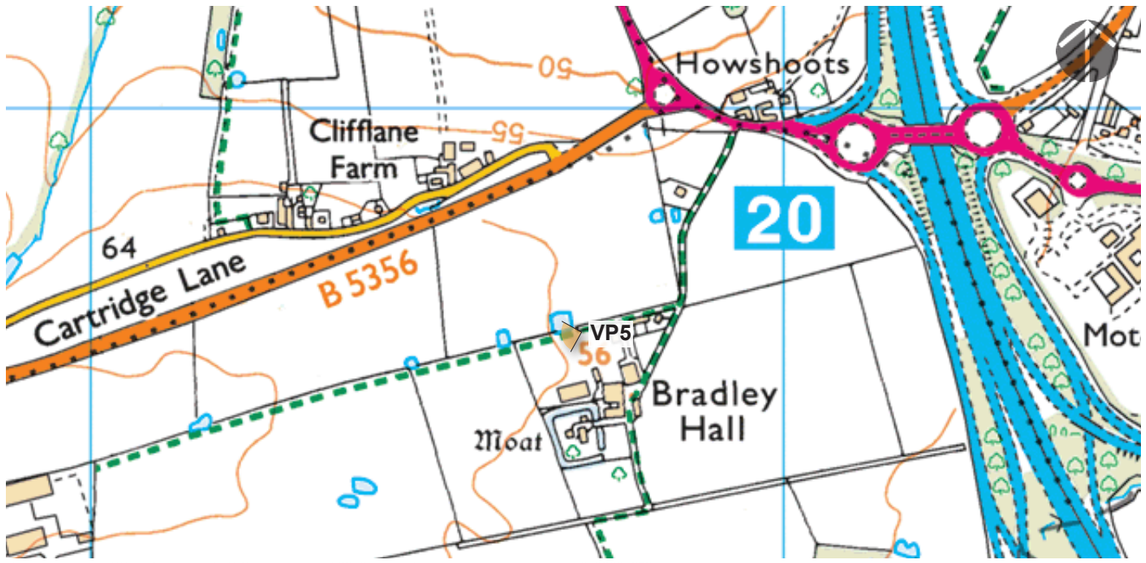
Camera Location:

365728.10 (E) 384679.02N)
60.72 mAOD(Sensor Height)

Date/Time of Photography:
25 September 2018/13:30

Camera Equipment:
Canon EOS 5D Mark III
50mm f1,4 Lens

Survey Equipment:
SP80 GNSS/RTK
Mobilemapper 20
DigiTerra



Panorama:

No visualisations produced

VIEWPOINT 6

Camera Location:

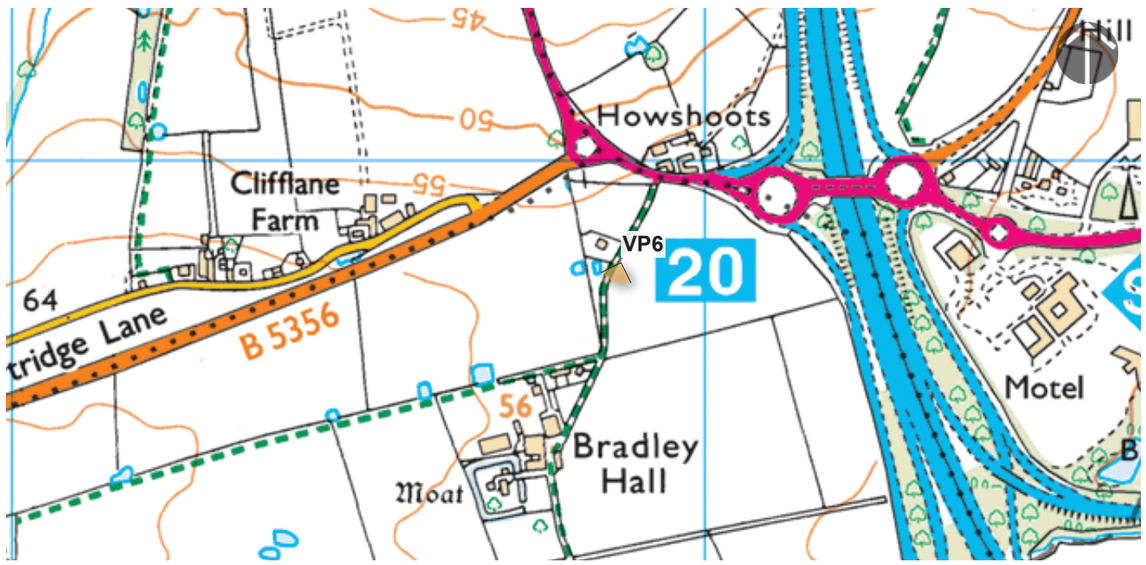
Camera Location:

365879.10 (E) 384851.18 (N)
60.37 mAOD(Sensor Height)

Date/Time of Photography:
25 September **2018/16:10**

Camera Equipment:
Canon EOS 5D Mark III
50mm f1,4 Lens

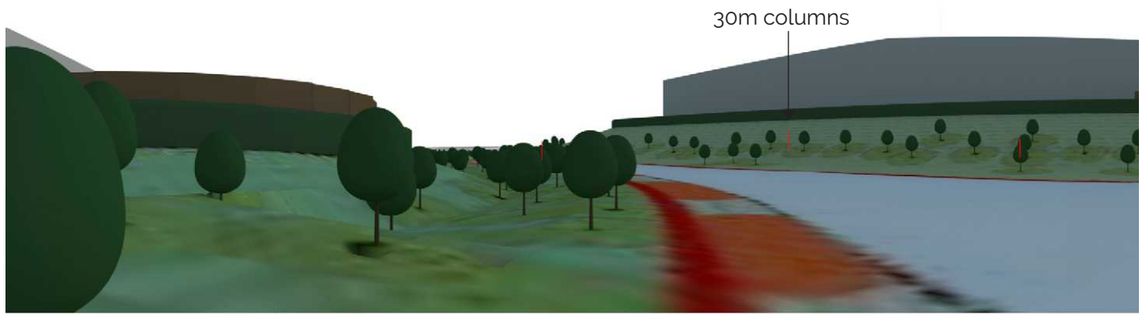
Survey Equipment:
SP80 GNSS/RTK
Mobilemapper 20
DigiTerra



Photograph - 3D Model Mapping:

Existing View

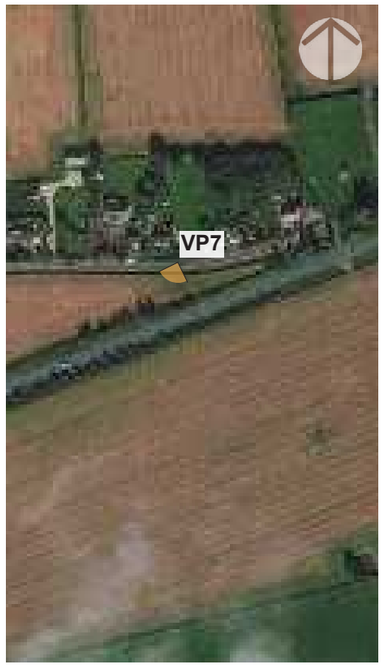
3D Model with columns



Composite View

VIEWPOINT 7

Camera Location:



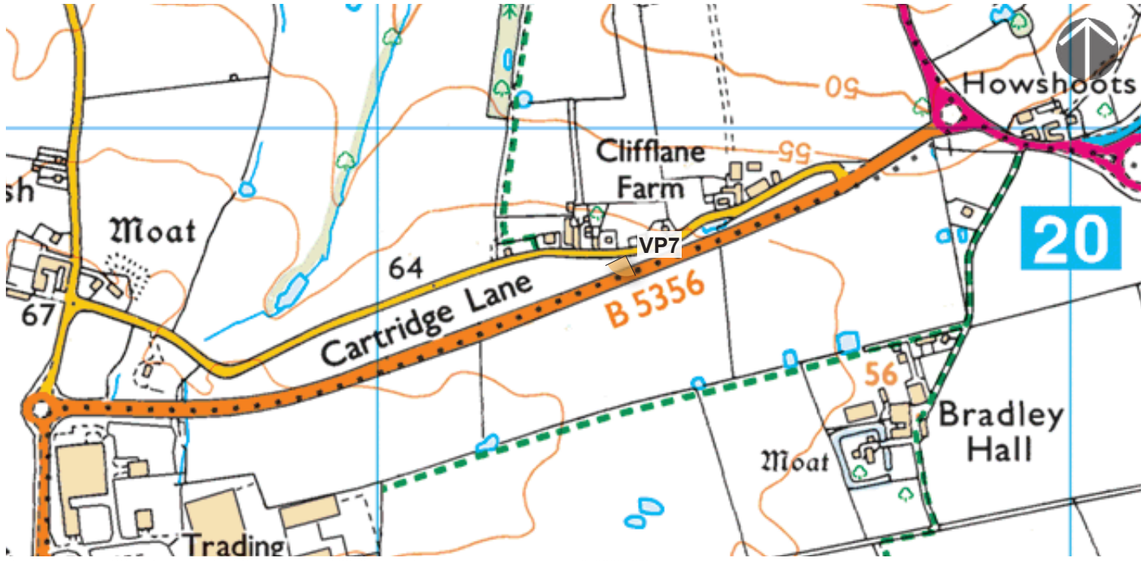
Camera Location:

365302.78 (E) 384824.76 (N)
63.26 mAOD(Sensor Height)

Date/Time of Photography:
25 September **2018/15:45**

Camera Equipment:
Canon EOS 5D Mark III
50mm f1,4 Lens

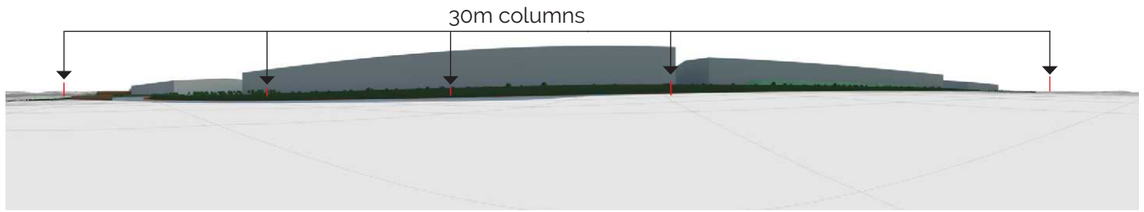
Survey Equipment:
SP80 GNSS/RTK
Mobilemapper 20
DigiTerra



Photograph - 3D Model Mapping:

Existing View

3D Model with columns



Composite View

Photomontage View

VIEWPOINT 8

Camera Location:

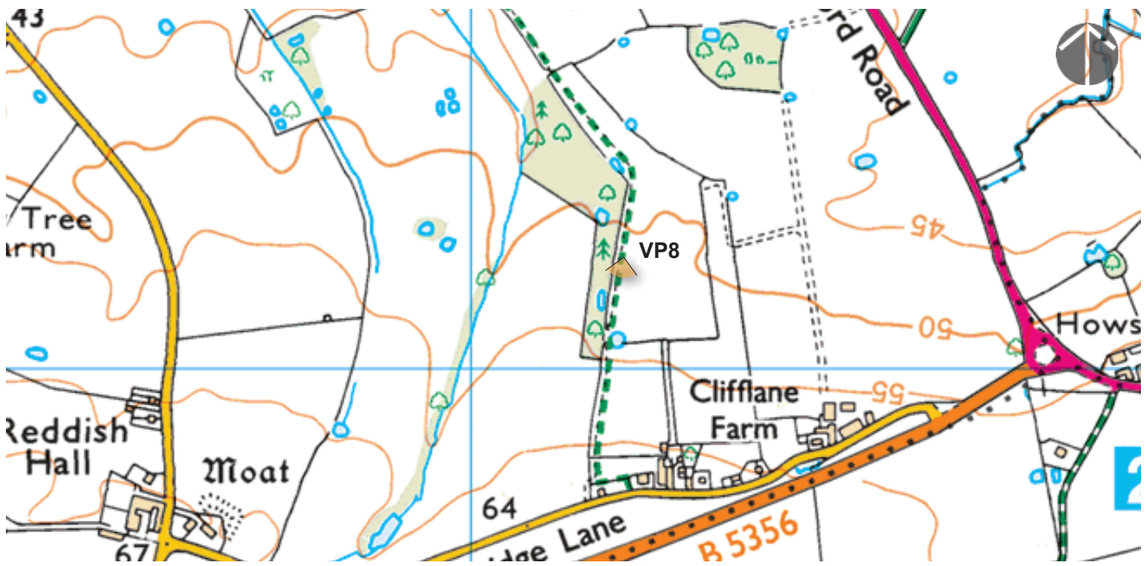
Camera Location:

365194.82 (E) 384990.18 (N)
56.59 mAOD(Sensor Height)

Date/Time of Photography:
25 September **2018/15:40**

Camera Equipment:
Canon EOS 5D Mark III
50mm f1,4 Lens

Survey Equipment:
SP80 GNSS/RTK
Mobilemapper 20
DigiTerra



Panorama:

No visualisations produced

VIEWPOINT 9

Camera Location:

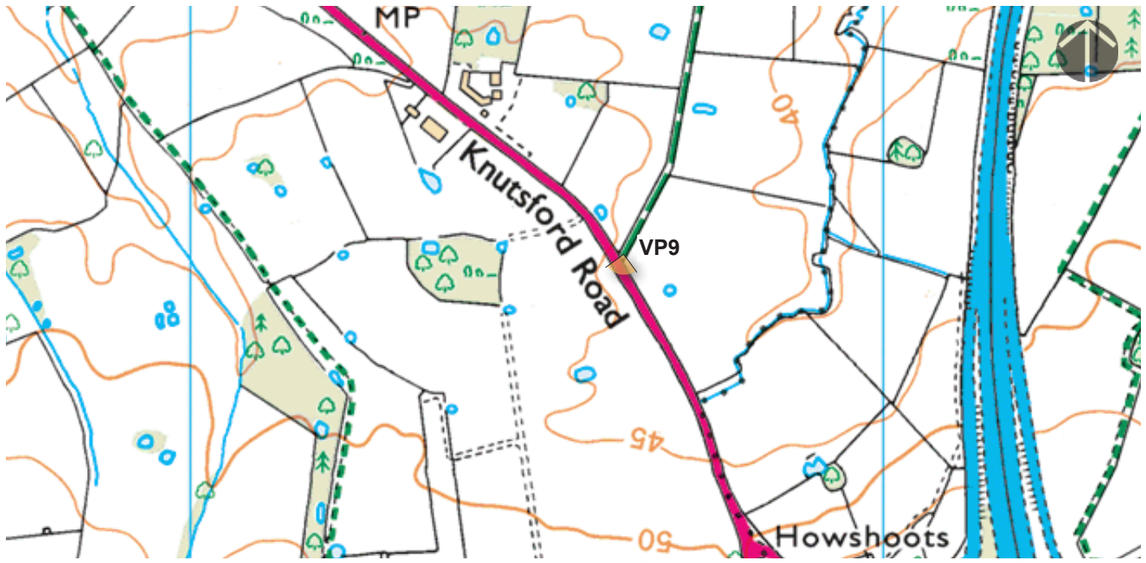
Camera Location:

365634.43 (E) 385476.15 (N)
46.39 mAOD(Sensor Height)

Date/Time of Photography:
25 September 2018/16:00

Camera Equipment:
Canon EOS 5D Mark III
50mm f1,4 Lens

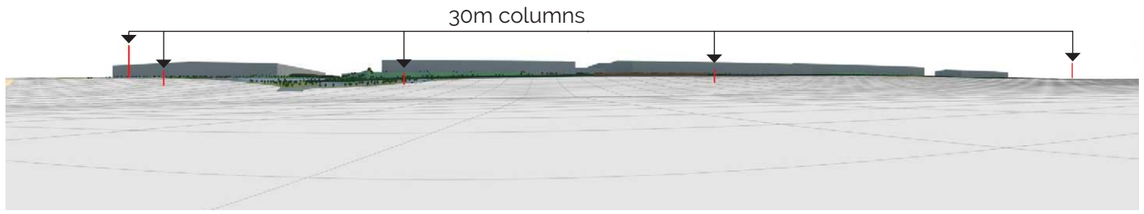
Survey Equipment:
SP80 GNSS/RTK
Mobilemapper 20
DigiTerra



Photograph - 3D Model Mapping:

Existing View

3D Model with columns

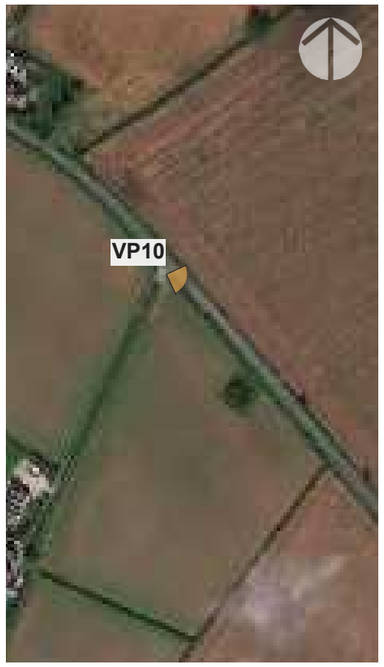


Composite View

Photomontage View

VIEWPOINT 10

Camera Location:



Camera Location:

364337.08 (E) 385471.50 (N)
44.83 mAOD(Sensor Height)

Date/Time of Photography:
24 September **2018/15:10**

Camera Equipment:
Canon EOS 5D Mark III
50mm f1,4 Lens

Survey Equipment:
SP80 GNSS/RTK
Mobilemapper 20
DigiTerra

Panorama:

No visualisations produced

VIEWPOINT 11

Camera Location:

Camera Location:

363805.47 (E) 384599.26 (N)
67.93 mAOD(Sensor Height)

Date/Time of Photography:
24 September 2018/15:40

Camera Equipment:
Canon EOS 5D Mark III
50mm f1,4 Lens

Survey Equipment:
SP80 GNSS/RTK
Mobilemapper 20
DigiTerra

Panorama:

No visualisations produced

VIEWPOINT 12

Camera Location:

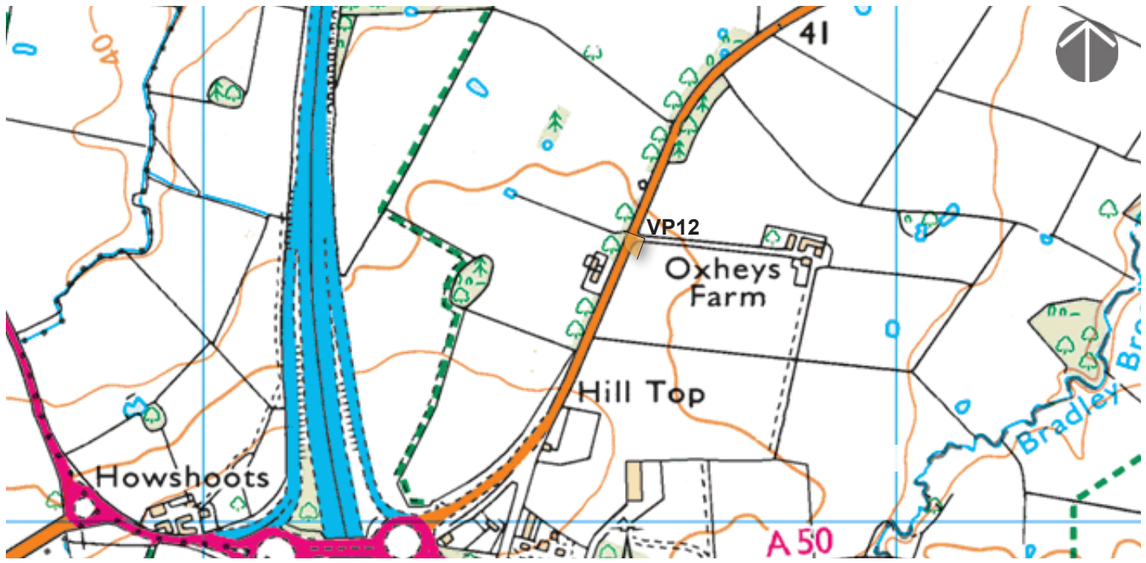
Camera Location:

366630.74 (E) 385408.33 (N)
52.16 mAOD(Sensor Height)

Date/Time of Photography:
25 September 2018/10:00

Camera Equipment:
Canon EOS 5D Mark III
50mm f1,4 Lens

Survey Equipment:
SP80 GNSS/RTK
Mobilemapper 20
DigiTerra



Panorama:

No visualisations produced

VIEWPOINT 13

Camera Location:

Camera Location:

368191.92 (E) 383997.98 (N)
66.02 mAOD(Sensor Height)

Date/Time of Photography:
25 September **2018/11:10**

Camera Equipment:
Canon EOS 5D Mark III
50mm f1,4 Lens

Survey Equipment:
SP80 GNSS/RTK
Mobilemapper 20
DigiTerra

Panorama:

No visualisations produced

VIEWPOINT 14

Camera Location:

Camera Location:

368081.71 (E) 382600.03 (N)
53.80 mAOD(Sensor Height)

Date/Time of Photography:
25 September **2018/11:20**

Camera Equipment:
Canon EOS 5D Mark III
50mm f1,4 Lens

Survey Equipment:
SP80 GNSS/RTK
Mobilemapper 20
DigiTerra

Panorama:

No visualisations produced

VIEWPOINT 15

Camera Location:

Camera Location:

366261.87 (E) 382814.22 (N)
64.31 mAOD(Sensor Height)

Date/Time of Photography:
25 September **2018/11:40**

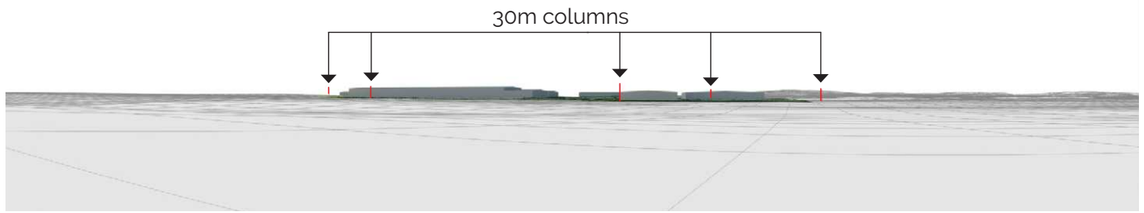
Camera Equipment:
Canon EOS 5D Mark III
50mm f1,4 Lens

Survey Equipment:
SP80 GNSS/RTK
Mobilemapper 20
DigiTerra

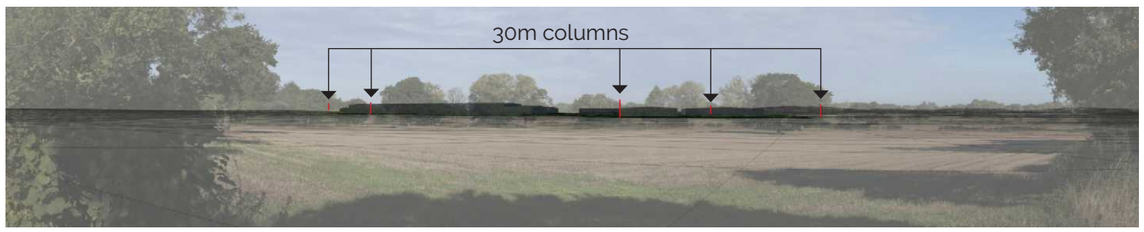
Photograph - 3D Model Mapping:

Existing View

3D Model with columns



Composite View



Photomontage View

VIEWPOINT 16

Camera Location:

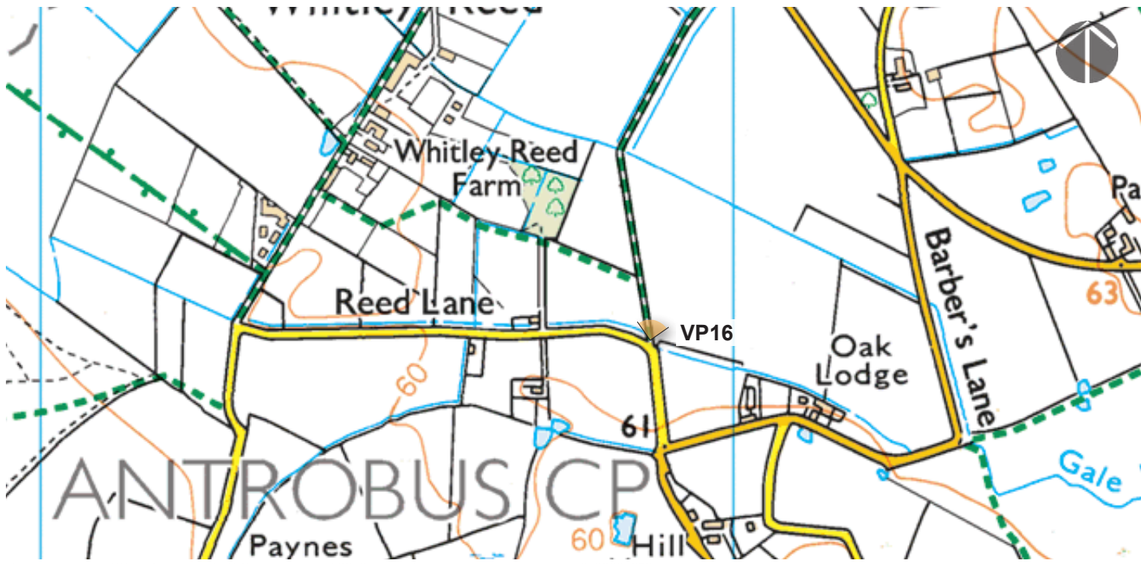
Camera Location:

364884.52 (E) 381466.36 (N)
60.06 mAOD(Sensor Height)

Date/Time of Photography:
25 September **2018/11:55**

Camera Equipment:
Canon EOS 5D Mark III
50mm f1,4 Lens

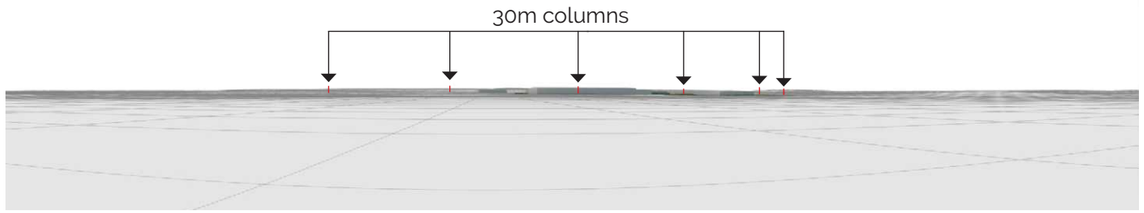
Survey Equipment:
SP80 GNSS/RTK
Mobilemapper 20
DigiTerra



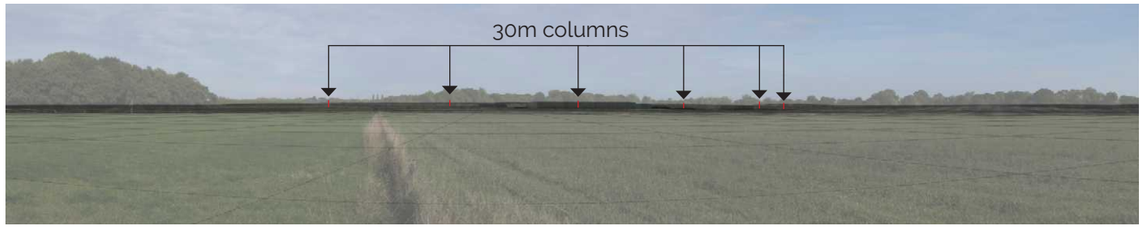
Photograph - 3D Model Mapping:

Existing View

3D Model with columns



Composite View



Photomontage View

VIEWPOINT 17

Camera Location:

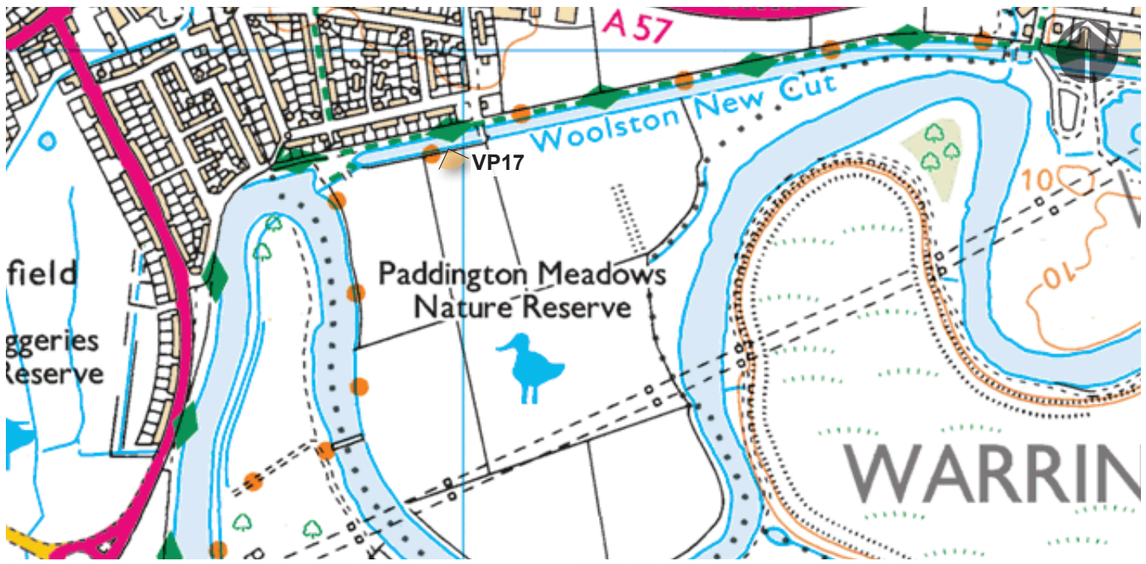
Camera Location:

362963.63 (E) 388835.74 (N)
8.18 mAOD(Sensor Height)

Date/Time of Photography:
25 September 2018/14:15

Camera Equipment:
Canon EOS 5D Mark III
50mm f1,4 Lens

Survey Equipment:
SP80 GNSS/RTK
Mobilemapper 20
DigiTerra

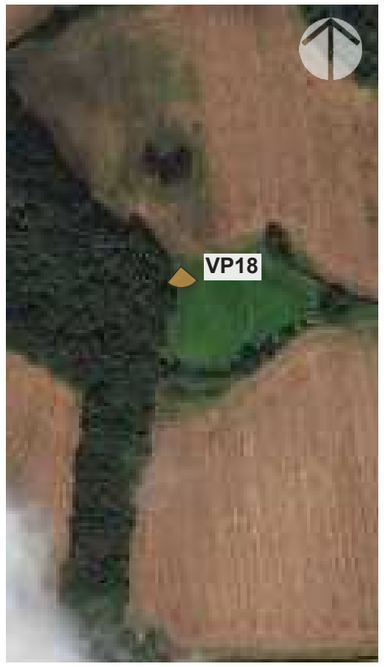


Panorama:

No visualisations produced

VIEWPOINT 18

Camera Location:



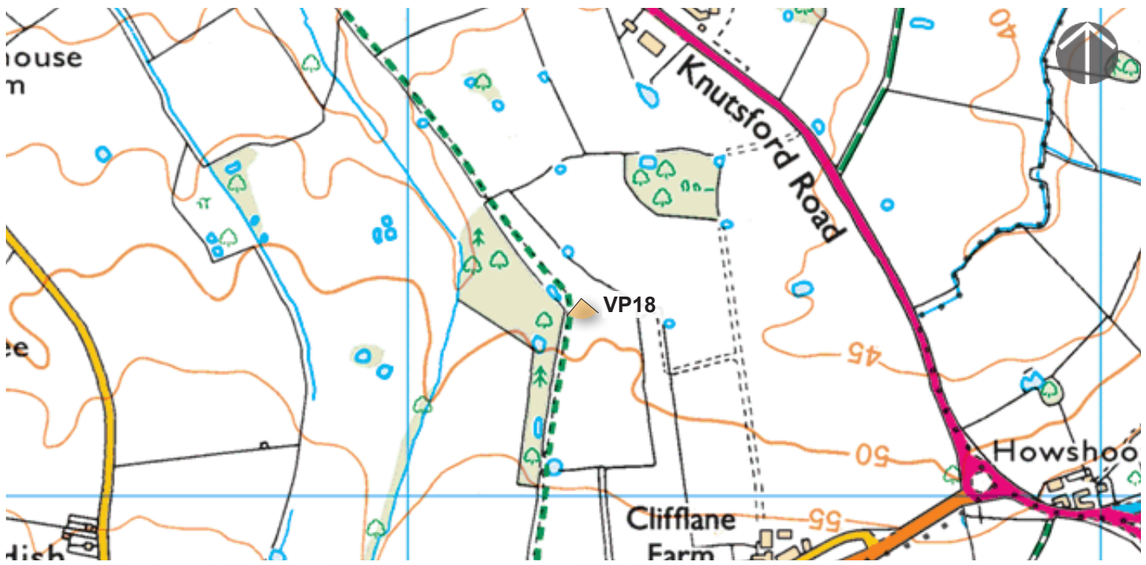
Camera Location:

365242.47 (E) 385284.36 (N)
53.66 mAOD(Sensor Height)

Date/Time of Photography:
25 September 2018/15:15

Camera Equipment:
Canon EOS 5D Mark III
50mm f1,4 Lens

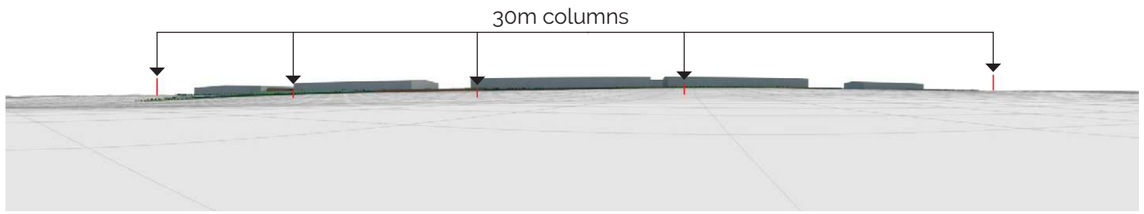
Survey Equipment:
SP80 GNSS/RTK
Mobilemapper 20
DigiTerra



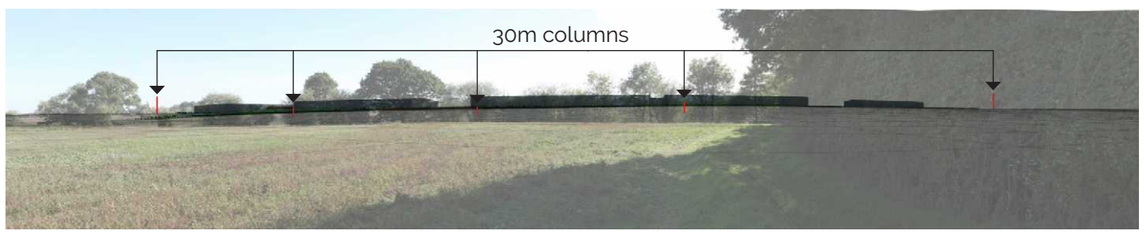
Photograph - 3D Model Mapping:

Existing View

3D Model with columns



Composite View



Photomontage View

VIEWPOINT 19

Camera Location:

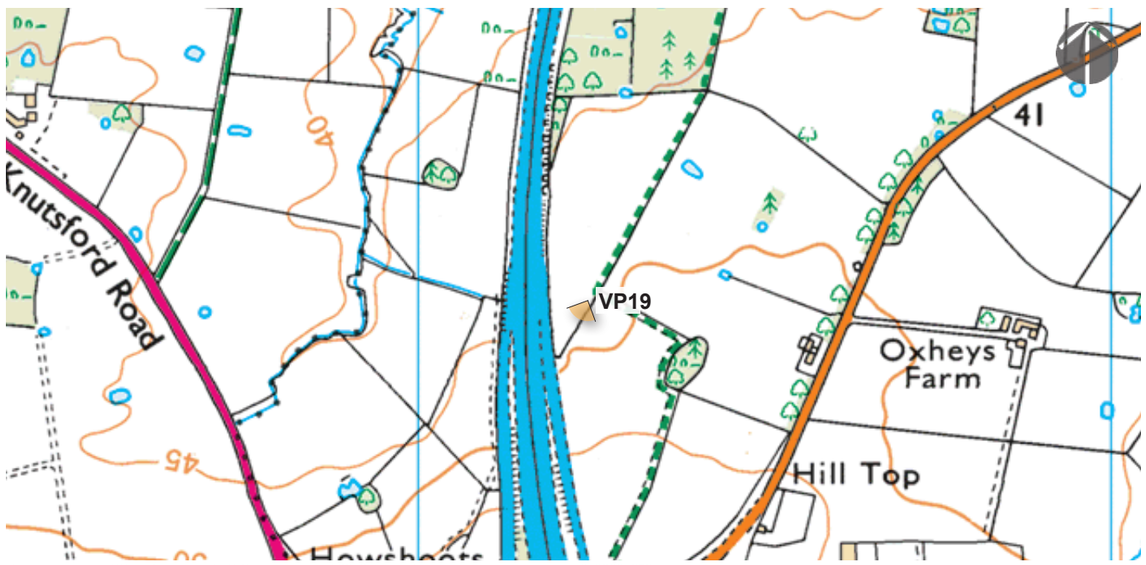
Camera Location:

366264.67 (E) 385448.02 (N)
49.47 mAOD(Sensor Height)

Date/Time of Photography:
25 September 2018/10:40

Camera Equipment:
Canon EOS 5D Mark III
50mm f1,4 Lens

Survey Equipment:
SP80 GNSS/RTK
Mobilemapper 20
DigiTerra



Panorama:

No visualisations produced

VIEWPOINT 20

Camera Location:

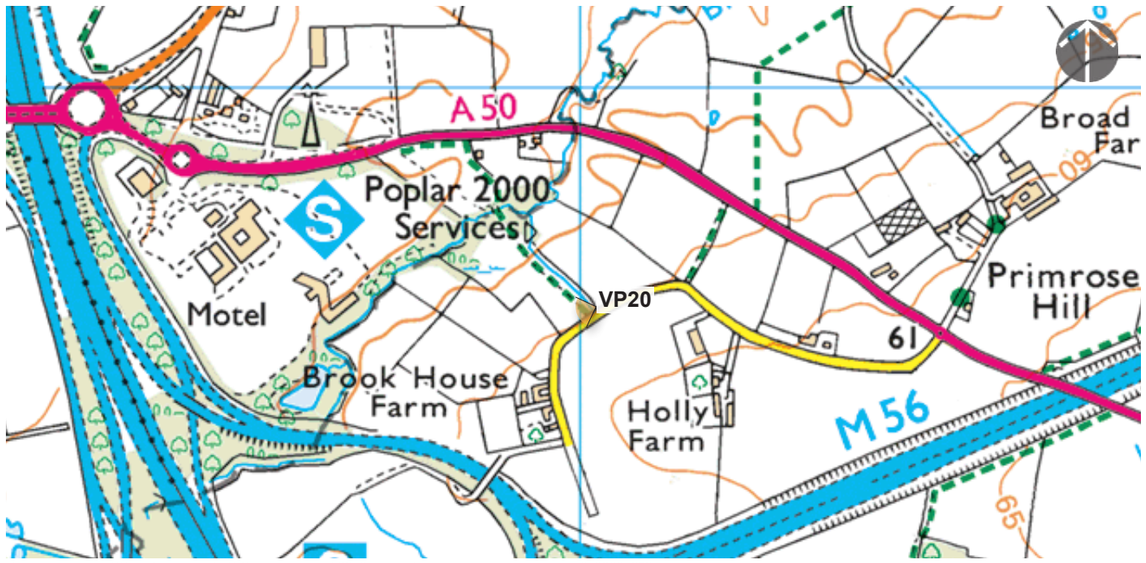
Camera Location:

367024.59 (E) 384673.49 (N)
54.45 mAOD(Sensor Height)

Date/Time of Photography:
25 September **2018/11:00**

Camera Equipment:
Canon EOS 5D Mark III
50mm f1,4 Lens

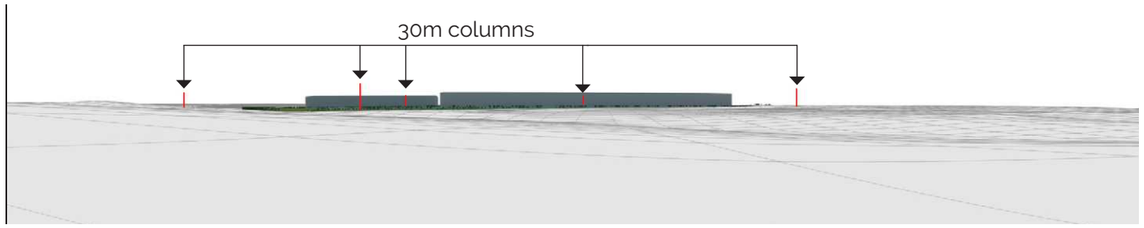
Survey Equipment:
SP80 GNSS/RTK
Mobilemapper 20
DigiTerra



Photograph - 3D Model Mapping:

Existing View

3D Model with columns



Composite View

Photomontage View

VIEWPOINT 21

Camera Location:

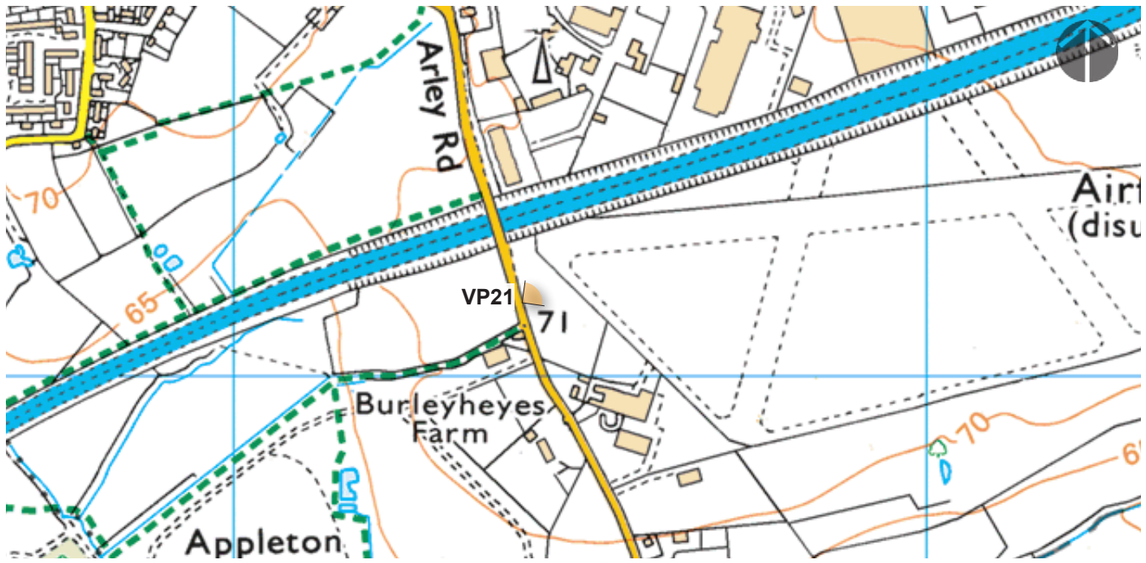
Camera Location:

364416.42 (E) 383127.05 (N)
73.85 mAOD(Sensor Height)

Date/Time of Photography:
25 September 2018/12:10

Camera Equipment:
Canon EOS 5D Mark III
50mm f1,4 Lens

Survey Equipment:
SP80 GNSS/RTK
Mobilemapper 20
DigiTerra

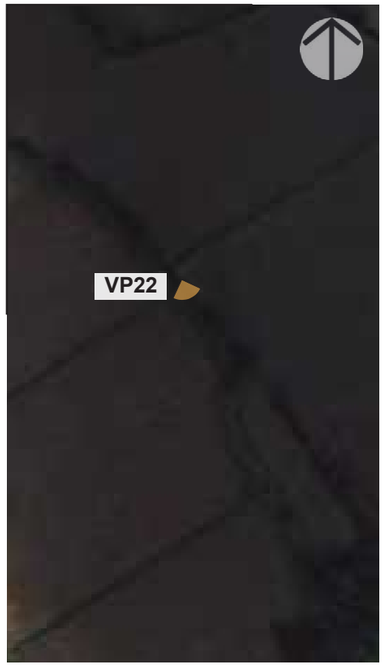


Panorama:

No visualisations produced

VIEWPOINT 22

Camera Location:



Camera Location:

364703.65 (E) 385958.02 (N)
32.06 mAOD(Sensor Height)

Date/Time of Photography:
25 September **2018/15:00**

Camera Equipment:
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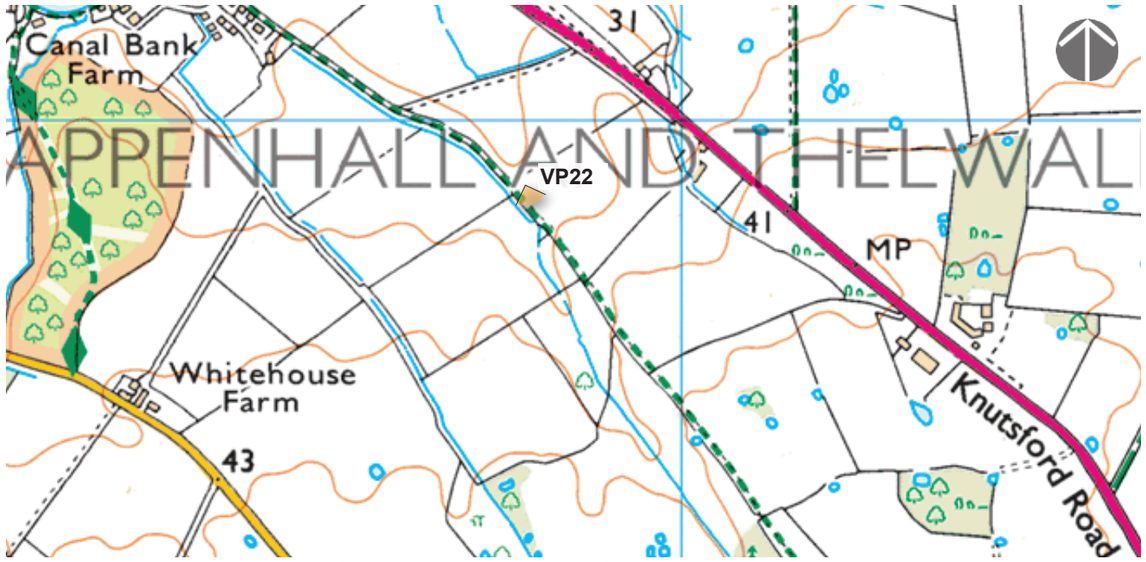
50mm f1,4 Lens

