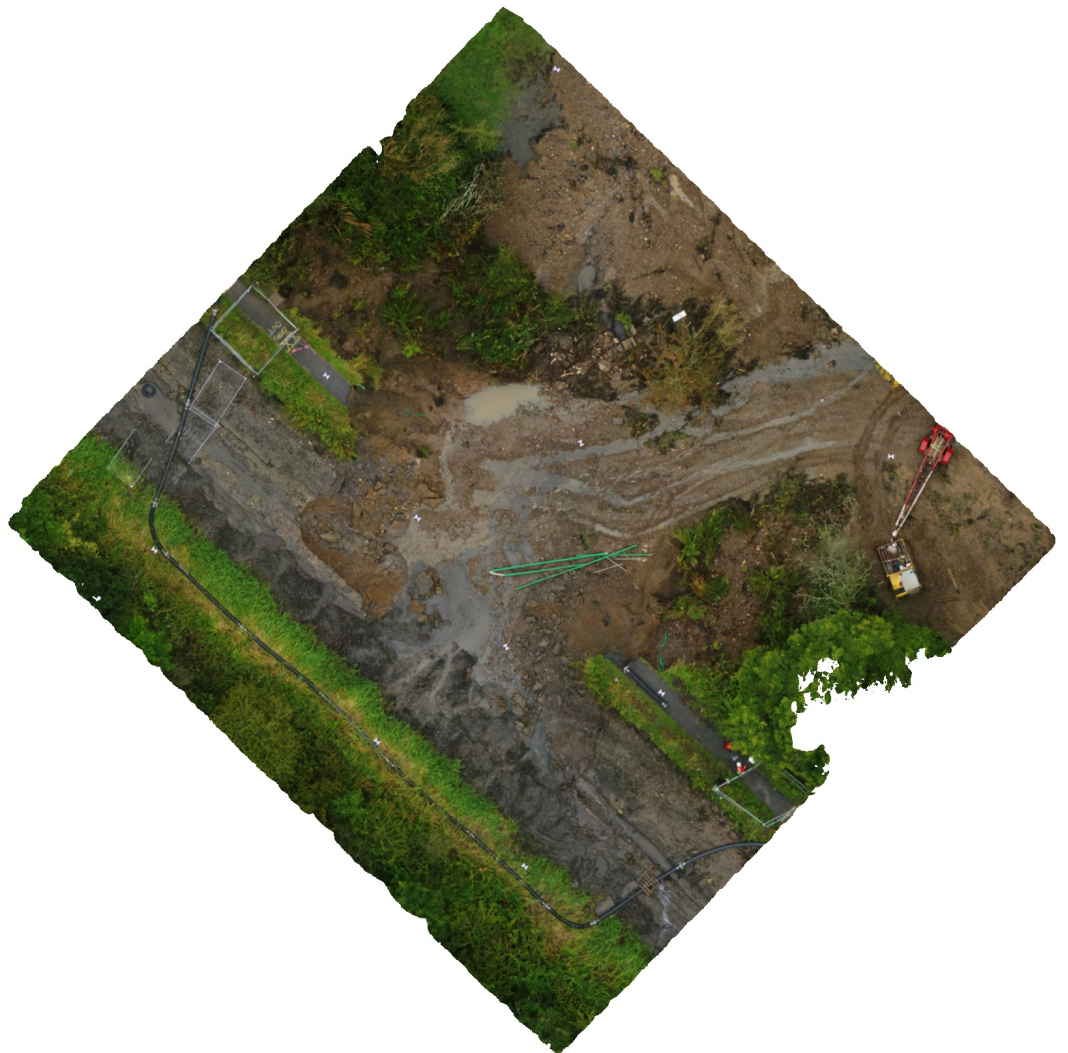


Agisoft PhotoScan

Processing Report, Union Canal breach
07 October 2020



Survey Data

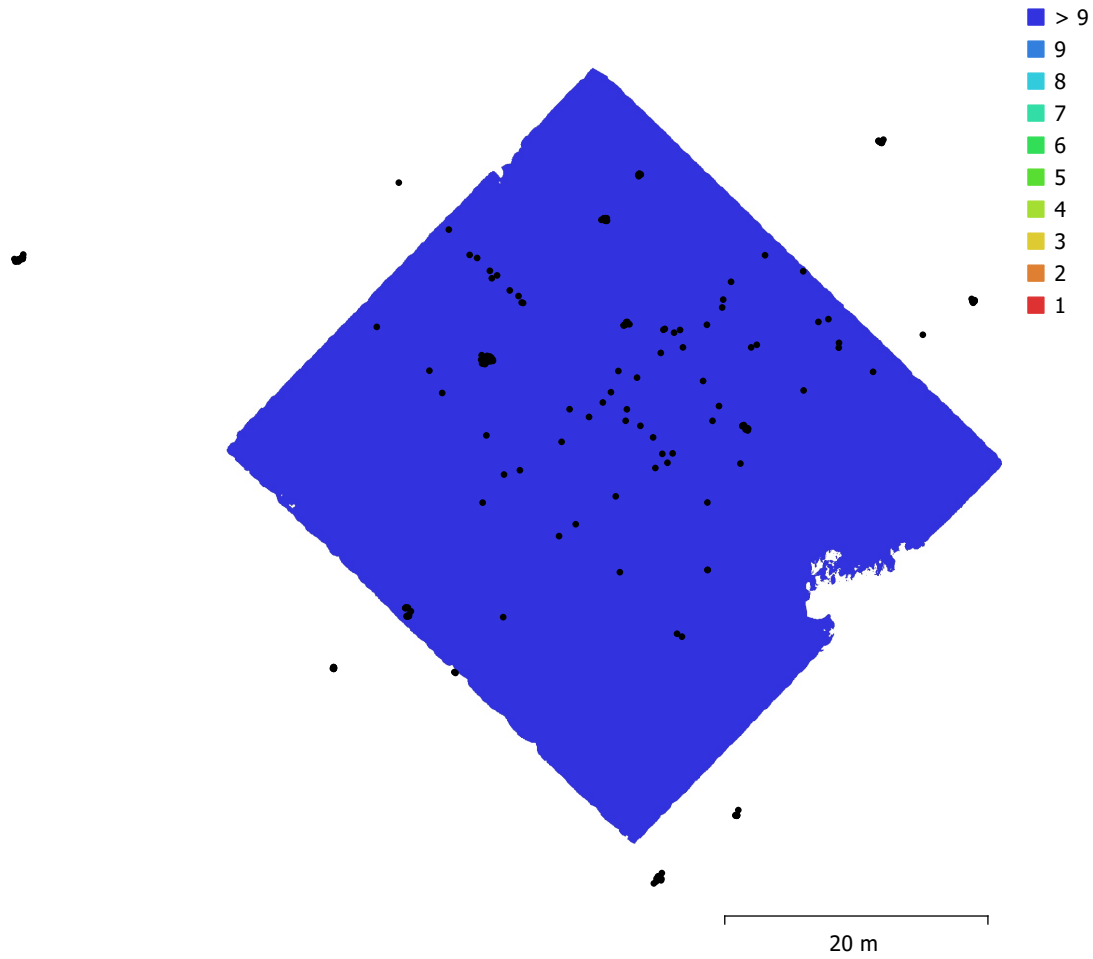


Fig. 1. Camera locations and image overlap.

Number of images:	214	Camera stations:	213
Flying altitude:	45.8 m	Tie points:	143,954
Ground resolution:	4.84 mm/pix	Projections:	859,805
Coverage area:	1.73e+03 m ²	Reprojection error:	0.424 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
FC6540, DJI DL 35mm F2.8 LS ASPH (35mm)	6016 x 4008	35 mm	4.03 x 4.03 μm	No

Table 1. Cameras.