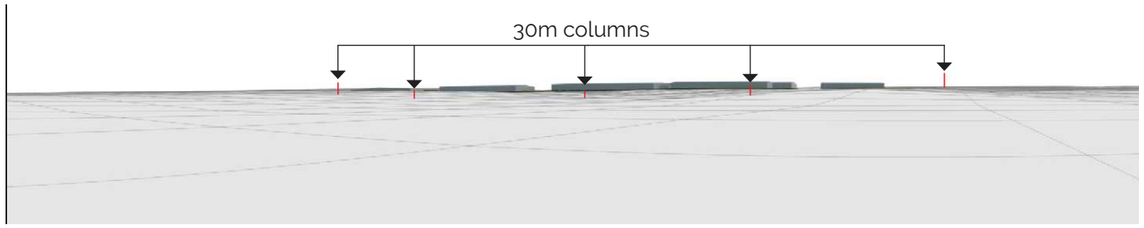
Survey Equipment:
SP80 GNSS/RTK
Mobilemapper 20
DigiTerra



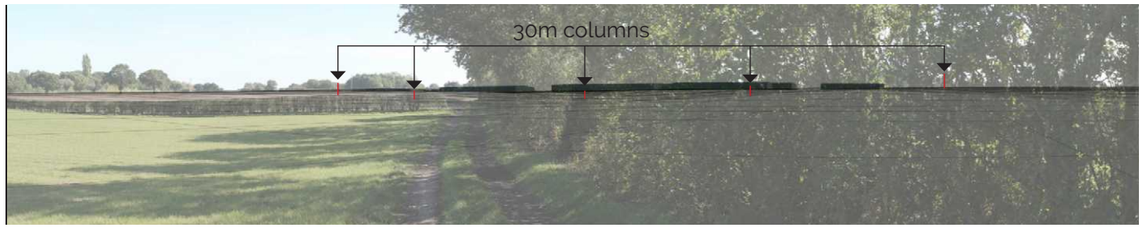
Photograph - 3D Model Mapping:

Existing View

3D Model with columns



Composite View



Photomontage View

VIEWPOINT 23

Camera Location:

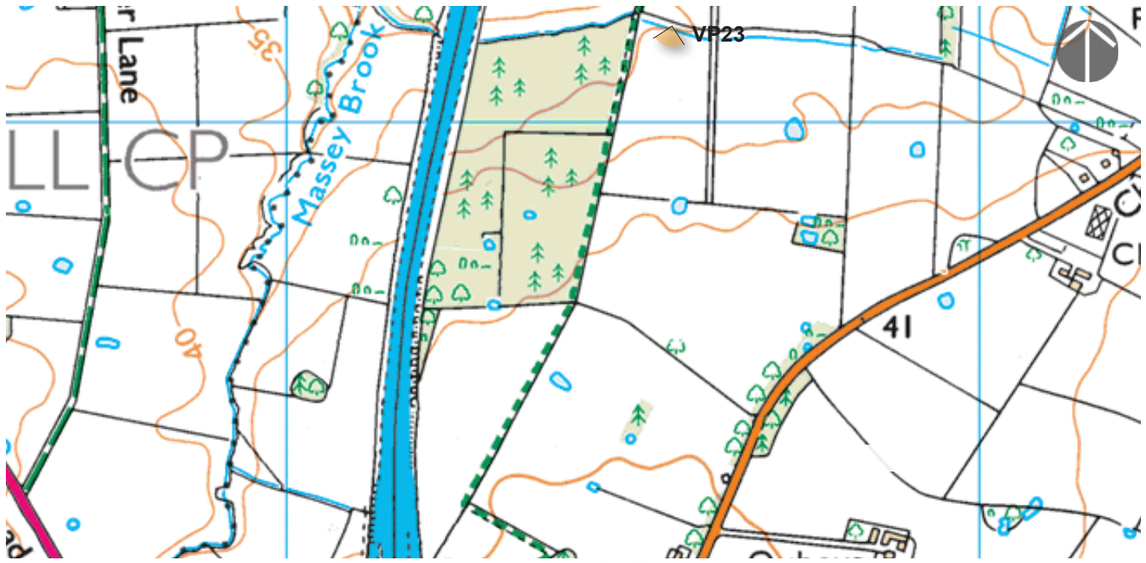
Camera Location:

366521.47 (E) 386146.22 (N)
37.00 mAOD(Sensor Height)

Date/Time of Photography:
25 September 2018/10:25

Camera Equipment:
Canon EOS 5D Mark III
50mm f1,4 Lens

Survey Equipment:
SP80 GNSS/RTK
Mobilemapper 20
DigiTerra



Panorama:

No visualisations produced

Camera Location:

Camera Location:

364270.95 (E) 384097.66 (N)
72.79 mAOD(Sensor Height)

Date/Time of Photography:
25 September **2018/12:20**

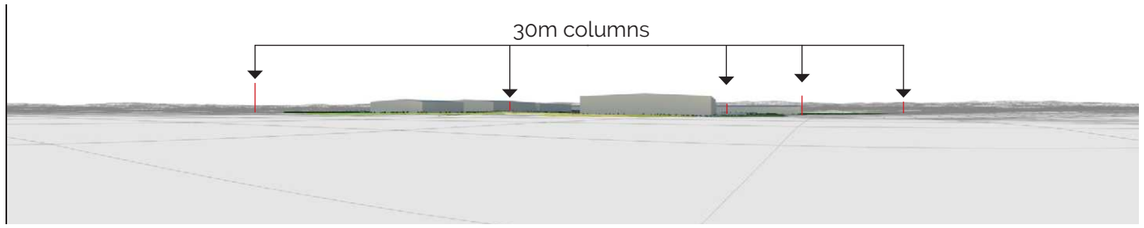
Camera Equipment:
Canon EOS 5D Mark III
50mm f1,4 Lens

Survey Equipment:
SP80 GNSS/RTK
Mobilemapper 20
DigiTerra

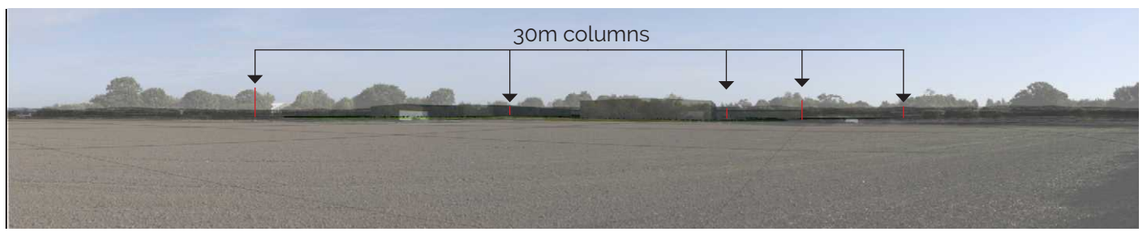
Photograph - 3D Model Mapping:

Existing View

3D Model with columns

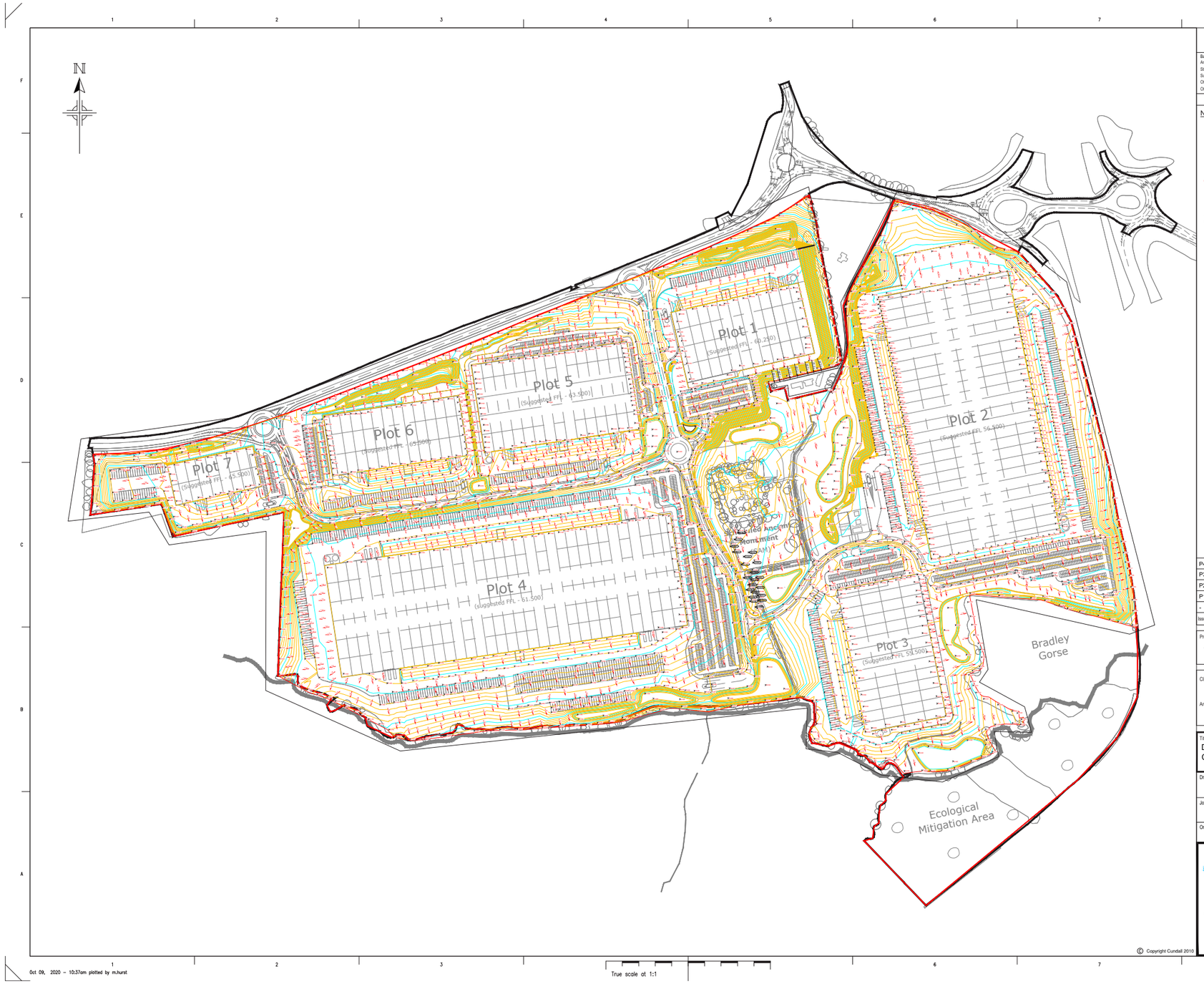


Composite View



Photomontage View

APPENDIX 1.2: LAYOUT INFORMATION USED FOR 3D MODEL CONSTRUCTION



1015524 | A1

Based on.

Architects Drg No.		Rev
Structural Drg No.		Rev
Survey Drg No.		Rev
Other Drg No.		Rev
Other Drg No.		Rev

DO NOT SCALE FROM THIS DRAWING

Notes

LEGEND:

- MINOR CONTOUR (200mm INTERVAL)
- MAJOR CONTOUR (1m INTERVAL)
- SITE BOUNDARY

NOTE:
ACOUSTIC BUND INDICATIVELY DISPLAYED WITH 1:3 SLOPE

THIS DRAWING IS FOR SCHEME DEVELOPMENT PURPOSES ONLY AND DOES NOT REPRESENT FINISHED DESIGN LEVELS

Issue	Date	Description	By	Chkd	Verfd
P4	09.10.20	REVISED PLOT 1 BUND	MH	RT	BW
P3	20.03.20	REVISED LAYOUT	AW	RB	MH
P2	13.03.20	GABION WALL ADDED	AW	RB	MH
P1	25.02.20	REVISED LAYOUT	AW	RB	MH
-	-	FIRST ISSUE	JS	AF	LF

Project
SIX: 56 WARRINGTON

Client
LANGTREE / FIRST INDUSTRIAL

Architect
STEPHEN GEORGE PARTNERS

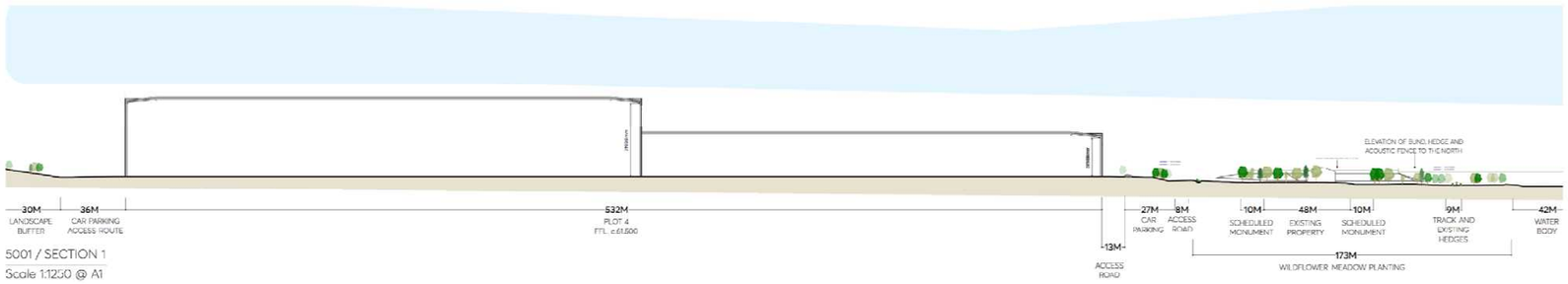
Title
DETAILED FINISHED LEVELS CONTOURS

Drawing No.	Drawing Status
CLXX(52)4003	INFORMATION
Job No. 1015524	Scale 1:2500

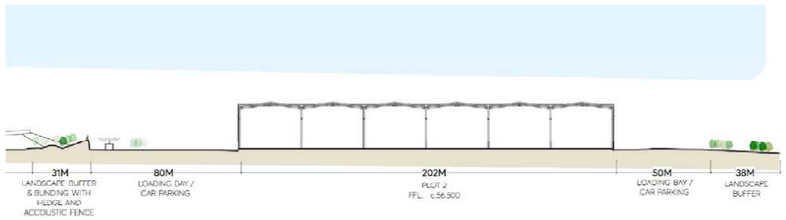
Originator	Checked	Verified	Issue.
JS	AF	LF	-

CUNDALL

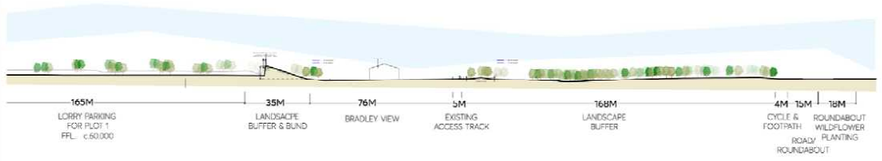
4th Floor, Partnership House
Regent Farm Road,
Gosforth,
Newcastle NE3 3AF
Telephone: +44 (0)191 213 1515
Website: www.cundall.com



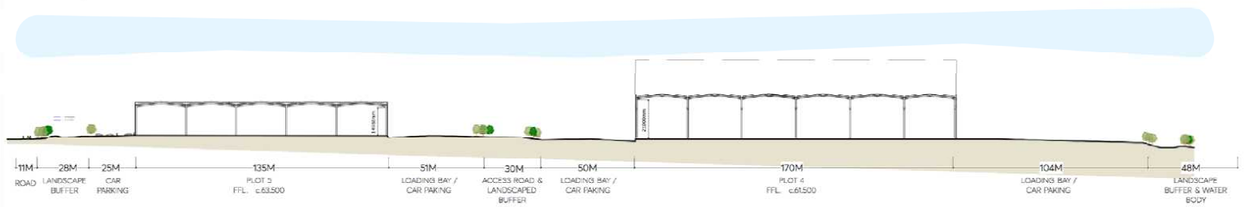
5001 / SECTION 1
Scale 1:1250 @ A1



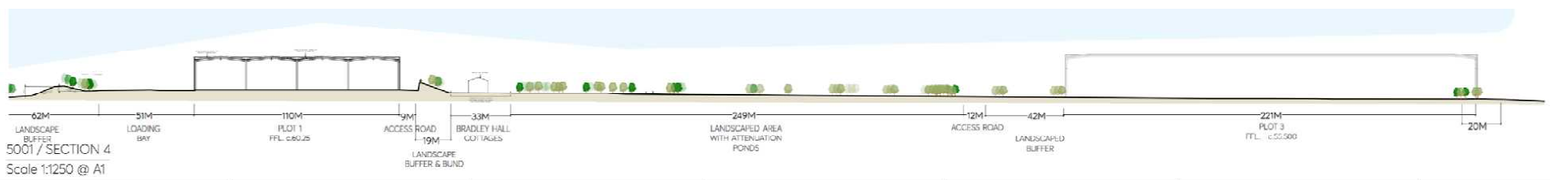
5001 / SECTION 1 CONTINUED
Scale 1:1250 @ A1



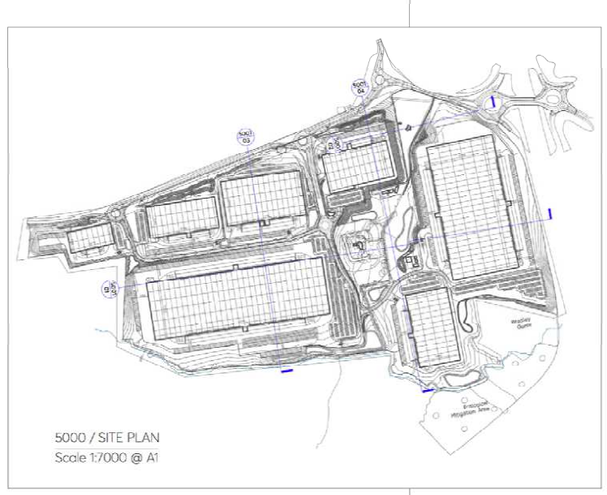
5001 / SECTION 2
Scale 1:1250 @ A1



5001 / SECTION 3
Scale 1:1250 @ A1



5001 / SECTION 4
Scale 1:1250 @ A1



5000 / SITE PLAN
Scale 1:7000 @ A1

NOTES:
1. DO NOT SCALE FROM THIS DRAWING. ALWAYS WORK TO NOTED DIMENSIONS.
2. ALL SETTING OUT LEVELS AND DIMENSIONS TO BE CHECKED ON SITE PRIOR TO THE INSTALLATION OF MATERIALS AND ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE CONTRACT ADMINISTRATOR IMMEDIATELY.
3. THIS DRAWING MUST BE READ WITH THE RELEVANT SPECIFICATION DOCUMENTS AND DETAIL DRAWINGS. ANY DISCREPANCIES MUST BROUGHT TO THE ATTENTION OF THE CONTRACT ADMINISTRATOR IMMEDIATELY.
4. THIS DRAWING IS COPYRIGHT PROTECTED AND MAY NOT BE REPRODUCED IN WHOLE OR PART WITHOUT WRITTEN AUTHORITY.
5. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.

THIS DRAWING WAS PLOTTED ON:
15/10/20

REVISION HISTORY

DATE	REV	ZONE	DESCRIPTION	CHK
22/07/20	4		Amendment to counteurs within Section 4	ST
15/10/20	5		Updated following amendment to bund on masterplan	ST
15/10/20	6		Updated following comments from Spawforths	ST

KEY

PROPOSED TREE PLANTING HEIGHTS IN 5 YEARS & 10 YEARS

ORIGINATOR
LAYER LANDSCAPE ARCHITECTURE
E hello@layer-lng.com
W www.layer-lng.com
T +44 (0) 1420 544 157

CLIENT
LANGTREE PROPERTY PARTNERS

PROJECT
SIX56, WARRINGTON

DRAWING TITLE
ILLUSTRATIVE SECTIONS

DRAWING NUMBER	REV	STATUS
133-LYR-XX-XX-DWG-L-5001	6	PLANNING

SCALE	CREATED BY	CHECKED BY
VARIOUS	O KINGSHOTT	S TUBGY

APPENDIX 1.2: LAYOUT INFORMATION USED FOR 3D MODEL CONSTRUCTION

KEY

Tree Removal

- Tree to be removed
- Tree group to be removed
- Hedgerow to be removed

Tree Retention

- Category A Tree (High Value)
- Category B Tree (Moderate Value)
- Category C Tree (Low Value)
- Category U Tree (Negligible Value)
- Category A Group (High Value)
- Category B Group (Moderate Value)
- Category C Group (Low Value)
- Shrub Masses
- Root Protection Area (RPA)
- Hedgerows (from topographical data)

N.B. Minor alterations have been made to BS 5837 colours (RPAs & U Category) to illustrate clearly the proposed quanta of tree removal.

See LSC Ltd Tree Constraints Plans Fig 01a - 08a.

LANDSCAPE SCIENCE CONSULTANCY LTD
The Old Barracks, Sandon Road
Grantham, Lincolnshire
NG31 9AS

01476 569600
e: admin@landscapescienceconsultancy.co.uk
www.landscapescienceconsultancy.com

PROJECT:
SIX 56 WARRINGTON

TITLE: TREE REMOVAL PLAN - SHEET 1 of 8

SCALE: Not to Scale DATE: February 2019

SOURCE: Reproduced under OS Licence AL100014007

JOB No	Figure No	Revision	Drawing Size
M88.17b	01b	B	A3

Spectra Precision SP80 GNSS Receiver

The Most Connected GNSS Receiver

CONNECTED
RELIABLE
RUGGED
INNOVATIVE

Z BLADE TECHNOLOGY INSIDE

SP80 GNSS Receiver

The Spectra Precision SP80 is a next generation GNSS receiver that combines decades of GNSS RTK technology with revolutionary new GNSS processing. Featuring the new 240 channel "5G" chipset, the SP80 system is optimized for tracking and processing signals from all GNSS constellations.

In addition, SP80 is the most connected GNSS receiver in the industry. It is the first to offer a unique combination of integrated 3.5G cellular, Wi-Fi and UHF communications with SMS, email and anti-theft features.

These powerful capabilities, packaged in an ultra-rugged and cable-free housing with unlimited operation time (hot-swappable batteries), make SP80 an extremely versatile turnkey solution.

Key Features

- New 240-channel 5G ASIC
- Z-Blade GNSS centre
- 3.5G cellular modem
- Internal TRx UHF radio
- Built-in WiFi communication
- SMS and e-mail alerts
- Anti-theft protection
- Hot swappable batteries

Patented inside-the-rod mounted UHF antenna design

Unique 6G GNSS-centric Technology

Exclusive Z-Blade processing technology running on a next-generation Spectra Precision 240-channel 6G ASIC fully utilizes all 6 GNSS systems: GPS, GLONASS, BeiDou, Galileo, QZSS and SBAS. The unique GNSS-centric capability optimally combines GNSS signals without dependency on any specific GNSS system: this allows SP80 to operate in GPS-only, GLONASS-only or BeiDou-only mode if needed. In addition, SP80 supports the recently approved RTCM 3.2 Multiple Signal Messages (MSM), a standardized definition for broadcasting all GNSS signals from space, regardless of their constellation. This protects the surveyor's investment well into the future by providing superior performance and improved productivity as new signals become available.

SMS and Email Messaging

SP80 has a unique combination of communication technologies including an integrated 3.5G GSM/UMTS modem, Bluetooth and Wi-Fi connectivity, and optional internal UHF transmit/receive radio. The cellular modem may be used for SMS (text messages) and e-mail alerts as well as regular Internet or VRS connectivity. Likewise, SP80 can use all available RTK correction sources and connect to the Internet from the field using WiFi hotspots, where available. The internal UHF transmit/receive radio allows for quick and easy setup as a local base station. This saves time and increases the surveyor's efficiency.

Anti-Theft Protection

A unique anti-theft technology secures SP80 when installed as a field base station or remote or pacer pieces and can detect if the product is disturbed, moved or stolen. This technology allows the surveyor to lock the device to a specific location and make it unusable if the device is moved elsewhere. In this case, SP80 will generate an audio alert and show an alert message on its display. Furthermore, an SMS or e-mail will be sent to the surveyor's mobile phone or computer and provides the receiver's current coordinates allowing tracking of its position and facilitating recovery of the receiver. SP80's anti-theft technology provides surveyors with remote security and peace of mind.

The Most Powerful Tool for Reliable Field Use

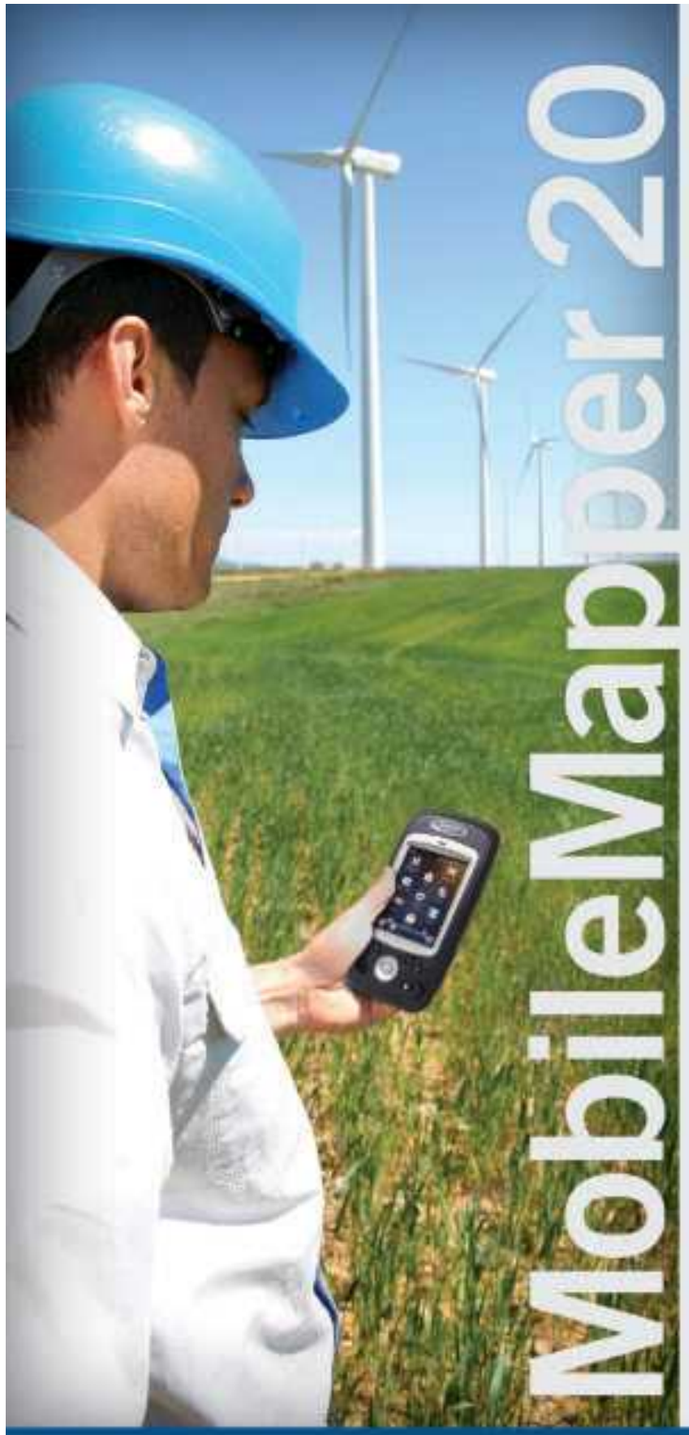
The SP80's rugged housing, created by Spectra Precision's engineering design lab in Germany, incorporates a host of practical innovations. Dual hot-swappable batteries can be easily exchanged in the field as a one hand operation for an interruption-free working day, ensuring surveyors remain productive until the job is done. The impact-resistant glass-fiber reinforced casing, designed to withstand 2m pole drops and waterproof to IP67, ensures that SP80 can handle the toughest outdoor conditions. The patented UHF antenna, set inside the rugged carbon fiber rod, extends the range of RTK radio performance at the same time as ensuring protection. The sunlight readable display offers instant access to key information like the number of satellites, RTK status, battery charge and available memory. These powerful design features combine to make SP80 the most capable, most reliable GNSS receiver, backed by a comprehensive standard 2 year warranty.

The Spectra Precision Experience

With the most advanced and rugged field data collectors from Spectra Precision, surveyors get maximum productivity and reliability every day. Spectra Precision Survey Pro or EASY Survey software is specifically tailored for the SP80 GNSS receiver providing easy-to-use, yet powerful GNSS workflows, letting the surveyor concentrate on getting the job done. Spectra Precision Survey Office Software provides a complete office suite for post-processing GNSS data and adjusting survey data, as well as exporting the processed results directly back to the field or to engineering design software packages. Combined with Spectra Precision field and office software, SP80 is a very powerful and complete solution.

SPECTRA PRECISION

MobileMapper®20



MobileMapper 20

Geographical Information Systems and Location Based Services are now being used in a wide range of applications and organizations. The growing need for geo-localization is naturally boosting the demand for efficient and affordable data collection solutions. Spectra Precision is leading the democratization of GNSS, enabling wider access to professional mapping. With MobileMapper 20, Spectra Precision makes it possible to deploy a professional accurate GIS receiver to any field work force.

Powerful and complete, MobileMapper 20 is the ideal enabling tool for a huge range of positioning applications.

With MobileMapper 20, organizations will improve the quality of their georeferenced information and their field productivity, yielding reduced operational costs.

Secure Your Field Work

- A wide range of capabilities in a compact, lightweight design
- Several days of battery life
- Rugged and reliable

Unpack and Start Logging

- Ready-to-use complete mapping solution for field and office
- User friendly Windows® Embedded Handheld 6.5
- Easy-to-use software for short learning curve and quick logging operations

Ideal for Data Maintenance or Inspection

- Log your assets in real-time with 1 to 2 meter accuracy
- Connect field and office work force for maximum productivity
- Achieve half meter accuracy with post-processing

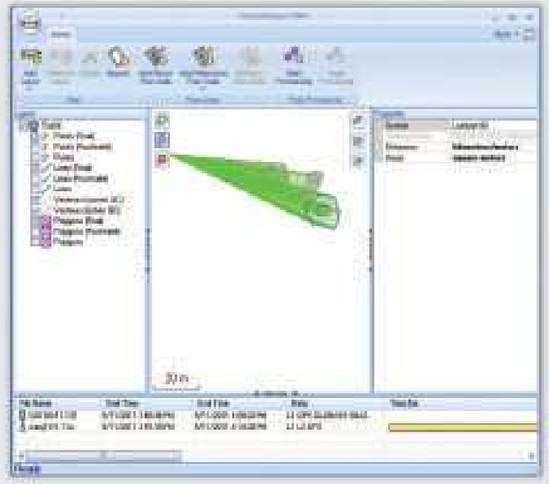
MobileMapper Field and Office Software

A complete solution

The Spectra Precision MobileMapper software suite includes all the GIS features that professionals really need, without the burden of complicated and rarely used functions.

Running on MobileMapper receivers, MobileMapper Field is the perfect solution for GIS data collection, asset management, area measurement, map creation and update. The software is very intuitive and easy-to-use, requiring minimum training. It also provides a direct interface to external sensors for a complete field solution.

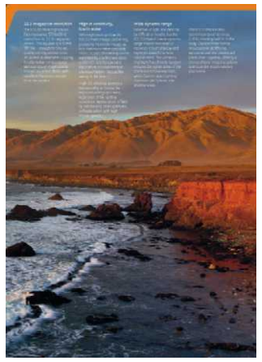
The Spectra Precision MobileMapper Office tool can be used to differentially post-process raw GPS data collected with the MobileMapper Field software. Through an Internet connection, MobileMapper Office can automatically find and download the base data files that will match the collected raw data, it then computes corrected positions automatically.

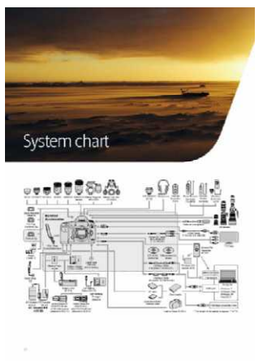


Tune MobileMapper 20 To Your Applications

With Windows Embedded Handheld 6.5 you may upload recovery utilities or software on your MobileMapper 20, to suit your next job. You can collect GIS/GPS points and maps via the GIS application of your choice, other third-party software such as ESRI® ArcPad® or a purpose-built Spectra Precision application.

APPENDIX 1.5: CAMERA EQUIPMENT (CANON 5D MARK III)





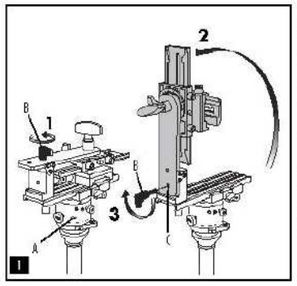

SIGMA
50mm 1:1.4 DG ø77

Manfrotto

INSTRUCTIONS

303SPH

SPHERICAL "VR" HEAD



The spherical "VR" head is designed to allow virtual scenes to be created by Computer from a various panoramic sequences of digital or digitized photographs, taken at different vertical angles

There are 4 requirements to achieve good panoramic sequence shots:
1. Accurate levelling of the panoramic axis
2. A Panoramic head that enables you to choose the angle of rotation between one shot and the next.
3. The ability to position the camera so the "Nodal Point" of the lens (the front lens) is exactly above the panoramic axis of rotation, to eliminate any parallax problems between the near and distant objects in the scene.
4. An additional rotating axis that enables you to shoot several panoramic sequences at different vertical angles in order to achieve a complete spherical scene

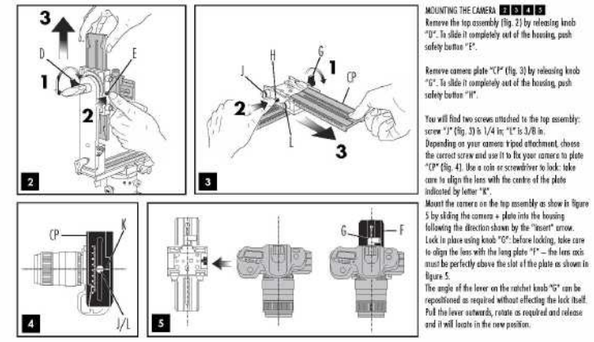
The spherical "VR" head comprises three main modules that perform the functions mentioned above in points 2, 3 and 4.

Unless your tripod has a built-in levelling device (such as the Manfrotto 410 Bella tripod's Shiftball), you will need to use one of the levelling accessories available from the Manfrotto range to ensure accurate levelling of the head (see point 1).

SET UP 1

Fix the levelling device (not supplied) to the tripod, then fix the "VR" head on the levelling device via female attachment "A".
Completely remove knob "B", rotate the bracket into the vertical position as shown in fig. 1 and lock it in place by screwing the knob "B" into hole "C".

2



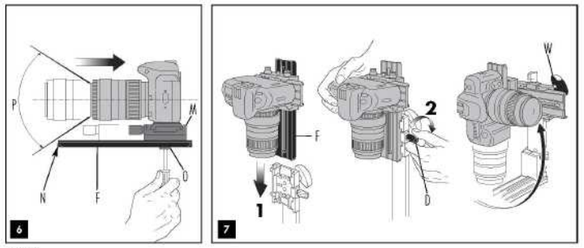
MOUNTING THE CAMERA 2 3 4 5

Remove the top assembly (fig. 2) by releasing knob "D". To slide it completely out of the housing, push safety button "E".

Remove camera plate "CP" (fig. 3) by releasing knob "G". To slide it completely out of the housing, push safety button "H".

You will find two screws attached to the top assembly: screw "J" (fig. 3) is 1/4 in; "L" is 3/8 in.
Depending on your camera tripod attachment, choose the correct screw and use it to fix your camera to plate "CP" (fig. 4). Use a coin or screwdriver to lock: take care to align the lens with the centre of the plate indicated by letter "K".
Mount the camera on the top assembly as shown in figure 5 by sliding the camera + plate into the housing following the direction shown by the "insert" arrow.
Lock in place using knob "G": before locking, take care to align the lens with the long plate "I" – the lens axis must be perfectly above the slot of the plate as shown in figure 5.
The angle of the lever on the ratchet knob "G" can be repositioned as required without effecting the lock itself. Pull the lever outwards, rotate as required and release and it will locate in the new position.

3



NOTE 6

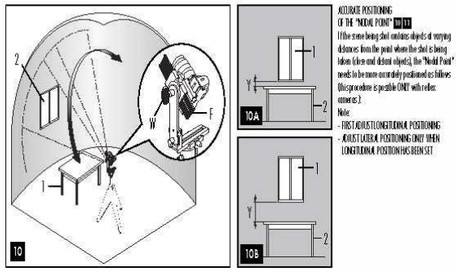
The position of the housing "M" relative to the long plate "I" will need to be adjusted: loosen screw "O" to slide the housing. The ideal position is with the camera body as far back on the plate as it can go before the front edge "N" of the long plate "I" becomes visible in the camera's field of view "P".

MOUNT THE CAMERA ON THE HEAD 7

Mount the whole top assembly + camera on the head as shown in figure 7 by sliding the long plate "I" into its housing and locking it by screwing knob "B", then unscrew knob "W" and move the camera on the vertical plane.

4

5



- LONGITUDINAL POSITIONING 10

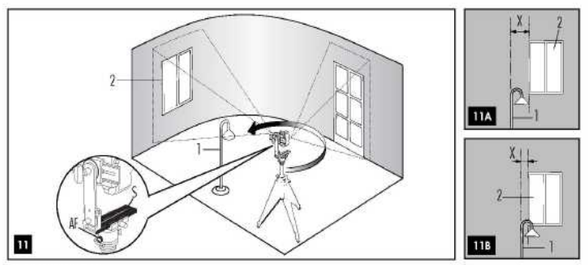
(See Figure 10A and 10B) unscrew knob "W" and move the camera on the vertical plane to bring the two objects (1st to the top and then to the bottom of the frame, checking whether the height gap "Y" between the two objects varies in the two frames: the more constant the distance remains, the more accurately the "Nodal Point" has been positioned.
2. For optimum results, make minor adjustments by moving plate "I".
Once the right position is achieved it is VERY USEFUL to memorize it by noting the position of the plate "I" on the index on the graduated scale.

ACCURATE POSITIONING OF THE "NODAL POINT" 10 11

If the scene being shot contains objects at varying distances from the point where the shot is being taken (close and distant objects), the "Nodal Point" needs to be more accurately positioned as follows: (this procedure is possible ONLY with reflex cameras.)
Note:
- FIRST ADJUST LONGITUDINAL POSITIONING
- ADJUST LATERAL POSITIONING ONLY WHEN LONGITUDINAL POSITION HAS BEEN SET

6

7

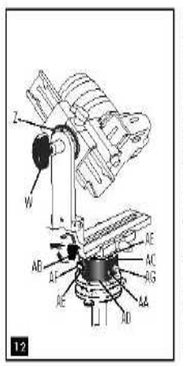


- LATERAL POSITIONING 11

(Ref. Figure 11): Choose a frame that contains both a near object "1" and a distant object "2" situated along the same horizontal line of vision.
1. (See Figure 11A and 11B): unscrew knob "AF" and move the camera around the panoramic axis so that the two objects are first on the left hand side of the frame, then on the right. Check whether the horizontal gap "X" between the two objects varies in the two frames: the more constant the distance remains, the more accurately the "Nodal Point" has been positioned.
2. For optimum results, make minor adjustments by moving plate "S".

Once the right position is achieved it is VERY USEFUL to memorize it by noting the position of the plate "S" on the index on the graduated scale.

7



INSTRUCTIONS FOR SPHERICAL PANORAMA DISPOSITING 12

A spatial panoramic scene is obtained by adding together panoramic representations at different angles from the horizontal. First you will need to choose the number of panoramic sequences you will need to complete the sphere depending on the angle of the lens you will be using.
Before starting with the panoramic sequence, choose the initial vertical angle using the round scale "2C" (fig. 12).
Unscrew locking knob "AB" or remove it completely if you do not need it (it must be used to completely stop rotation when the head is used in non-vertical position), so to avoid any accidental movement of the head in any position.

Divide the number of shots or the angle of rotation between each shot for the first panoramic sequence from the chart below).

Angle	90°	60°	45°	36°	30°	24°	20°	15°	10°	5°
n. shots	4	6	8	10	12	15	18	24	36	72

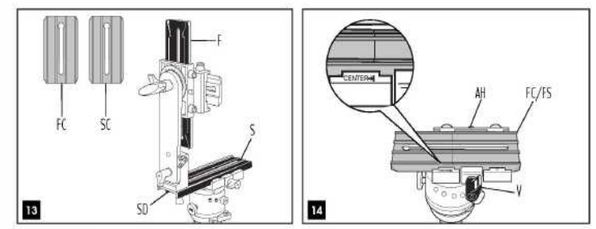
- Screw knob "AG" into the related fixing hole "AH".
- Release locking lever "AB" and rotate the camera on top plate "AE" to the position of the first shot.
- Hold the camera in position and rotate the central barrel "AC" until the first "click stop" is reached, then lock lever "AB".
- Take the first shot and then rotate the camera to the next "click stop" without releasing "AB" and take the second shot.
Continue this process until the start position is reached.

Once you have completed the first complete panoramic sequence, you can start on the other panoramic sequences needed to cover the sphere, change the vertical angle using knob "2B" and repeat the operations described above for each of the sequences.

The base of the head "AD" has graduated scale markings from 0 to 360° and a reference index "AA" on the central barrel "AC". This is to be used to set angles not on the chart. To use the head in this way, unlock knob "2G" to disengage the "click stop" during rotation of central barrel "AC" and use the locking knob "2H" to lock the position during shooting.

NOTE: The angle of the lever on the ratchet knob "AB" can be repositioned as required without effecting the lock itself. Pull the lever outwards, rotate as required and release and it will locate in the new position.

8



ADDITIONAL PLATES 13

If you have a very compact camera we suggest you to use the short plates "SC" (fig. 13) and "FC" (supplied with the head) instead of the two long plates "F" and "S" in order to reduce space and weight of the system.
To replace the plate "S" unscrew screw "SD" (fig. 13)
To replace the plate "F", please refer to fig. 6 and unscrew screw "O"

USE OF THE KIT AS AN OBJECT PANORAMA TURNTABLE 14

The head can also be used as a turntable, useful for shooting object panoramas. For this use, loosen knob "H" and push button "AH" to slide the lower plate "S" out of the housing on the panoramic rotation base unit. In place of the long plate and top assembly, mount one of the two shorter plates supplied as a base for your object. The plate housing has a "center" mark to help you position your object accurately above the center of panoramic rotation.

9

Appendix 4.6 – Extract from the Warrington Borough Council Local Plan – Preferred Development Options Regulations 18 Consultation July 2017 – Pages 40-42

WARRINGTON
Borough Council

Warrington Borough Council
Local Plan

Preferred Development Option
Regulation 18 Consultation
July 2017

Warrington Garden City Suburb

5.28 The south eastern extension of Warrington will create a new Garden City Suburb, providing the potential development of around 7,000 new homes to be delivered over the full 20 years of the Plan. This includes land for 950 homes which is outside of the Green Belt.

5.29 The suburb will also provide a major new employment area as an extension of the existing Appleton Thorn / Barleycastle estates at the intersection of the M6 and M56.

5.30 The initial development concept envisages this area will be focussed around three garden neighbourhoods centred around a new district centre and a new country park. Walking, cycling and public transport linkages will connect these neighbourhoods to their local and district centres, Stockton Heath, the new employment zone and the City Centre. An extensive and attractive green network would form the framework to this development area.

5.31 The Council has prepared a more detailed Development Concept which assesses the capacity of the area, identifies indicative infrastructure requirements, sets out proposed development principles and an indicative development phasing.

Infrastructure Requirements

5.32 There is a significant requirement for infrastructure to support this level of growth, including a network of new distributor roads, a new secondary school, up to 4 new primary schools, a major new park, district centre, health facilities and leisure facilities. To achieve the full development potential of the area may require a further higher level connection across the Ship Canal.

5.33 Given the scale of this development proposal, it will be necessary for the Council to work with landowners to prepare a more detailed masterplan and ensure the timely delivery of infrastructure to support individual phases of development.