Camera Calibration

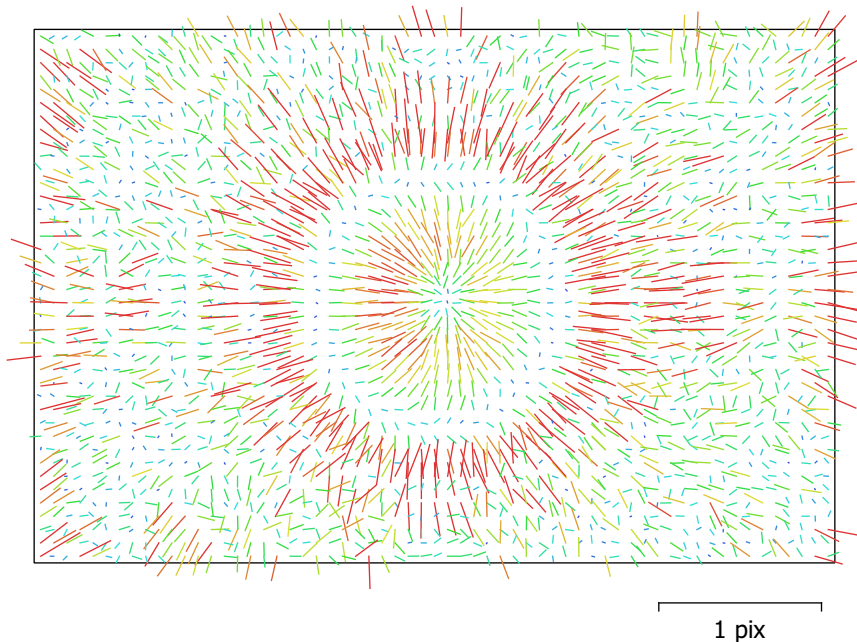


Fig. 2. Image residuals for FC6540, DJI DL 35mm F2.8 LS ASPH (35mm).

FC6540, DJI DL 35mm F2.8 LS ASPH (35mm)

214 images

Type **Frame** Resolution **6016 x 4008** Focal Length **35 mm** Pixel Size **4.03 x 4.03 μm**

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	9209.88	0.072	1.00	-0.05	-0.34	-0.11	0.16	-0.15	-0.03	-0.18
Cx	-42.3353	0.096		1.00	0.02	-0.01	0.00	-0.00	0.96	0.02
Cy	31.8916	0.086			1.00	-0.03	0.01	-0.00	0.03	0.86
K1	-0.0047241	6.9e-05				1.00	-0.97	0.91	-0.01	-0.02
K2	0.041979	0.0011					1.00	-0.98	0.01	0.00
K3	-0.174153	0.0048						1.00	-0.01	0.00
P1	-0.00222815	3.5e-06							1.00	0.03
P2	0.00158962	2.9e-06								1.00

Table 2. Calibration coefficients and correlation matrix.