Development Trajectory

	0-5	6-10	11-15	16-20	**Total**
Garden City Suburb	406	496	48	0	**950**
Garden City Suburb (Green Belt)	0	2,114	2,096	2,114	**6,324**
TOTAL	**406**	**2,610**	**2,144**	**2,114**	**7,274**

Table 19: Garden City Suburb Housing Trajectory

	0-5	6-10	11-15	16-20	**Total**
Garden City Suburb (Green Belt)	22	30.3	45.9	18.6	**116.80**

Table 20: Garden City Suburb Employment Land Trajectory

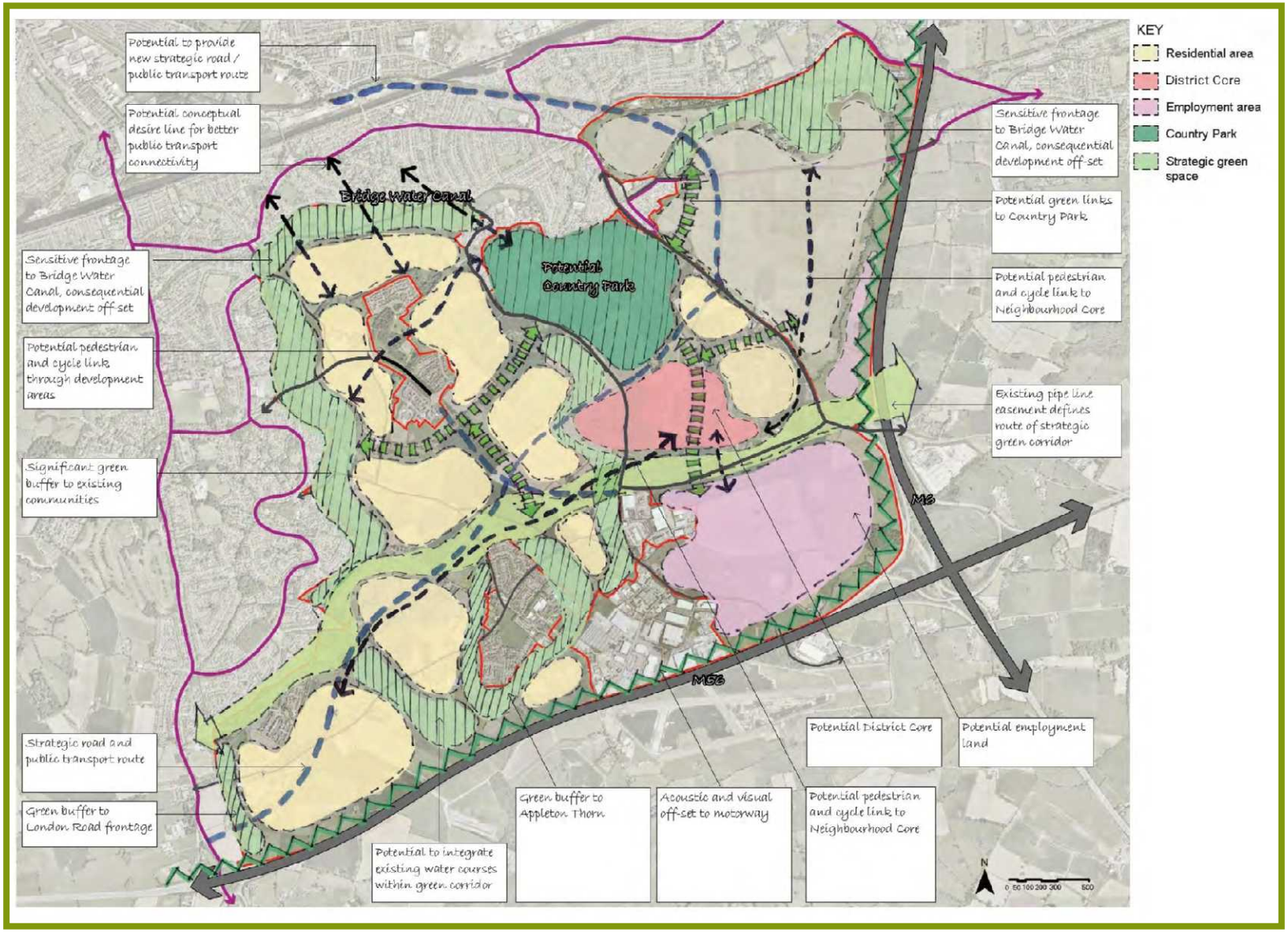


Figure 7: Warrington Garden City Suburb

5.34 The trajectory is based on the principle that no further residential development is acceptable in south east Warrington, other than non-green belt sites, until the first phase of the new strategic road link is completed. There is therefore no Green Belt Release during the first 5 years of the Plan. In addition, the new secondary school must be completed by the end of the 5 to 10 year period for any further Green Belt land to be released.

5.35 The assumptions around development capacity are set out in the Development Concept document. The trajectory is based on a gross density of 20 dwellings per hectare. This is below the standard Green Field assumption contained in the Council's SHLAA but is considered to be appropriate for the type of development envisaged in this part of Warrington. It reflects best practice examples from successful urban extensions of a similar scale and context to south east Warrington. It also provides an overall balance between built and green space which is consistent with the most recent guidance on garden city design.

5.36 The Council has however also assessed the potential capacity if the standard SHLAA density assumption is applied. This would increase the capacity of the area by around 1,000 homes. As part of the consultation on the Preferred Development Option, the Council will be seeking views on the appropriate density to be applied in this area to balance residential quality against the need to minimise Green Belt release.

Safeguarded Land

5.37 The Council is proposing to safeguard the land adjacent to the Garden City Suburb. The Council considers this represents a continuation of the preferred development option, providing the opportunity to increase the size of the suburb to meet future development need beyond the Plan period. The safeguarding area will cover the General Area 9 as set out in the Green Belt Assessment and will ensure a long term defensible boundary to the Green Belt is provided by the M6 and M56.

5.38 The balance of land to be allocated for development and safeguarded for future development will be dependent upon the density applied across the Garden City suburb. Based on a gross density of 20 dwellings per hectare, it is likely that the whole of General Area 10 will need to be allocated. This may therefore require further land to be safeguarded, beyond General Area 9 to meet the requirement set out in Table 3.

5.39 If the standard SHLAA density is applied then not all of General Area 10 will need to be allocated. Based on the illustrative masterplan contained in the Development Concept, this will mean the area comprising development parcels C1 to C3 as well as a portion of the district centre would be safeguarded as opposed to being allocated. Together with General Area 9, this may be sufficient to meet all of Warrington's safeguarding requirement. It should be noted however that the Council has only undertaken an initial assessment of development Capacity within General Area 9 and there are sensitive environmental assets to the north of the area which would need to be protected.

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10.2 South East Warrington Urban Extension

10.2.1 The South East Warrington Urban Extension will be developed as a sustainable urban extension to the south east of the main urban area of Warrington. It will create an attractive, well-designed and distinctive place set within a strong landscape framework of open spaces. The Urban Extension will be well served by new community infrastructure and a network of sustainable transport links maximising travel by walking, cycling and public transport.

10.2.2 The South East Warrington Urban Extension will deliver around 4,200 homes of which around 2,400 will be delivered within the plan period. It will enable development to be comprehensively planned with new homes phased in accordance with the delivery of wide ranging supporting infrastructure.

10.2.3 The South East Warrington Urban Extension will mostly occupy land that was owned by the former New Town Commission, now owned by Homes England, and will effectively extend and grow the existing communities of Grappenhall Heys and Appleton Cross / Pewterspear. The allocation will also extend south towards the M56 to include land to the south and east of Stretton.

10.2.4 The new residential community will be supported by new social infrastructure including two new primary schools; a new secondary school; new leisure and health facilities; local shops and other local community facilities.

10.2.5 The Urban Extension will provide a range of housing types with a particular focus on family housing, homes for older people and the provision of affordable housing.

10.2.6 New development will be designed to support walking and cycling for local journeys within the Urban Extension itself and to other local destinations. Improved public transport services will provide access to the Town Centre as well as the South East Warrington Employment Area and other employment locations in the wider Warrington area.

10.2.7 The development will be supported by a new strategic link connecting the allocation site with the A49 and easing congestion at the Cat & Lion junction. Additional connections will be made to the A49 at Lyons Lane and Longwood Road junctions as well as a link to the A50 to the east, via a new connection to Grappenhall Lane. The development will also contribute to wider transport mitigation measures to offset the impact on Junctions 10 of the M56 and Junction 20 of the M6, in agreement with Highways England.

10.2.8 The proposed allocation takes into account Warrington's wider vision for future transportation in the borough as set out in LTP4, which seeks to deliver a future mass transit public transport scheme and a possible further crossing of the Ship Canal.

10.2.9 The development of the South East Warrington Urban Extension will ensure the permanence of the revised Green Belt boundaries whilst preserving and enhancing important ecological and heritage assets within the site.

10.2.10 Key development requirements and principles, are set out in the allocation policy below.

10.2.11 The development concept diagram has been informed by a masterplanning exercise, working with principal landowners and taking into account representations made to previous Local Plan consultations.

10.2.12 Prior to the submission of any planning applications for the development of the South East Warrington Urban Extension, a Development Framework will be prepared and approved by the Council to guide development in accordance with the allocation policy.

10.2.13 The Development Framework will be prepared by the principal landowners, in consultation with the Council, key statutory consultees and the local community. To ensure a holistic approach to the delivery of the Urban Extension, the Development Framework will provide a comprehensive spatial masterplan that identifies primary development parcels and the location of key physical, social and environmental infrastructure, alongside a phasing strategy and trajectory, which identifies when key infrastructure is required, how it will be funded and the mechanism for delivery. This is important given the existing constraints on transport and community infrastructure in South Warrington.

10.2.14 The Development Framework will establish a range of parameters for the development of the Urban Extension, including, but not limited to: development areas (reflecting a mix of land uses including residential, retail and community i.e. schools), densities, strategic movement linkages, road network typologies and strategic blue and green infrastructure. It will be important for the Development Framework to be sufficiently flexible and kept under review throughout the delivery of the Urban Extension, to react to changing circumstances where necessary.

10.2.15 Taking into account the need to prepare the Development Framework and the initial required infrastructure improvements, the Council anticipates the first homes being completed in 2025/26. Of key importance prior to further residential development in this area is the delivery of a scheme to address existing congestion at the Cat & Lion junction.

Policy MD2 - South East Warrington Urban Extension

MD2.1 Key Land Use and Infrastructure Requirements

1. Land to the south east of Warrington, extending from Grappenhall Heys in the north, to the M56 in the south, as defined on the Proposals Map, will be removed from the Green Belt and allocated as the South East Warrington Urban Extension.

2. The South East Warrington Urban Extension will deliver a minimum of 4,200 homes in total of which around 2,400 homes will be delivered within the Plan Period.

3. The Urban Extension will be supported by a wide range of infrastructure as follows:

a. A range of housing tenures, types and sizes, including affordable homes, custom and self-build plots and supported and extra care housing.
b. Two 2 form entry primary schools, capable of expansion to 3 forms of entry
c. A new secondary school to provide a minimum of 4 forms of entry.
d. A new leisure facility incorporating health provision.
e. Local shops and other community facilities of an appropriate scale.
f. An extensive green infrastructure network.
g. Playing pitches.
h. A range of smaller areas of open space within the residential development to serve the new community.
i. A Community Recycling Centre.
j. A comprehensive package of transport improvements, for both on-site and off-site works.
k. Compensatory green belt improvements and ecological mitigation and enhancement.
l. Flood mitigation and drainage including exemplary sustainable drainage systems (SuDS).

MD 2.2 Delivery and Phasing

4. The principal landowners and developers will be required to prepare a comprehensive Development Framework for the South East Warrington Urban Extension. The Development Framework will accord with the site-specific requirements of this policy and wider Local Plan requirements. The Framework will be subject to consultation with statutory consultees and the local community before being finalised.

5. The Development Framework will be agreed with the Council in advance of planning applications being submitted. The Development Framework will be a material consideration in the determination of planning applications across the Urban Extension; planning permissions will only be granted where they are consistent with the Development Framework.

6. To ensure a coordinated approach to new development across the whole of the Urban Extension allocation, the Development Framework will provide:

a. A comprehensive spatial masterplan for the entire Urban Extension, based on the principles and requirements set out in this policy and reflecting site opportunities and constraints;
b. A comprehensive delivery strategy for the Urban Extension comprising:
    i. a residential phasing plan and trajectory
    ii. an infrastructure delivery plan, with details on phasing, delivery triggers and delivery responsibilities
c. An allocation wide approach to infrastructure funding, including planning obligations.

7. No residential development will be permitted to commence until the funding and the programme for the delivery of a highway scheme to relieve the A49 London Road/B5356 Stretton Road junction has been confirmed and works have commenced on site. A limit of housing completions will be set until such a scheme is complete and operational.

8. Any development adjacent to the allocation boundary must not undermine the integrity or the delivery of the South East Warrington Urban Extension.

MD2.3 Detailed Site-specific Requirements

<u>New Homes</u>
9. The Urban Extension will provide residential development across a series of new neighbourhoods, each comprising an appropriate mix of housing in accordance with Policy DEV2, including a minimum of 30% provision of affordable housing.

10. Supported housing for older people will be required within the Urban Extension. The precise nature of this will need to be agreed with the Council based on need and the Council's broader strategy to encourage independent living.

11. Specific provision should be made for self-build/custom-build plots in the Urban Extension, subject to demand as demonstrated by the Council's self-build register.

12. To ensure the efficient use of land and to reflect the area's urban fringe location, residential development will be constructed to an average minimum net density of 35dph.

<u>Community Facilities</u>
13. The Urban Extension will be required to deliver two new 2 form entry primary schools, capable of expansion to 3 forms of entry and a new secondary school providing a minimum of 4 forms of entry.

14. The new secondary school should be located centrally within the overall allocation site, whilst the new primary schools should be located to ensure all homes are within easy walking distance of a primary school, taking into account the location of existing primary schools in the area.

15. The Urban Extension will be required to deliver a new leisure facility including flexible space for health care. The Council will support the co-location of this facility with the new secondary school.

16. The Urban Extension should also include local shops, a supermarket, and other appropriate local services and community facilities. Any proposal for retail development above 2,500 sq.m. will require a retail needs assessment and be subject to the sequential assessment set out in Policy DEV5.

Green Infrastructure Network

17. The Development Framework will define a green infrastructure network to ensure the provision of an accessible, comprehensive and high quality network of multi-functional green spaces which connect the different parts of the Urban Extension and provide links into Warrington's wider green space network.

18. In accordance with Policy DC5 a range of types and sizes of open space will be required in line with the Council's open space standards. This should include provision of local parks and gardens; natural and semi-natural greenspace; equipped and informal play areas; sports pitches; and allotment plots.

19. The long term management and maintenance arrangements for the green infrastructure network within the Urban Extension must be secured.

Natural Environment

20. Development within the Urban Extension will be required to protect and enhance existing wildlife corridors and provide new corridors to link the site into Warrington's wider ecological network and the Great Manchester Wetlands Nature Improvement Area.

21. The layout of new development must take into account existing landscape features, including watercourses, woodlands, significant hedgerows and contribute to the wider objectives of the Mersey Forest and have regard to sites identified in Policy DC4 (Ecological Network) which should be protected in accordance with the requirements of Policy DC4 and national guidelines.

22. In accordance with Policy DC4 development within the allocation site will be required to evidence that it will not have any adverse impacts on the integrity of the Mersey Estuary Special Protection Area. If habitats within the allocation site or on adjacent land are suitable to support significant populations of qualifying species of wintering birds, avoidance measures and mitigation will be required and any planning application may need to be assessed through project specific Habitats Regulations Assessment.

23. A scheme for measurable biodiversity net gain should be demonstrated through the use of the Defra Metric and provided for all development parcels that come forward for planning approval. Mitigation measures for loss of habitat will only be allowed if shown to be necessary by application of the mitigation hierarchy in accordance with the requirements of Policy DC4.

Green Belt Boundary

24. The Green Belt boundary is defined by Stretton Road and the M56 to the south and Broad Lane, the southern edge of Grappenhall Heys and then broadly following Lumb Brook

Road and Green Lane to the east. Where this boundary consists of field boundaries, these will need to be strengthened to create a new recognisable and permanent Green Belt boundary.

25. Development at the south west edge of the allocation will be required to respect the Green Belt boundary and the character of the washed over Green Belt settlement of Stretton to the west of the A49.

26. A scheme of compensatory improvements to the environmental quality and accessibility of land remaining in the Green Belt will be required. The improvements should be made in the immediate vicinity of the Urban Extension where possible. Financial contributions will be considered where this would help ensure that the benefits of compensatory improvements can be maximised by providing them in the most appropriate location.

Transport and Accessibility

27. A comprehensive package of transport improvements will be required to support the Urban Extension. Required improvements will include:

a. Ensuring appropriate access arrangements for the site as a whole and for individual development parcels.
b. Improved cycling and walking routes well related to the green infrastructure network; connecting the new and existing residential areas and the South East Warrington Employment Area.
c. Providing public transport enhancements to connect the new community with the South East Warrington Employment Area; Stockton Heath; Warrington Town Centre and employment opportunities within the wider Warrington area.
d. providing additional connections to the A49 to alleviate the A49 London Road/B5356 Stretton Road junction as well as improved junctions on the A49 at Lyons Lane and Longwood Road.
e. providing an improved connection from the allocation site to the A50.
f. a proportionate contribution to improvements to increase capacity at Junctions 10 of the M56 and Junction 20 of the M6.
g. On site safeguarding of potential mass transit routes.
h. A contribution towards the delivery of a connection across the Bridgewater Canal and/or Ship Canal.
i. Other network improvements as identified by an appropriate Transport Assessment.

28. The layout of development should maximise the potential for walkable neighbourhoods, with a legible hierarchy of routes, providing new footpaths and cycleways that link to existing networks beyond the site.

29. Good accessibility to public transport services should be provided by ensuring that the bus routes and bus stops within the site are accessible by pedestrians and cyclists via effective footpaths and cycle routes.

30. The Urban Extension should be supported by an area-wide travel plan, encompassing the needs of all site users. This area-wide travel plan should replace the need for a series of individual travel plans.

31. The Urban Extension should contribute to the Council's wider aspiration of enhancing the Bridgewater Canal as a recreational resource and for the Canal's tow path to provide a cycle and pedestrian link across the Borough.

Utilities and Environmental Protection

32. A site-wide foul and surface water strategy will be required across the Urban Extension as a whole, incorporating appropriate Sustainable Drainage Systems (SUDS) and flood alleviation measures. The surface water strategy will be required to improve on greenfield run-off rates. Development proposals will be expected to incorporate infiltration SuDS and SuDS with multi-functional benefits in preference to traditional underground storage systems.

33. The surface water strategy should be integrated with the site's green infrastructure network in order to maximise ecological and potentially recreational benefits.

34. Improvements to the water supply and sewerage network will be required, ensuring that surface water drainage is not combined with foul discharge. A site wide clean water strategy will also be required.

35. Development within Urban Extension must not impact on the operation of the existing gas pipeline which crosses the site.

36. A Community Recycling Centre to serve the Urban Extension and the wider south Warrington area should be provided within the allocation boundary.

37. The Urban Extension should be designed to mitigate the impacts of climate change; be as energy efficient as possible and seek to meet a proportion of its energy needs from renewable or low carbon sources in accordance with Policy ENV7.

38. Development proposals may be required to assess the impact on the groundwater environment and incorporate appropriate mitigating measures.

39. The design and layout of the Urban Extension must incorporate appropriate measures to mitigate any noise and air quality impacts from the M56 and A49.

40. Development within the Urban Extension will be required to mitigate air quality impacts on the Manchester Mosses SAC in accordance with Policy ENV8 (Part 4).

Historic Environment

41. Development within the Urban Extension will be required to be designed in order to ensure that heritage assets and their settings are conserved and, where appropriate, enhanced within the context of the overall development, through appropriate mitigation measures, having regard to the South East Warrington Urban Extension Heritage Impact Assessment.

Why we have taken this approach

10.2.16 The South East Warrington Urban Extension performed well in terms of the assessment against the objectives of the Local Plan, the requirements of the Government's National Planning Policy Framework and the Local Plan's Sustainability Appraisal.

Figure 18 – Illustrative Development Concept for South East Warrington Urban Extension

10.2.17 Figure 18 details the amended Green Belt boundary and shows how the Urban Extension could be implemented. It is for illustrative purposes only. The definitive boundary of the allocation is shown on the Policies Map.

10.7.18 The South East Warrington Urban Extension is of a sufficient scale to provide a wide range of services to support a new residential community in this part of Warrington, including a secondary school, new primary school provision, health and leisure facilities and a network of open spaces. Its location will also ensure good access to the surrounding urban area including Grappenhall, Stockton Heath District Centre,

Warrington Town centre and the proposed South East Warrington Employment Area.

10.2.19 The ability to make such a significant and sustainable contribution towards meeting Warrington's long term development needs provides the exceptional circumstances required to justify the removal of the South East Warrington Urban Extension from the Green Belt.

10.2.20 The Allocation Policy will ensure that development comes forward in a comprehensive manner with phasing of development linked to the provision of infrastructure.

10.2.21 It will also provide a strong Green Belt boundary in this part of Warrington and will ensure that development preserves and enhances the built and natural environment.

10.2.22 Given the scale of development within the South East Warrington Urban Extension, development will continue beyond the plan period. This will ensure that land is available for Warrington's future development needs and maintains the long term permanence of the Green Belt.

10.2.23 The Council, working with the Principal Landowners, will be taking a leading role in coordinating the delivery of the South East Warrington Urban Extension.

10.2.24 The Principal Landowners have confirmed their commitment to ensuring a comprehensive form of development and their support of the build rates which have informed the development trajectory. They are supportive of the preparation of the Development Framework for the South East Warrington Urban Extension and the delivery of the wide range of infrastructure that is required to support its delivery. The cost of the required infrastructure will be shared on a proportionate basis between developers.

10.2.25 The allocation Policy, together with the Council's Infrastructure Delivery Plan, set out the key infrastructure requirements to support the South East Warrington Urban Extension.

10.2.26 To meet the requirements of Policy MD2 regarding protection of the ecology on the site, the applicant will be required to provide evidence that the development will not result in an adverse effects both alone and in combination with other plans and projects on the integrity of the Mersey Estuary SPA through loss of functionally linked habitat and disturbance from both construction and operation of the development.

10.2.27 To demonstrate this, a survey will be required to determine habitats and current use of the site to support a significant population[1] of qualifying birds associated

[1] A significant population is classified as a site that is regularly used by 1% or more of the population of qualifying bird species.

Appendix 4.7 – ES Addendum – Text Deleted from Original ES Technical Paper 2 – Landscape and Visual Impact Assessment – Technical Paper 4

Six 56 Warrington

ES Addendum – Text Deleted from Original ES Technical Paper 2 – Landscape and Visual Impact Assessment – Technical Paper 4

Section Number / Paragraph Number / Table number / Figure Number in Original Paper	Text Deleted from Original ES	Reason
Section 1 / Paragraph 1.7	Socio Economic	Addendum Socio Economic Technical Paper requested by Council
Section 2 / Paragraph 2.2 & 2.3	Text regarding NPPF (2018)	Replaced with text regarding the updated NPPF 2109
Section 2 / Paragraph 2.14 & 2.15	Text regarding National Planning Practice Guidance	Text updated for published guidance
Section 2 / Paragraph 2.30	(Preferred Options July 2017)	Amended to reflect updated framework
Section 5 / Paragraph 5.4	'Areas' and 'with'	Grammatical amendment
Section 5 / Paragraph 5.17	of	Grammatical amendment
Section 5 / Paragraph 5.26	: however, the Site	Restructuring of sentence for additional information
Section 5 / Paragraph 5.43	The presence of the industrial parks to the west strongly influence the character of this side of the Site, however, as the buildings become more visible	Sentence replaced to include more detail.
Section 5 / Paragraph 5.46	'V' and 'with a multitude of small lanes serving only a relatively small number of scattered properties'	Amended to include additional information on character and visual amenity
Section 5 / Paragraph 5.47	are more visually contained by the industrial parks to the west and dense vegetation around the M6 Motorway and the slip roads associated with it and the M56	Sentence replaced with more detailed information regarding character and visual amenity

	Motorway.	
Section 5 / Paragraph 5.54	And m	Words removed from previous paragraph to start new paragraph.
Section 6 / Paragraph 6.4	This new bunding will require the creation of maximum 1:3 gradient slopes, as this will be a natural self-stabilising slope. This also enables planting to be incorporated along the bund.	Replacement with text regarding 1:3 slopes and steeper reinforced slopes
Section 6 / Paragraph 6.6	Avoiding the vehicular trafficked areas	Design change
Section 6 / Paragraph 6.7	In order to bring visitors into contact with scheduled ancient monument the existing PROW Appleton FP23 will be moved to the west to bring users closer to the monument	PROW no longer relocated.
Section 6 / Paragraph 6.7	to	Restructuring of sentence
Section 7 / Paragraph 7.23	towards	Corresponding to updated Masterplan
Section 7 / Paragraph 7.25	minor	Corresponding to updated Masterplan
Section 7 / Paragraph 7.58	7.3	Amended table reference to 4.14
Section 7 / Table 4.15	The location is close to the proposed new access road and roundabout, which will include associated infrastructure such as street lighting and signage	Relocation of access road to opposite side of Unit 1
Section 8 / Paragraph 8.4	Towards the end of construction the proposed landscaping	Masterplan amendments have removed this route.

	elements will seek to incorporate new hedgerow planting within the interior landscaped areas, therefore providing a safer route for animals to travel through the Site to this ecological mitigation zone.	
Section 8 / Paragraph 8.2	Immediately as construction has started along all external boundaries	Amended to clarify bunds as being introduced as part of the enabling works rather than day one of construction
Section 8 / Paragraph 8.10	The proposals will seek to incorporate new hedgerows along the perimeter of the Site to the north and within the central landscape areas surrounding the Scheduled Ancient Monument, leading around the western side of Plot 3 on the Illustrative Masterplan to the Ecological Mitigation Area to the south east.	Masterplan amendments have removed this route.
Section 10 / Table 4.17	2027/	Amended to updated timescales
Section 10 / Paragraph 10.8	'but it is understood that a new proposal is to be submitted and that the decision against the existing proposal is to be appealed. The following assessment is based on the refused scheme,' and 'is not approved'	Updated to reflect developments in new planning application
Section 10 / Paragraph 10.9	18.5m or 83.00 AOD	Unit reduced to 18m
Section 10 / Paragraph 10.17	For the	Restructuring of sentence

Six 56 Warrington

Second ES Addendum – Text Deleted from Original ES Technical Paper 2 – Landscape and Visual Impact Assessment – Technical Paper 4 Revision G

Section Number / Paragraph Number / Table number / Figure Number in Original Paper	Text Deleted from Original ES	Reason
Front cover	F 15.10.20	Updated revision
Page 2	F 15.10.20	Updated revision
Paragraph 1.4 and Paragraph 1.5	have	Change in tense
Paragraph 1.6	Have Been This	Change in tense
Paragraph 1.9	This addendum should however be read in conjunction with the original ES submitted to WBC in April 2019 as the other technical papers (Ground Conditions and Contamination; Socio-Economic, Air Quality, Utilities, Energy, Waste and Agricultural Land and Soils) have not been amended or subject to change and as such are not included within this addendum, but still remain valid and still form part of the ES for the planning application. See Appendix 18 of the ES Part 1 Addendum which provides Consultants confirmation that there are no changes to the significance of impacts in the Ground Conditions and Contamination; Socio-Economic, Air Quality, Utilities, Energy, Waste and Agricultural Land and Soils Technical Papers arising from the updated project description presented in this ES Addendum.	Text is no longer relevant to this paper.
Section 2 paragraph 2.1	NPPF 2018	Updated ref to NPPF 2021
Paragraph 2.3	NPPF 2019 National Planning Policy Framework (February 2019) 2.3. The updated Framework replaces the first Framework, which	Replaced in this section with updated text on NPPF 2021

	was published March 2012 and includes minor clarifications to the revised version, published in July 2018. It sets out the Government's planning policies for England and how these should be applied. In ensuring that the planning system contributes to achieving sustainable development para.9 of the Framework states that 'Planning policies and decisions should play an active role in guiding development towards sustainable solutions but in doing so should take local circumstances into account, to reflect the character, needs and opportunities of each area'. 2.4. Under the section 3 Plan-making, para.20d states that 'conservation and enhancement of the natural, built and historic environment, including landscapes and green infrastructure and planning measures to address climate change mitigation and adaption'. 2.5. Under section 6 Building a strong, competitive economy, para. 84 refers to ensuring that development is 'sensitive to its surrounding' where sites to meet local business and community needs in rural areas may have to be found adjacent to or beyond existing settlements. 2.6. Section 8 Promoting healthy and safe communities, refers to the needs for 'accessible green infrastructure' in para.91c and para.96 states that 'Access to a network o high quality open spaces and opportunities for sport and physical activity is important for the health and well-being of communities'. 2.7. Section 11 Making effective use of land states in para.117 that 'Planning policies and decisions should	

	promote an effective use of land in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions'. In para.118a it states that planning policies and decisions should 'encourage multiple benefits from both urban an rural land, including through mixed use schemes and taking opportunities to achieve net environmental gains - such as developments that would enable new habitat creation or improve public access to the countryside'. The Framework supports the use as much use of possible of previously-developed or brownfield land providing this does not conflict with other policies within the Framework such as causing harm to designated sites of importance for biodiversity. 2.8. Within Section 11 sub heading Achieving appropriate densities, para.122d states that planning policies and decisions should make efficient use of land and take into account 'the desirability of maintaining an area's prevailing character and setting…or of promoting regeneration and change' and in para.122e 'the importance of securing well-designed, attractive and healthy places'. 2.9. Section 12 Achieving well-designed places, para.125 states that design policies 'should be developed with local communities so they reflect local aspirations and are grounded in an understanding and evaluation of each area's defining characteristics. Neighbourhood plans can play an important roles in identifying the special qualities of each area and explaining how this should be reflected in	

	development'. Para.127b states that planning policies and decisions should ensure that developments are 'visually attractive as a result of good architecture, layout and appropriate and effective landscaping', para127c that they are 'sympathetic to local character and history, including the surrounding built environment and landscape setting…' and in para.127d that they 'establish or maintain a strong sense of place…to create attractive, welcoming and distinctive places to live, work and visit'. 2.10. Furthermore, Section 12 para.128 refers to the need to consider 'design quality' throughout the evolution and assessment of proposals and in para.130 states that 'Permission should be refused for development of poor design that fails to take the opportunities available for improving the character and quality of an areas and the way it functions…'. 2.11. In Section 15 Conserving and enhancing the natural environment, para.170 states that 'Planning policies and decisions should contribute to and enhance the natural and local environment by: a) protecting and enhancing valued landscapes sites of biodiversity or geological value and soils…' and b) 'recognising the intrinsic character and beauty of the countryside and the wider benefits from natural capital and ecosystem services - including the economic and other benefits of the best and most versatile agricultural land and of trees and woodland' and d) 'minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are	

	more resilient to current and future pressures'. 2.12. In para.171 of the Framework it states that 'Plans should…take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries'. Furthermore, in para.172 it states that 'Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty…planning should be refused for major development other than in exceptional circumstances and where it can be demonstrated that the development is in the public interest'. 2.13. In para.180 of the Framework it states that 'Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the Site or wider areas to impacts that could arise from the development'. Para 180b says that policies and decisions should 'identify and protect tranquil areas which have remained relatively undisturbed by noise…' and in para.180c 'limit the impact of light pollution…' National Planning Practice Guidance 2.14. Planning Practice Guidance (PPG) is to be updated, where necessary, to reflect the changes in the	

	new Framework published in July 2018. It is understood that guidance with respect to topics such as Design, Natural Environment, and Open space are still relevant even though originally drafted to support the first Framework. Under PPG with respect to the Natural Environment, it is stated that one of the core principles in the NPPF is that 'planning should recognise the intrinsic character and beauty of the countryside' and that where appropriate 'landscape character assessments should be prepared to compliment Natural England's National Character Area profiles'. Both national and local landscape character assessments are reviewed in the baseline section 5 Baseline Information, of this report. 2.15. Under PPG with respect to Design, the importance of good quality design as an integral part of sustainable development is recognised and that 'development should seek to promote character in townscape and landscape by responding to and reinforcing locally distinctive patterns of development, local man-made and natural heritage and culture, while not preventing or discouraging appropriate innovation'. It also recognises that a well-designed space has a distinctive character, which often makes a place special and valued.	
Paragraph 2.28	The Department for Communities and Local Government (DCLG) has also launched a National Planning Practice Guidance web-based resource to support the Framework.	Not relevant
Paragraph 2.40	Warrington Preferred Development Options Consultation Document (PDO) (July 2017)	Updates to Warrington Draft Local Plan 2021-2038

	2.40. The council is currently undertaking a review of its Local Plan and has prepared its PDO drawing on the evidence base. It confirms the need for Green Belt release to meet a housing target of 1,113 per annum and an employment target of 381 hectares over a 20-year plan period. The PDO identifies the Six56 Warrington site as a site for potential employment land as part of a wider Garden Suburb. South Warrington Urban Extension Framework Plan Document June 2017 Warrington Submission Version Local Plan (2019) and Garden Suburb Development Framework (March 2019) 2.41. This Masterplan and Development Framework provides the evidence basis to inform the emerging Local Plan (Preferred Options July 2017). The Framework prepared by consultants AECOM, assesses the opportunity to provide a natural urban extension to southern Warrington to accommodate sustainable residential growth and unlock further employment development opportunities. The Site falls within an area, which has been identified as employment land within the Framework. The Framework also identifies and approach to green infrastructure which correspond with the northern and southern boundaries of the Site determined by the major transport corridors. 2.42. The Council consulted on the next stage of their Local Plan, the Proposed Submission Version Local Plan in April 2019, for a period of 8 weeks. This Submission Version of the Local Plan was presented to Full Council Board on the 25th March 2019, seeking approval to commence public	

	consultation. This Plan is now in the public domain. Following consultation the Council are reviewing all of the representations made during the consultation prior to submitting the Plan for 'Examination in Public' to be carried out by an independent Inspector. Following the Examination in Public, the Inspector will issue a report setting out their recommendations, including any required modifications to the Plan. The Council must carry out a final consultation on any Main Modifications before formally adopting the Plan.	
Paragraph 4.4	Landscape Institute Advice Note 01/11 (March 2011) Photography and Photomontage in Landscape and Visual Impact Assessment.	Superseded
Paragraph 5.28	NPPF paragraph 113	NPPF paragraph number change
Paragraph 7.14	has been granted permission for a proposed industrial development	Application now dismissed following call in inquiry
Paragraph 7.17	43.5m	Changed to 30m
Paragraph 7.22	24.5m 43.5m	Change in building heights
Paragraph 7.60	002	Change in revision reference to 003
Paragraph 8.4	85.50 21m	Changes to AOD and building height
Paragraph 8.5	therefore no mitigation measures are required. However,	Change in grammar.
Paragraph 9.10	however, the height of the proposed units within Zone B2 will stand prominently above the canopy of the new tree planting and bunding therefore the proposed building units will still be visible.	Reference to impact of reducing building heights
Table 4.17 Cumulative Development	Warrington Garden Suburb Phase (March 2019) around 7,400 homes, with around only 5,100 of these homes to be delivered within the Plan Period, up to 2037. Assumed 2020-2025	Change to SE Urban Extension Change to Local Plan including number of dwellings proposed Change to development trajectory

	Assumed 2026-2030 Assumed 2031-2035 Assumed 2036-2040	
Paragraph 10.8	with the decision now pending. which is to construct a new national distribution centre on land opposite the existing site. referred to the SoS at the time of writing	Update to status of Stobart site which was dismissed following call-in inquiry.
Paragraph 10.9	are	Change in tense
Paragraph 10.10	104.50m	Change to AOD
Paragraph 10.17	WBCs Local Plan is under review and the Submission Version Local Plan (October 2021) (March 2019) and Preferred Development Options (PDO) document which propose the release of Green Belt land to allow the Garden City Suburb has not be approved at the time of this assessment. Preferred Development Options. with further employment land identified within a potential district core separated by a strategic green corridor following B5356 Grappenhall Lane (see **Appendix 4.6**). The PDO includes for residential development and a potential country park, the latter on the existing southern boundary of Grappenhall.	Updates to status and latest Local Plan Version.
Paragraph 10.18	Major To the M56 Motorway and M6 Motorway corridors PDO With respect to the Proposed Development, however, this would, over what is assumed to be a medium to long time frame, serve to amalgamate the Site into wider urban development. The infancy of the Emerging Local Plan ensures uncertainty as to the reliability of the information available at the time	Updates to status and latest Local Plan Version and SE Urban Extension

	of writing; details will therefore be subject to change.	
Paragraph 10.19	Should this materialise	Change to SE Urban Extension
Section 2 / 2.40-2.41	Warrington PDO 2017; South Warrington Urban Extension Framework Plan 2017; Warrington Submission Version Local Plan 2019 Garden Suburb Development 2019	Reference to Warrington Draft Local Plan 2021-2038

Appendix 4.8 – Residential Visual Amenity Assessment (RVAA)

LAYER
LANDSCAPE ARCHITECTURE

SIX56 | WARRINGTON

PLANNING

Appendix 4.8 - Residential Visual Amenity Assessment

July 2020

Table of Contents

1. INTRODUCTION

Background

1.0 Layer Landscape Architecture Ltd (LAYER) have been instructed by Langtree Property Partners and First Panattoni to undertake a Residential Visual Amenity Assessment (RVAA) in response to the request of the Local Planning Authority (LPA), Warrington Borough Council (WBC) to submit further information in support of the planning application. LAYER is a registered practice of the Landscape Institute and the report has been authored and checked by Chartered Members of the Landscape Institute (CMLI).

1.1 RVAA is an additional stage beyond what is normally considered within a Landscape and Visual Impact Assessment (LVIA) and focuses exclusively on private views and private visual amenity. An RVAA may be used by the LPA when determining the appropriate weighting of potential affects on Residential Amenity in consideration of the overall planning balance.

Purpose of the Assessment

1.2 Visual amenity is defined in Guidelines for Landscape and Visual Assessment, Third Edition 2013 (GLVIA3) as *'the overall pleasantness of the views they enjoy of their surroundings'*. Residential Visual Amenity is defined as the overall quality, experience and nature of views and outlook available to occupants of residential properties, including views from gardens and domestic curtilage. As such it forms a component in the consideration of Residential Amenity, other considerations may include noise and air quality.

1.3 Significant adverse effects on views and visual amenity may be experienced by people at their place of residence through the introduction of a new development into the landscape or townscape. Whilst this does not necessarily outweigh other planning considerations, there are situations where the effect on the outlook or visual amenity of a residential property is so great that it is not generally considered to be in the public interest to permit such conditions to occur, where they did not exist before.

1.4 The purpose of the RVAA is to determine if the effect of the development on Residential Visual Amenity is of such a nature or magnitude that it potentially affects living conditions or Residential Amenity. This is referred to as the Residential Visual Amenity Threshold (RVA Threshold).

Methodology

1.5 The Landscape Institute has issued a technical guidance note with respect to the undertaking of a RVAA[1] and this has been followed for the undertaking this assessment. The RVAA follows the four stages referred to in the guidance, which is shown in Figure 1 RVAA Process. For more information regarding the guidance set out within the Landscape Institutes Technical Note please refer to **Appendix 1**.

[1] Residential Visual Amenity Assessment LI Technical Guidance Note 2/19 (March 2019)

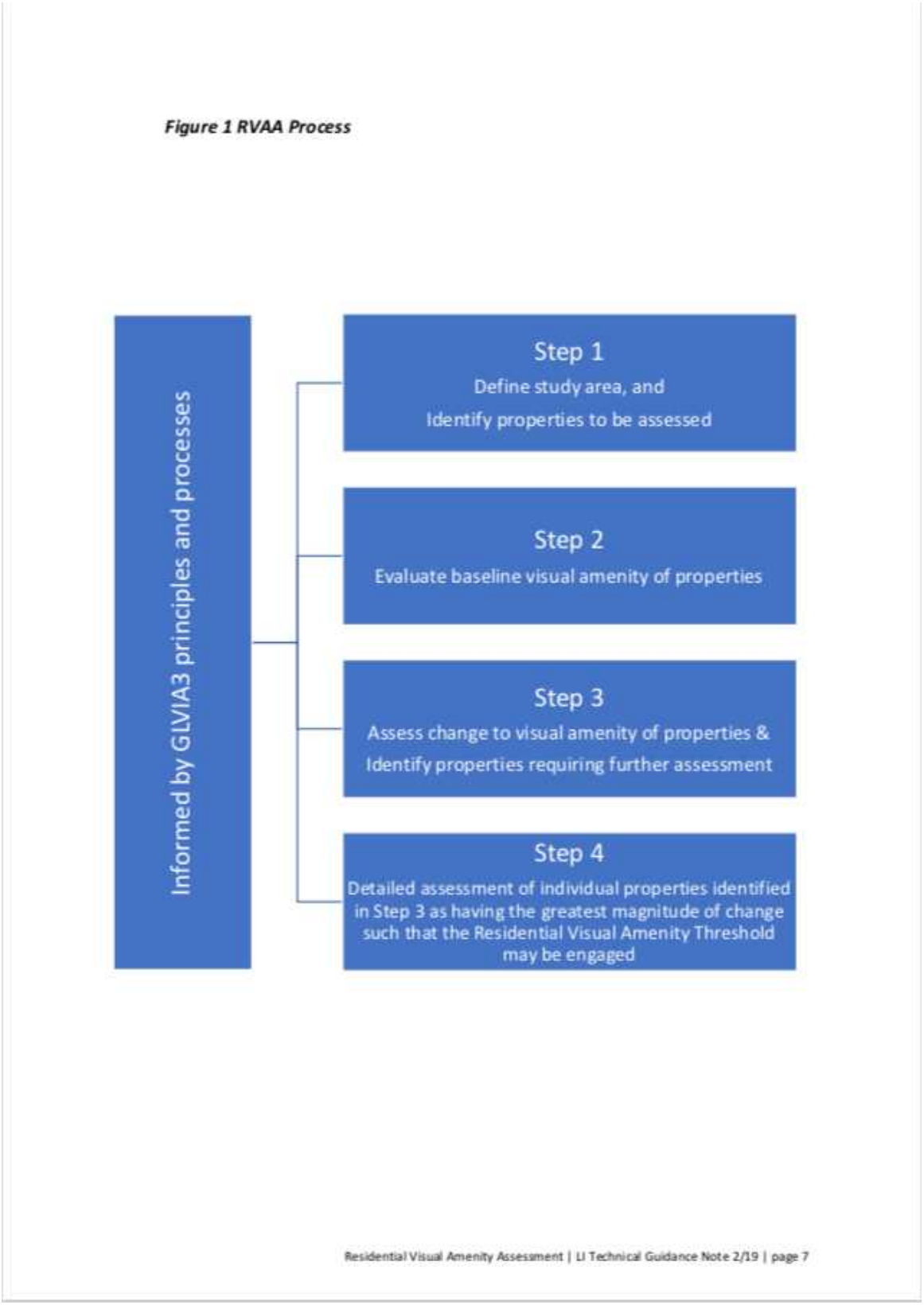


Figure 1 Extract from the Residential Visual Amenity Assessment LI Technical Guidance Note 2/19 page 7 – RVAA Process

1.6 The Residential Visual Amenity Assessment is undertaken via a four-step process.

- Step 1 – Definition of the study are and scope of the assessment
- Step 2 – Evaluation of the Baseline Visual Amenity
- Step 3 – Assessment of likely change to visual amenity of properties
- Step 4 – Formatting the RVAA Judgement

1.7 The changes that may occur due to the introduction of the proposed development are assessed for the RVAA using the magnitude and significance of visual effects criteria as set out within the Guidance for Landscape & Visual Impact Assessment Third Edition (GLVIA3) which also forms the basis for the methodology used throughout this Chapter.

1.8 Within Step 3 of the Landscape Institute Technical Note, the guidance sets out a framework that is to be considered when describing and evaluating the predicted magnitude of visual change and related visual amenity effects, which may lead to the property being considered to reach the threshold. These include:

- *"Distance of property from the proposed development having regard to its size / scale and location relative to the property (e.g. on higher or lower ground);*
- *Type and nature of the available views (e.g. panoramic, open, framed, enclosed, focused etc.) and how they may be affected, having regard to seasonal and diurnal variations;*
- *Direction of view / aspect of property affected, having regard to both the main / primary and peripheral / secondary views from the property;*
- *Extent to which development / landscape changes would be visible from the property (or parts of) having regard to views from principal rooms, the domestic curtilage (i.e. garden) and the private access route, taking into account seasonal and diurnal variations;*
- *Scale of change in views having regard to such factors as the loss or addition of features and compositional changes including the proportion of view occupied by the development, taking account of seasonal and diurnal variations;*

- *Degree of contrast or integration of new features or changes in the landscape compared to the existing situation in terms of form, scale and mass, line, height, colour and texture, having regard to seasonal and diurnal variations;*
- *Duration and nature of the changes, whether temporary or permanent, intermittent or continuous, reversible or irreversible etc.; and*
- *Mitigation opportunities – consider implications of both embedded and potential further mitigation."*

1.9 A judgement is formed from, using the criteria above, in combination with an informed professional judgement regarding whether the threshold has been reached. The technical note states that *"the factors which might contribute to the threshold being reached, or the way in which these are expressed, may be different for different types of development (for example, one might use terms such as 'overwhelming/overbearing' for tall structures, or 'overly intrusive' for a development overlooking a garden or principal room)."* Due to the varying outcomes possible for reaching the threshold, the professional judgment requires an explanatory narrative setting out why the effects are considered to reach the Residential Visual Amenity Threshold.

1.10 For the purpose of recording and presenting this assessment, a standard form has been used for each property or group of properties. Night time effects have been considered more generally in the Lighting Assessment (Doc ref: 1015524-RPT-LG-002)

2. ASSESSMENT

Stage 1 Definition of Study Area and Scope of Assessment

2.0 The RVAA uses data collected from the LVIA. The study area for the LVIA was initially established as 2.0 kilometres measured from the centre of the site. A Zone of Theoretical Visibility was also confirmed through digital and field surveys with representative viewpoints agreed with the LPA.

2.1 Viewpoints assessed for the LVIA have been reviewed to define where the highest magnitude of change would occur and further desktop and field surveys have been undertaken to determine which residential properties should be considered within this RVAA. Following this process the study area for this RVAA was determined as being broadly 500 metres from the boundary of the site, which is shown on Appendix 2 - Figure 1.

2.2 The properties assessed are listed and their location are also shown in Appendix 2 - Figure 2. In the majority of cases, properties have been assessed individually but in some instances properties have been grouped where it was felt that their general outlook was similar and they were in close association with each other.

2.3 The assessment was undertaken only from publicly accessible locations and permission to enter private land has not been requested for the purpose of this assessment. Where assumptions have been made this is made clear in the assessment.

Stage 2 Evaluation of Baseline Visual Amenity

2.4 The baseline visual conditions are described for each property or group of properties covering the type, nature, extent and quality of views that are likely to be experienced from the dwelling itself and its domestic curtilage (gardens and drives).

2.5 In accordance with GLVIA3 and the LVIA that has been undertaken for this development, residents at home are considered to be visual receptors with a **high** sensitivity to change.

Stage 3 Assessment of likely change to visual amenity of properties

2.6 Similar to the process undertaken for the LVIA, the assessment considers the magnitude and significance of the likely visual effects of the development from each property using the same criteria and definition of terms applied. For the purpose of this assessment, the predicted change in view is firstly described and the assessment of the effect is recorded below. Where a viewpoint is located close to the property in question, this is referred to for cross-referencing.

Stage 4 Forming the RVAA judgement

2.7 Based on the assessment undertaken in the preceding stage 3, a concluding judgement is made to determine whether the predicted visual effects have reached the RVA Threshold and therefore potentially a matter for considering Residential Amenity. Each judgement is explained to ensure transparency of the process. A summary of the effects of residential amenity can be found in the next section of this report.

3. SUMMARY

3.0 The RVAA has assessed that there are a number of properties, which are predicted will experience substantial adverse visual effects as a result of the development. In determining whether the RVA Threshold has been reached, the focus has been on whether the visual intrusion is of such a magnitude as to render the property an unattractive place to live as distinct from whether the development can be seen and results in significant adverse visual effects.

3.1 Planning precedent is established through a number of planning inquiry and appeal decisions and with respect to RVAA, the LI Technical Guidance Note 2/19 provides a useful reference point to a number of previous decisions. There is no 'right to a view' but the judgement regarding the RVA Threshold is based on whether the proposal would affect the outlook of the resident to such an extent that it was unpleasant and overwhelming rendering the property an unattractive place to live.

3.2 Based on the above criteria the assessment concludes that none of the properties assessed would reach the RVA Threshold. Summaries of the result for each property have been collated below.

No.	Name	Distance	Magnitude	Significance of Effect	RVA Threshold Judgement
1	Tan House Farm Cattery	350m	Moderate	Moderate High Adverse	Not Reached
2	The Barn, Tan House Farm Cattery	310m	High	High Adverse	Not Reached
3	Birchels Gorse	290m	High	High Adverse	Not Reached
4	Barley Castle Farm	270m	High	High Adverse	Not Reached
5	Reddish Hall Farm	210m	Minor	Moderate Adverse	Not Reached
6	Grappenhall Ridge	250m	Negligible	Minor Adverse	Not Reached
7	Broomfield Cottage	310m	Negligible	Minor Adverse	Not Reached
8	2,3 & 4 Broad Lane	380m	Minor	Moderate Adverse	Not Reached
9	Grappenhall Lodge	45m	Moderate	Moderate High Adverse	Not Reached
10	1 & 2 Ivy Cottage	65m	Substantial	Substantial Adverse	Not Reached
11	Southcott	60m	Substantial	Substantial Adverse	Not Reached
12	Hunters Lodge and Hunters Croft	50m	Substantial	Substantial Adverse	Not Reached
13	Manor Farm	35m	Substantial	Substantial Adverse	Not Reached
14	Croftside	30m	Substantial	Substantial Adverse	Not Reached
15	The Bungalow	20m	Substantial	Substantial Adverse	Not Reached
16	5 & 7 Cartridge Lane	15m	Substantial	Substantial Adverse	Not Reached
17	Clifflane Farm House	20m	Substantial	Substantial Adverse	Not Reached
18	Howshoot Farm	25m	Substantial	Substantial Adverse	Not Reached
19	Bradley View	7m	Substantial	Substantial Adverse	Not Reached
20	Bradley Hall Cottages	6m	Substantial	Substantial Adverse	Not Reached

Appendix 1 – Landscape Institute Technical Note 2/19 Residential Visual Amenity Assessment

Landscape Institute Technical Guidance Note

Residential Visual Amenity Assessment (RVAA)

Technical Guidance Note 2/19

15 March 2019

This Technical Guidance Note has been prepared in support of landscape and other appropriately qualified professionals who are engaged in RVAA. It is not prescriptive but aims to improve standards and it promotes a logical approach which should contribute to well informed decision making.

Foreword

The third edition of the Guidelines for Landscape and Visual Impact Assessment, GLVIA3, published in 2013, is well established as providing 'best practice guidance' when undertaking landscape and visual impact assessment (LVIA). With respect to visual impact the focus of GLVIA3 and LVIA is on public views and public visual amenity.

Residential Visual Amenity Assessment (RVAA) is a stage beyond LVIA and focusses exclusively on private views and private visual amenity. RVAA has become more common particularly when development proposals are the subject of a planning appeal. A RVAA may be used by the decision maker when weighing potential effects on Residential Amenity in the planning balance.

This Technical Guidance Note is prepared in support of landscape and other appropriately qualified professionals who are engaged in RVAA. It is not prescriptive but aims to improve standards. It promotes a logical approach which should contribute to well informed decision making.

I wish to express my thanks to all those who responded to the consultation draft, contributed by offering suggestions and submitted examples of RVAA*.

Marc van Grieken FLI

* Examples of RVAAs and their presentation tools may be added to the LI website or included in a revised edition of this note.

1. Introduction

Context

1.1 This Technical Guidance Note has been prepared to assist landscape professionals when undertaking Residential Visual Amenity Assessments (RVAA). People's visual amenity is defined in Guidelines for Landscape and Visual Impact Assessment – Third Edition, 2013 (GLVIA3)[1] as:

> *"the overall pleasantness of the views they enjoy of their surroundings"*

1.2 In this document, Residential Visual Amenity means: 'the overall quality, experience and nature of views and outlook available to occupants of residential properties, including views from gardens and domestic curtilage'. Residential Visual Amenity is one component of 'Residential Amenity'.

Views and visual amenity in the planning process

1.3 The planning system is designed to act in the public interest when making planning decisions. Nevertheless, effects on private interests are considered by planners in the 'planning balance'. This includes weighing effects on Residential Amenity.

1.4 Residential Amenity comprises a range of visual, aural, olfactory and other sensory components. Development can cause effects on one or more components of Residential Amenity, for example effects of noise, dust, access to daylight, vibration, shadow flicker, outlook and visual amenity. Sometimes this is referred to as 'living conditions'.

1.5 Changes in views and visual amenity are considered in the planning process. In respect of private views and visual amenity, it is widely known that, no one has 'a right to a view.' This includes situations where a residential property's outlook / visual amenity is judged to be 'significantly' affected by a proposed development, a matter which has been confirmed in a number of appeal / public inquiry decisions. (see also **Appendix 1 Planning Precedent**).

1.6 It is not uncommon for significant adverse effects on views and visual amenity to be experienced by people at their place of residence as a result of introducing a new development into the landscape. In itself this does not necessarily cause particular planning concern. However, there are situations where the effect on the outlook / visual amenity of a residential property is so great that it is not generally considered to be in the public interest to permit such conditions to occur where they did not exist before.

1.7 Appeals / public inquiries often consider the visual amenity component of Residential Amenity. Notably there have been many decisions relating to wind energy developments, perhaps not

[1] Guidelines for Landscape and Visual Impact Assessment, Third edition, Landscape Institute and Institute of Environmental Management and Assessment, 2013

surprising given the height and size of modern wind turbines. A selection of decision extracts is included as background information in **Appendix 1**.

1.8 Judgements formed in respect of Residential Visual Amenity should not be confused with the judgement regarding Residential Amenity because the latter is a planning matter. Nor should the judgement therefore be seen as a 'test' with a simple 'pass' or 'fail'.

1.9 Landscape professionals should confine their judgement to Residential **Visual** Amenity. The final judgement regarding effect on Residential Amenity (which to greater or lesser extent may be informed by the judgement formed by the landscape professional in respect of Residential **Visual** Amenity) is a planning matter and requires weighing all factors and likely effects (positive as well as negative) in the 'planning balance'. This is a matter for qualified planners and not for landscape professionals.

2. Purpose of RVAA

2.1 The purpose of RVAA is to provide an informed, well-reasoned answer to the question: 'is the effect of the development on Residential Visual Amenity of such nature and / or magnitude that it potentially affects 'living conditions' or Residential Amenity'? In this guidance this is referred to as the Residential Visual Amenity Threshold.

2.2 The Residential Visual Amenity Threshold remains a constant irrespective of the type and nature of the development being assessed in the RVAA. However, the factors which might contribute to the threshold being reached, or the way in which these are expressed, may be different for different types of development (for example, one might use terms such as 'overwhelming/overbearing' for tall structures, or 'overly intrusive' for a development overlooking a garden or principal room). Determining whether the threshold has been reached requires informed professional judgement. It is the process by which informed professional judgement is engaged to reach a conclusion regarding the Residential Visual Amenity Threshold that is the subject of this Technical Guidance Note. It is important that assessors communicate their conclusions in a measured, rational manner. In keeping with recommendations in GLVIA3 this should be done using succinct narrative as opposed to a numerical tabular assessment format. Tables summarising narrative can, however, be very helpful.

2.3 It should be noted that RVAA does not consider, or provide information on, the other components of Residential Amenity referred to above such as noise and air quality. Decision makers, practitioners and others should consider RVAA alongside other relevant documents relating to Residential Amenity that may be provided in support of an application.

RVAA and EIA

2.4 A LVIA prepared in accordance with GLVIA3 provides an appropriate starting point for a RVAA. LVIA usually forms part of Environmental Impact Assessment (EIA).

2.5 LVIA findings of significant (adverse) effects on outlook and /or on visual amenity at a residential property do not automatically imply the need for a RVAA. However, for properties in (relatively) close proximity to a development proposal, and which experience a high magnitude of visual change, a RVAA may be appropriate, and may be required by the determining / competent authority. The scope of a RVAA is normally agreed with the determining / competent authority.

3. Undertaking a RVAA

Approach

3.1 In terms of general approach RVAA should provide a transparent, objective assessment, grounded in GLVIA3 principles and processes, evaluating and assessing the likely change to the visual amenity of a dwelling resulting from a development. RVAA requires assessors to draw a conclusion whether the effect of the development on visual amenity and / or views from the property reaches the Residential Visual Amenity Threshold. Forming such a judgement requires experience in addition to thorough and logical evaluation and reasoning. Experience may be gained, for example, through peer review of the assessment by another landscape architect, or by visiting completed developments and checking if the changes in views and visual amenity were as predicted. Another form of reviewing one's judgement may be through analysing the information and reasoning used by planning Inspectors (England, Wales and Northern Ireland) and Reporters (Scotland) in reaching their findings and conclusions when they ascertain if the Residential Visual Amenity Threshold has been reached. However, assessors should not stray into the realms of planning balance.

Process

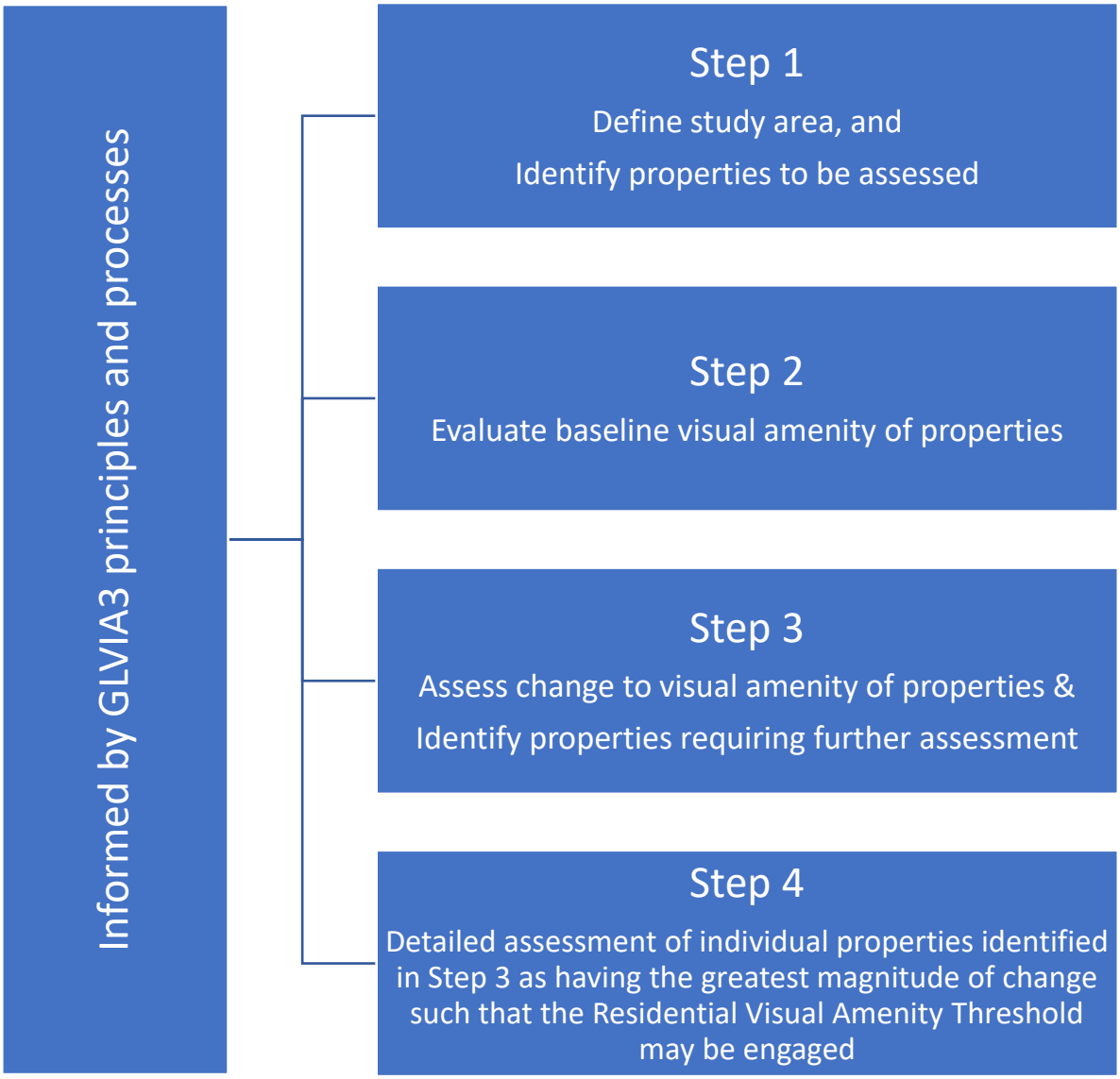
3.2 This guidance recommends that a full RVAA comprises four 'steps' and in situations where all four are engaged this will typically involve some iteration of the third and fourth steps. The first three steps fall broadly within the normal scope of LVIA consisting of an assessment of the magnitude and significance of visual effect (in the EIA context) and change to visual amenity likely to be experienced by occupants at those individual residential properties which were identified while scoping the RVAA.

3.3 The fourth and final step of RVAA requires a further assessment of change to visual amenity examining whether the Residential Visual Amenity Threshold is likely to be, or has been, reached. Whether or not this final step is engaged depends on the circumstances specific to the case. It will generally be clarified either during pre-application consultations relating to the accompanying LVIA, or subsequent to it during the RVAA. In any event RVAA should be considered supplementary to LVIA following on from, and informed by, the latter's findings and conclusions.

3.4 Consultation with the determining / competent authority is recommended to ensure that the scope of a RVAA accompanying an application is agreed in advance. In practice, a RVAA is generally only justified when the effect on Residential Visual Amenity could reach the Residential Visual Amenity Threshold.

3.5 The RVAA process is summarised below in **Figure 1 RVAA Process** and described in more detail in the following Methodology section.

Figure 1 RVAA Process



The relationship between GLVIA3 and this RVAA guidance

3.6 The RVAA approach and methodology set out in this document accords with GLVIA3 principles and processes. Paragraph 6.1 (page 98) of GLVIA3 states:

> *"An assessment of visual effects deals with the effects of change on views available to people and their visual amenity. The concern here is with assessing how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements."*

3.7 However, it should be stressed that, RVAA is distinct from LVIA as noted in GLVIA3 at paragraph 6.17 (pages 107 and 109), which states:

> *"Effects of development on private property are frequently dealt with mainly through 'residential amenity assessments'. These are separate from LVIA although visual effects assessment may sometimes be carried out as part of a residential amenity assessment, in which case this will supplement and form part of the normal LVIA for a project. Some of the principles set out here for dealing with visual effects may help in such assessments but there are specific requirements in residential amenity assessment."*

3.8 RVAA is concerned specifically with the effects of change to the views and visual amenity available to people at their place of residence. As explained above the key difference between RVAA and LVIA is that RVAA focuses on private visual amenity at individual properties whilst LVIA focusses on public amenity and views. In relation to private property and residential receptors GLVIA3 states at paragraph 6.36 (page 114):

> *"The issue of whether residents should be included as visual receptors and residential properties as private viewpoints has been discussed in Paragraph 6.17. If discussion with the competent authority suggests that they should be covered in the assessment of visual effects it will be important to recognise that residents may be particularly susceptible to changes in their visual amenity - residents at home, especially using rooms normally occupied in waking or daylight hours, are likely to experience views for longer than those briefly passing through an area. The combined effects on a number of residents in an area may also be considered, by aggregating properties within a settlement, as a way of assessing the effect on the community as a whole. Care must, however, be taken first to ensure that this really does represent the whole community and second to avoid double counting of the effects".*

3.9 It should be noted that 'combined effects on a number of residents' referred to above, by means of 'aggregating properties within a settlement' is a matter of LVIA and not of RVAA.

4. Methodology

4.1 The recommended four RVAA steps should provide a transparent, robust framework and reporting structure for the assessment, one which is grounded in established GLVIA3 principles and processes, as summarised below.

RVAA Steps

1. Definition of study area and scope of the assessment – informed by the description of the proposed development[2], defining the study area extent and scope of the assessment with respect to the properties to be included.

2. Evaluation of baseline visual amenity at properties to be included having regard to the landscape and visual context and the development proposed.

3. Assessment of likely change to visual amenity of included properties in accordance with GLVIA3 principles and processes.

4. Further assessment of predicted change to visual amenity of properties to be included forming a judgement with respect to the Residential Visual Amenity Threshold.

4.2 The RVAA steps are described in more detail as follows.

Step 1 – Definition of study area and scope of the assessment

4.3 The type and nature of development proposal and its likely effects informs the determination of both the need for, and the scope of, a RVAA. The description of the development should provide a robust, transparent basis for defining the extent of the study area and the scope, including which properties to include in the assessment. Mapping techniques such as Zone of Theoretical Visibility (ZTV) analysis are useful in this regard. The description of the development will be substantially the same as that used in the LVIA, but may be more focussed on a more limited geographic area.

4.4 There are no standard criteria for defining the RVAA study area nor for the scope of the RVAA, which should be determined on a case-by-case basis taking both the type and scale of proposed development, as well as the landscape and visual context, into account.

4.5 As a starting point the study area will typically be established using the general approach recommended in GLVIA3 (see Chapter 6, paragraph 6.2, page 98) and using such aids as ZTV mapping[3]. This should focus on identifying the properties to be included for assessment and should be proportionate to the proposed development in question having regard to the

[2] Type and nature of the development having regard to scale, form, massing etc and existing landscape context.
[3] GLVIA3, paragraph 5.2, page 70, and paragraphs 6.2, page 98, and 6.7-6.12, pages 101-103 etc.

landscape and visual context. Simply being able to see a proposed development from a property is no reason to include it in the RVAA.

4.6 Over the last few years a large number of RVAAs have been prepared, especially relating to wind energy proposals. Local Planning Authorities (LPA) have frequently requested 'study areas' of up to 3 or even 5 km. The logic for these (exceptionally) large study areas was based on certain findings of LVIAs which identified significant visual effects from 'settlements' or from clusters of residential properties within this range. This fails to recognise that RVAA is a stage beyond LVIA. Consequently, many RVAAs, including those of windfarms with large turbines (150m and taller), have included disproportionately extensive study areas incorporating too many properties. This appears to largely be based on the misconception that if a significant effect has been identified in the LVIA adjacent to a property at 2.5km it will also potentially lead to reaching the Residential Visual Amenity Threshold.

4.7 When assessing relatively conspicuous structures such as wind turbines, and depending on local landscape characteristics, a preliminary study area of approximately 1.5 - 2 km radius may initially be appropriate in order to begin identifying properties to include in a RVAA. However, other development types including potentially very large but lower profile structures and developments such as road schemes and housing are unlikely to require RVAA, except potentially of properties in very close proximity (50-250m) to the development. For example, when assessing effects of overhead transmissions lines, generally only those properties within 100 – 150 metres of the finalised route are potentially considered for inclusion in a RVAA.

4.8 Properties are normally assessed individually, but if their outlook and / or views are in all aspects the same (for example if a development is visible from the rear gardens only of a small row of houses) they could be assessed as one (group). This will be at the discretion of the assessor and will require a clear explanation of the reason for the grouping or clustering.

Step 2 – Evaluation of Baseline Visual Amenity

4.9 The next step involves describing and evaluating the baseline visual conditions at the properties to be included, informed as appropriate by desk study and fieldwork. Fieldwork is briefly discussed at the end of this section.

4.10 The existing (or baseline) visual amenity of a residential property should be described in terms of the type, nature, extent, and quality of views that may be experienced 'in the round' (see glossary) from the dwelling itself, including its 'domestic curtilage' (domestic gardens and access drives).

4.11 When evaluating the baseline, it is recommended that the following aspects are considered:

- the nature and extent of all potentially available existing views from the property and its garden / domestic curtilage, including the proximity and relationship of the property to surrounding landform, landcover and visual foci. This may include primary / main views from the property or domestic curtilage, as well as secondary / peripheral views; and

- views as experienced when arriving at or leaving the property, for example from private driveways / access tracks.

4.12 In accordance with GLVIA3 residents at home are considered, amongst 'visual receptors', to be the most 'susceptible' to change[4] and to attach most value to their private, views and visual amenity. They are therefore considered to be most sensitive[5].

Step 3 – Assessment of likely change to visual amenity of properties

4.13 The third step in the process assesses the magnitude and significance of likely visual effect at the included properties. Effects are examined in accordance with GLVIA3 principles and processes[6], considering the 'nature of the receptor' ('sensitivity' comprising 'value' and 'susceptibility') with the 'nature of effect'. The assessment findings may be recorded in both narrative and tabular form as appropriate, but the conclusion should be fully explained. The aim of Step 3 is to identify those properties requiring further assessment in Step 4 in relation to the Residential Visual Amenity Threshold judgement.

4.14 Considerations which provide a framework for describing and evaluating the predicted magnitude of visual change and related visual amenity effects which may lead to the property being considered in Step 4 include:

- Distance of property from the proposed development having regard to its size / scale and location relative to the property (e.g. on higher or lower ground);
- Type and nature of the available views (e.g. panoramic, open, framed, enclosed, focused etc.) and how they may be affected, having regard to seasonal and diurnal variations;
- Direction of view / aspect of property affected, having regard to both the main / primary and peripheral / secondary views from the property;
- Extent to which development / landscape changes would be visible from the property (or parts of) having regard to views from principal rooms, the domestic curtilage (i.e. garden) and the private access route, taking into account seasonal and diurnal variations;
- Scale of change in views having regard to such factors as the loss or addition of features and compositional changes including the proportion of view occupied by the development, taking account of seasonal and diurnal variations;
- Degree of contrast or integration of new features or changes in the landscape compared to the existing situation in terms of form, scale and mass, line, height, colour and texture, having regard to seasonal and diurnal variations;
- Duration and nature of the changes, whether temporary or permanent, intermittent or continuous, reversible or irreversible etc.; and

[4] GLVIA3, paragraph 6.33
[5] Ibid, paragraphs 6.31-6.36
[6] Footnote '13' (first instance) missing in consultation draft?

- Mitigation opportunities – consider implications of both embedded and potential further mitigation.

4.15 This step will typically involve both desk study and detailed fieldwork but is unlikely to require visits to individual properties which, for the purposes of this step, can generally be assessed from the nearest publicly available vantage / access point. Where this is not feasible then visits to certain individual properties (or clusters of) may be appropriate.

4.16 Step 3 should conclude by identifying which properties should be assessed further in the final step in order to reach a judgement regarding the Residential Visual Amenity Threshold.

Step 4 – Forming the RVAA judgement

4.17 The final step of RVAA involves a more detailed examination of the predicted effects on the visual amenity at those properties identified for further assessment in the previous step.

4.18 There is an important distinction between this concluding step of RVAA and the preceding one. In Step 3 the assessor has reached a conclusion with respect to magnitude and (EIA) significance of visual effect, and the change in visual amenity at the property. In this final step, and only for those properties where the largest[7] magnitude of effect has been identified, a further judgement is required. This concluding judgement should advise the decision maker whether the predicted effects on visual amenity and views at the property are such that it has reached the Residential Visual Amenity Threshold, therefore potentially becoming a matter of Residential Amenity. This judgement should be explained in narrative setting out why the effects are considered to reach the Residential Visual Amenity Threshold. Equally, judgements should explain why the threshold has not been reached.

4.19 The Residential Visual Amenity Threshold judgement should be communicated in a coherent manner, using text with clear descriptions, employing terminology which is commonly understood and descriptors which may have previously been used. Assessors should ensure that their judgements are unambiguous and have a clear, rational conclusion. Some examples of descriptions and descriptors that might be used include: 'blocking the only available view from a property', or 'overwhelming views in all directions'; and 'unpleasantly encroaching' or being 'inescapably dominant from the property'. It may also be useful to employ bespoke graphics such as annotated aerial photographs and wireframe visualisations to aid this further assessment in Step 4.

4.20 The key point regarding Step 4 is that the judgement required in this final, concluding step goes beyond the assessment undertaken in Step 3 which is restricted to judging the magnitude and significance of visual effect, typically as a supplement to the accompanying LVIA.

[7] In line with GLVIA3 best practice (page 38, paragraph 3.27, point 2), visual impact magnitude is expressed on a sliding scale from minimum to maximum, typically using descriptors such as negligible, small, medium and large. Being a continuum, each of these has its upper and lower limits. It is important for assessors to keep in mind that RVAA is only concerned with those properties in the highest magnitude category.

Fieldwork and Associated Activities

4.21 In keeping with advice on LVIA set out in GLVIA3 it is standard practice to carry out fieldwork and use various tools when undertaking a RVAA. Fieldwork will be focussed on those properties identified for inclusion in the RVAA in Step 1; for those properties included in Step 4 it may also include visiting those properties subject to occupier consent. It requires prior preparation (desk study) and appropriate tools and materials such as drawings, maps and visualisations etc. Dependent on assessment scope and consultation feedback more than one visit may be required. Fieldwork will typically include the following:

- Fieldwork – Initial fieldwork may be used during Steps 1-3 to evaluate and assess the general visual amenity of the included properties, based on assessment scope and consultation feedback. The scoping of properties from publicly accessible locations is usually appropriate. The initial fieldwork would typically form the basis for identifying those dwellings to be assessed in more detail in Step 4, namely those which may require detailed inspection of views and visual amenity, both from inside the property as well as from its garden and general curtilage;

- Visualisation – Preparation of suitable graphic and / or visual material such as ZTVs and wirelines may be appropriate for use during fieldwork and as an aid to assessment, in addition to aiding presentation of RVAA findings. Depending on the circumstances and consultation responses, and feedback from determining / competent authorities, the type and nature of visualisations may vary. In any event visualisations should be proportionate to the development proposal in question and appropriate to the project phase / assessment stage, and considered in the context of relevant best practice guidance including LI Technical Guidance Note 02/17[8] Such visualisations may be shared with residents at the appropriate stage when documents become publicly available, or as agreed between the parties and their clients; and

- Property Inspection – the purpose of the property inspection is to gather information pertinent to the assessment of Residential Visual Amenity. There are no standard protocols for property inspections but best practice dictates that they should be arranged between the parties on a case by case basis with the involvement of the determining / competent authority as and when appropriate. In the event that access to private property cannot be obtained, and having employed best endeavours to do so, assessment can and should be undertaken from appropriate publicly accessible locations.

4.22 Communication with local residents needs to be carefully planned and executed with sensitivity, demonstrating respect for residents' privacy. It is recommended that site visits and property inspections be conducted in pairs. Assessors should make it clear to residents that, although he/she is unable to comment on the findings during the site visit, the RVAA report will be made publicly available at the appropriate stage in the planning process.

4.23 Residents of private property are likely to be concerned regarding potential visual effects and change to the visual amenity of their homes. This concern is reflected in RVAA best practice which, as with LVIA and in line with advice in GLVIA3, considers residential receptors to be of

[8] 'Visual representation of development proposals', Landscape Institute Technical Guidance note 02/17 (31 March 2017)

the highest visual sensitivity (high susceptibility and high value)[9]. It is important that residents are made aware of this and how to make representations to the decision maker / competent authority regarding the proposed development in order to express any concerns felt.

Seasonal and Diurnal Considerations

4.24 Seasonal and diurnal variation (including lighting impacts) are factors that need consideration when assessing the visual amenity baseline and the likely visual effects resulting from a development proposal. Both these aspects form part of the evaluation factors / objective considerations set out in Step 3 of the RVAA process and should be dealt with in line with advice contained in GLVIA3 (refer paragraph 6.12, page 103 and paragraph 6.28, page 112).

Cumulative Considerations

4.25 Cumulative impacts on the landscape and visual resource are matters to be addressed in the LVIA of a proposed development in accordance with recommendations in GLVIA3 (refer Chapter 7). As a rule, future cumulative visual effects are not assessed in RVAA, the focus of which concerns effects on existing visual amenity. Existing cumulative development will form part of the baseline visual amenity considered in Step 2 of RVAA; future cumulative development is generally not a RVAA consideration. However, in certain circumstances, it may be appropriate to consider a particular cumulative proposal which is effectively already part of the existing landscape baseline. For example: where an extension to an existing development is consented, or under construction, but not yet built; or where two developments are proposed simultaneously. Such circumstances should be dealt with on a case by case basis in consultation with the competent / determining authority.

RVAA Presentation Techniques

4.26 Examples of RVAA graphics and presentation techniques generally can be found on the Directorate for Planning and Environmental Appeals (DPEA) website[10] (for Scotland) and the Planning Inspectorate[11] and Department for Communities and Local Government websites[12] (for England & Wales). Going forward practitioners may add examples of RVAAs and presentation tools to the LI website subject to client approvals and anonymising of individual properties. Meanwhile the aforementioned websites contain examples of RVAAs in the public domain made available by planning and other decision-making authorities.

[9] However, it is important to note that, RVAA is distinct from LVIA in that its ultimate purpose is to provide a further assessment of residential visual amenity concluding with a judgement in relation to the Residential Visual Amenity Threshold taking any previous LVIAs as the starting point, as explained in Section 3 Undertaking a RVAA above.
[10] http://www.dpea.scotland.gov.uk/
[11] https://acp.planninginspectorate.gov.uk/
[12] https://www.planningportal.co.uk/

5. Summary and Conclusions

5.1 The purpose of carrying out a Residential Visual Amenity Assessment (RVAA) is to form a judgement, to assist decision makers, on whether a proposed development is likely to change the visual amenity of a residential property to such an extent that it becomes a matter of 'Residential Amenity'. Potential effects on Residential Amenity are a planning matter and should not be judged by landscape architects.

5.2 The threshold at which a residential property's visual amenity becomes an issue of Residential Amenity has sometimes been described as the point when 'the effect(s) of the development on the 'private interest' is so great that it becomes a matter of 'public interest''. The planning system is only concerned with public interest. In certain circumstances, however, the effect of the development is so great that it is not in the public interest to create or allow 'such conditions' where they did not exist before. This is sometimes referred to as the 'public interest test'. However, this is a legal / planning term and not recommended for use by landscape practitioners. This guidance uses the term Residential Visual Amenity Threshold.

5.3 The recommended approach to undertaking a RVAA is grounded in principles and process set out in GLVIA3. The recommended method for undertaking a RVAA involves four steps. It follows a structured assessment process employing a range of objective criteria to underpin the ultimate professional judgement regarding the Residential Visual Amenity Threshold. The aim is to identify those residential properties whose visual amenity has the potential to be affected to the largest magnitude of impact. Properties with the highest magnitude of effect are assessed further culminating in a professional judgement as to whether the Residential Visual Amenity Threshold is likely to be reached at this property or not.

5.4 There are no hard and fast rules or criteria for making this judgement, but it does require objective, logical evaluation and reasoning, and must be explained in clear and common language. A RVAA judgement so executed will contribute to well informed decision making.

Glossary

The following glossary of terms commonly used in relation to RVAA is intended to supplement that provided in GLVIA3.

Planning balance

When forming a judgement if a development is acceptable or not, all relevant planning matters pertaining to the proposed development (both planning benefits and disbenefits) will be given, greater or lesser, weight in forming the judgement. This is often referred to as the 'planning balance'.

'In the round'

'In the round' means the combined or all-round visual amenity experience at, or from a property. Visual amenity is *"the overall pleasantness of the views they enjoy of their surroundings" (paragraph* 2.20, page 21; GLVIA)

Judgement

Judgement in RVAA (as in LVIA) means: the considered, well-reasoned, informed and dispassionate opinion of the qualified professional (refer GLVIA3 paragraphs 2.21-2.26, pages 21-22).

Outlook

The outlook of a property incorporates the views from, and visual amenity of, all aspects of the building and its domestic curtilage. Different 'aspects' of a property's outlook may be identified and assessed, namely its 'main' or 'front' aspect, as opposed to its 'side' or 'rear' aspects.

Overbearing

The Department for Communities and Local Government online planning portal defines 'overbearing' as *"the impact of a development or building on its surroundings, particularly a neighbouring property, in terms of its scale, massing and general dominating effect"*[13].

Principal room

The principal room(s) of a residential property is a living room, or one fulfilling the same primary use role. In some properties this room may not be located on the ground floor, but on an upper storey. A conservatory may also fulfil a living room / primary use role depending on the circumstances and the internal arrangement of the residence.

[13] https://www.planningportal.co.uk/directory_record/412/overbearing

Domestic curtilage

The domestic gardens and access drives / roads immediately surrounding a residential property including patios, terraces, courtyards and forecourts. The domestic curtilage does not extend to surrounding paddocks and other peripheral land / outbuildings within the property ownership, or to public or private approach roads.

Public interest

The 'public interest' is a legal term which the Merriam Webster online law dictionary defines as "the general welfare and rights of the public that are to be recognized, protected, and advanced"[14]. The Law Society online legal glossary defines it as "the overall welfare of the general public."[15]

Residential Amenity

The Merriam Webster online law dictionary defines 'amenity' as "the quality of being pleasant or agreeable", and further in relation to property as "the attractiveness and value of real estate or of a residential structure."[16]

Residential Visual Amenity

The overall quality, experience and nature of views and outlook available to occupants of residential properties, including views from gardens and domestic curtilage. It represents the visual component of Residential Amenity.

Residential Visual Amenity Threshold

The threshold at which the visual amenity of a residential property is changed and adversely affected to the extent that it may become a matter of Residential Amenity and which, if such is the case, competent, appropriately experienced planners will weigh this effect in their planning balance.

Scenic quality

The quality of a view in terms of 'scenery'; the scenic attributes of a view.

Significant effect / Significantly affected

When undertaking an LVIA as part of an EIA the assessor is required to report on all effects and to identify 'significant' effects. A LVIA should explain which of the range of effects reported are 'significant' in the context of EIA and why.

[14] https://www.merriam-webster.com/dictionary/interest#legalDictionary
[15] https://www.lawsociety.org.uk/for-the-public/legal-glossary/#P
[16] https://www.merriam-webster.com/dictionary/amenity

Visual amenity

The overall pleasantness of the views available to people of their surroundings which provide an attractive visual setting or backdrop for the enjoyment of activities of those living, working and recreating, visiting or travelling through an area (GLVIA3 Glossary, page 158).

Visual effects

Effects on specific views and on the general visual amenity experienced by people (GLVIA3 Glossary, page 158).

Visual impacts

The action which results in / causes the effect. For example, introducing a built structure into an undeveloped landscape will have an impact on the landscape and views which will be experienced by people as effects on local landscape character and visual amenity. It is the purpose of LVIA to judge the magnitude and significance of the resulting landscape and visual effects (see next entry)

Visual impacts versus effects

GLVIA3 distinguishes between landscape and visual impacts and effects. Paragraph 1.15 (page 9) *"This guidance generally distinguishes between the 'impact', defined as the action being taken, and the 'effect', defined as the change resulting from that action, and recommends that the terms should be used consistently in this way."*

Appendix 1 – Planning Precedent

Introduction

A1.1 This Appendix is intended to provide some background to the RVAA guidance with reference to inquiry / appeal decisions that illustrate how Inspectors and Reporters have reached conclusions in respect of Residential Visual Amenity.

Judgement

A1.2 In the Baillie decision Reporter David Russell concluded that assessing effects on private visual amenity is ultimately a matter of judgement[17]:

> *"Any assessment of acceptability in these circumstances relies on judgement rather than measurement."*

A1.3 And:

> *"Given that I have found that this wind farm, because of its visual prominence and proximity, would have a significant detrimental impact on the visual amenity of some of the people living nearby, and as the impact would be long term, that interpretation would appear to preclude the granting of consent for this application. However, the guidance also confirms that proposals are to be considered on a case by case basis, and I consider that this inevitably requires a judgement to be reached on the acceptability of the impacts identified."*

Reasoning

Clocaenog Forest Windfarm

A1.4 In the Clocaenog Forest windfarm Report of Findings in para 4.237[18], the inspector concludes:

> *However, for three properties there is a risk that residential amenity would be affected to such a degree that the PPW standard of "good neighbourliness" would not be achieved and there would be conflict with Policy NTE/7 of the CLDP, and VOE 9 of the DLDP. This level of impact, which could make a property an unattractive place in which to live, has been found to be against the public interest and therefore unacceptable in Inspectors' appeal decisions[266], and permission has been refused. I therefore consider that the adverse impact on the residential amenity of the three dwellings is important and relevant matter to be weighed against the benefits of the project under s104(7) of the PA2008.*

A1.5 The subsequent decision letter by the Secretary of State[19] concludes*:*

> *"The Secretary of State agrees that the arguments in this case and in respect of this particular issue are finely balanced. He agrees with the ExA's view that it is not possible*

[17] Erection of wind farm at Bardnaheigh Farm, Westfield, by Thurso (Baillie). Case reference IEC/3/105/3, 17th August 2009
[18] Clocaenog Forest Wind Farm, Examining Authority's Report of Findings and Conclusions and Recommendation to the Secretary of State for Energy and Climate Change, Wendy J Burden BA(Hons) DipTP MRTPI Examining Authority Clocaenog Forest Windfarm DCO
[19] Decision letter 12 September 2014, 12.04.09.04/217C, paragraph 4.14

to mitigate the impacts of the wind farm on the three properties in question. He considers the matter has been considered appropriately during the examination of the application and that residential amenity is not an issue of sufficient magnitude to justify the withholding of consent given the benefits of the Development. In these circumstances, he considers that the interference with the human rights of the occupants of the three properties would be proportionate and justified in the public interest."

Burnthouse Farm Windfarm

A1.6 At the Burnthouse Farm windfarm inquiry[20] Inspector Jill Kingaby stated at paragraph 119 of her report that:

"No individual has the right to a particular view but there comes a point when, by virtue of the proximity, size and scale of a given development, a residential property would be rendered so unattractive a place to live that planning permission should be refused. The test of what would be unacceptably unattractive should be an objective test."

A1.7 At paragraph 120 of the Burnthouse Farm report the Inspector comments further on the threshold for determining unacceptable effects on visual amenity:

"There needs to be a degree of harm over and above an identified substantial adverse effect to take a case into the category of refusal in the public interest. Changing the outlook from a property is not sufficient."

A1.8 In the conclusions on her report Inspector Kingaby addressed the living conditions of neighbouring occupiers and stated that:

"The methodology for assessing the visual impact on residential occupiers was considered fully at the Inquiry. I accept that the approach used by Inspectors in the Enifer Downs, Poplar Lane and Carland Cross Appeals and elsewhere should not be regarded as a mechanistic 'test' and has no status in terms of being part of statutory documentation or planning policy or guidance. However, it seems to me that a logical, transparent and objective approach to assessing visual impact should be adopted".

A1.9 The Inspector also observed that judging serious harm to living conditions which might lead to a recommendation for planning permission to be refused in the public interest is a more stringent requirement than identifying of a significant adverse effect in EIA, stating:

"I consider that when assessing the effect on visual outlook, it is helpful to pose the question 'would the proposal affect the outlook of these residents to such an extent i.e. be so unpleasant, overwhelming and oppressive that this would become an unattractive place to live?"

A1.10 Inspector Kingaby's recommendations were endorsed by the Secretary of State (SoS) and summarised in the SoS decision letter dated 6 July 2011 at paragraphs 10 and 11.

[20] Burnthouse Farm Windfarm, SoS Decision (APP/D0515/A/10/2123739) 6th July 2011

Langham Windfarm

A1.11 In the Langham Windfarm appeal decision[21] the Inspector stated that

> *"The planning system controls development in the public interest, and not in the private interest. The preservation of open views is a private interest, which the planning regime is not intended to protect. But public and private interests may overlap. The issue is whether the number, size, layout and proximity of wind turbines would have such an overwhelming and oppressive visual impact on a dwelling and its amenity space that they would result in unsatisfactory Living Conditions, and so unacceptably affect amenities and the use of land and buildings which ought to be protected in the public interest."*

Enifer Downs Windfarm

A1.12 The issue of Residential Visual Amenity was first addressed by Inspector Lavender in the Enifer Downs appeal decision[22] in which he observed that:

> *"when turbines are present in such number, size and proximity that they represent an unpleasantly overwhelming and unavoidable presence in main views from a house or garden, there is every likelihood that the property concerned would come to be widely regarded as an unattractive and thus unsatisfactory (but not necessarily uninhabitable) place in which to live."*

A1.13 In coming to his decision Inspector Lavender considered the extent to which:

- the visual experience from the dwelling and garden may be comparable to "actually living within the turbine cluster" rather than a turbine cluster being present close by; or
- the experience of the turbines is "unpleasantly overwhelming and unavoidable".