Camera Locations

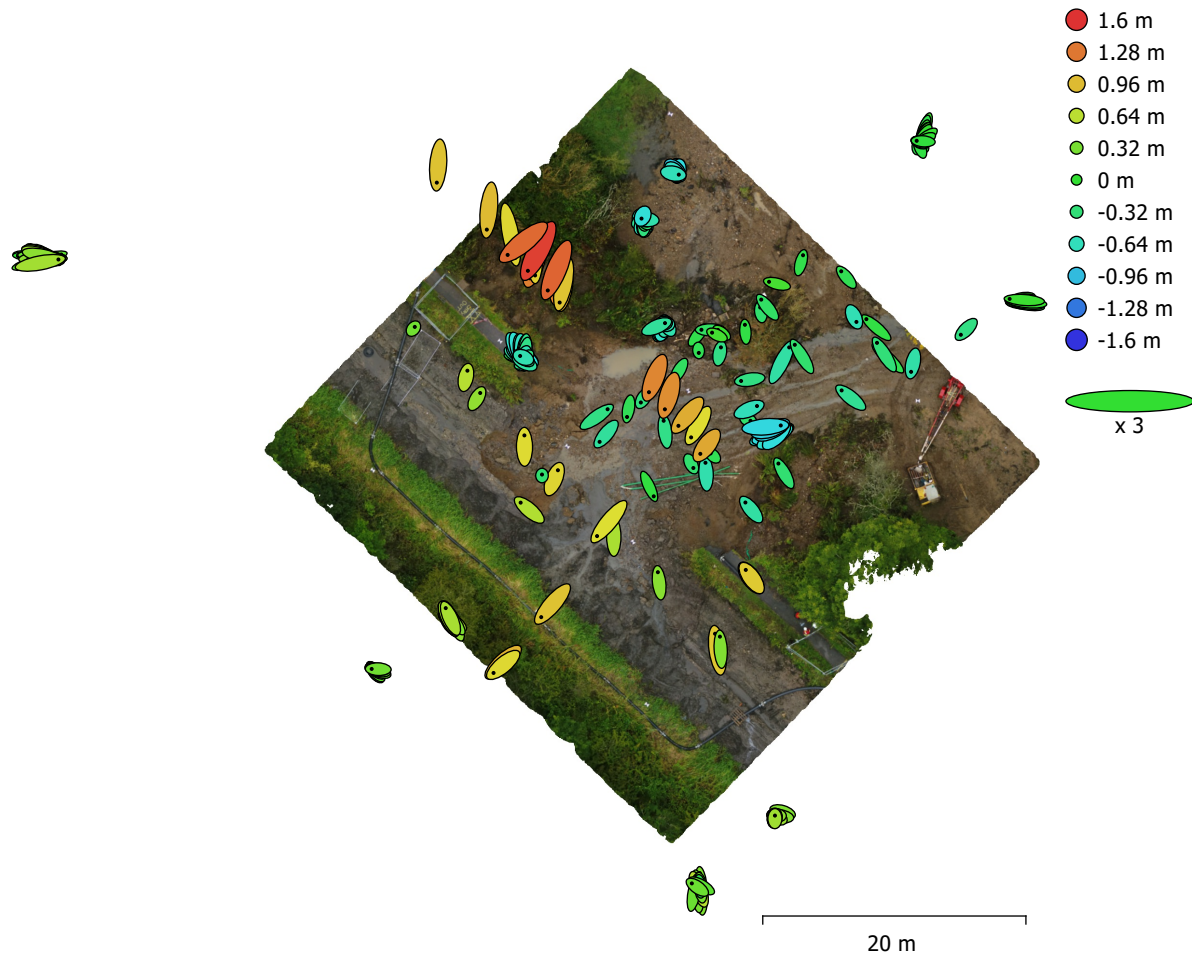


Fig. 3. Camera locations and error estimates.

Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
 Estimated camera locations are marked with a black dot.

X error (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total error (cm)
38.4525	38.8439	54.2356	54.6575	76.9997

Table 3. Average camera location error.
 X - Easting, Y - Northing, Z - Altitude.