Carland Cross Windfarm

A1.14 In the subsequent Carland Cross decision[23] Inspector Lavender elaborated and qualified his position stating:

> *"The planning system is designed to protect the public rather than private interests, but both interests may coincide where, for example, visual intrusion is of such magnitude as to render a property an unattractive place in which to live. This is because it is not in the public interest to create such living conditions where they did not exist before. Thus I do not consider that simply being able to see a turbine or turbines from a particular window or part of the garden of a house is sufficient reason to find the visual impact unacceptable (even though a particular occupier might find it objectionable)."*

[21] Langham Windfarm, Appeal Decision APP/D2510/A/10/2130539. 29th September 2011
[22] Enifer Downs Windfarm, Appeal Decision APP/X2220/A/08/2071880. 28thApril 2009
[23] Carland Cross Windfarm, Appeal Decision APP/D0840/A/09/2103026 19th Jan 2010

Preston New Road Exploration Works (Appeal A)

A1.15 In the Preston New Road (Appeal A) fracking development appeal case[24] the Secretary of State agreed with the Inspector stating in the decision letter:

> *"For the reasons given at IR12.117-12.120, the Secretary of State agrees with the Inspector that the proposal would not affect the outlook of any residential property to such an extent that it would be so unpleasant, overwhelming and oppressive that it would become an unattractive place to live (IR12.118)."*

[24] Preston New Road Exploration Works Secretary of State Decision (Appeal A) (APP/Q2371/W/15/3134386), 6th October 2016

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Appendix 2 – Residential Amenity Figures

SIX56 | WARRINGTON

Stage 02
Appendix 2 - Residential Amenity Figures
July 2020

133-LYR-XX-XX-RPT-L-0006-01

PLANNING

LAYER
LANDSCAPE ARCHITECTURE

CONTENTS

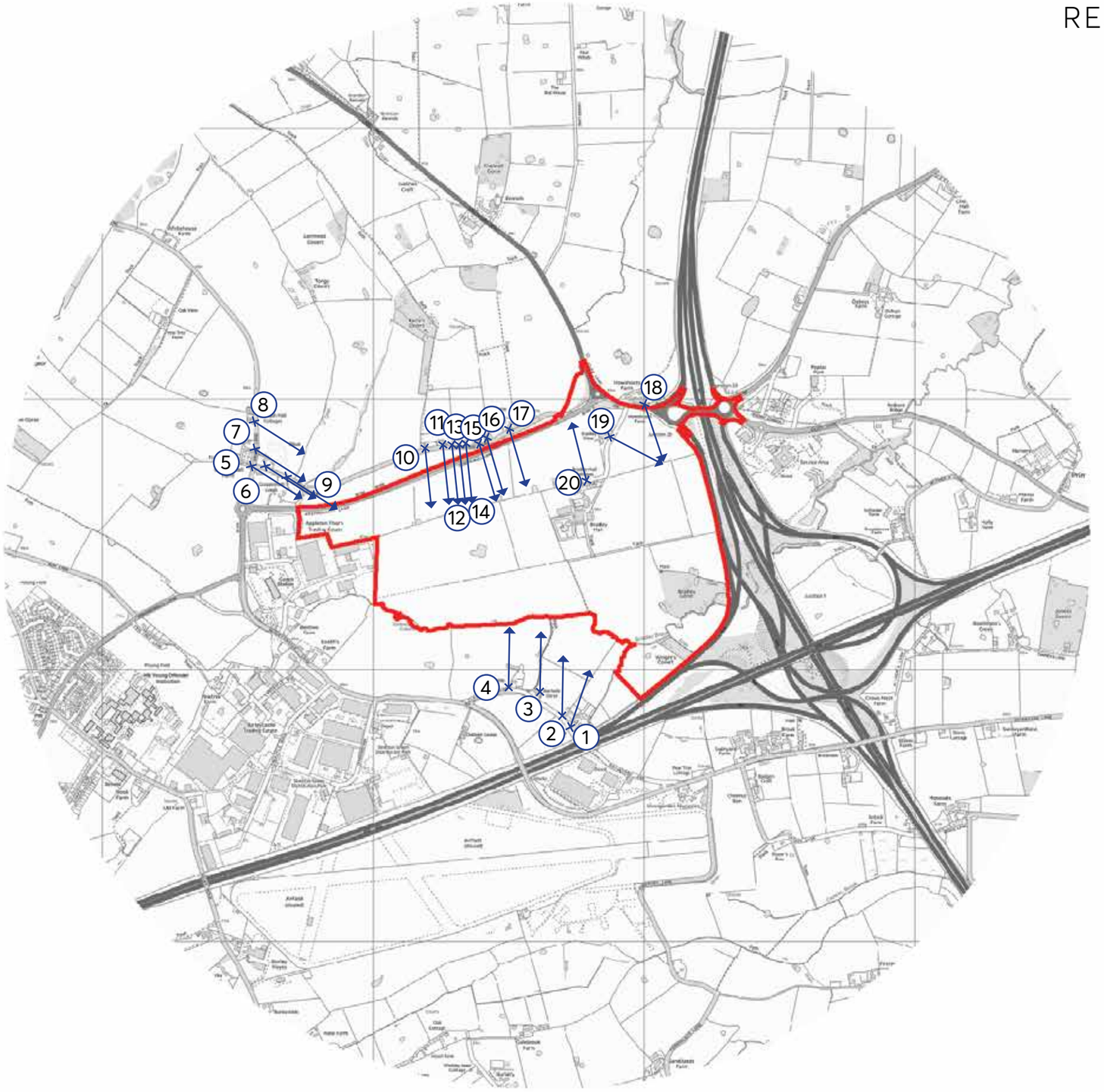
LANDSCAPE FIGURES 15
500M OFFSET

KEY

Six56, Warrington site boundary

<500m Offset

LANDSCAPE FIGURES
RESIDENTIAL VIEWPOINT LOCATIONS



KEY

Six56, Warrington site boundary

Residential viewpoint location

Viewpoint	Description
Viewpoint 1	Tan House Farm, Cattery
Viewpoint 2	The Barn, Tan House Farm, Cattery
Viewpoint 3	Birchels Gorse
Viewpoint 4	Barley Castle Farm
Viewpoint 5	Reddish Hall Farm
Viewpoint 6	Grappenhall Ridge
Viewpoint 7	Buttyfold
Viewpoint 8	1 - 4 Reddish Hall Cottages
Viewpoint 9	Grappenhall Lodge Travellers Site
Viewpoint 10	1 & 2 Ivy Cottage
Viewpoint 11	Southcott
Viewpoint 12	Hunters Lodge and Hunters Croft Lane
Viewpoint 13	Manor Farm
Viewpoint 14	Croftside
Viewpoint 15	The Bungalow
Viewpoint 16	No. 5 & 7 Cartridge Lane
Viewpoint 17	Clifflane Farm
Viewpoint 18	Howshoot Farm
Viewpoint 19	Bradley View
Viewpoint 20	Bradley Hall Cottages

Appendix 3 – Residential Assessment Survey

SIX56 | WARRINGTON

STAGE 02

Appendix 3 - Residential Assessment Survey

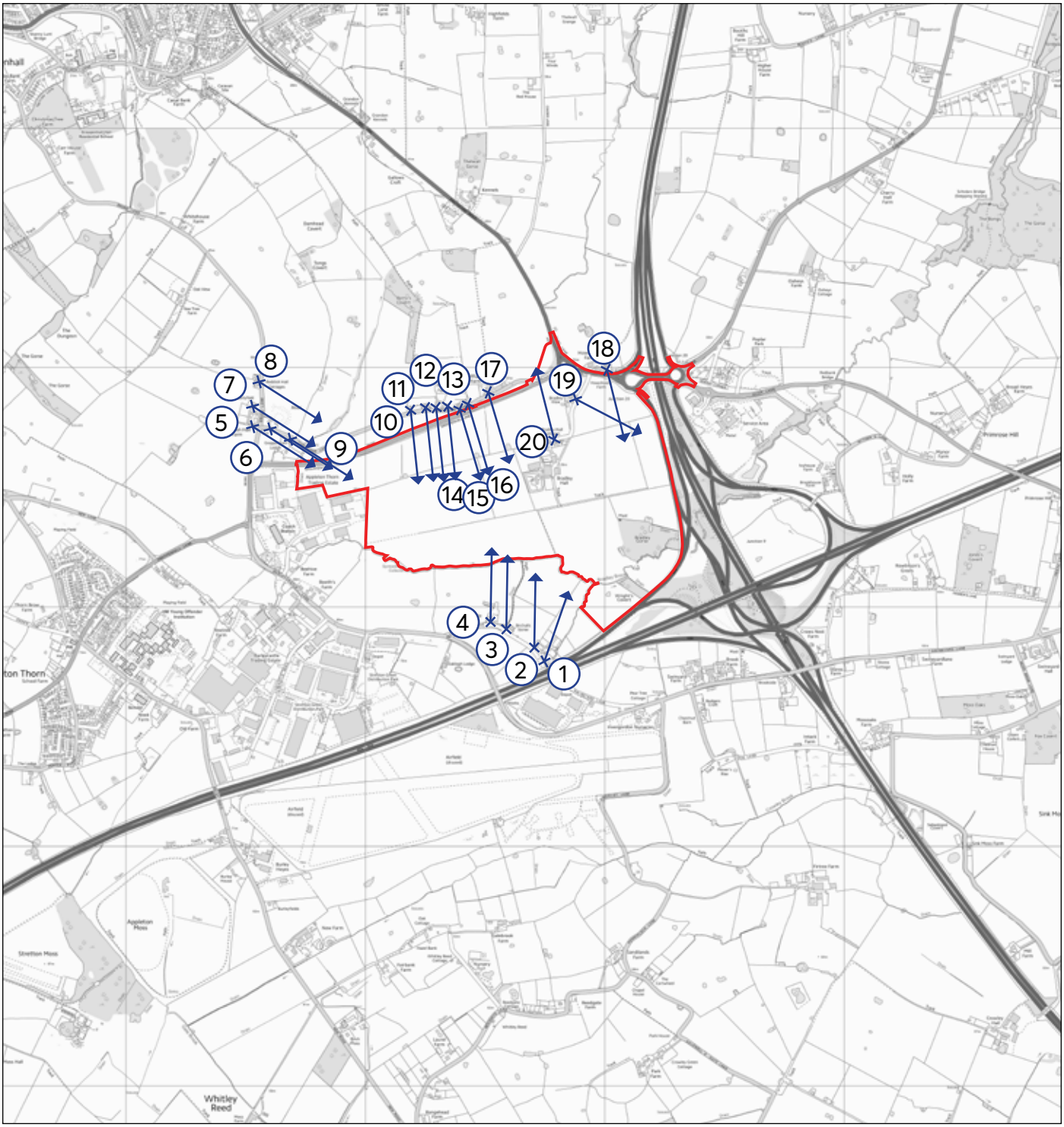
July 2020

133-LYR-XX-XX-RPT-L-0005-02

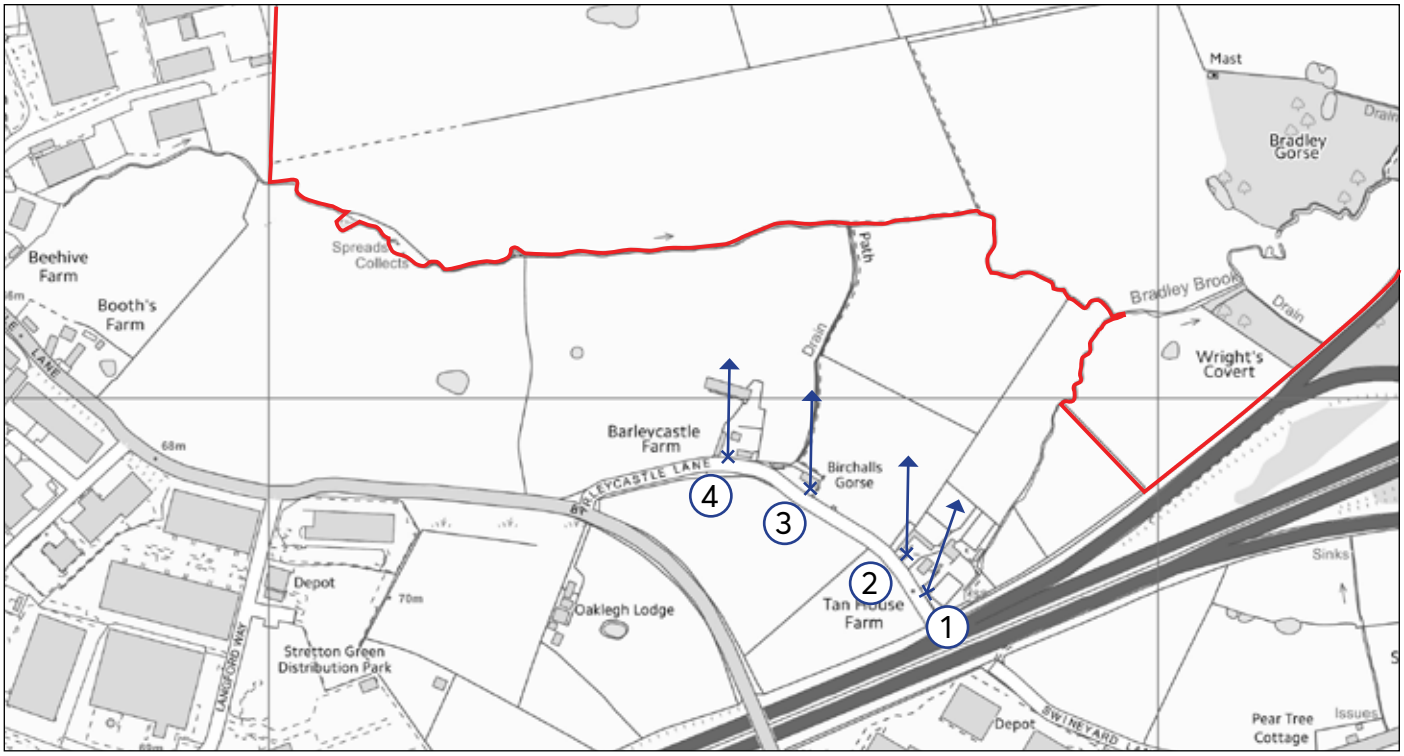
LAYER

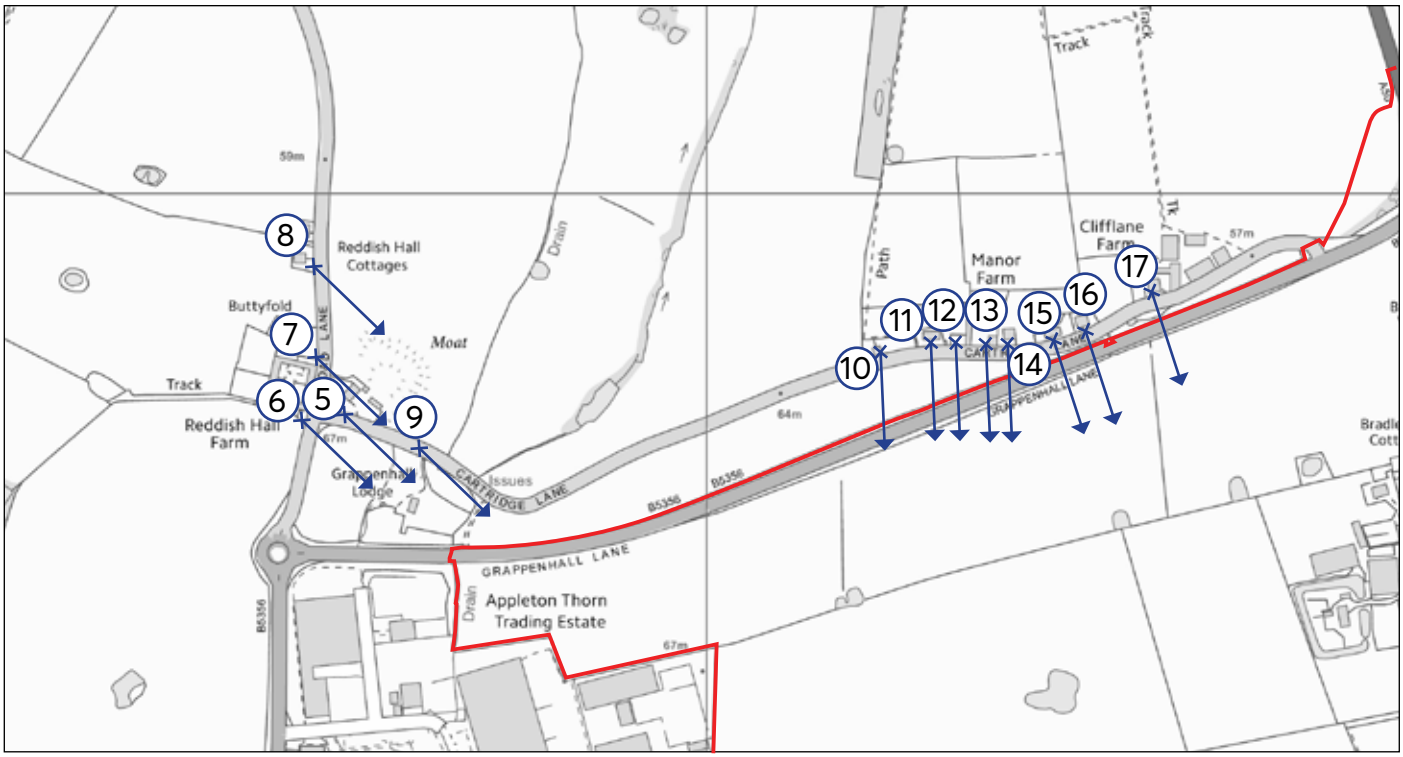
LANDSCAPE ARCHITECTURE

RESIDENTIAL ASSESSMENT SURVEY FORM 1.0
PROPERTY LOCATIONS

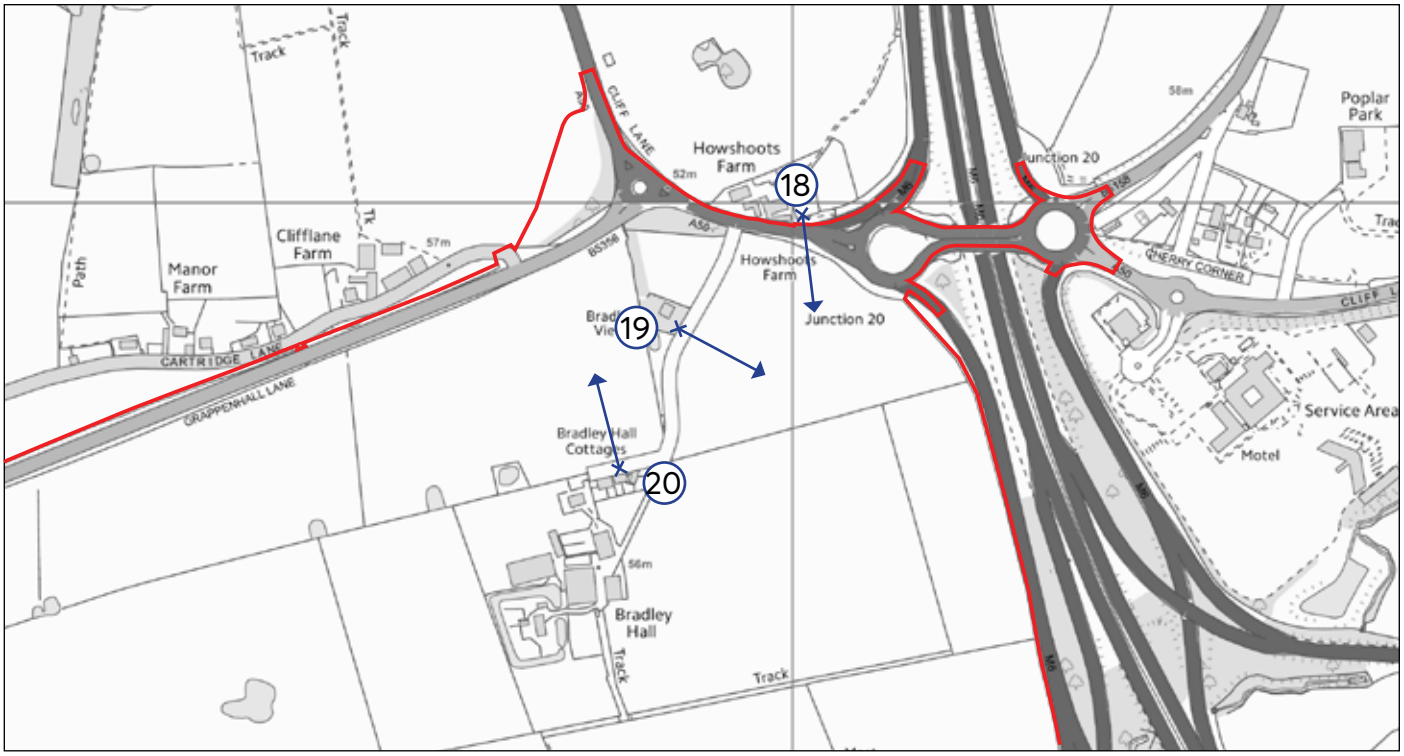


RESIDENTIAL ASSESSMENT SURVEY FORM 1.1
PROPERTY LOCATIONS





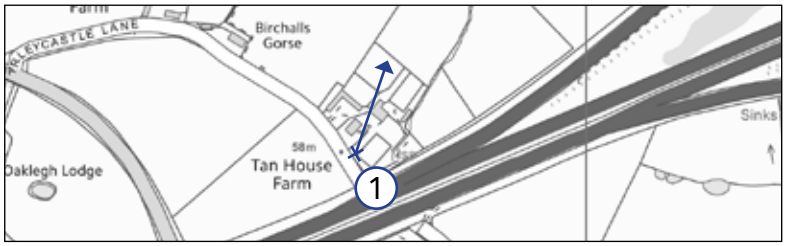
RESIDENTIAL ASSESSMENT SURVEY FORM 1.2
PROPERTY LOCATIONS



RESIDENTIAL ASSESSMENT SURVEY FORM 2.0

VIEWPOINT 1

LOCATION
(Plan)



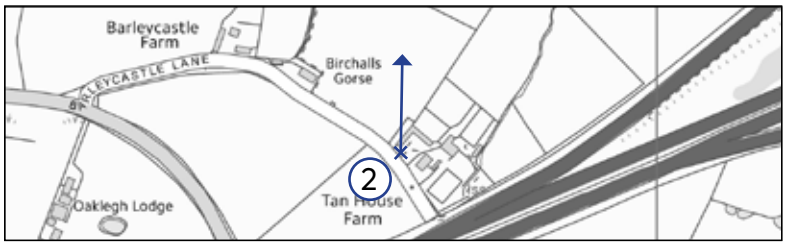
View taken from publicly accessible area in front of the property. Site boundary to the rear of property.

VIEWPOINT 1	Tan House Farm Cattery, Barleycastle Lane		
No. of Properties	1	**Orientation of Properties**	southwest-northeast
Distance From Site	350m	**Direction of View towards site**	northwest-northeast
Description of Existing Views	Located close to the M6 northbound carriageway and Lymm interchange slip road, although partially filtered with boundary vegetation when in leaf. Views northward are across fields towards Bradley Brook, although largely screened by outbuildings and the adjacent property (2). Views southwards are partially screened by garden vegetation and are less panoramic due to M6 boundary vegetation and the elevated crossing of the M6 of the redirected Barleycastle Lane/Swineyard Lane.		
Predicted Change in View	Plot 3 is located approximately 350m to the north with Plots 2 and 4 slightly further away. The brook will provide some filtering to the lower levels and perimeter screen planting is proposed. On completion, the new units will be clearly visible although from ground storey windows on the northern elevation of the property the effect is likely to be variable due to existing outbuildings. Boundary vegetation will establish and grow to provide greater screening and filtering to views but this will several years.		
Effect on Residential Amenity	Magnitude: Moderate Significance of Effects: Moderate High Adverse Views southwards remain unchanged by the development. Views northwards will be affected but are in part screened by large outbuildings and are also heavily influenced and framed by the close proximity of the M6 and Lymm interchange slip road boundary vegetation. The distance to the development, combined with the existing and proposed visual buffer provided by fields and existing vegetation results in the assessment concluding that the **RVA threshold is not reached.**		

RESIDENTIAL ASSESSMENT SURVEY FORM 2.1

VIEWPOINT 2

LOCATION
(Plan)



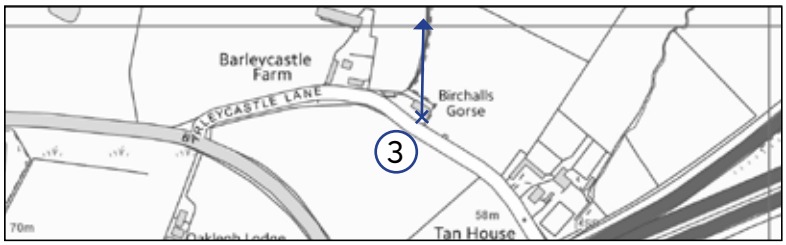
View taken to the side of the property from publicly accessible area.

VIEWPOINT 2	The Barn, Tan House Farm Cattery		
No. of Properties	2	**Orientation of Properties**	southwest-northeast and northwest -southeast
Distance From Site	310m	**Direction of View towards site**	northwest - northeast
Description of Existing Views	The properties are arranged in an 'L' shaped configuration around a central courtyard. Views east and south are largely focused on the courtyard with the neighbouring property (1) dominating the near ground to the east. Views northwards are across a rear garden and fields towards Bradley Brook with vegetation running north-south from the brook providing additional filtering of views towards the Lymm Interchange slip road. Views westerly are along across fields with vegetation hedgerow to Barleycastle Lane framing the view towards the nearby property of Birchels Gorse (3) with roofs associated with buildings within the Appleton Thorn trading estate visible on the horizon but heavily filtered by field boundary vegetation.		
Predicted Change in View	Plot 3 is located approximately 310m to the north with Plots 2 and 4 slightly further away. The brook will provide some filtering to the lower levels and perimeter screen planting is proposed. On completion, however, the new units will be clearly visible from the northward facing property. Similarly for the west facing property, views will be open but more towards Plot 4 located approximately 400m away. South facing, gable end windows, overlook Barleycastle Lane and the fields beyond. Existing boundary vegetation will establish and grow to provide greater screening and filtering to views but this will take several years to mature sufficiently.		
Effect on Residential Amenity	Magnitude: High Significance of Effects: High Adverse Views southwards remain unchanged by the development. Views northwards will be affected as Plots 3 and 4 in particular will be clearly visible above existing vegetation across a wide panorama. Views in a westerly/northwesterly direction will be similarly affected with Plot 4 visible across a large part of the view. The distance to the development, combined with the existing and proposed visual buffer provided by fields and existing vegetation results in the assessment concluding that the **RVA threshold is not reached.**		

RESIDENTIAL ASSESSMENT SURVEY FORM 2.2

VIEWPOINT 3

LOCATION
(Plan)



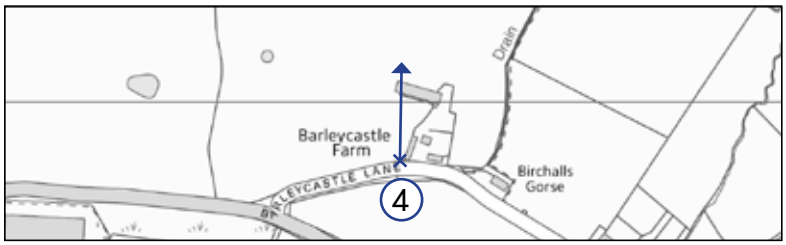
View taken to the rear of the property along the PROW Buxton FP23.

VIEWPOINT 3	Birchels Gorse		
No. of Properties	1	**Orientation of Properties**	northeast - southwest
Distance From Site	290m	**Direction of View to Proposed Development**	northerly
Description of Existing Views	Views facing northwards are across open fields towards Bradley Brook and beyond with Bradley Copse visible on the horizon. Gantries associated with the Lymm interchange slip road are visible further to the east. Views south, are across the lane to open fields and vegetation on the embankment to the redirected Barley Castle Lane, which crosses the M6 to the southwest. High sided vehicles using the M56 and Lymm Interchange slip road may be glimpse when vegetation is out of leaf.		
Predicted Change in View	Views to the south and southwest will be unaffected by the development. Similar to the nearby properties along the lane (Viewpoints 1 and 2). Plot 3 is located approximately 290m to the north with Plots 2 and 4 slightly further away. The brook will provide some filtering to the lower levels and perimeter screen planting is proposed. On completion, however, the new units will be clearly visible. Existing boundary vegetation will establish and grow to provide greater screening and filtering to views but this will take several years to mature sufficiently.		
Effect on Residential Amenity	Magnitude: High Significance of Effects: High Adverse Views northwards will be affected as Plots 3 and 4 in particular, will be clearly visible above existing vegetation across a wide panorama. Views in a westerly/northwesterly direction will be similarly affected with Plot 4 visible across a large part of the view. The distance to the development, combined with the existing and proposed visual buffer provided by fields and existing vegetation results in the assessment concluding that the **RVA threshold is not reached.**		

RESIDENTIAL ASSESSMENT SURVEY FORM 2.3

VIEWPOINT 4

LOCATION
(Plan)

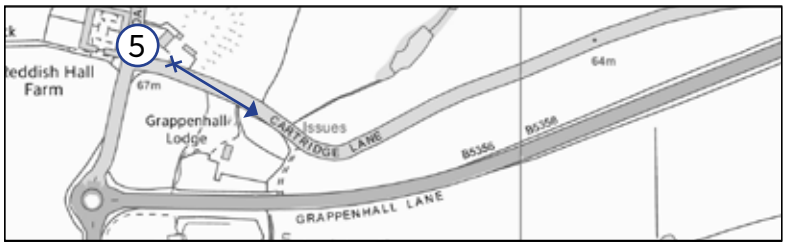


View taken to the side of the property along Barleycastle Lane.

VIEWPOINT 4	Barley Castle Farm		
No. of Properties	1	**Orientation of Properties**	north-south
Distance From Site	270m	**Direction of View to Proposed Development**	northwards
Description of Existing Views	A two storey property, views southwards are largely screened at ground level by a boundary hedgerow to Barleycastle Lane, with upper storey windows likely to have views across the lane and onto a field with boundary planting to the re-directed lane which passes over the M56 as well as boundary planting to the M56 with both forming a middle ground backdrop. High sided vehicles are visible on the M56 when vegetation is out of leaf. Views northwards are across a rear garden with managed boundary hedging to open fields towards Bradley Brook and beyond with Bradley Copse and Barry's Covert visible on the horizon. A low shed and outbuildings to the west and northwest corner of the property screen views channelling them north and north eastwards. Views eastwards are more limited with fewer and smaller windows with boundary hedging screening ground floor windows, but a gable end window provides views east towards property 3 with oblique views south easterly across open fields to the M56 and north easterly across open fields and woodland blocks in the distance.		
Predicted Change in View	Views to the south and west will be unaffected by the development. Plot 4 is located approximately 250m to the north with Plot 3 slightly further away to the northeast. The brook will provide some filtering to the lower levels and perimeter screen planting is proposed. On completion, however, the new units will be clearly visible. Existing boundary vegetation will establish and grow to provide greater screening and filtering to views, but this will take several years to mature sufficiently.		
Effect on Residential Amenity	Magnitude: High Significance of Effects: High Adverse Only views northwards will be affected as Plots 4 and 3 in particular, will be clearly visible above existing vegetation and across a wide panorama with Plot 4 visible across a large part of the view. The distance to the development, combined with the existing and proposed visual buffer provided by fields and existing vegetation results in the assessment concluding that the **RVA threshold is not reached**.		

RESIDENTIAL ASSESSMENT SURVEY FORM 2.4
VIEWPOINT 5

LOCATION
(Plan)

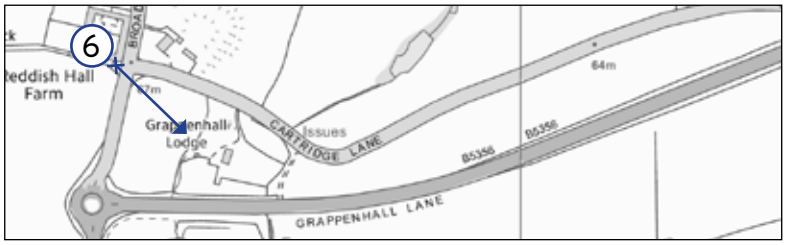


View taken to the front of the property at the junction of Broard Lane and Cartridge Lane facing towards the site boundary.

VIEWPOINT 5	Reddish Hall Farm		
No. of Properties	1	**Orientation of Properties**	northeast-southwest
Distance From Site	210m	**Direction of View to Proposed Development**	south-eastwards
Description of Existing Views	A two storey property, south-westerly views are across a lawn and mature boundary trees to Cartridge Lane and Broad Lane with open agricultural fields. To the south large units on the edge of Appleton Thorn Industrial Park are visible. To the southeast, boundary vegetation to Grappenhall Lodge and field vegetation including northwards to Barry's Covert screens views. Views to the west are screened by the property of Grappenhall Ridge. Views northwards are across agricultural land with extensive boundary vegetation and small woodlands with distant hills on the horizon. Small gable end windows and wider windows on the south-western elevation exist although the latter is partially screened by outbuildings.		
Predicted Change in View	Due to the presence of existing vegetation to the west of the property it is likely that only heavily filtered views of the upper portions of proposed units in particular plots 6, 7, will be visible. Views in all other directions will remain unaffected by the proposed development.		
Effect on Residential Amenity	Magnitude: Minor Significance of Effects: Moderate Adverse Due to the distance to the development, the presence of existing vegetation and the main orientation of views from the property the assessment concludes that the **RVA threshold is not reached**.		

RESIDENTIAL ASSESSMENT SURVEY FORM 2.5
VIEWPOINT 6

LOCATION
(Plan)



View taken to the front of the property across the junction of Broad Lane and Cartridge Lane

VIEWPOINT 6	Grappenhall Ridge		
No. of Properties	4	**Orientation of Properties**	Square arranged around internal courtyard. Access through southern elevation
Distance From Site	250m	**Direction of View to Proposed Development**	East in a part single storey development.
Description of Existing Views	A single storey barn style conversion and two storey building abutting Broad Lane, small windows face to the east and onto Broad Lane with property 6 across the road. There are similarly small windows on the southern elevation but there are fewer where views are across open fields with woodland further south forming the backdrop framed by the boundary hedge along Broad Lane. Views west are across private gardens and onto open fields and woodland. Views to the north are limited due to the presence of the adjacent property (7) which also has mature boundary vegetation.		
Predicted Change in View	Only the eastern elevation has the potential to view the development but similar to property 7 this is likely to be heavily filtered. It is assumed that as they face onto the road that visibility from them is controlled or limited for privacy.		
Effect on Residential Amenity	Magnitude: Negligible Significance of Effects: Minor Adverse Due to the distance to the development, the presence of existing vegetation and the relatively small windows orientated towards the development, the assessment concludes that the **RVA threshold is not reached**.		

RESIDENTIAL ASSESSMENT SURVEY FORM 2.6
VIEWPOINT 7

LOCATION
(Plan)

View taken to the front of the property along Broad Lane

VIEWPOINT 7	Buttyfold		
No. of Properties	1	**Orientation of Properties**	east - west
Distance From Site	310m	**Direction of View to Proposed Development**	eastwards
Description of Existing Views	A two storey house with the front elevation to Broad Lane set back across lawns and garden with mature trees and shrubs bordering the lane. The middle ground is formed by agricultural fields with vegetation running north-south along field boundaries and a water course filtering views to the east. To the south property 6 contains views with west across private garden backing on to fields with woodland visible beyond. Views to the north east potential from upper storey windows across wooded agricultural land with urban development associated with the Greater Manchester conurbation and the Pennine mountain range.		
Predicted Change in View	Only the eastern elevation has the potential to view the development but similar to property 6 this is likely to be heavily filtered by near and middle ground vegetation with only a small portion of upper rooflines of the proposed development potentially visible.		
Effect on Residential Amenity	Magnitude: Negligible Significance of Effects: Minor Adverse Due to the distance to the development and the presence of existing vegetation providing screening the assessment concludes that the **RVA threshold is not reached**.		

RESIDENTIAL ASSESSMENT SURVEY FORM 2.7
VIEWPOINT 8

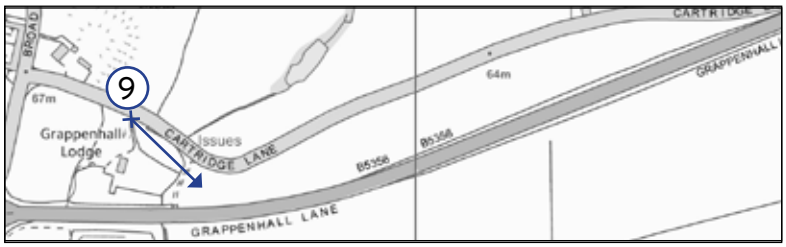
LOCATION
(Plan)

View taken to the front of N° 1 Broad Lane

VIEWPOINT 8	1-4 Reddish Hall Cottages		
No. of Properties	4	**Orientation of Properties**	east-west
Distance From Site	380m	**Direction of View to Proposed Development**	eastwards
Description of Existing Views	A group of a detached and semi-detached two storey house set back from Broad Lane by shallow gardens and managed hedges, views eastwards are across the front gardens and Broad Lane onto large, open agricultural fields with dense boundary and woodland providing a middle ground horizon. The most easterly unit within Appleton Thorn Trading Estate is just visible. North and north easterly the topography drops opening up views towards the western side of the Greater Manchester conurbation and Pennine range in the far distance. Northwards is similarly open across fields with the settlement of Grappenhall in part visible through breaks in mature woodland and boundary vegetation with scattered properties in closer proximity. Tall buildings within Warrington may be glimpsed to the north west. Views west are across rear gardens towards fields with a backdrop of mature hedgerow and woodland. Views south are towards adjacent properties. The relatively high location of these properties provides a wide panorama.		
Predicted Change in View	Only views from the eastern/front elevation of the properties which have small panelled or sash style windows have the potential to view the proposed development. It is likely that views of the development will be heavily filtered by existing vegetation but that the upper portions and rooflines of the parts of the proposed development will be visible particularly, when vegetation is out of leaf and where existing vegetation is thinnest.		
Effect on Residential Amenity	Magnitude: Minor Significance of Effects: Moderate Adverse Due to the distance to the development and the presence of existing vegetation providing screening the assessment concludes that the **RVA threshold is not reached**.		

RESIDENTIAL ASSESSMENT SURVEY FORM 2.8
VIEWPOINT 9

LOCATION
(Plan)



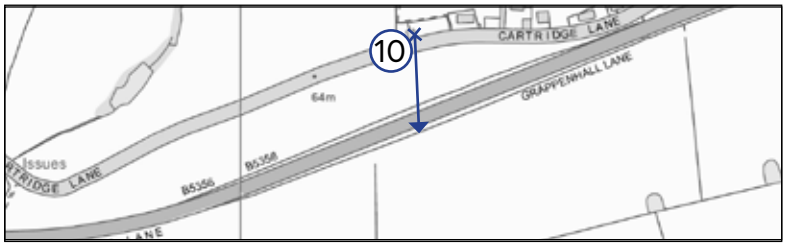
View taken to the front of the property along Cartridge Lane

VIEWPOINT 9	Grappenhall Lodge Travellers Site		
No. of Properties	Approximately 5	**Orientation of Properties**	Variable
Distance From Site	45m	**Direction of View to Proposed Development**	Southwest
Description of Existing Views	Believed to be a collection of static units, views are likely to be heavily contained to within the site due to the dense perimeter vegetation although this is weaker on the western boundary where views are feasible across the existing fields.		
Predicted Change in View	Due to the close proximity of the site the development will be clearly visible, in particular Plots 4, 6 and 7, where the introduction of large buildings will be a noticeable change in the view although this is offset to some degree with the close proximity of the Trading Estate to the south. Due to the variable orientation of lodges within the site, it is likely that not all be affected to the same degree and maybe limited unless outlooks are orientated towards the development.		
Effect on Residential Amenity	Magnitude: Moderate Significance of Effects: Moderate High Adverse Due to the variable nature of building orientation and the existing close proximity of a similar land use, the assessment concludes that the **RVA threshold is not reached**.		

RESIDENTIAL ASSESSMENT SURVEY FORM 2.9

VIEWPOINT 10

LOCATION
(Plan)

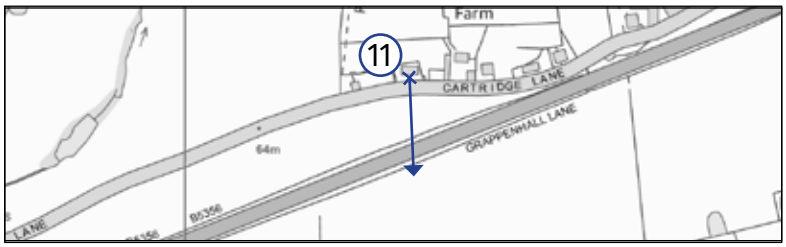


View taken to the front of the property along Cartridge Lane

VIEWPOINT 10	1 & 2 Ivy Cottage		
No. of Properties	2	**Orientation of Properties**	north-south
Distance From Site	65m	**Direction of View to Proposed Development**	south
Description of Existing Views	Two storey semi-detached property which has minimal frontage with direct views south across Cartridge Lane and across a narrow field separating the properties from the busy B5356 Grappenhall Lane, beyond which are existing open fields although the latter will generally only be visible from upper storey windows due to hedgerow vegetation and the gently rolling nature of the topography. Tree cover is relatively sparse. Views west are across open fields with mature field vegetation and trees forming a backdrop to the middle ground. Wide panoramic views are available to the north due to the higher elevation across rear gardens across open fields sloping down towards abundant woodland visible in the middle and far ground. Distant views are available to the north east towards high ground north of Bolton believed to be Rivington Pike. Views north are contained by dense garden vegetation and the adjacent property.		
Predicted Change in View	Views from small panelled windows on the southern elevations of the properties will experience significant change. Large units will extend across virtually the entire panorama and will be skylined as well as in close proximity. Proposed boundary vegetation will mature eventually to soften views of the buildings but the it will also be skylined foreshortening the current view.		
Effect on Residential Amenity	Magnitude: Substantial Significance of Effects: Substantial Adverse Whilst views to the south are significantly and adversely affected, the wide panoramic views to the north remain unaffected and a degree of separation exists with the existing field between. In view of this the assessment concludes that the **RVA threshold is not reached**.		

RESIDENTIAL ASSESSMENT SURVEY FORM 2.10
VIEWPOINT 11

LOCATION
(Plan)



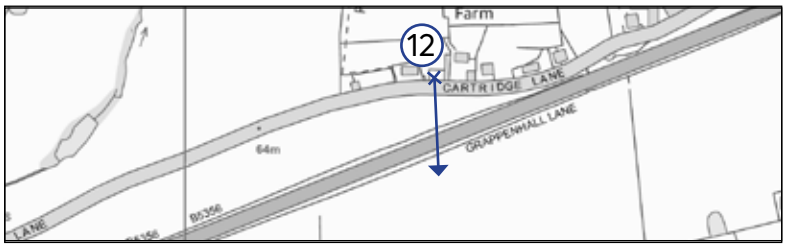
View taken to the front of the property along Cartridge Lane

VIEWPOINT 11	Southcott		
No. of Properties	1	**Orientation of Properties**	north-south
Distance From Site	60m	**Direction of View to Proposed Development**	south
Description of Existing Views	Similar to property 10 with views south across Cartridge Lane and Grappenhall Lane with fields beyond. The property is single storey and is set back from Cartridge Lane with a front garden and mature hedge to the majority of the boundary filtering views southwards. Views east and west are contained by mature garden vegetation but views north are, in part, contained by boundary hedging but also potentially wide and panoramic.		
Predicted Change in View	Only views from the southern elevation will be affected although the western portion of the property is heavily screened by the existing boundary hedgerow. Nevertheless, from some windows similar to the preceding properties along Cartridge Lane, viewers will experience significant change. Large units will extend across virtually the entire panorama and will be skylined as well as in close proximity. Proposed boundary vegetation will mature eventually to soften views of the buildings but the it will also be skylined foreshortening the current view.		
Effect on Residential Amenity	Magnitude: Substantial Significance of Effects: Substantial Adverse Whilst some views to the south from the property are likely to be significantly and adversely affected, the wide panoramic views to the north remain unaffected. In view of this the assessment concludes that the **RVA threshold is not reached**.		

RESIDENTIAL ASSESSMENT SURVEY FORM 2.11

VIEWPOINT 12

LOCATION
(Plan)

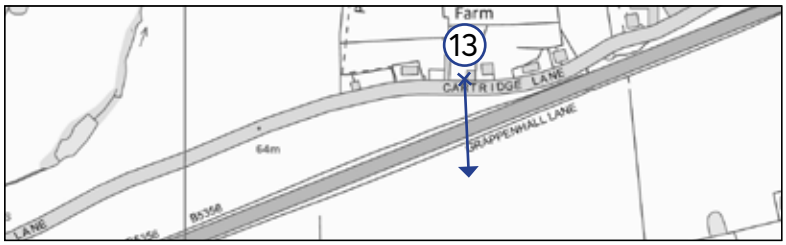


View taken on the driveway of both properties along Cartridge Lane

VIEWPOINT 12	Hunters Lodge and Hunters Croft Lane		
No. of Properties	2	**Orientation of Properties**	east west and north south
Distance From Site	50m	**Direction of View to Proposed Development**	south
Description of Existing Views	Hunters Croft is a two storey barn style conversion and is aligned north-south with the main elevations to the west across garden and towards the adjacent property 11 with more limited windows looking east over an internal courtyard shared with Manor Farm. The south facing gable along Cartridge Lane is windowless. The separate lodge is two storey with roof windows located further to the north and is oriented east-west with views south across the garden of Hunters Croft and Southcott with boundary hedging to the lane filtering views further south. Views north are across open fields with the panoramic views afforded from this elevated location.		
Predicted Change in View	Views west and east from Hunters Croft will experience change due to the close location of large units within the development but these will be viewed obliquely and are more likely to affect views from within the garden and courtyard areas. Views south from Hunters Lodge will be more direct from the northern elevation but framed and contained by the adjacent residencies. Views north will remain unaffected.		
Effect on Residential Amenity	Croft: Magnitude: Substantial Significance of Effects: Substantial Adverse Lodge: Magnitude: Moderate Significance of Effects: Moderate High Adverse Due to the orientation of the Croft and the distance separation and restricted views from the Lodge, the assessment concludes that the **RVA threshold is not reached**.		

RESIDENTIAL ASSESSMENT SURVEY FORM 2.12
VIEWPOINT 13

LOCATION
(Plan)

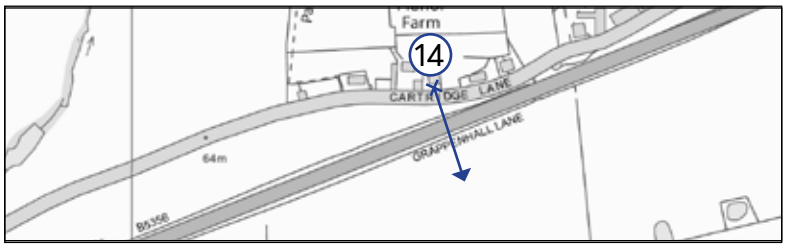


View taken to the front of the properties along Cartridge Lane

VIEWPOINT 13	Manor Farm		
No. of Properties	2	**Orientation of Properties**	north-south and east-west
Distance From Site	35m	**Direction of View to Proposed Development**	south
Description of Existing Views	The larger central unit which is orientated east west has windows on all floors which overlook a shared courtyard with the adjacent property 12 and the adjacent north south orientated building. The latter has gable end windows facing Cartridge Lane as well as windows in the western elevation which overlook the courtyard between it and the adjacent property 12. The eastern elevation has considerably less windows facing a small courtyard garden. Views north from the larger unit are across a garden and across open fields with a panoramic view offered at this elevation.		
Predicted Change in View	The southern elevation of the main unit will experience direct views onto the development, but these will be framed and contained by the adjacent properties. The gable end windows to the adjacent building will also experience direct views of the development as will users of the central courtyard. Large units will extend across the view and will be skylined as well as in close proximity. Proposed boundary vegetation will mature eventually to soften views of the buildings but it will also be skylined, foreshortening the current view. Views from the smaller unit will also experience oblique views of the development primarily from the western elevation. Views north will remain unaffected.		
Effect on Residential Amenity	<u>Main building:</u> Magnitude: Substantial Significance of Effects: Substantial Adverse <u>Secondary:</u> Magnitude: High Significance of Effects: High Adverse Due to the distance separation and restricted views from the larger building where views north are not affected together with the limited effect upon the majority of what would be oblique views from the adjacent building, the assessment concludes that the **RVA threshold is not reached.**		

RESIDENTIAL ASSESSMENT SURVEY FORM 2.13
VIEWPOINT 14

LOCATION
(Plan)

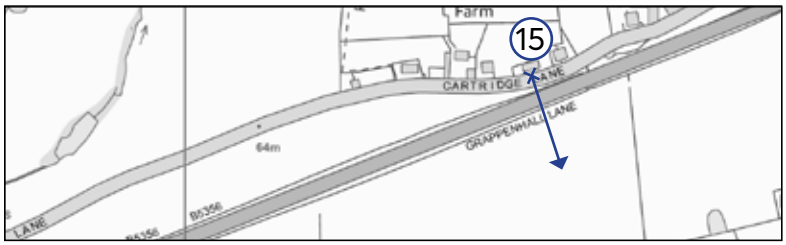


View taken to the front of the properties along Cartridge Lane

VIEWPOINT 14	Croftside		
No. of Properties	1	**Orientation of Properties**	east-west
Distance From Site	30m	**Direction of View to Proposed Development**	south
Description of Existing Views	The property is a single storey but with roof windows on the southern elevation. Views south are across a shallow lawn and boundary hedge over Cartridge Lane, a narrow field and the busy B5356 Grappenhall Lane, beyond which, are existing open fields, although the latter will generally only be visible from upper roof windows. Views east are generally limited by garden and boundary vegetation with views north across a large garden and the fields and woodland beyond. Views west are contained by the adjacent and close proximity of property 13.		
Predicted Change in View	Views from windows on the southern elevations of the property will experience significant change. Large units will extend across virtually the entire panorama to the south and south west and will be skylined as well as in close proximity. Proposed boundary vegetation will mature eventually to soften views of the buildings but the it will also be skylined, foreshortening the current view. Views south east and east are likely to be heavily screened, particularly by vegetation in leaf. Views north remain unaffected.		
Effect on Residential Amenity	Magnitude: Substantial Significance of Effects: Substantial Adverse Whilst views to the south are significantly and adversely affected, the wide panoramic views across a large garden to the north remain unaffected. In view of this the assessment concludes that the **RVA threshold is not reached**.		

RESIDENTIAL ASSESSMENT SURVEY FORM 2.14
VIEWPOINT 15

LOCATION
(Plan)

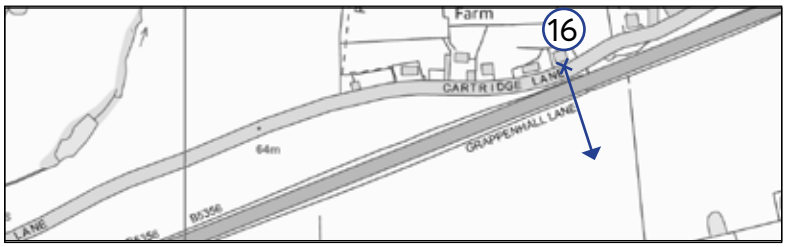


View taken to the front of the properties along Cartridge Lane

VIEWPOINT 15	The Bungalow		
No. of Properties	1	**Orientation of Properties**	south-west
Distance From Site	20m	**Direction of View to Proposed Development**	south
Description of Existing Views	A single storey building with extensive panelled windows on the southern elevation. Views south are over a shallow garden and boundary hedge, over Cartridge Lane are an increasingly narrow field and the busy B5356 Grappenhall Lane, beyond which are existing open fields with woodland visible on the horizon believed to be Bradley Copse to the south east and boundary vegetation to the M56 due south. A low voltage overhead transmission line is also visible. View east and west are constrained by the adjacent properties and mature trees along the lane. Views north are across garden but are contained by a dense copse.		
Predicted Change in View	Views from small panelled windows on the southern elevations of the properties will experience significant change. Large units will extend across virtually the entire panorama and will be skylined as well as in close proximity. Proposed boundary vegetation will mature eventually to soften views of the buildings but this will also be skylined, foreshortening the current view.		
Effect on Residential Amenity	Magnitude: Substantial Significance of Effects: Substantial Adverse Whilst views to the south are significantly and adversely affected, the wide panoramic views to the north remain unaffected. In view of this the assessment concludes that the **RVA threshold is not reached.**		

RESIDENTIAL ASSESSMENT SURVEY FORM 2.15
VIEWPOINT 16

LOCATION
(Plan)

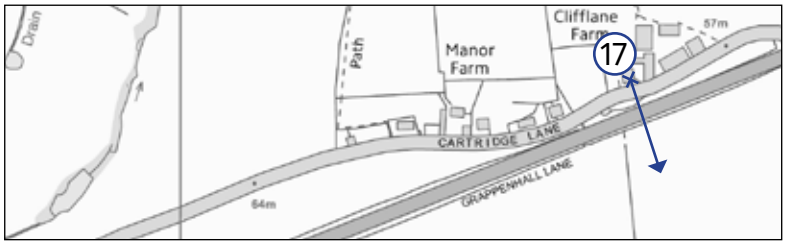


View taken to the front of the properties along Cartridge Lane

VIEWPOINT 16	No. 5 & 7 Cartridge Lane		
No. of Properties	2	**Orientation of Properties**	south-west
Distance from Site	15m	**Direction of View to Proposed Development**	south
Description of Existing Views	A two storey terrace with parking areas to the south and ground floor and first storey windows to the southern elevation. Views south are over Cartridge Lane, towards narrow copse and the busy B5356 Grappenhall Lane, beyond which are existing open fields with woodland visible on the horizon believed to be Bradley Copse to the south east and boundary vegetation to the M56 due south. A low voltage overhead transmission line is also visible. Views west are in part contained by the adjacent property 15 and mature boundary and garden vegetation, views east are towards the next property 17 and a dense copse separating the Cartridge Lane from Grappenhall Lane but views open out towards the north east. Views north are contained by a small but dense copse.		
Predicted Change in View	Views from windows on the southern elevation of the properties will experience significant change. Large units will extend across virtually the entire panorama and will be skylined as well as in close proximity. Existing vegetation will provide a degree of filtering and proposed boundary vegetation will mature eventually to soften views of the buildings but it will also be skylined, foreshortening the current view.		
Effect on Residential Amenity	Magnitude: Substantial Significance of Effects: Substantial Adverse Views to the south are significantly and adversely affected whilst views to the west and east are oblique and will benefit from a degree of filtering from existing vegetation. Views to the north remain unaffected. There is an, albeit limited, degree of separation provided by the narrow copse and the existing and busy Grappenhall Lane but overall this assessment concludes that the **RVA threshold is not reached**.		

RESIDENTIAL ASSESSMENT SURVEY FORM 2.16
VIEWPOINT 17

LOCATION
(Plan)

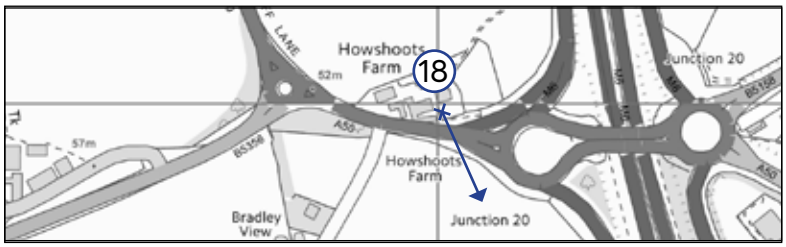


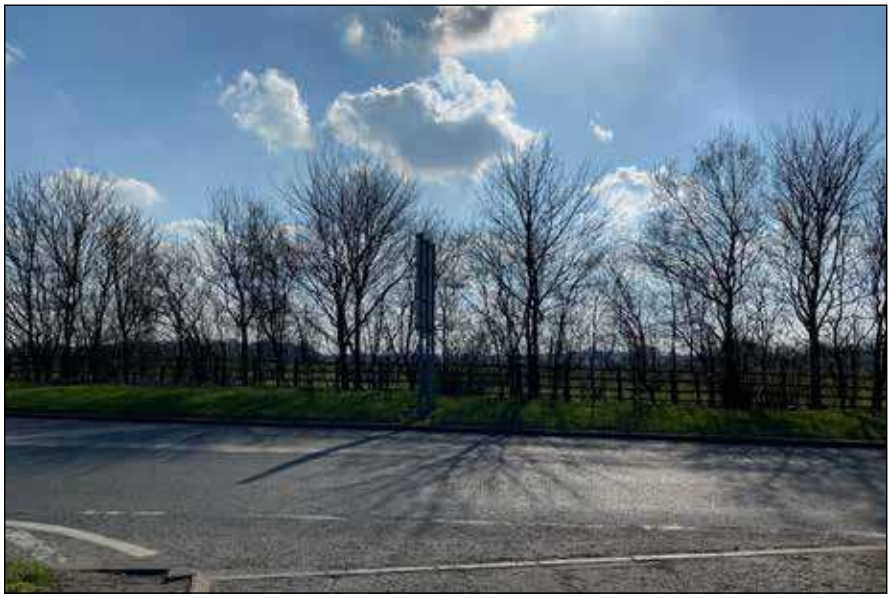
View taken to the front of the properties along Cartridge Lane

VIEWPOINT 17	Clifflane Farm		
No. of Properties	1	**Orientation of Properties**	east-west
Distance from Site	20m	**Direction of View to Proposed Development**	south
Description of Existing Views	The property is a two storey building with windows on the south elevation. Views are across a shallow garden and boundary wall with Cartridge Lane across a narrow copse separating it with Grappenhall Lane. Due to the slight elevation in topography to the south and overlapping boundary hedges, the fields further to the south are likely only visible from first storey windows. Views south east are partially screened by large barns and the copse by the roundabout with Grappenhall Lane and Cliff Lane. Views north are contained by adjacent buildings and views north-west and west are more open across a large garden onto open fields and towards woodland including Barry's Covert in the middle distance and the adjacent property 16.		
Predicted Change in View	Views from windows on the southern elevation of the property will experience significant change. Large units will extend across virtually the entire panorama and will be skylined as well in close proximity. Existing vegetation will provide a degree of filtering and proposed boundary vegetation will mature eventually to soften views of the buildings but the it will also be skylined, foreshortening the current view.		
Effect on Residential Amenity	Magnitude: Substantial Significance of Effects: Substantial Adverse Views to the south are significantly and adversely affected whilst views to the west and east are oblique and will benefit from a degree of filtering from existing vegetation. Views to the north and north west remain unaffected. There is an, albeit limited, degree of separation provided by the existing copse and the existing and busy Grappenhall Lane and overall this assessment concludes that the **RVA threshold is not reached**.		

RESIDENTIAL ASSESSMENT SURVEY FORM 2.15
VIEWPOINT 18

LOCATION
(Plan)



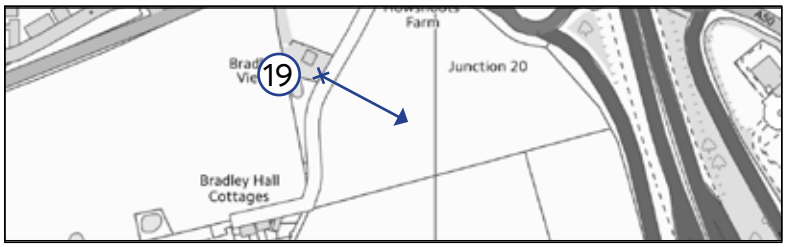


View taken to the front of the properties along the A50 Cliffe Lane

VIEWPOINT 18	Howshoots Farm		
No. of Properties	1	**Orientation of Properties**	east-west
Distance from Site	25m	**Direction of View to Proposed Development**	south and west
Description of Existing Views	The two storey residence is close to the busy Lymm Interchange roundabout grade separated above the M6. Views south are across Cliff Lane containing road signage and street lighting and towards a tall boundary hedgerow filtering views to open fields beyond. Views north are contained by large outbuildings, views east towards the interchange are largely sceened by dense maturing vegetation. Views north are partially screened by nearby mature trees and a field group but otherwise open up, offering views across wooded agricultural land and towards the M6 with traffic and infrastructure including gantries and lighting likely visible.		
Predicted Change in View	Only the view south and west will be affected by the proposed development. The large units of Plots I and 2 will dominate the fore and middle ground, although perimeter planting will over time establish to increase the visual buffer offered by the existing hedgerow.		
Effect on Residential Amenity	Magnitude: Substantial Significance of Effects: Substantial Adverse Whilst the proposed development is relatively close, the existing and busy road provides a degree of separation with the development. Existing views to the east, west and north remain unchanged and overall this assessment concludes that the **RVA threshold is not reached**.		

RESIDENTIAL ASSESSMENT SURVEY FORM 2.17
VIEWPOINT 19

LOCATION
(Plan)

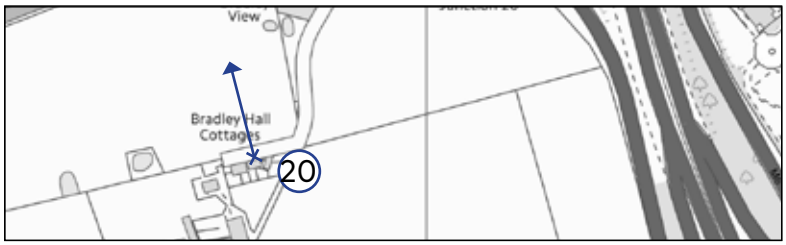


View taken to the front of the property from unnamed track

VIEWPOINT 19	Bradley View		
No. of Properties	1	**Orientation of Properties**	north-east south west
Distance from Site	7m	**Direction of View to Proposed Development**	360^{0}
Description of Existing Views	A two storey development within a large walled and fenced compound in the middle of fields within the north eastern corner of the site. Views south are towards Bradley Hall Cottages and Bradley Hall with mature trees along the middle ground. Bradley Copse and boundary planting along the M56 and Lymm Interchange slip road form the backdrop. To the east the Lymm Interchange slip road forms a vegetated backdrop with the existing copse close to Howshoots Farm and Cliff Lane providing a shortened vista to the north. Westerly views are towards the Appleton Thorn Trading Estate, across open fields and north easterly across the hedged boundary to the Site and Grappenhall Lane, with the tops of some residences along Cartridge Lane likely visible from first storey windows.		
Predicted Change in View	The predicted change to the view is anticipated to be considerable due to the property being located within an area that will be surrounded by development New and large scale development is proposed in close proximity on its northern and eastern boundaries, (Plots 1 and 2). Western and southern views will also be dominated by new large scale buildings although at a greater distance. Due south will retain a degree of the existing vegetation cover surrounding the retained Bradley Hall Cottages and Bradley Hall.		
Effect on Residential Amenity	Magnitude: Substantial Significance of Effects: Substantial Adverse The proposed development surrounds the property, with the result that no view will be unchanged. Buffer planting is proposed around the property to provide some separation from the adjacent development. In view of this, whilst it is recognised that the change is significantly adverse, the assessment concludes that the **RVA threshold is not reached.**		

RESIDENTIAL ASSESSMENT SURVEY FORM 2.18
VIEWPOINT 20

LOCATION
(Plan)



View taken to the front of the property from unnamed track

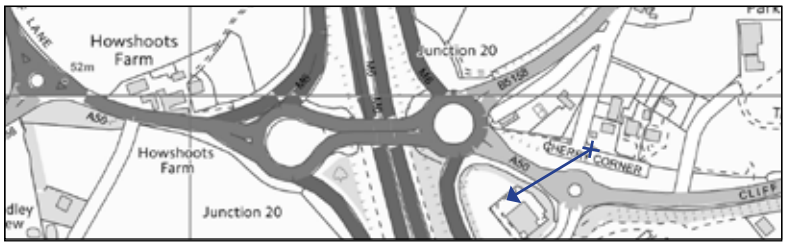
VIEWPOINT 20	Bradley Hall Cottages		
No. of Properties	7	**Orientation of Properties**	east-west and north-south
Distance from Site	6m	**Direction of View to Proposed Development**	Predominantly north and south also easterly
Description of Existing Views	The majority of properties are two stories and have views from their north and south elevations. Northwards, views are across fields towards Grapenhall Lane and will be open to the skyline as the topography drops to the north. The property at the eastern end of the group has views predominantly to the east, across open fields towards the Lymm Interchange slip road and boundary vegetation. Oblique views in a north westerly direction are also likely from upper storey windows. Views south and south westerly are across gardens but are largely contained by the farm buildings of Bradley Hall in close proximity.		
Predicted Change in View	The predicted change in view will be considerable with development surrounding the group. Whilst views to the south west will largely be retained to some extent, with the retention of Bradley Hall in the near ground, views south east, east, north and westerly will be radically changed by large scale development.		
Effect on Residential Amenity	Magnitude: Substantial Significance of Effects: Substantial Adverse The proposed development retains a buffer zone around the properties and car parking areas, allowing the large buildings to be set a short distance from the properties, especially to the north and east (Plots 1 and 2, 30m and 110m respectively). Proposed wetland provides a buffer to plot 3. Views to the west are less direct but views will be available from gardens and front curtilage. In view of this, whilst it is recognised that the change is significantly adverse, the assessment concludes that the **RVA threshold is not reached.**		

RESIDENTIAL ASSESSMENT SURVEY FORM 2.20
CHERRY CORNER AND SWINEYARD LANE

A number of properties within the 500m boundary have been discounted from this assessment due to the a number of elements including: the residential receptors facing away from the site boundary, distance between the site boundary and residential receptors; and heavy filtering of the development by existing built form and vegetation as well as both the M56 and M6 Motorways. In all cases it can concluded that the **RVA threshold would note be reached**.

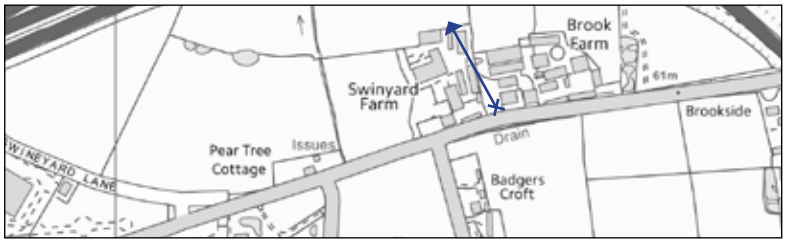
CHERRY CORNER

LOCATION
(Plan)



SWINEYARD LANE

LOCATION
(Plan)



Appendix 4.9 – Night Time Photography, Six56, Warrington (July 2020)

MSE
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Night Time Photography

Six56

Warrington

July 2020

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Introduction

Mike Spence BA (Hons), MLD, CMLI, REIA, FRGS is a one of the UK's leading independent exponents of technical photography, verified photomontages and visualisations. Since 2013 Mike has been a technical advisor to the Landscape Institute on 'photography and photomontage in landscape and visual impact assessment', and has been undertaking this work for over 25 years. He is one of the main technical authors of TGN 06/19 and provided technical support to Scottish Natural Heritage on their windfarm visualisation guidance. He has delvered workshops on night time photograhy through IEMA. His background as a Chartered Landscape Architect, Registered EIA Practitioner and Fellow of the Royal Geographic Society working on strategic infrastructure projects has meant that the accuracy of the visualisation work is paramount, and technical photography, together with extensive surveying experience and detailed 3D modelling using real world co-ordinates ensures that the visualisations produced follow a clear and transparent methodology to ensure they are as accurate as possible.

Recent projects include the UNESCO World Heritage Sites at Kew Royal Botanic Gardens, Fountains Abbey for The National Trust, and Derwent Valley Mills for Amber Valley Borough Council. Mike has halso been working closely with Bath City Council on proposed development in the UNESCO World Heritage City of Bath. Mike's work and objective technical checks have been used at numerous Public Inquiries and Planning Hearings, on behalf of both local authorities and developers.

In June 2020 Layer contacted MSEnvironmental to request Night TimeTechnical Photography and GNSS/RTK Surveying for the proposed Six56 development.

Verified Photography

The photographs were taken with a full frame camera (Canon EOS 5D Mark IV) and 24mm lens combination consistent with the emerging understanding of the requirement for night-time technical photography.

As part of the work 4 viewpoints were identified providing views of the site and visited on 22, 23 &24 June and 2 July 2020. The weather was good with clear visibility.

Technical Photography

The camera was mounted on a Manfrotto 303 SPH panoramic tripod head, levelled using a Manfrotto Leveller, supported on a Manfrotto Tripod. The tripod head was levelled using a spirit level, to avoid pitch and roll. The camera was set with the centre of the lens 1.60m above ground level. Photographs were taken in Manual mode with an aperture of f/6,3 or wider and a fixed focal length throughout. The panoramic tripod head was set with increments to give approximately 50% overlap between frames. Photographs were taken in landscape format. From each photograph location a full field of view was taken centred around a nodal point. The nodal point was set to avoid any problems of foreground parallax. A Sigma 24mm f/1.4 lens was used for all viewpoint photographs.

Technical information for the camera locations is provided.

Surveying

The position of each camera location was surveyed using Spectra Precision GNSS equipment with Real Time KinematicCorrection (RTK) which achieves an accuracy down to 1cm in eastings, northings and height (metres Above Ordnance Datum). The equipment included Spectra Precision SP80 GNSS smart antennae with Mobile Mapper 20 data recorder. Points were saved using DigiTerra software. A photograph of the camera location was taken, and shown in Appendix 1.1.

Summary

This work has been undertaken in accordance with TGN 06/19 and the developing understanding of night-time photography work.

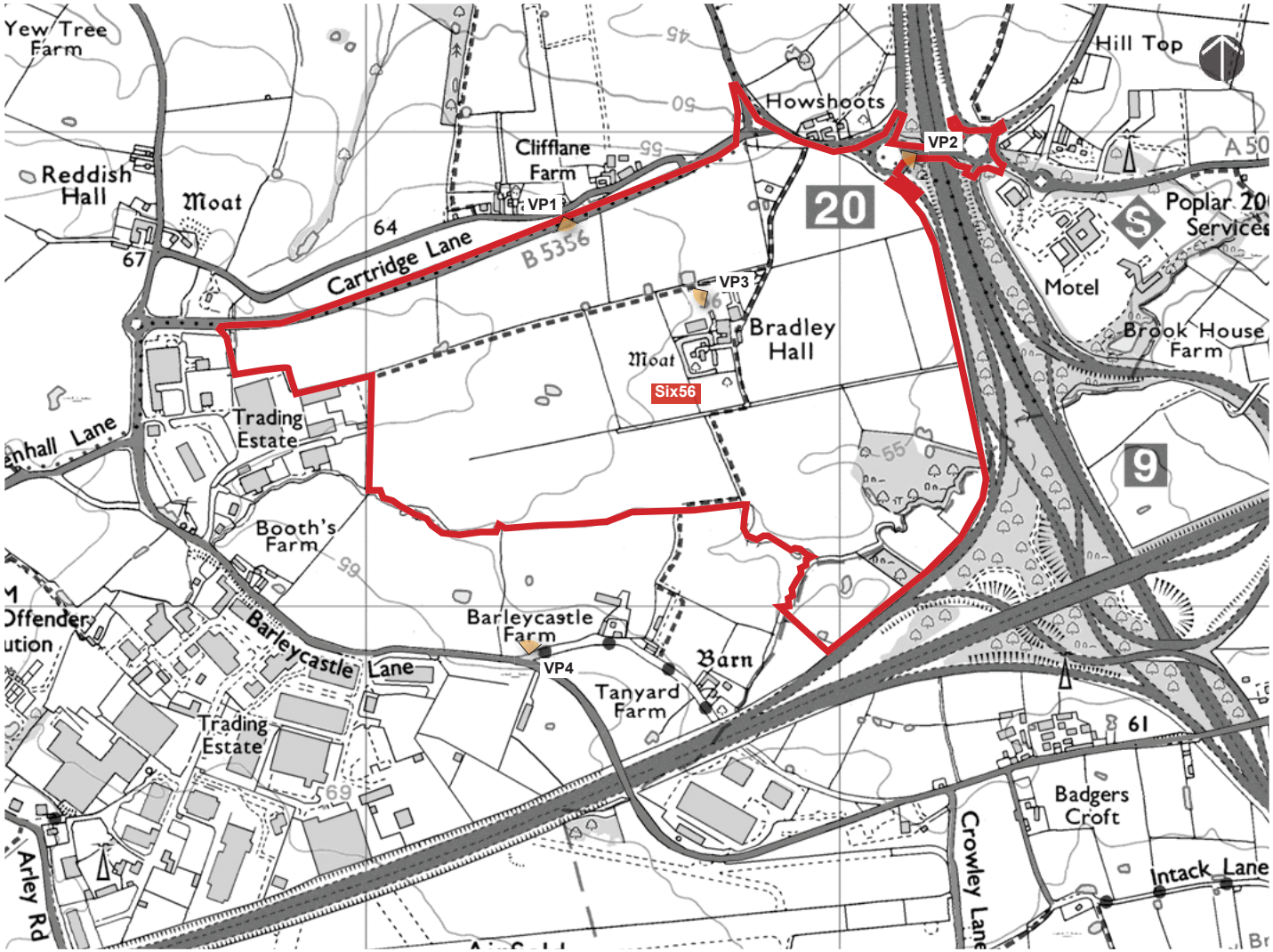
The photography has been undertaken in a robust manner, using professional full frame sensor DSLR and 24mm lens with panoramic head and tripod. The camera position has been surveyed using highly accurate GNSS equipment, giving high levels of accuracy of camera location.

The photography and surveying have followed a transparent methodology, and the resultant photographs are considered robust and fit for purpose to illustrate the night-time summer context of the proposed development site.

Mike Spence

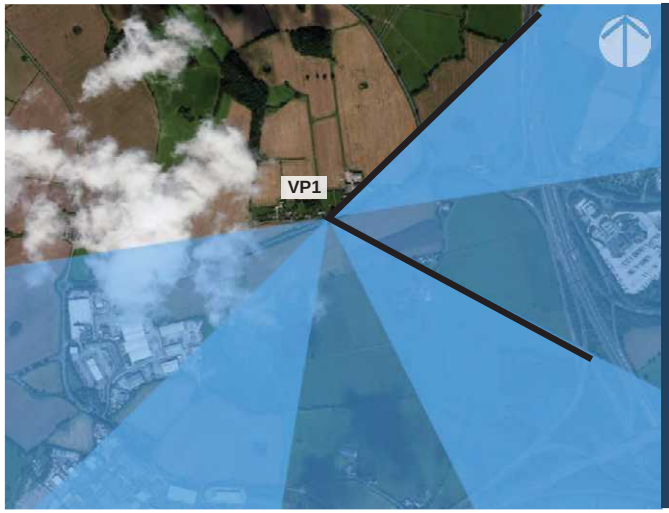
M.A.Spence BA(Hons), MLD, CMLI, REIA, FRGS 3 July 2020
Principal, MSEnvironmental

The following photographs with accompanying maps and grid co-ordinates illustrate precisely where the photographs were taken from. This would allow anyone to visit the camera location and gain the same view as that taken:



VIEWPOINT 1A VIEW FROM GRAPPENHALL LANE, B5356

Camera Location:



Camera Location:

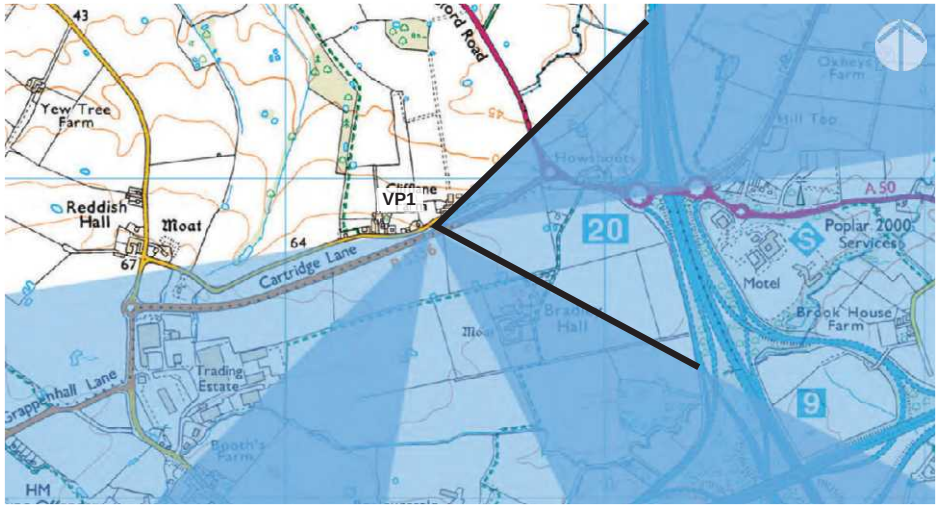
365446.707 (E) 384832.053 (N)
61.529mAOD (Sensor Height)

GNSS/RTK enabled to 1cm accuracy

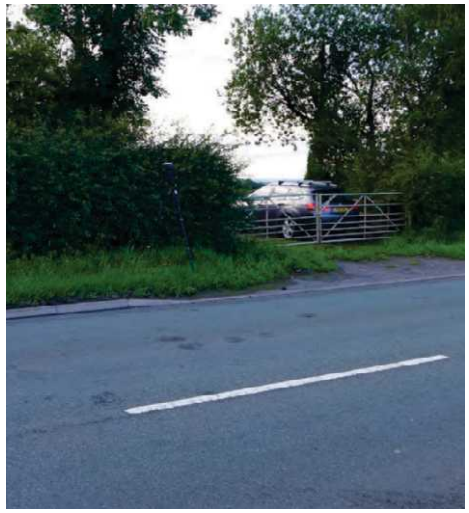
Date/Time of Photography:
2 July 2020/2000-2330

Camera Equipment:
Canon EOS 5D Mark IV
24mm f1.4 Lens

Survey Equipment:
SP80 GNSS
Mobilemapper 20



Tripod:



Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:04

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:39

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:55

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:10

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:21

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:41

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:56

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:22

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:38

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:10

Point of Perspective

Point of Perspective

Point of Perspective

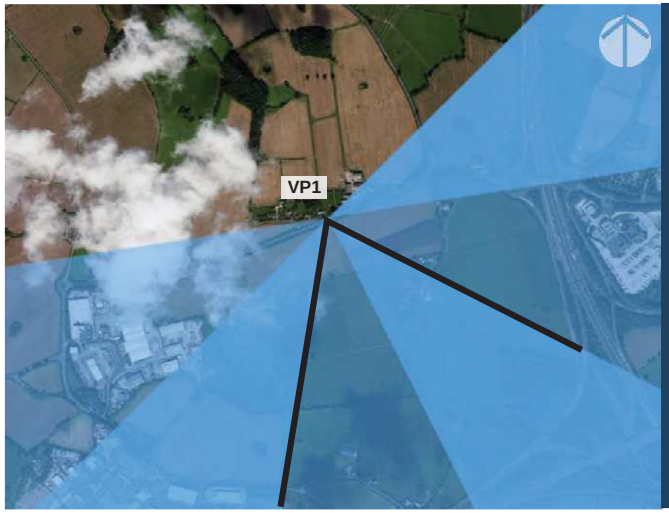
Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:38

VIEWPOINT 1B VIEW FROM GRAPPENHALL LANE, B5356

Camera Location:



Camera Location:

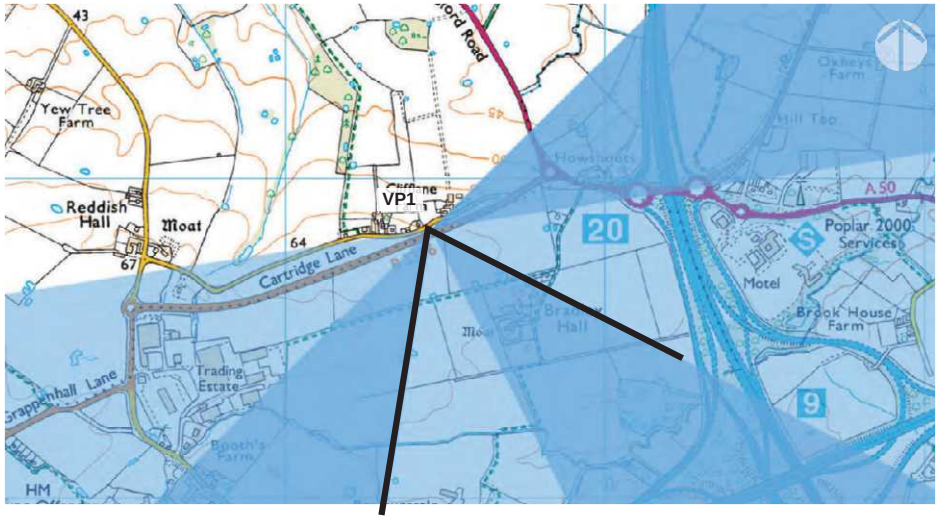
365446.707 (E) 384832.053 (N)
61.529mAOD (Sensor Height)

GNSS/RTK enabled to 1cm accuracy

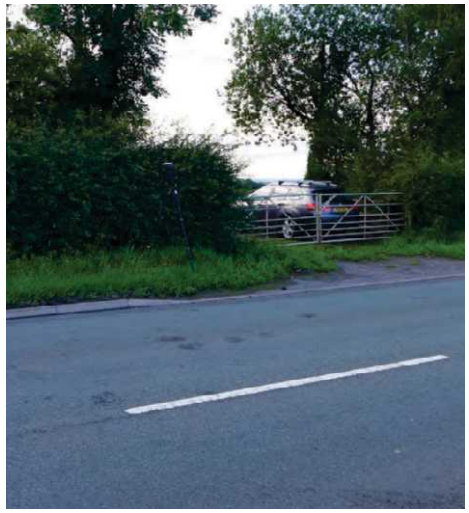
Date/Time of Photography:
2 July 2020/2000-2330

Camera Equipment:
Canon EOS 5D Mark IV
24mm f1.4 Lens

Survey Equipment:
SP80 GNSS
Mobilemapper 20



Tripod:



Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:04

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:39

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:55

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:10

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:21

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:41

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:56

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:22

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:38

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:10

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:38

VIEWPOINT 1C VIEW FROM GRAPPENHALL LANE, B5356

Camera Location:

Camera Location:

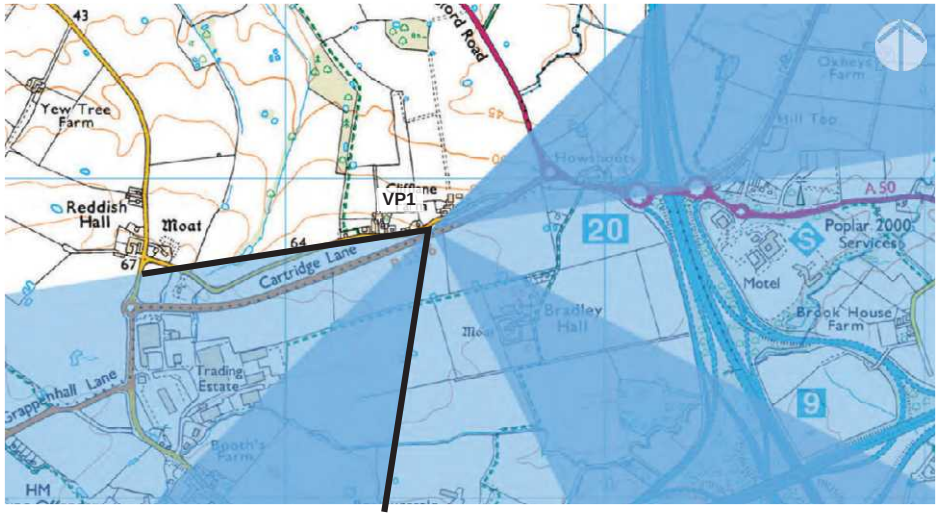
365446.707 (E) 384832.053 (N)
61.529mAOD (Sensor Height)

GNSS/RTK enabled to 1cm accuracy

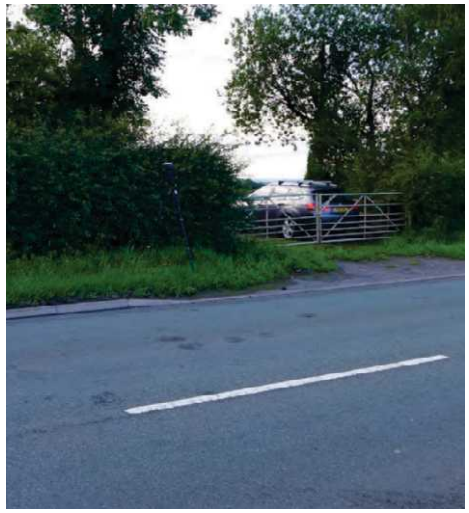
Date/Time of Photography:
2 July 2020/2000-2330

Camera Equipment:
Canon EOS 5D Mark IV
24mm f1.4 Lens

Survey Equipment:
SP80 GNSS
Mobilemapper 20



Tripod:



Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:04

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:39

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:55

Point of Perspective

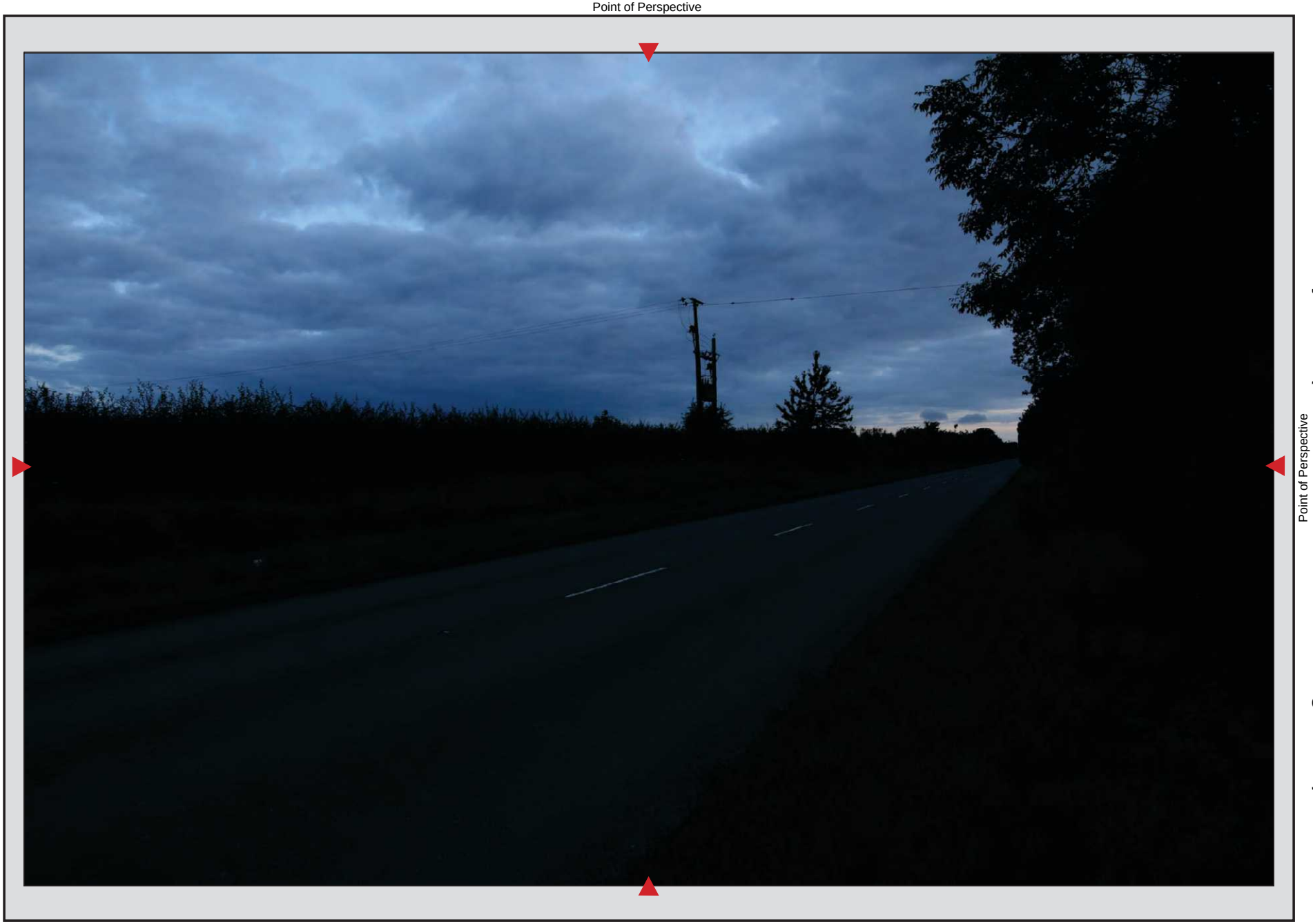
Point of Perspective

Point of Perspective

Point of Perspective

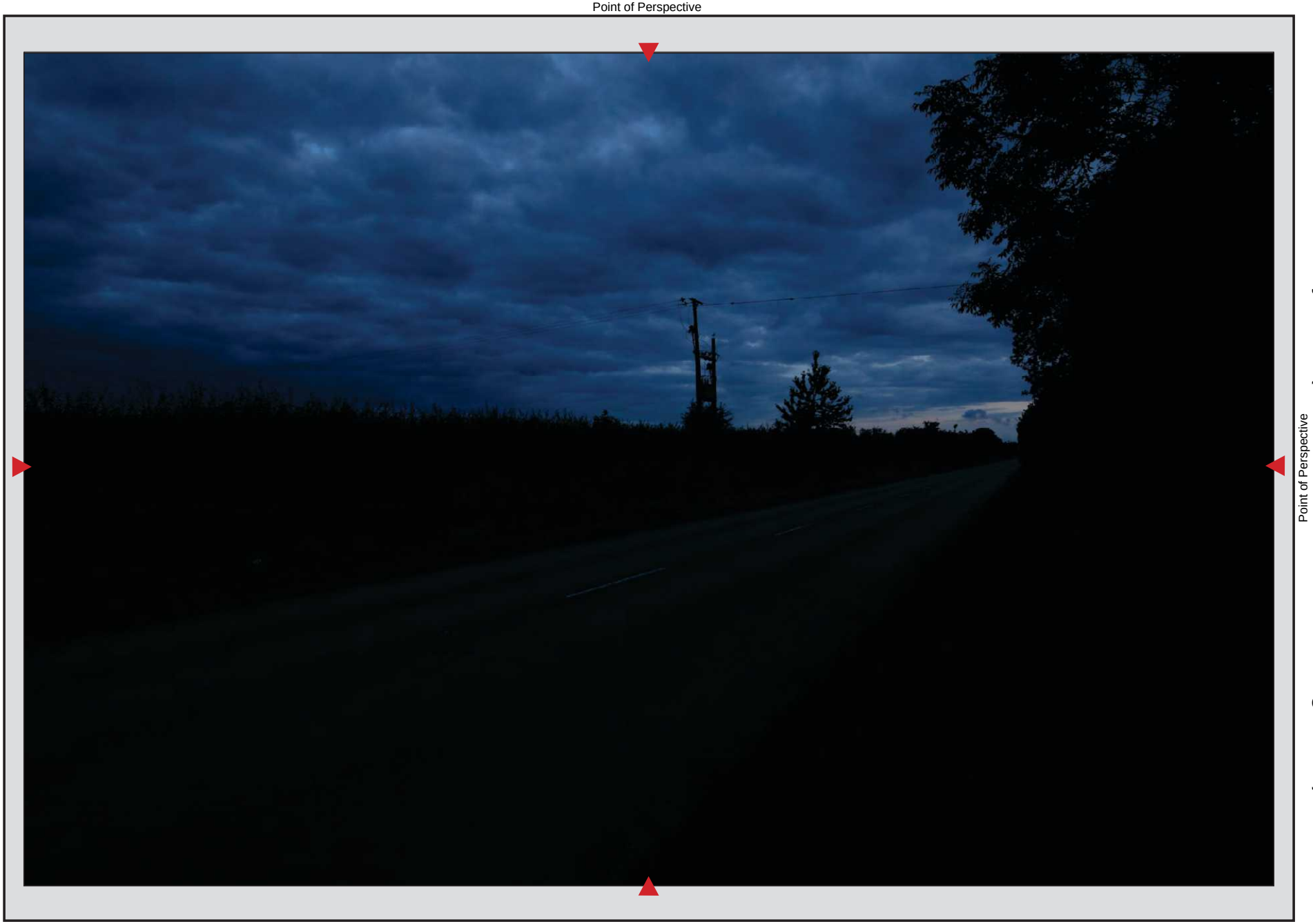
24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:10



24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:21



24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:41

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:56

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:22

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:38

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:10

Point of Perspective

Point of Perspective

Point of Perspective

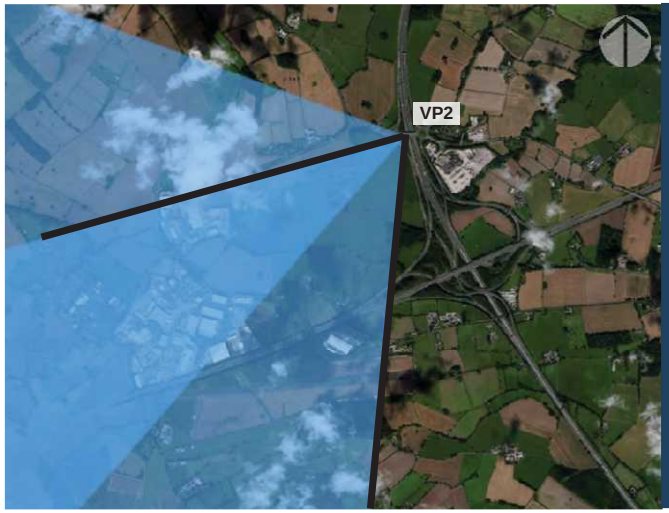
Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:38

VIEWPOINT 2A VIEW FROM M6 E IT RO N ABO T

Camera Location:



Camera Location:

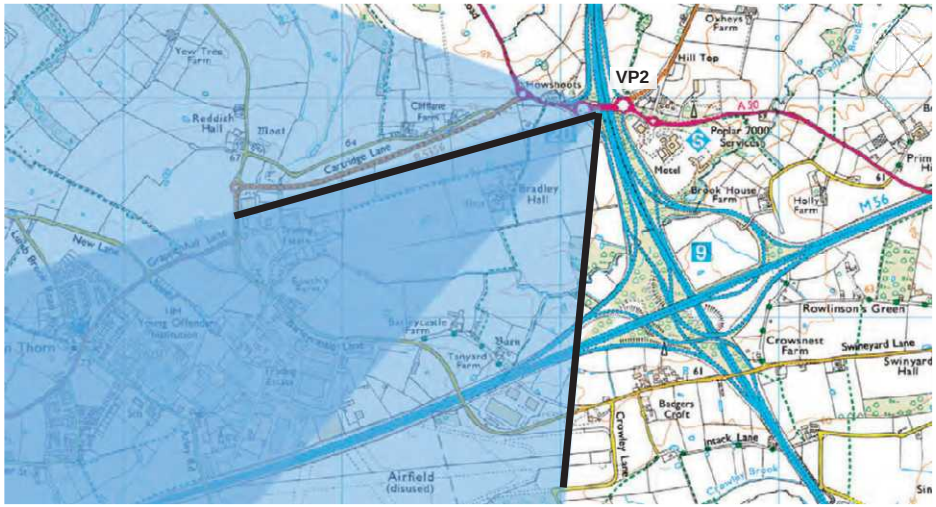
366168.048 (E) 384958.222 (N)
60.494mAOD (Sensor Height)

GNSS/RTK enabled to 1cm accuracy

Date/Time of Photography:
22 June 2020/2000-2330

Camera Equipment:
Canon EOS 5D Mark IV
24mm f1.4 Lens

Survey Equipment:
SP80 GNSS
Mobilemapper 20



Tripod:

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:01

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:14

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:34

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:56

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:26

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:53

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:36

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:05

Point of Perspective

Point of Perspective

Point of Perspective

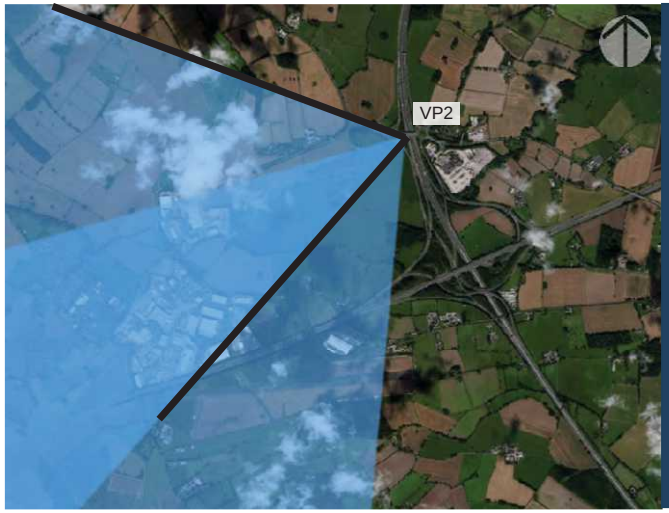
Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:32

VIEWPOINT 2B VIEW FROM M6 EXIT ROUNDABOUT

Camera Location:



Camera Location:

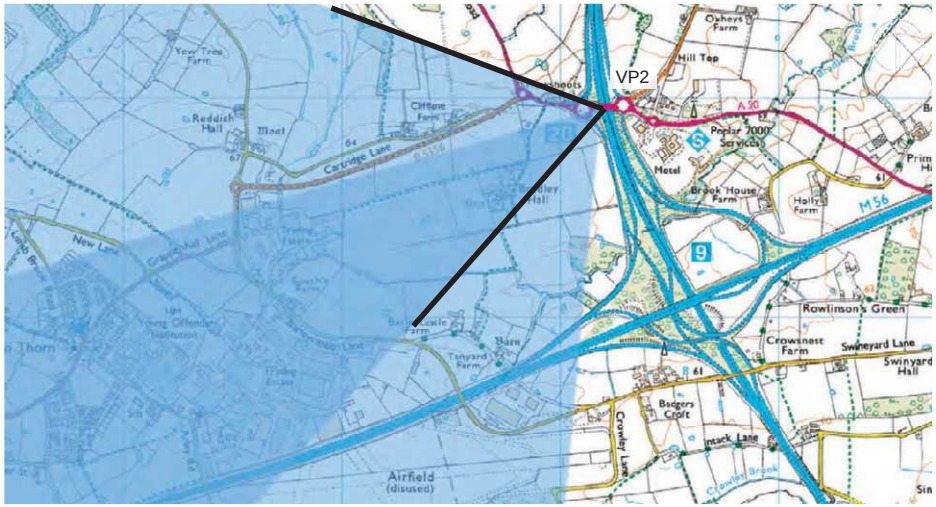
366168.048 (E) 384958.222 (N)
60.494mAOD (Sensor Height)

GNSS/RTK enabled to 1cm accuracy

Date/Time of Photography:
22 June 2020/2000-2330

Camera Equipment:
Canon EOS 5D Mark IV
24mm f1.4 Lens

Survey Equipment:
SP80 GNSS
Mobilemapper 20



Tripod:

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:01

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:14

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:34

Point of Perspective

Point of Perspective

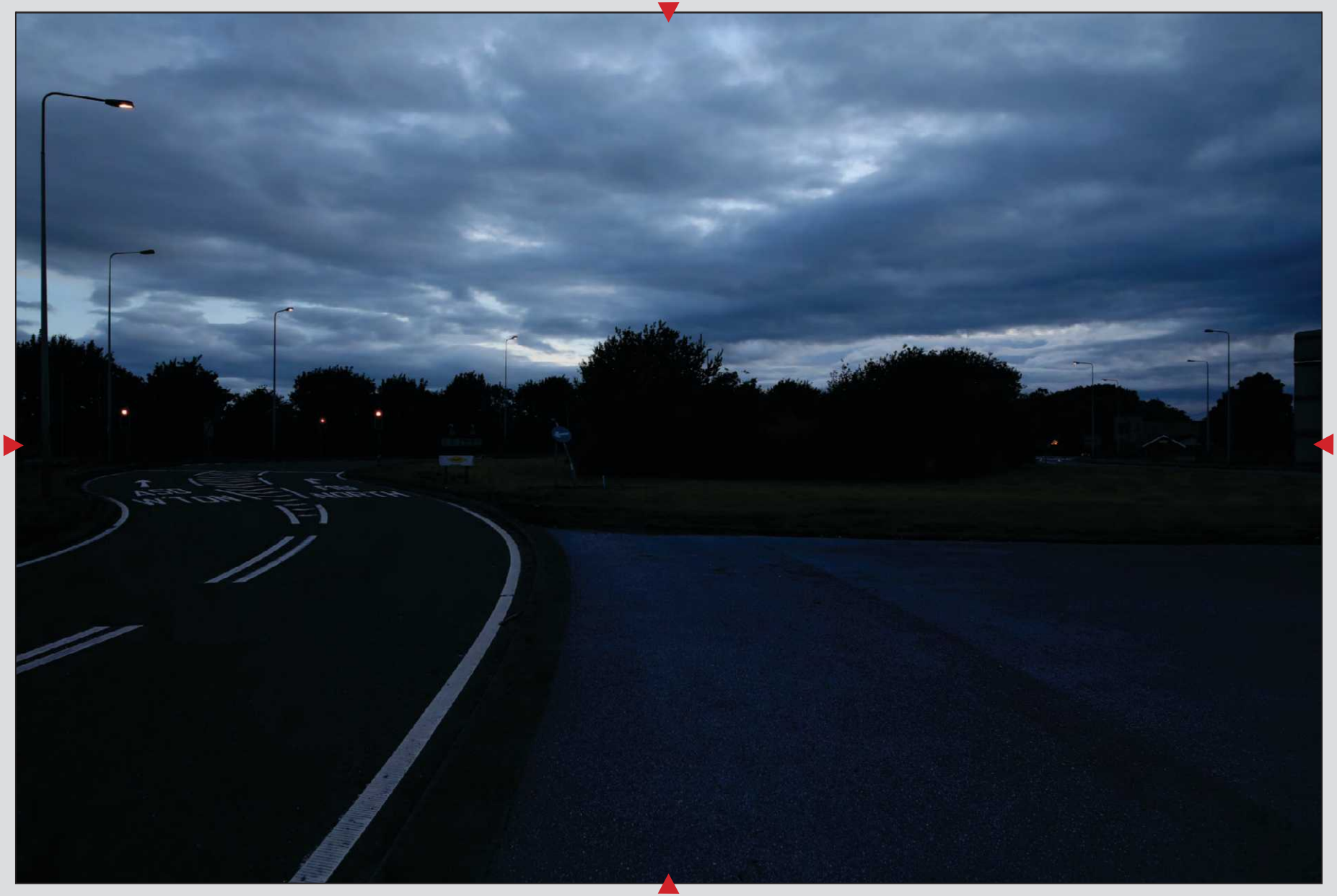
Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:56

Point of Perspective



Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:26

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:53

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:36

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:05

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:32

VIEWPOINT 3A VIEW FROM CENTRE OF SITE

Camera Location:

Camera Location:

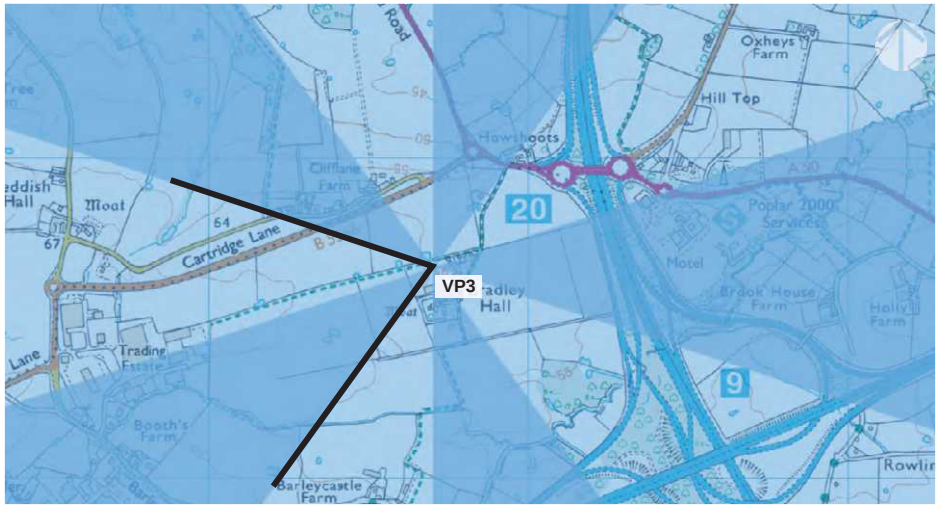
365718.289 (E) 384661.204 (N)
60.890mAOD (Sensor Height)

GNSS/RTK enabled to 1cm accuracy

Date/Time of Photography:
24 June 2020/2000-2330

Camera Equipment:
Canon EOS 5D Mark IV
24mm f1.4 Lens

Survey Equipment:
SP80 GNSS
Mobilemapper 20



Tripod:

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:04

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:40

Point of Perspective

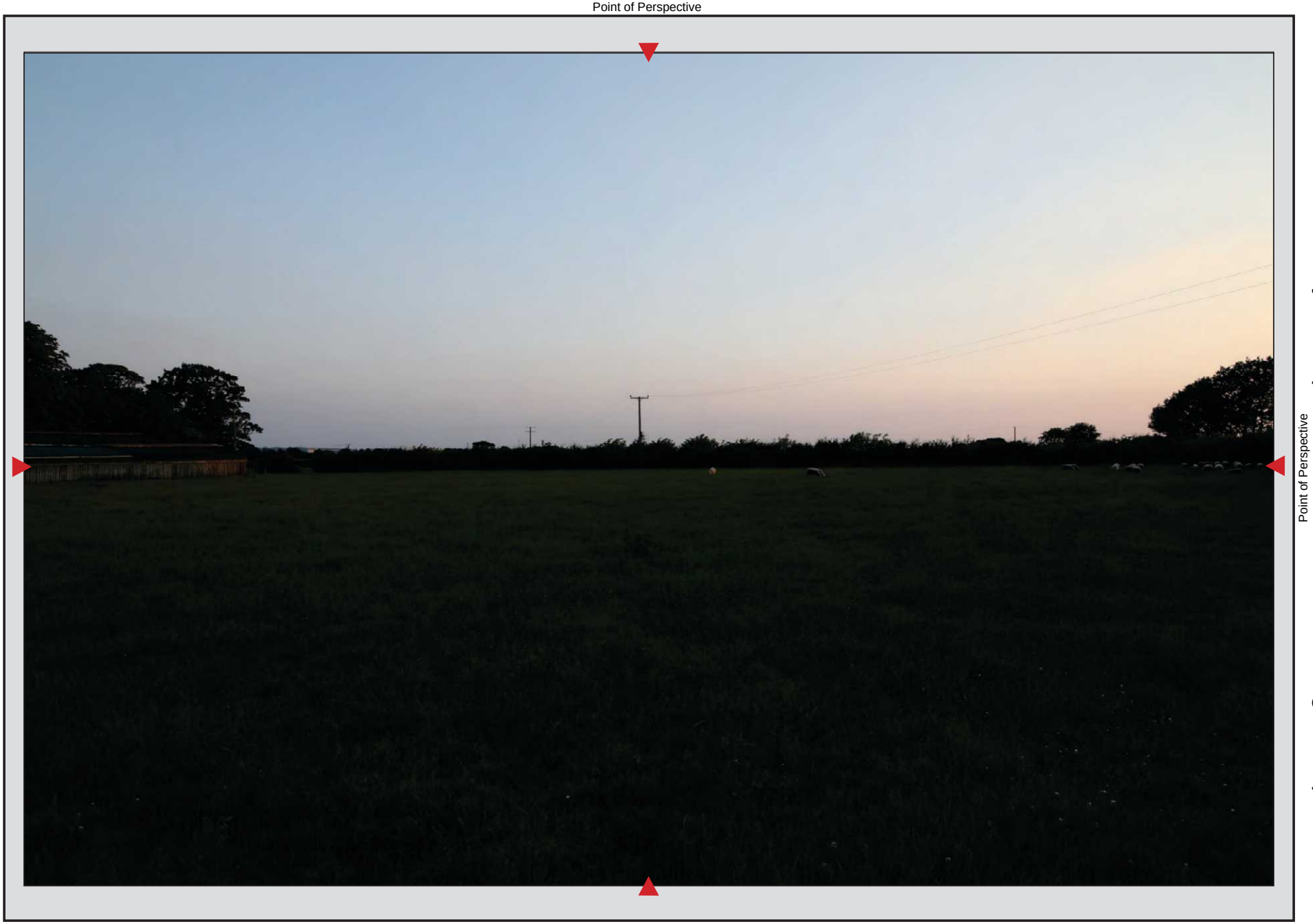
Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:56



24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:13

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:2

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:55

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:25

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:41

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:54

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:11

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:26

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:38

VIEWPOINT 3B VIEW FROM CENTRE OF SITE

Camera Location:

Camera Location:

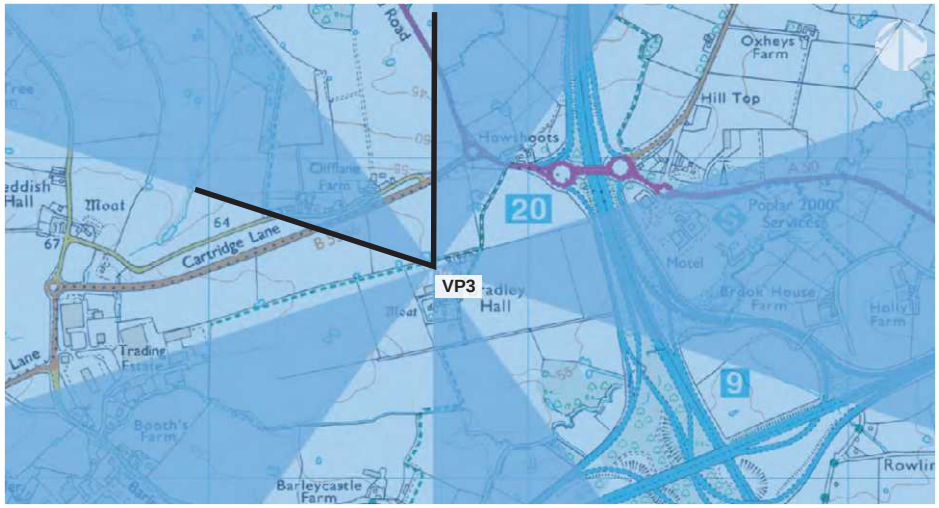
365718.289 (E) 384661.204 (N)
60.890mAOD (Sensor Height)

GNSS/RTK enabled to 1cm accuracy

Date/Time of Photography:
24 June 2020/2000-2330

Camera Equipment:
Canon EOS 5D Mark IV
24mm f1.4 Lens

Survey Equipment:
SP80 GNSS
Mobilemapper 20



Tripod:

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:04

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:40

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:56

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:13

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:2

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:55

Point of Perspective

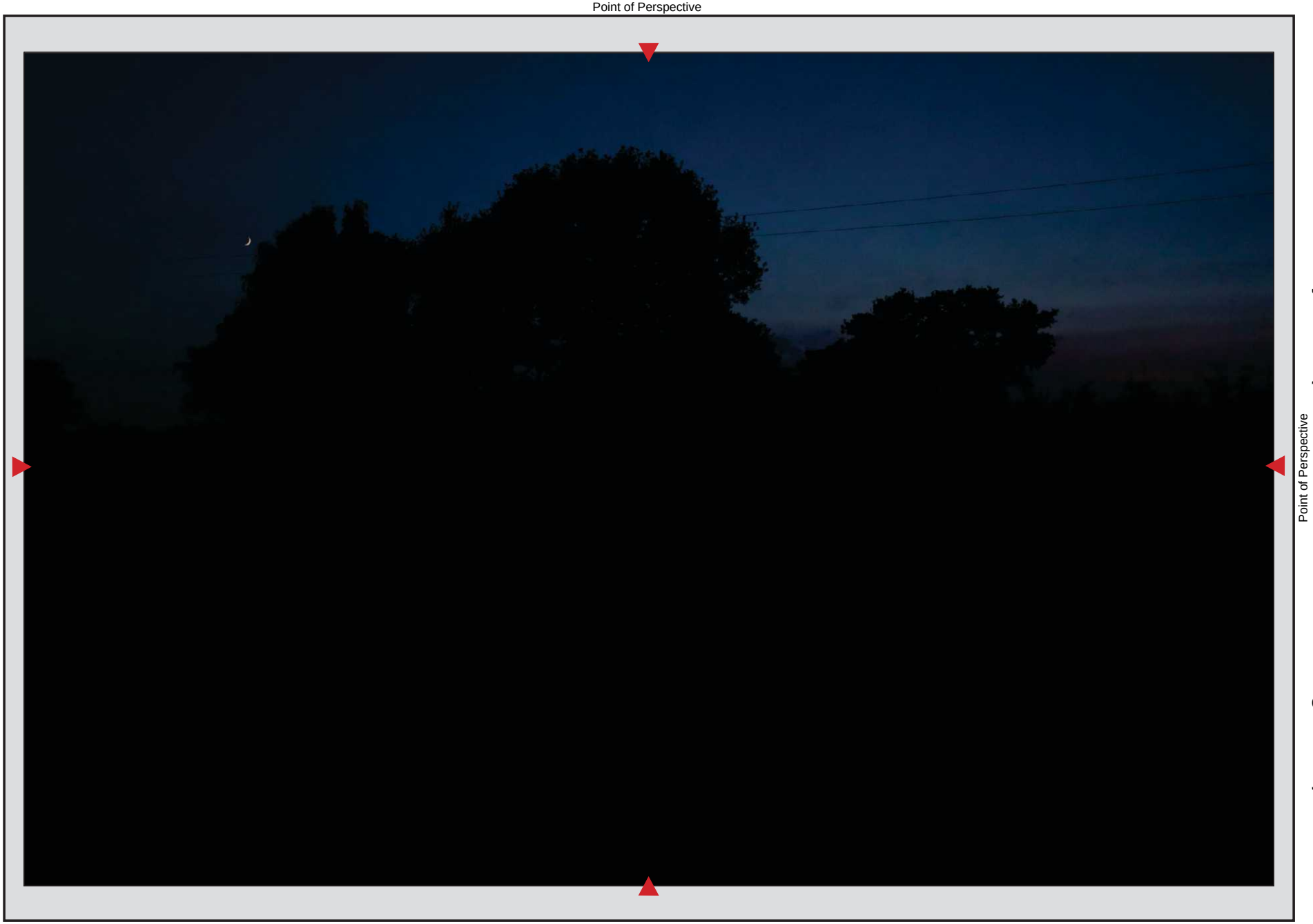
Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:25



24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:41

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:54

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:11

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:26

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:38

VIEWPOINT 3C VIEW FROM CENTRE OF SITE

Camera Location:

Camera Location:

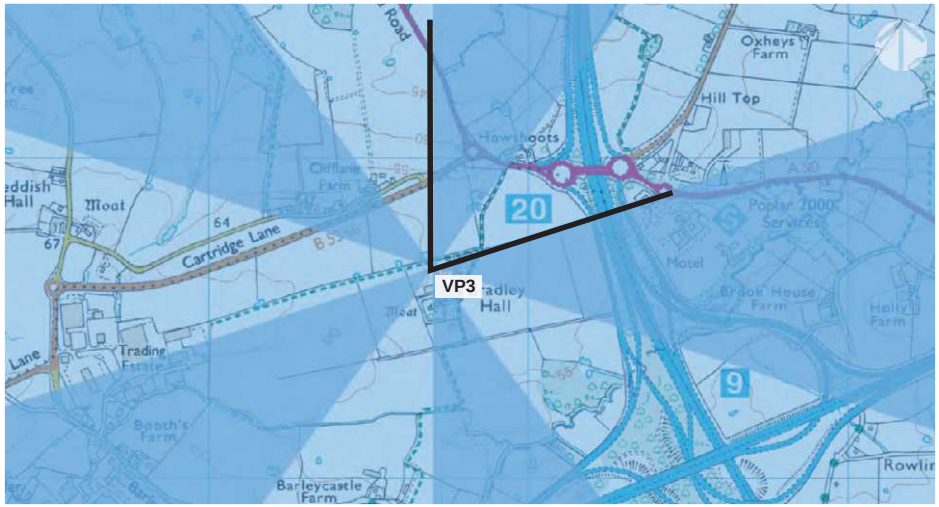
365718.289 (E) 384661.204 (N)
60.890mAOD (Sensor Height)

GNSS/RTK enabled to 1cm accuracy

Date/Time of Photography:
24 June 2020/2000-2330

Camera Equipment:
Canon EOS 5D Mark IV
24mm f1.4 Lens

Survey Equipment:
SP80 GNSS
Mobilemapper 20



Tripod:

Point of Perspective

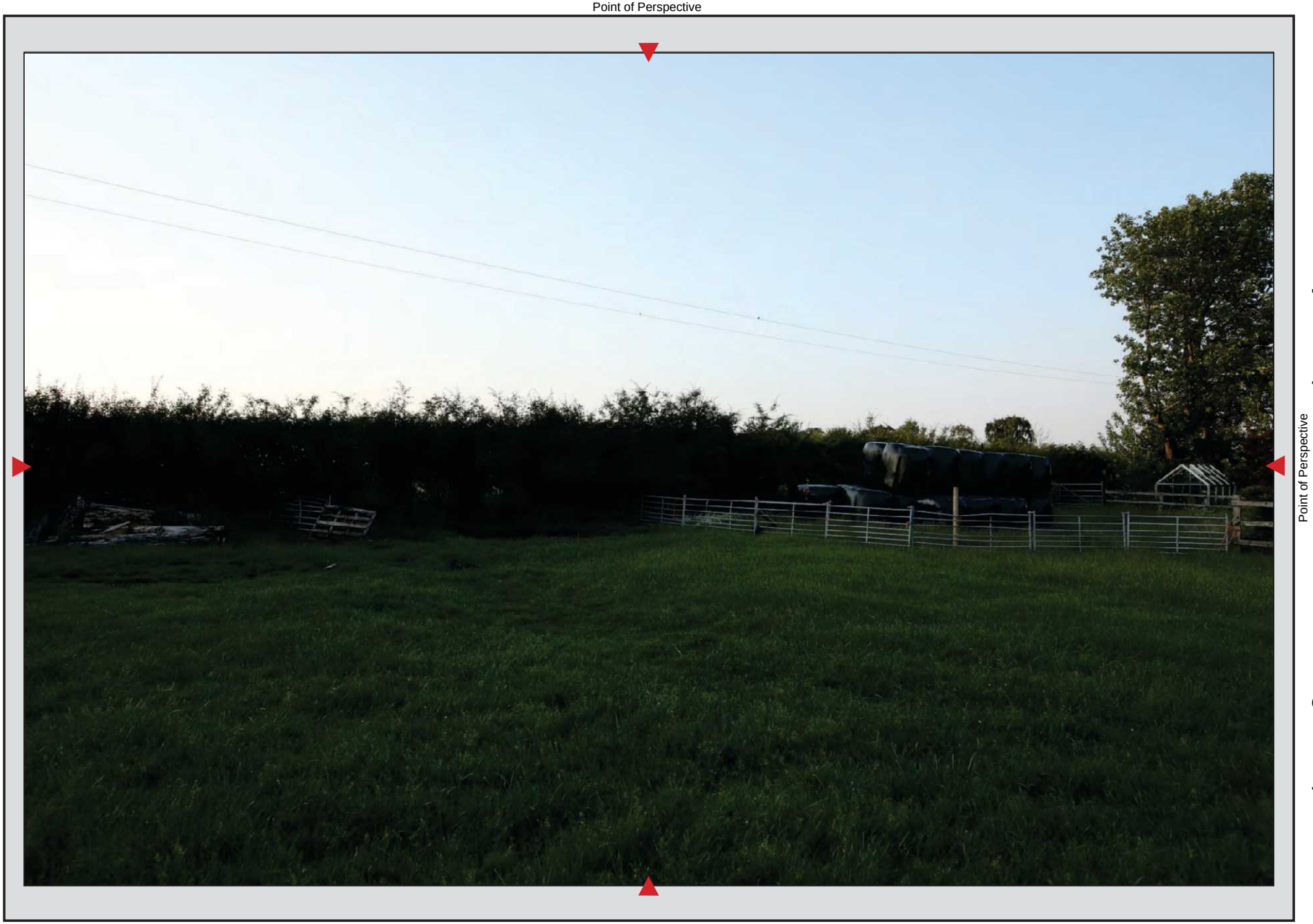
Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:04



24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:40

Point of Perspective

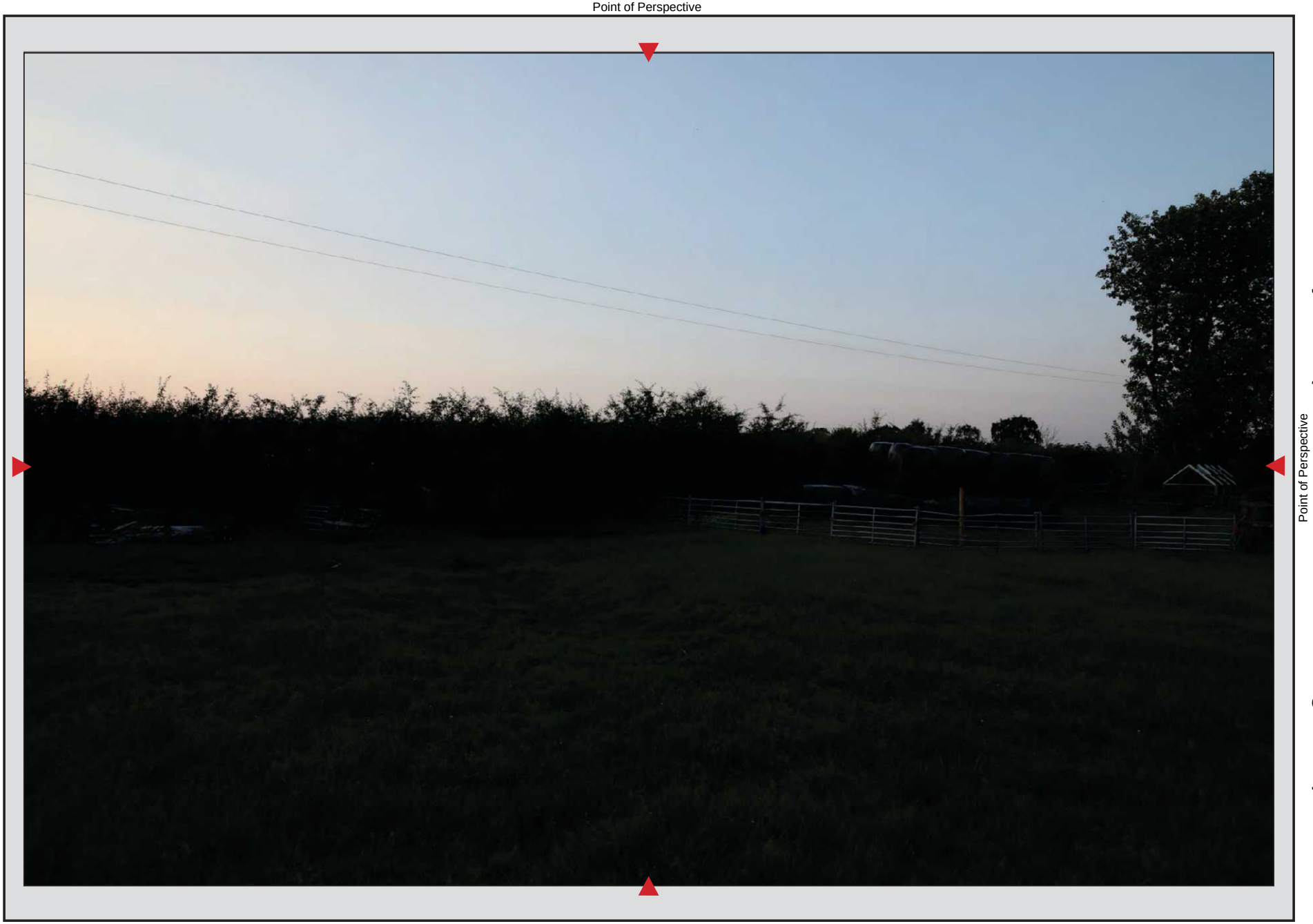
Point of Perspective

Point of Perspective

Point of Perspective

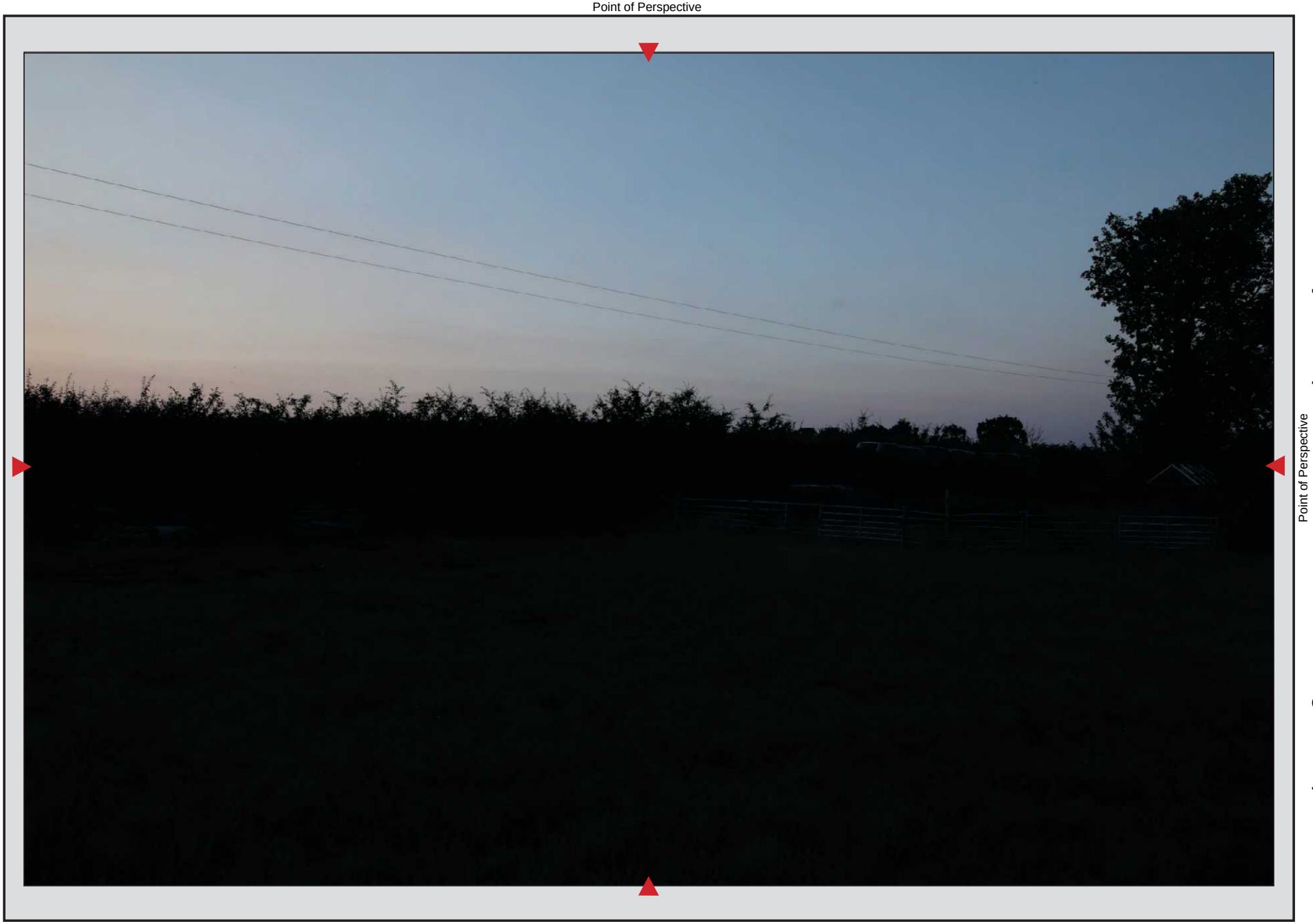
24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:56



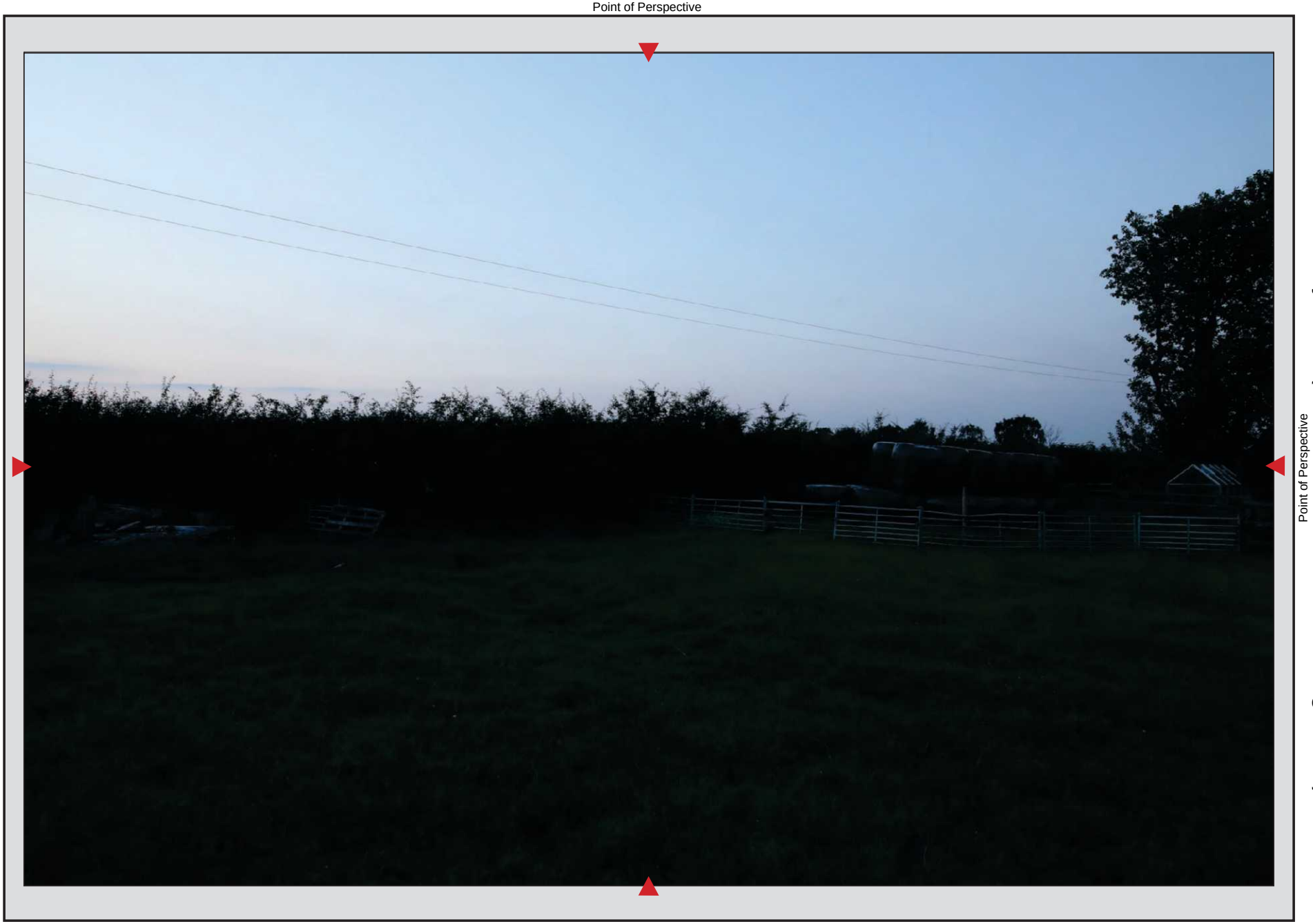
24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:13



24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:2



24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:55

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:25

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:41

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:54

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:11

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:26

Point of Perspective

Point of Perspective

Point of Perspective

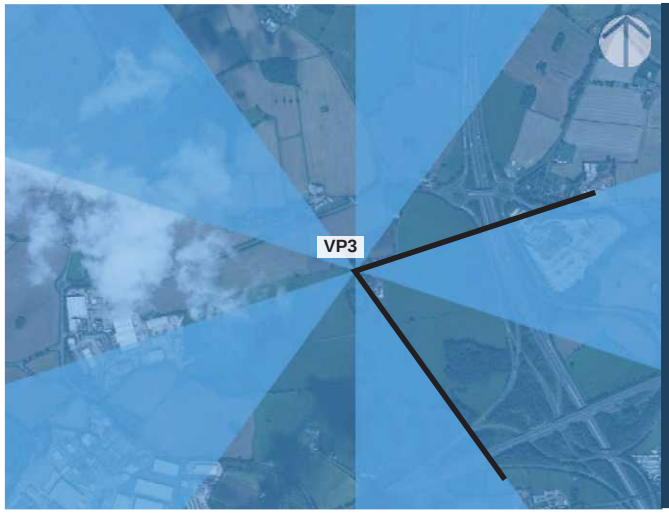
Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:38

VIEWPOINT 3 VIEW FROM CENTRE OF SITE

Camera Location:



Camera Location:

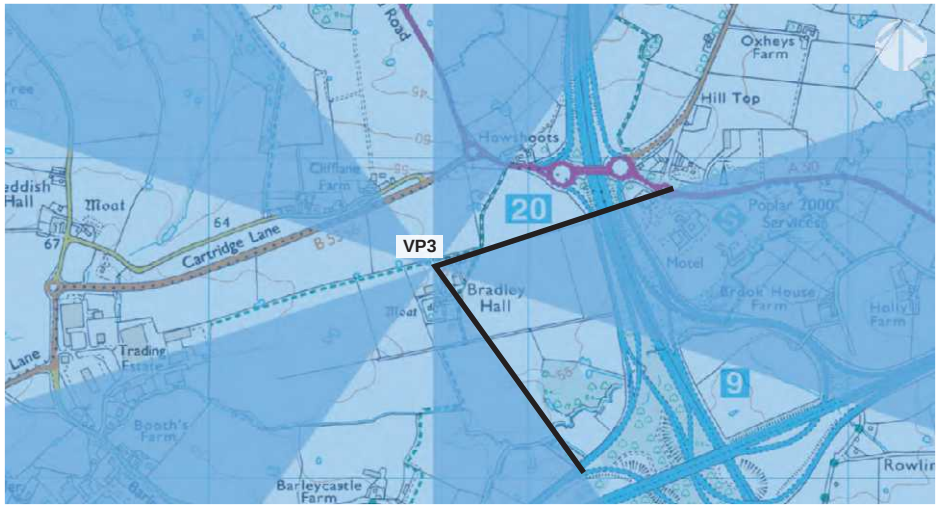
365718.289 (E) 384661.204 (N)
60.890mAOD (Sensor Height)

GNSS/RTK enabled to 1cm accuracy

Date/Time of Photography:
24 June 2020/2000-2330

Camera Equipment:
Canon EOS 5D Mark IV
24mm f1.4 Lens

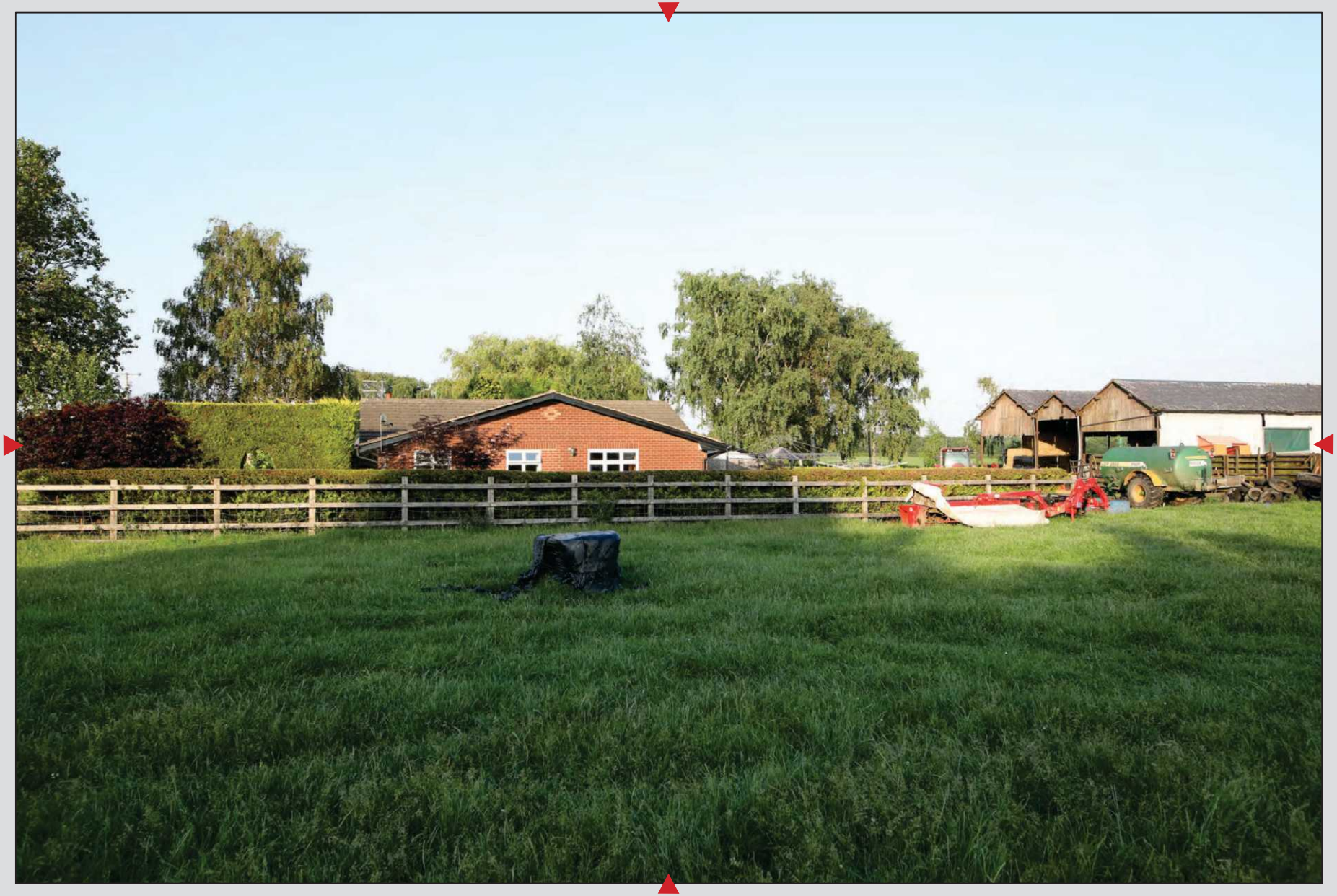
Survey Equipment:
SP80 GNSS
Mobilemapper 20



Tripod:

Point of Perspective

Point of Perspective



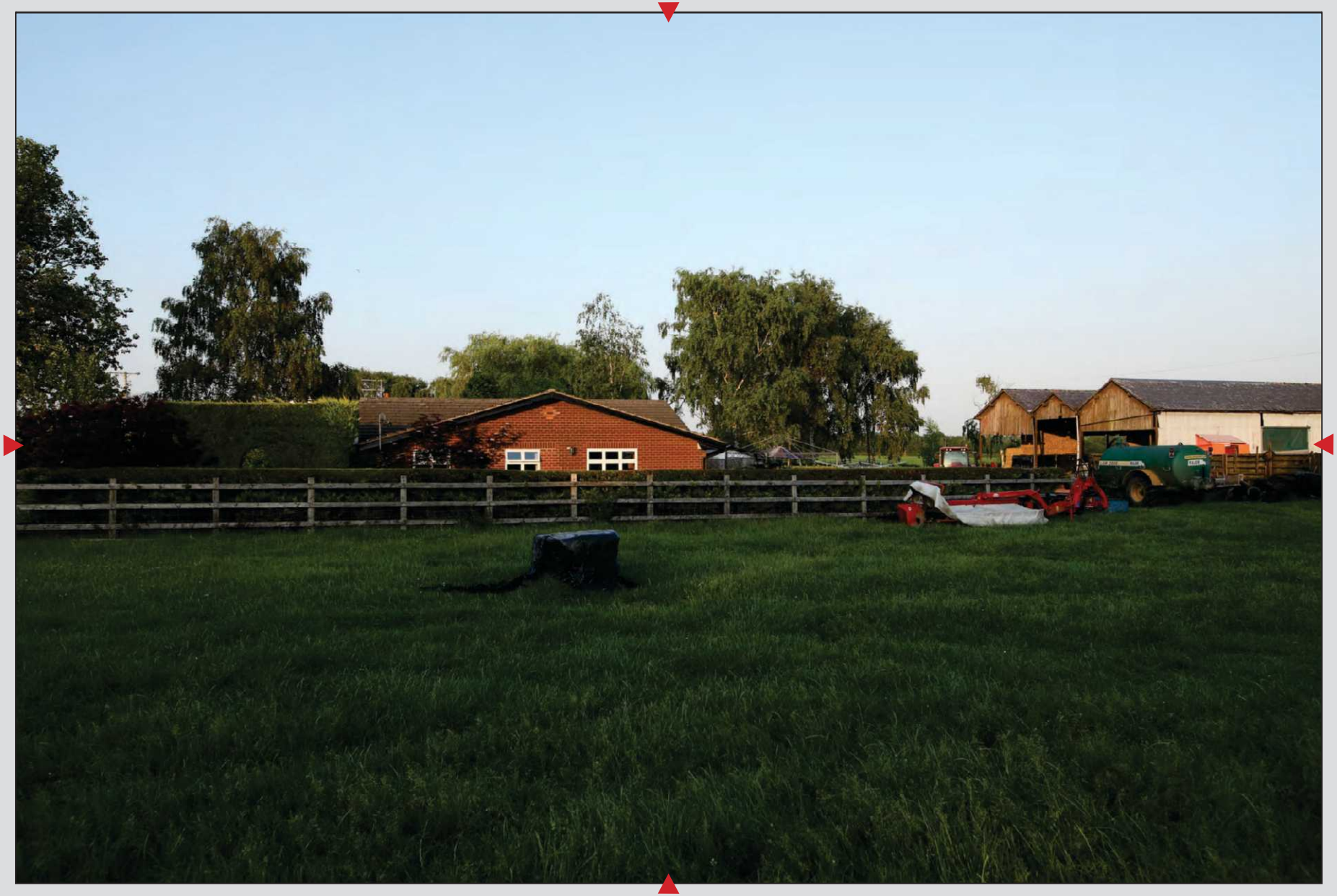
Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:04

Point of Perspective



Point of Perspective

Point of Perspective

Point of Perspective

24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:40

Point of Perspective

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:56

Point of Perspective

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:13

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:2

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:55

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:25

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:41

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:54

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:11

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:26

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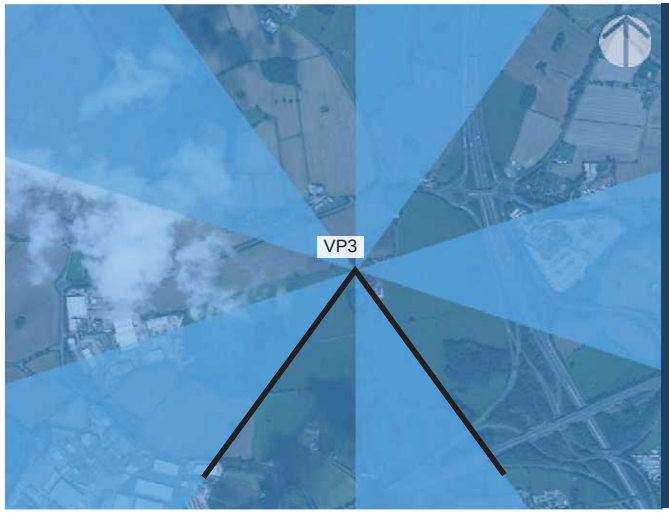
24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:38

VIEWPOINT 3E VIEW FROM CENTRE OF SITE

Camera Location:



Camera Location:

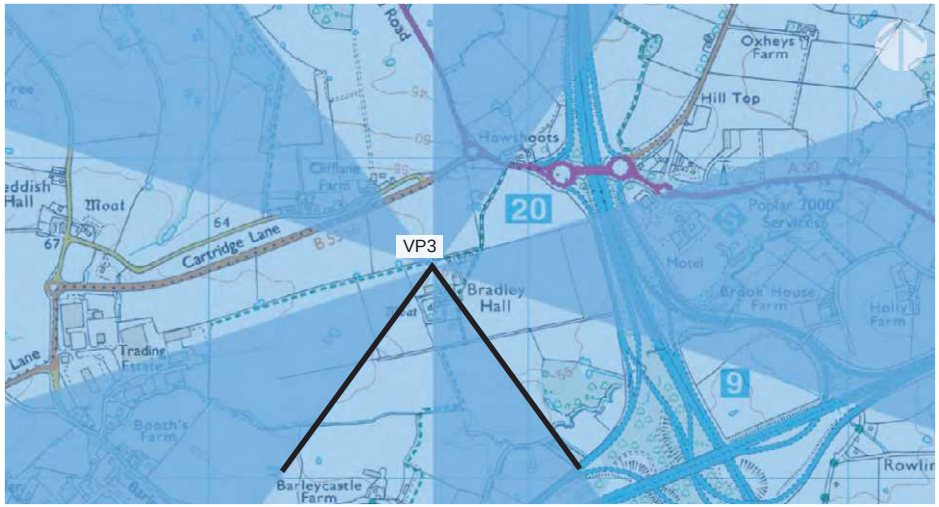
365718.289 (E) 384661.204 (N)
60.890mAOD (Sensor Height)

GNSS/RTK enabled to 1cm accuracy

Date/Time of Photography:
24 June 2020/2000-2330

Camera Equipment:
Canon EOS 5D Mark IV
24mm f1.4 Lens

Survey Equipment:
SP80 GNSS
Mobilemapper 20



Tripod:

Point of Perspective

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:04

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:40

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:56

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:13

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:55

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:25

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:41

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:54

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:11

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:26

Six56

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:3

VIEWPOINT 4A VIEW FROM BARLE CASTLE LANE

Camera Location:

Camera Location:

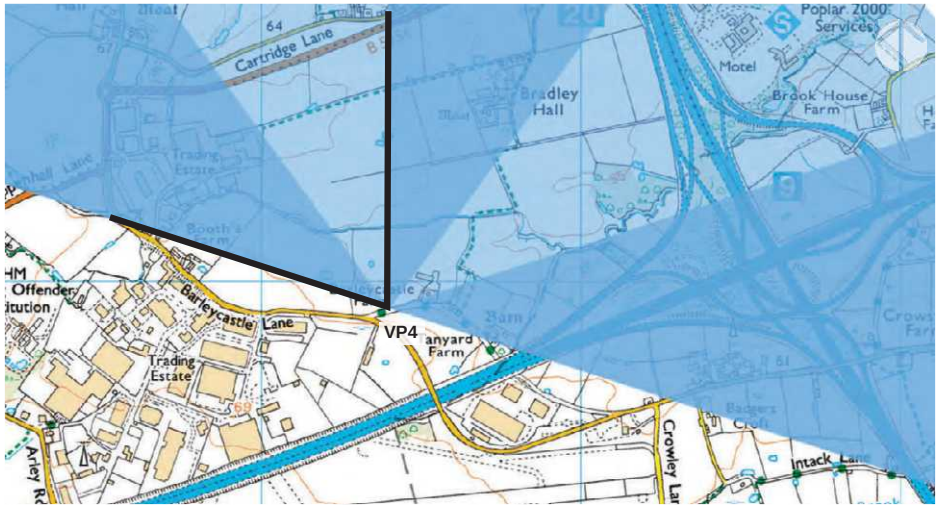
365383.092 (E) 383906.454 (N)
64.586mAOD (Sensor Height)

GNSS/RTK enabled to 1cm accuracy

Date/Time of Photography:
23 June 2020/2000-2330

Camera Equipment:
Canon EOS 5D Mark IV
24mm f1.4 Lens

Survey Equipment:
SP80 GNSS
Mobilemapper 20



Tripod:

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 19:53

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:26

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:56

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:14

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:31

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:56

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:12

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:24

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:40

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:55

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:11

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:38

VIEWPOINT 4B VIEW FROM BARLE CASTLE LANE

Camera Location:

Camera Location:

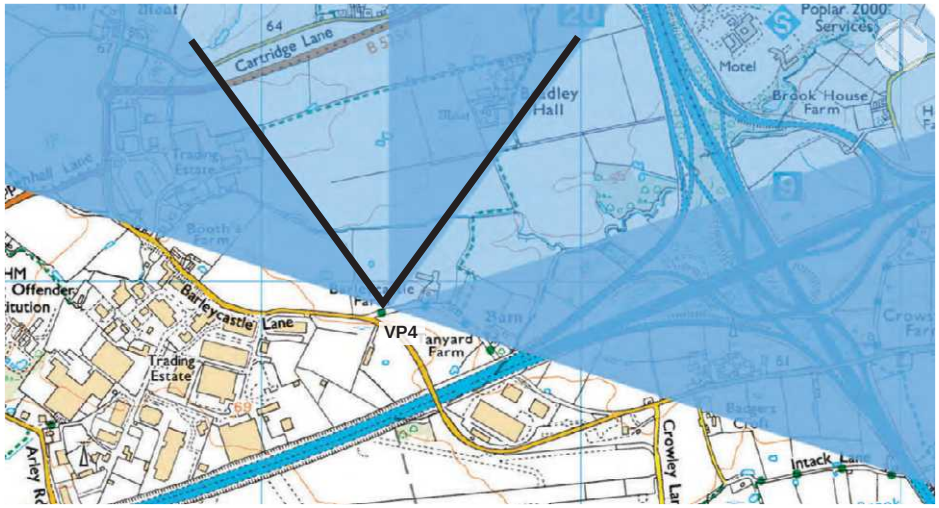
365383.092 (E) 383906.454 (N)
64.586mAOD (Sensor Height)

GNSS/RTK enabled to 1cm accuracy

Date/Time of Photography:
23 June 2020/2000-2330

Camera Equipment:
Canon EOS 5D Mark IV
24mm f1.4 Lens

Survey Equipment:
SP80 GNSS
Mobilemapper 20



Tripod:

Point of Perspective

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 19:53

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:26

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:56

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:31

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:56

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:12

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:24

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:55

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:11

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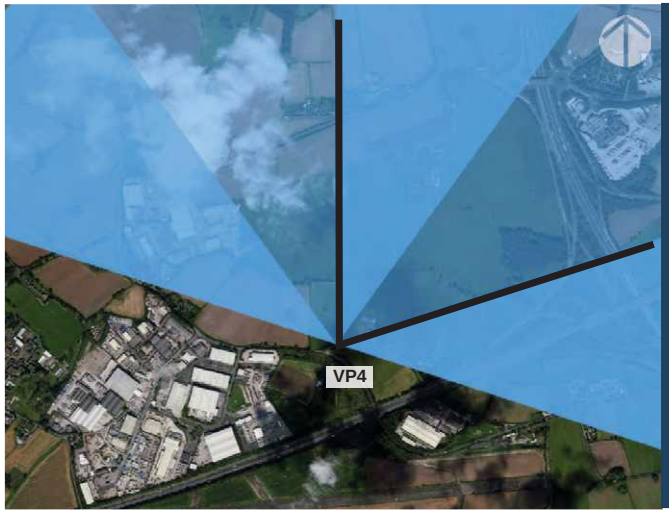
24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:38

VIEWPOINT 4C VIEW FROM BARLE CASTLE LANE

Camera Location:



Camera Location:

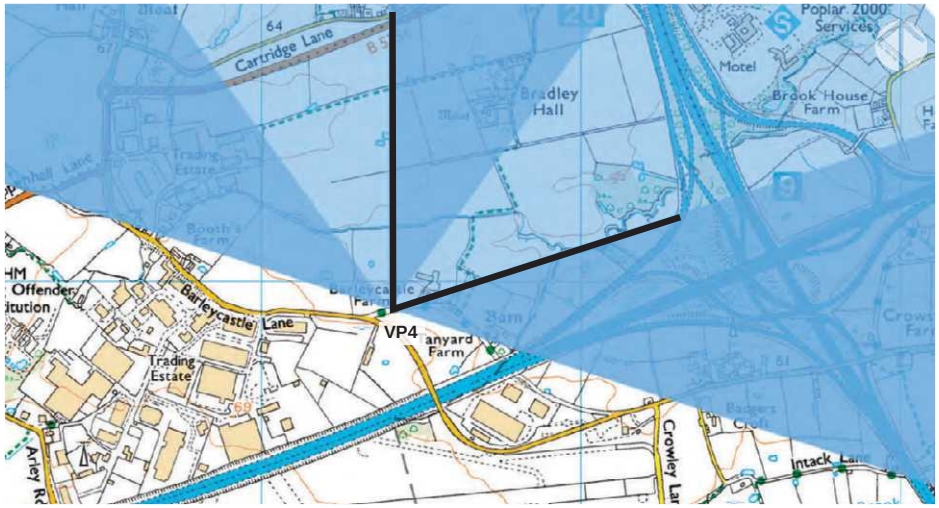
365383.092 (E) 383906.454 (N)
64.586mAOD (Sensor Height)

GNSS/RTK enabled to 1cm accuracy

Date/Time of Photography:
23 June 2020/2000-2330

Camera Equipment:
Canon EOS 5D Mark IV
24mm f1.4 Lens

Survey Equipment:
SP80 GNSS
Mobilemapper 20



Tripod:

Point of Perspective

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 19:53

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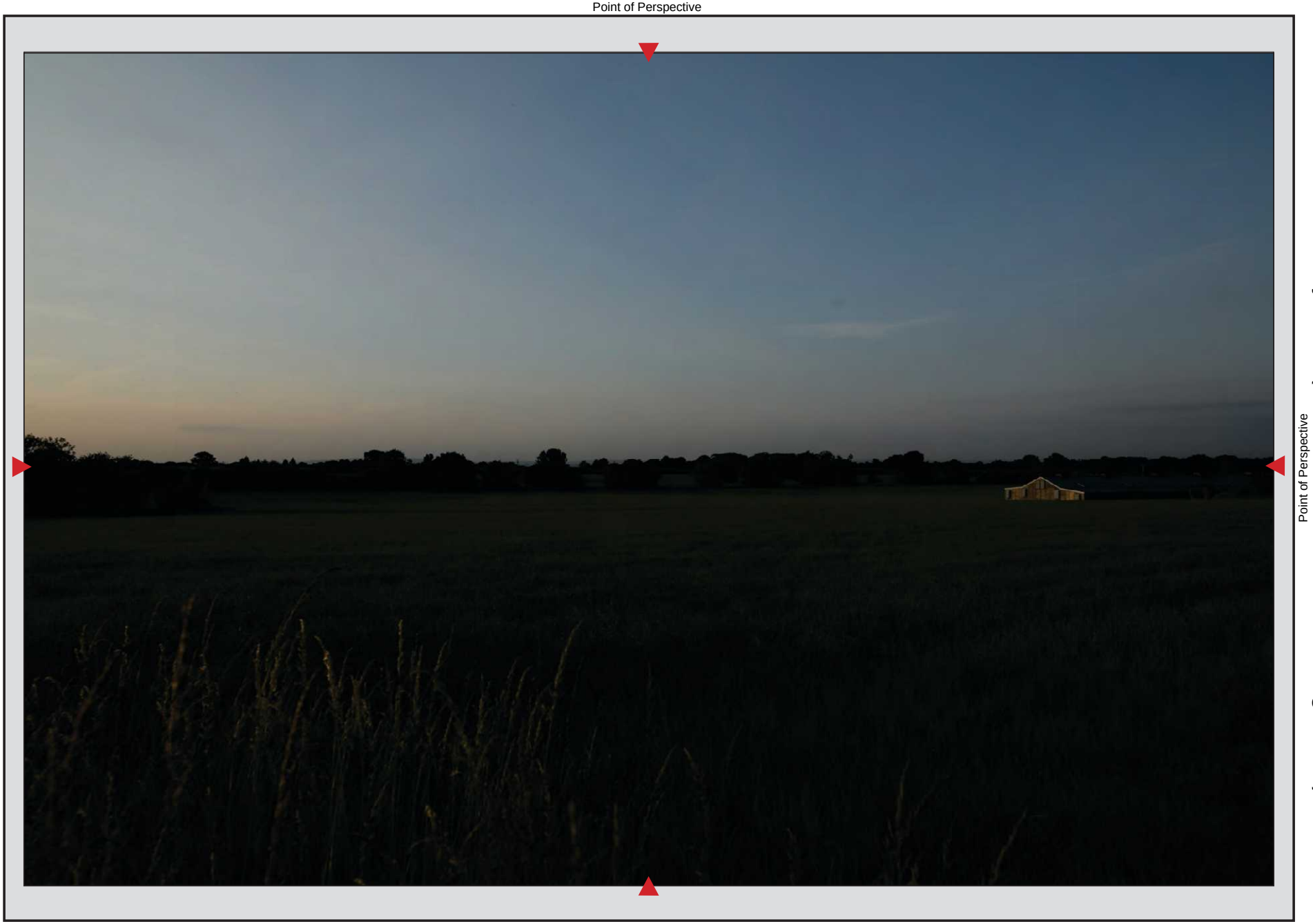
24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:26



24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 20:56

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 21:14

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:11

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:38

VIEWPOINT 4 VIEW FROM BARLE CASTLE LANE

Camera Location:

Camera Location:

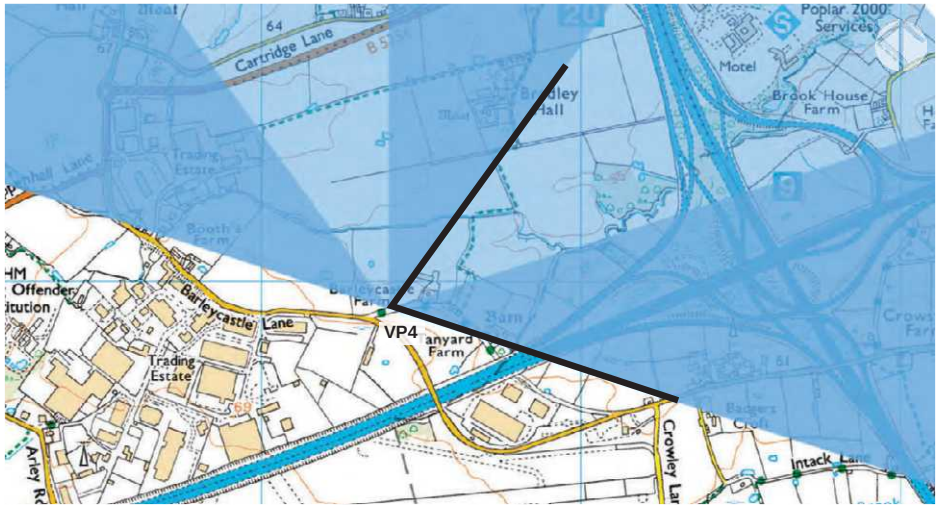
365383.092 (E) 383906.454 (N)
64.586mAOD (Sensor Height)

GNSS/RTK enabled to 1cm accuracy

Date/Time of Photography:
23 June 2020/2000-2330

Camera Equipment:
Canon EOS 5D Mark IV
24mm f1.4 Lens

Survey Equipment:
SP80 GNSS
Mobilemapper 20



Tripod:

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 19:53

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 22:55

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24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:11

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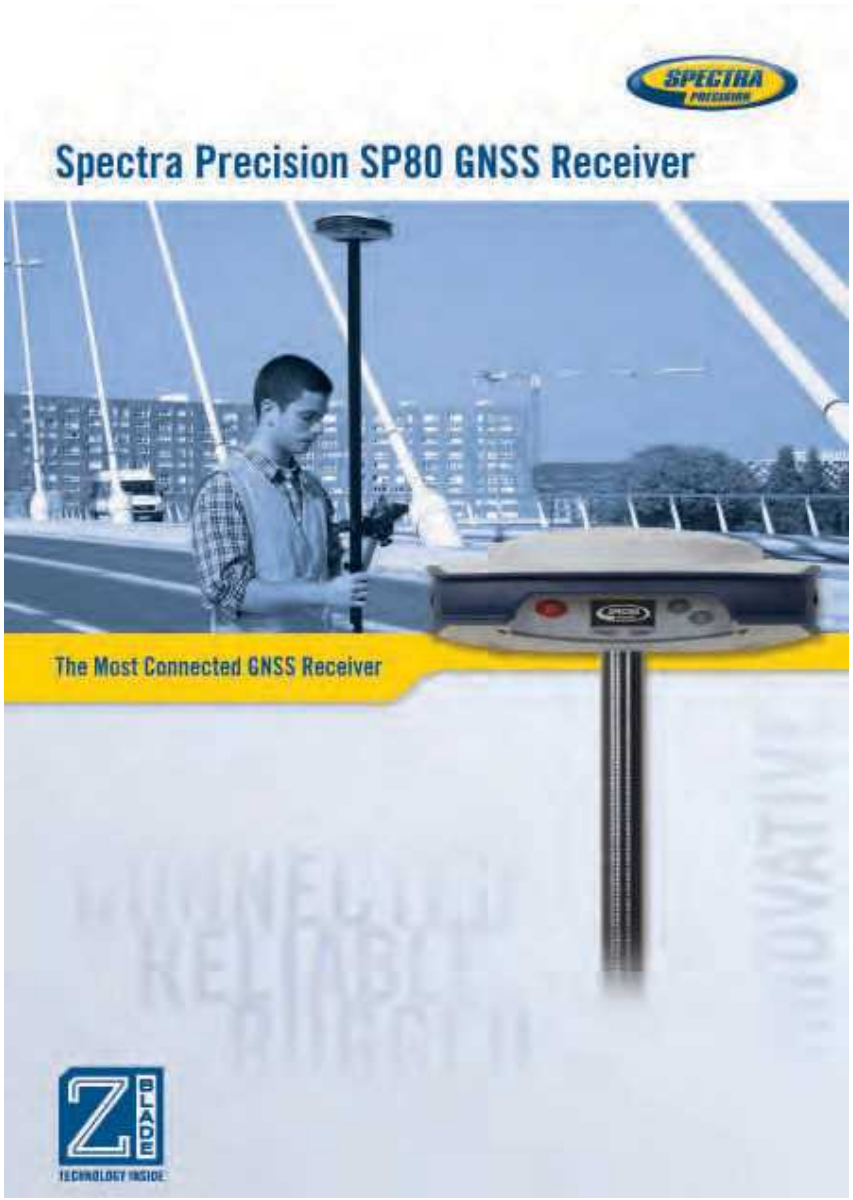
24mm Lens Planar Projection (actual 24.54mm; 72.52 deg HFoV)

Existing View Summer 23:38


SPECTRA PRECISION
Spectra Precision SP80 GNSS Receiver
The Most Connected GNSS Receiver
Z BLADE
TECHNOLOGY INSIDE


SP80
SP80
GNSS Receiver
Key Features

Unique 6G GNSS-centric Technology

Exclusive Z-Blade processing technology running on a next-generation Spectra Precision 240-channel 6G ASIC fully utilizes all 6 GNSS systems: GPS, GLONASS, BeiDou, Galileo, QZSS and SBAS. The unique GNSS-centric capability optimally combines GNSS signals without dependency on any specific GNSS system; this allows SP80 to operate in GPS-only, GLONASS-only or BeiDou-only mode if needed. In addition, SP80 supports the recently approved RTCM 3.2 Multiple Signal Messages (MSM), a standardized definition for broadcasting all GNSS signals from space, regardless of their constellation. This protects the surveyor's investment well into the future by providing superior performance and improved productivity as new signals become available.

SMS and Email Messaging

SP80 has a unique combination of communication technologies including an integrated 3.5G GSM/UMTS modem, Bluetooth and Wi-Fi connectivity, and optional internal UHF (transmit/receive). The cellular modem may be used for SMS (text message) and e-mail alerts as well as regular Internet or VRS connectivity. Likewise, SP80 can use all available RTK correction sources and connect to the Internet from the field using Wi-Fi hotspots, where available. The internal UHF transmit/receive radio allows for quick and easy setup as a local base station. This saves time and increases the surveyor's efficiency.

Anti-Theft Protection

A unique anti-theft technology secures SP80 when installed as a field base station in remote or public places and can detect if the product is disturbed, moved or stolen. This technology allows the surveyor to lock the device to a specific location and make it unusable if the device is moved elsewhere. In this case, SP80 will generate an audio alert and show an alert message on its display. Furthermore, an SMS or e-mail will be sent to the surveyor's mobile phone or computer and provides the receiver's current coordinates allowing tracking of its position and facilitating recovery of the receiver. SP80's anti-theft technology provides surveyors with utmost security and peace of mind.

The Most Powerful Tool for Reliable Field Use

The SP80's rugged housing, created by Spectra Precision's engineering design lab in Germany, incorporates a host of practical innovations. Dual hot-swappable batteries can be easily exchanged in the field as a one-hand operation for an interruption-free working day, ensuring surveyors remain productive until the job is done. The impact-resistant glass fiber reinforced casing, designed to withstand 2m pole drops and waterproof to IP67, ensures that SP80 can handle the roughest outdoor conditions. The patented UHF antenna, set inside the rugged carbon fiber rod, extends the range of RTK radio performance at the same time as ensuring protection. The sunlight readable display offers instant access to key information like the number of satellites, RTK status, battery charge and available memory. These powerful design features combine to make SP80 the most capable, most reliable GNSS receiver, backed by a comprehensive standard 2 year warranty.

The Spectra Precision Experience

With the most advanced and rugged field data collectors from Spectra Precision, surveyors get maximum productivity and reliability every day. Spectra Precision Survey Pro or FAST Survey software is specifically tailored for the SP80 GNSS receiver, providing easy-to-use, yet powerful GNSS workflows, letting the surveyor concentrate on getting the job done. Spectra Precision Survey Office Software provides a complete office suite for post-processing GNSS data and adjusting survey data, as well as exporting the processed results directly back to the field or to engineering design software packages. Combined with Spectra Precision field and office software, SP80 is a very powerful and complete solution.

SPECTRA precision

MobileMapper®20

MobileMapper 20

Geographical Information Systems and Location Based Services are now being used in a wide range of applications and organizations. The growing need for geo-localization is naturally boosting the demand for efficient and affordable data collection solutions. Spectra Precision is leading the democratization of GNSS enabling wider access to professional mapping. With MobileMapper 20, Spectra Precision makes it possible to deploy a professional accurate GIS receiver to any field work force.

Powerful and complete, MobileMapper 20 is the ideal enabling tool for a huge range of positioning applications.

With MobileMapper 20, organizations will improve the quality of their georeferenced information and their field productivity, yielding reduced operational costs.

Secure Your Field Work

- A wide range of capabilities in a compact, lightweight design
- Several days of battery life
- Rugged and reliable

Unpack and Start Logging

- Ready-to-use complete mapping solution for field and office
- User friendly Windows® Embedded Handheld 6.5
- Easy-to-use software for short learning curve and quick logging operations

Ideal for Data Maintenance or Inspection

- Log your assets in real-time with 1 to 2 meter accuracy
- Connect field and office work force for maximum productivity
- Achieve half meter accuracy with post-processing

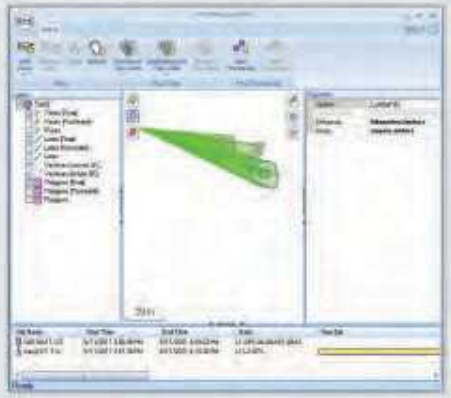
MobileMapper Field and Office Software

A complete solution

The Spectra Precision MobileMapper software suite includes all the GIS features that professionals really need, without the burden of complicated and rarely used functions.

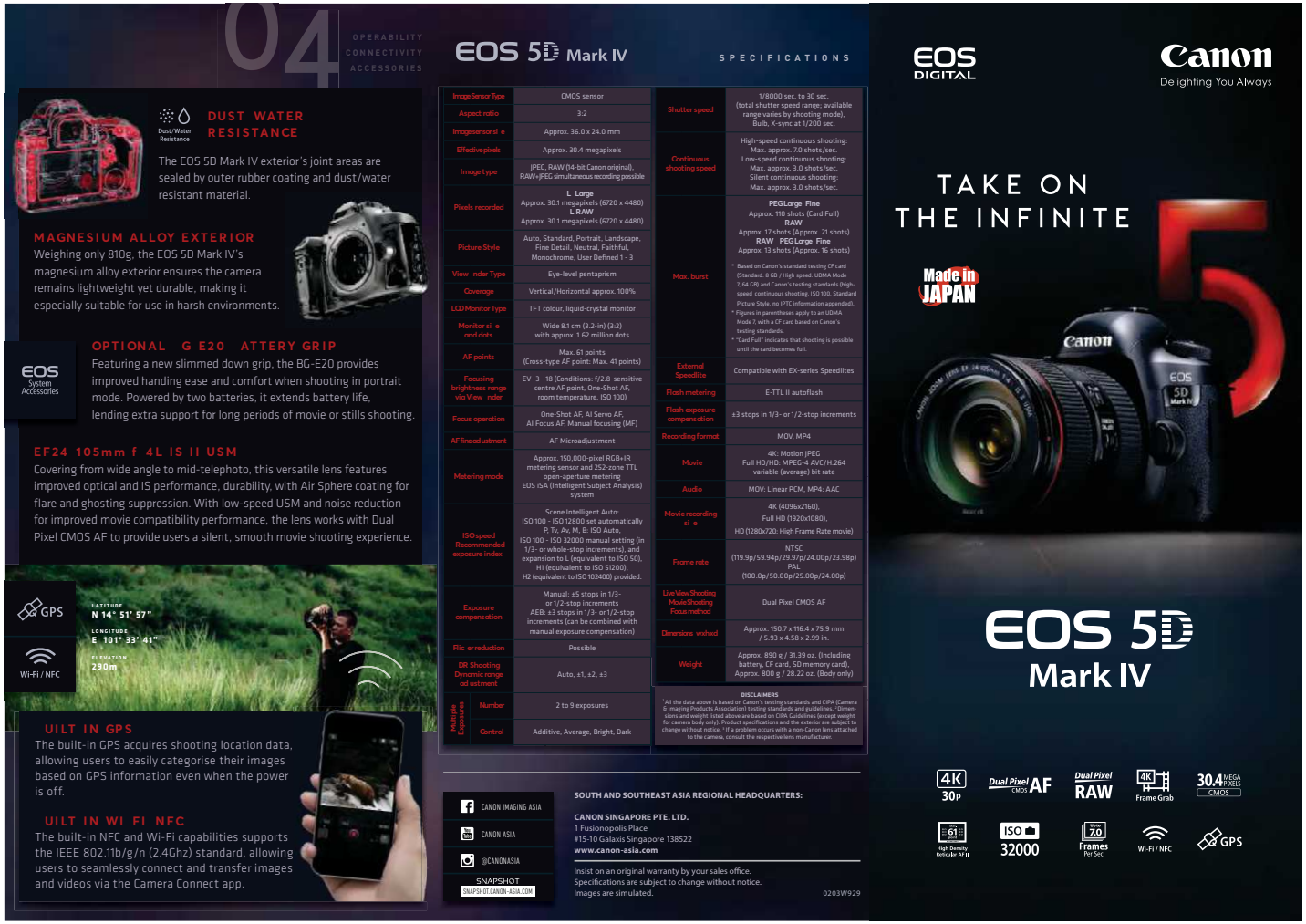
Running on MobileMapper receivers, MobileMapper Field is the perfect solution for GIS data collection, asset management, area measurement, map creation and update. This software is very intuitive and easy-to-use, requiring minimum training. It also provides a direct interface to external sensors for a complete field solution.

The Spectra Precision MobileMapper Office tool can be used to differentially post-process raw GPS data collected with the MobileMapper Field software. Through an automatic connection, MobileMapper Office can automatically find and download the base data files that will match the collected raw data; it then computes corrected positions automatically.



Tune MobileMapper 20 To Your Applications

With Windows Embedded Handheld 6.5 you may upload necessary utilities or software on your MobileMapper 20, to suit your most job. You can collect GIS/GPS points and maps via the GIS application of your choice, other third-party software such as ESRI® ArcPad® or a purpose-built Spectra Precision application.


04
OPERABILITY
CONNECTIVITY
ACCESSORIES
DUST WATER RESISTANCE
Dust/Water Resistance
The EOS 5D Mark IV exterior's joint areas are sealed by outer rubber coating and dust/water resistant material.
MAGNESIUM ALLOY EXTERIOR
Weighing only 810g, the EOS 5D Mark IV's magnesium alloy exterior ensures the camera remains lightweight yet durable, making it especially suitable for use in harsh environments.
EOS System Accessories
OPTIONAL G E20 ATTERY GRIP
Featuring a new slimmed down grip, the BG-E20 provides improved handing ease and comfort when shooting in portrait mode. Powered by two batteries, it extends battery life, lending extra support for long periods of movie or stills shooting.
EF24 105mm f 4L IS II USM
Covering from wide angle to mid-telephoto, this versatile lens features improved optical and IS performance, durability, with Air Sphere coating for flare and ghosting suppression. With low-speed USM and noise reduction for improved movie compatibility performance, the lens works with Dual Pixel CMOS AF to provide users a silent, smooth movie shooting experience.
GPS
LATITUDE N 14° 51' 57"
LONGITUDE E 101° 33' 41"
ELEVATION 290m
Wi-Fi / NFC
UILT IN GPS
The built-in GPS acquires shooting location data, allowing users to easily categorise their images based on GPS information even when the power is off.
UILT IN WI FI NFC
The built-in NFC and Wi-Fi capabilities supports the IEEE 802.11b/g/n (2.4Ghz) standard, allowing users to seamlessly connect and transfer images and videos via the Camera Connect app.
EOS 5D Mark IV
SPECIFICATIONS
Image Sensor Type CMOS sensor
Aspect ratio 3:2
Image sensor si e Approx. 36.0 x 24.0 mm
Effective pixels Approx. 30.4 megapixels
Image type JPEG, RAW (14-bit Canon original), RAW+JPEG simultaneous recording possible
Pixels recorded L Large Approx. 30.1 megapixels (6720 x 4480) L RAW Approx. 30.1 megapixels (6720 x 4480)
Picture Style Auto, Standard, Portrait, Landscape, Fine Detail, Neutral, Faithful, Monochrome, User Defined 1 - 3
View nder Type Eye-level pentaprism
Coverage Vertical/Horizontal approx. 100%
LCD Monitor Type TFT colour, liquid-crystal monitor
Monitor si e and dots Wide 8.1 cm (3.2-in) (3:2) with approx. 1.62 million dots
AF points Max. 61 points (Cross-type AF point: Max. 41 points)
Focusing brightness range via View nder EV -3 - 18 (Conditions: f/2.8-sensitive centre AF point, One-Shot AF, room temperature, ISO 100)
Focus operation One-Shot AF, AI Servo AF, AI Focus AF, Manual focusing (MF)
AF fine adjustment AF Microadjustment
Metering mode Approx. 150,000-pixel RGB+IR metering sensor and 252-zone TTL open-aperture metering EOS iSA (Intelligent Subject Analysis) system
ISO speed Recommended exposure index Scene Intelligent Auto: ISO 100 - ISO 12800 set automatically P, Tv, Av, M, B: ISO Auto, ISO 100 - ISO 32000 manual setting (in 1/3- or whole-stop increments), and expansion to L (equivalent to ISO 50), H1 (equivalent to ISO 51200), H2 (equivalent to ISO 102400) provided.
Exposure compensation Manual: ±5 stops in 1/3- or 1/2-stop increments AEB: ±3 stops in 1/3- or 1/2-stop increments (can be combined with manual exposure compensation)
Flic er reduction Possible
DR Shooting Dynamic range ad ustment Auto, ±1, ±2, ±3
Multiple Exposures Number 2 to 9 exposures
Multiple Exposures Control Additive, Average, Bright, Dark
Shutter speed 1/8000 sec. to 30 sec. (total shutter speed range; available range varies by shooting mode), Bulb, X-sync at 1/200 sec.
Continuous shooting speed High-speed continuous shooting: Max. approx. 7.0 shots/sec. Low-speed continuous shooting: Max. approx. 3.0 shots/sec. Silent continuous shooting: Max. approx. 3.0 shots/sec.
Max. burst PEGLarge Fine Approx. 110 shots (Card Full) RAW Approx. 17 shots (Approx. 21 shots) RAW PEGLarge Fine Approx. 13 shots (Approx. 16 shots)
* Based on Canon's standard testing CF card (Standard: 8 GB / High speed: UDMA Mode 7; 64 GB) and Canon's testing standards (high-speed continuous shooting, ISO 100, Standard Picture Style, no IPTC information appended).
* Figures in parentheses apply to an UDMA Mode 7, with a CF-card based on Canon's testing standards.
* "Card Full" indicates that shooting is possible until the card becomes full.
External Speedlite Compatible with EX-series Speedlites
Flash metering E-TTL II autoflash
Flash exposure compensation ±3 stops in 1/3- or 1/2-stop increments
Recording format MOV, MP4
Movie 4K: Motion JPEG Full HD/HD: MPEG-4 AVC/H.264 variable (average) bit rate
Audio MOV: Linear PCM, MP4: AAC
Movie recording si e 4K (4096x2160), Full HD (1920x1080), HD (1280x720: High Frame Rate movie)
Frame rate NTSC (119.9p/59.94p/29.97p/24.00p/23.98p) PAL (100.0p/50.00p/25.00p/24.00p)
Live View Shooting Movie Shooting Focus method Dual Pixel CMOS AF
Dimensions wxhxd Approx. 150.7 x 116.4 x 75.9 mm / 5.93 x 4.58 x 2.99 in.
Weight Approx. 890 g / 31.39 oz. (Including battery, CF card, SD memory card), Approx. 800 g / 28.22 oz. (Body only)
DISCLAIMERS
1 All the data above is based on Canon's testing standards and CIPA (Camera & Imaging Products Association) testing standards and guidelines. 2 Dimensions and weight listed above are based on CIPA Guidelines (except weight for camera body only). Product specifications and the exterior are subject to change without notice. 3 If a problem occurs with a non-Canon lens attached to the camera, consult the respective lens manufacturer.
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#15-10 Galaxis Singapore 138522
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Specifications are subject to change without notice.
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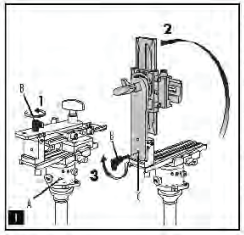
TAKE ON THE INFINITE
Made in JAPAN
EOS 5D Mark IV
4K 30p
Dual Pixel CMOS AF
Dual Pixel RAW
4K Frame Grab
30.4 MEGA PIXELS CMOS
61 High Density Reticular AF II
ISO 32000
7.0 Frames Per Sec
Wi-Fi / NFC
GPS


SIGMA
24mm f1:1.4 DG ø77

INSTRUCTIONS

303SPH

Spherical "PH" Head



The spherical "PH" head is designed to allow virtual scenes to be created by Computer Files of various panoramic sequences of digital or digitized photographs, stored in Round memory units.

There are 4 requirements to achieve good panoramic sequence shots:

1. Accurate leveling of the panoramic axis
2. A Panoramic head that enables you to choose the node of rotation between one shot and the next.
3. The ability to position the camera in the "Nodal Point" of the lens (the functional lens - exactly where the perpendicular axes of rotation, to eliminate any parallax problems between the near and distant objects in the scene).
4. An additional rotating axis that enables you to shoot several panoramic sequences at different inclinations (call angles) in order to achieve a complete spherical scene.

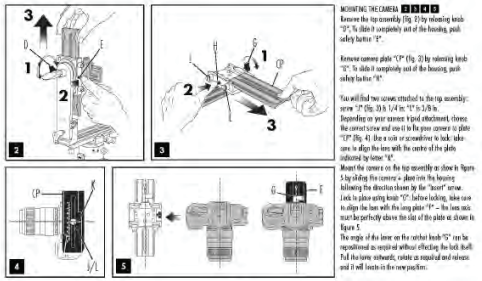
The spherical "PH" head comprises three main mobile units to perform the functions mentioned above in point 2, 3 and 4.

When your tripod has a ball-in-leveling device (such as the Manfrotto 546B tripod's 50mm half ball), you will need to use one of the leveling accessories available from the Manfrotto range to accomplish leveling of the head (see point 1).

SET UP

Fix the leveling device (not supplied) to the tripod, then fix the "PH" head on the leveling device via female attachment "A". Completely unscrew knob "B", rotate the interchangeable vertical position as shown in fig. 1 and lock in position by screwing the knob "B" in to lock "C".

2



MOUNTING THE CAMERA

Remove the top assembly (fig. 2) by unscrewing knob "D", fix (slide it completely out of the housing, push safety button "E".

Remove camera plate "CP" (fig. 3) by unscrewing knob "G". To slide it completely out of the housing, push safety button "H".

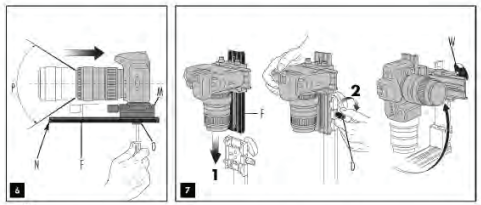
You will find two screws attached to the top assembly: screw "I" (fig. 3) & 1/4 in. "L" in 3/8 in.

Depending on your camera tripod attachment, choose the correct screw and use it to fix your camera to plate "CP" (fig. 4). Use a coin or screwdriver to lock. Make sure to align the lens with the centre of the plate indicated by letter "K".

Mount the camera on the top assembly as shown in figure 5 by sliding the camera + plate into the housing following the direction shown by the "insert" arrow. Lock to plate using knob "G" - before locking, take care to align the lens with the long plate "F" – the lens axis must be perfectly above the slot of the plate as shown in figure 5.

The angle of the lever on the ratchet knob "G" can be repositioned as required without effecting the lock itself. Pull the lever outwards, rotate as required and release and it will locate in the new position.

3



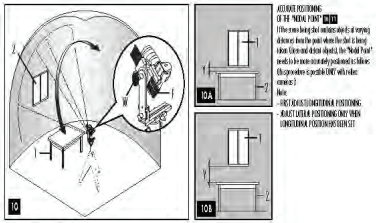
NOTE

The position of the housing "M" relative to the long plate "F" will need to be adjusted. Loosen screw "O" to slide the housing. The ideal position is with the camera body as far back on the plate as it can go before the front edge "R" of the long plate "F" becomes visible in the camera's field of view "P".

MOUNT THE CAMERA ON THE HEAD

Mount the whole top assembly + camera on the head as shown in figure 7 by sliding the long plate "F" into its housing and locking it by screwing knob "D", then unscrew knob "N" and move the camera on the vertical plane.

4



ADJUSTING POSITIONING OF THE "NODAL POINT"

(The ones long that accesses objects at varying distance from the point where the shot is being taken (close and distant objects), the "Nodal Point" needs to be more accurately positioned as follows: (To operate a spherical SHOT with a video camera:)

Note:

- FOR ULTRA LONGITUDINAL POSITIONING:
- ABOUT ULTRA POSITIONING WHEN LONGITUDINAL POSITIONING DOES NOT

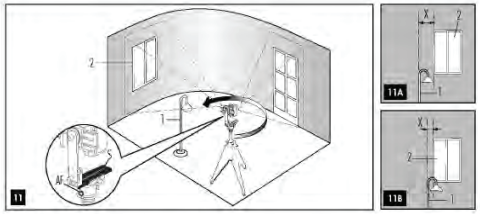
– LONGITUDINAL POSITIONING

(See Figure 10) Choose a scene that contains both a near object "1" and a distant object "2" divided along the same vertical line of vision.

1. Turn figure 10 (read 10A) unscrew knob "N" and move the camera on the vertical plate to bring the two objects first to the top and then to the bottom of the frame, checking whether the height gap "Y" between the two objects remains in the two frames; the more constant the distance remains, the more accurately the "Nodal Point" has been positioned.
2. For optimum results, make minor adjustments by moving plate "F".

Once the right position is achieved it is VERY USEFUL to memorize it by noting the position of the plate "F" on the index on the graduated scale.

4



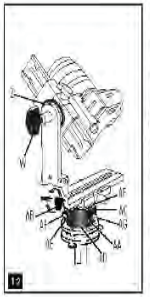
– LATERAL POSITIONING

(Ref. figure 11) Choose a scene that contains both a near object "1" and a distant object "2" situated along the same horizontal line of vision.

1. (See figure 11A and 11B) unscrew knob "N" and move the camera around the panoramic axis so that the two objects are first on the left hand side of the frame, then on the right. Check whether the horizontal gap "X" between the two objects varies in the two frames; the more constant the distance remains, the more accurately the "Nodal Point" has been positioned.
2. For optimum results, make minor adjustments by moving plate "F".

Once the right position is achieved it is VERY USEFUL to memorize it by noting the position of the plate "F" on the index on the graduated scale.

7



INSTRUCTIONS FOR SPHERICAL PANORAMA CONCEPTION

A typical panoramic scene is divided up into a number of shots taken at different angles from a horizontal 360° pan and zenith.

1. Decide the number of rotations you want yourself and the complete the photos depending on the angle of the lens you will be using.

Before starting with the panoramic sequence, choose the initial vertical angle using the central knob "J" (fig. 12).

Choose 5 shots (knob "M" or reverse, is completely if you do not need 12 shots to be used to complete a ring) on the vertical, the 6th shot is on a vertical position, with which any additional shots may be taken (if the need in any position).

Double the number of shots on the angle of rotation between each shot (see the chart below).

Angle	60°	45°	40°	30°	24°	20°	15°	12°	9°
n. shots	6	8	9	12	15	18	24	30	40

• Screw knob "AK" into the threaded spring hole "AH".
• Release locking lever "AB" and rotate the camera vertical plate "AC" to the position of the first shot.
• Hold the camera in position and rotate the central barrel "AL" until the first "clicking" is reached, then lock using "AB".
• Take the first shot and then rotate the camera to the next "clicking" position indicating "AB" and take the next shot.

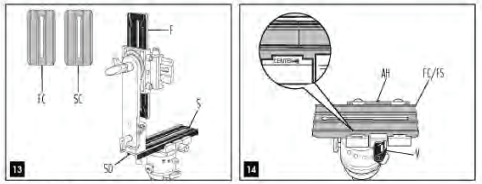
Continue this process until the entire rotation is finished.

Once you have completed the first complete panoramic sequence, you can then use the other panoramic sequences made at different inclinations, choosing the vertical angle using knob "M" and repeat points 2, 3 and 4 to complete the remaining sequences described at point 1 for each of the sequences.

The knob of the head "AJ" has graduated divisions ranging from 0 to 360° and is set between the "AL" on the part of barrel "AK". This can be used to set angles and on the chart. Since the head in this way cannot reach "0°" to facilitate the "click stop" during rotation of central barrel "AL" and use the locking knob "M" to lock the position during shooting.

NOTE: the zenith shot is taken with the camera in the "AH" and by the operation of zenith and nadir as mentioned above in the first shot. Put the lever downwards, rotate as required and release and it will locate in the new position.

8



ADDITIONAL PLATES

If you have a very compact camera we suggest you to use the short plates "SC" (fig. 13) and "FC" (supplied with the head) instead of the two long plates "F" and "S" in order to reduce space and weight of the system.

To replace the plate "S" unscrew screw "SD" (fig. 13).

To replace the plate "F", please refer to fig. 4 and unscrew screw "D"

USE OF THE KIT AS AN OBJECT PANORAMA TURNTABLE

The head can also be used as a turntable, useful for shooting object panoramas. For this use, loosen knob "I" and push button "AH" to slide the lower plate "S" out of the housing on the panoramic rotation base unit. In place of the long plate unit, top assembly, mount one of the two shorter plates supplied as a base for your object. The plate housing has a "center" mark to help you position your object accurately above the center of panoramic rotation.

9