Ground Control Points

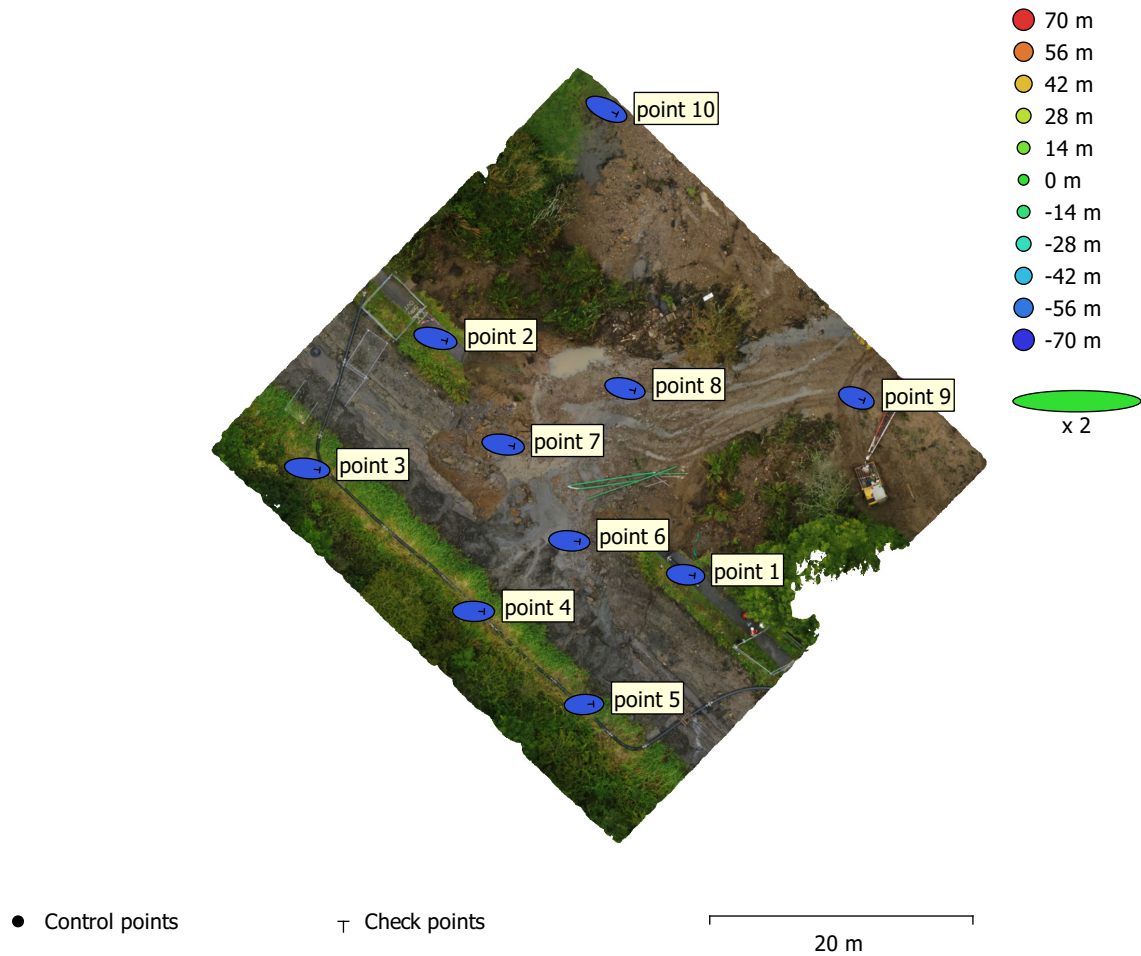


Fig. 4. GCP locations and error estimates.

Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.

Estimated GCP locations are marked with a dot or crossing.

Count	X error (m)	Y error (m)	Z error (m)	XY error (m)	Total (m)
10	0.793676	0.174304	62.8173	0.81259	62.8226

Table 4. Check points RMSE.

X - Easting, Y - Northing, Z - Altitude.

Label	X error (m)	Y error (m)	Z error (m)	Total (m)	Image (pix)
point 1	0.68552	-0.0709509	-62.8032	62.807	0.556 (103)
point 2	0.874668	-0.211709	-62.8994	62.9059	0.555 (120)
point 3	0.954636	-0.109623	-62.9918	62.9991	0.515 (55)
point 4	0.818586	-0.0174089	-62.9176	62.9229	0.879 (77)
point 5	0.72809	0.0345038	-62.8601	62.8643	0.629 (45)
point 6	0.795779	-0.0642322	-62.8204	62.8255	0.545 (126)
point 7	0.844218	-0.130639	-62.8485	62.8543	0.587 (116)
point 8	0.765814	-0.177484	-62.744	62.7489	0.616 (124)
point 9	0.594269	-0.203523	-62.5988	62.602	0.451 (66)
point 10	0.816767	-0.38254	-62.6886	62.6951	0.385 (50)
Total	0.793676	0.174304	62.8173	62.8226	0.589

Table 5. Check points.
X - Easting, Y - Northing, Z - Altitude.

Digital Elevation Model

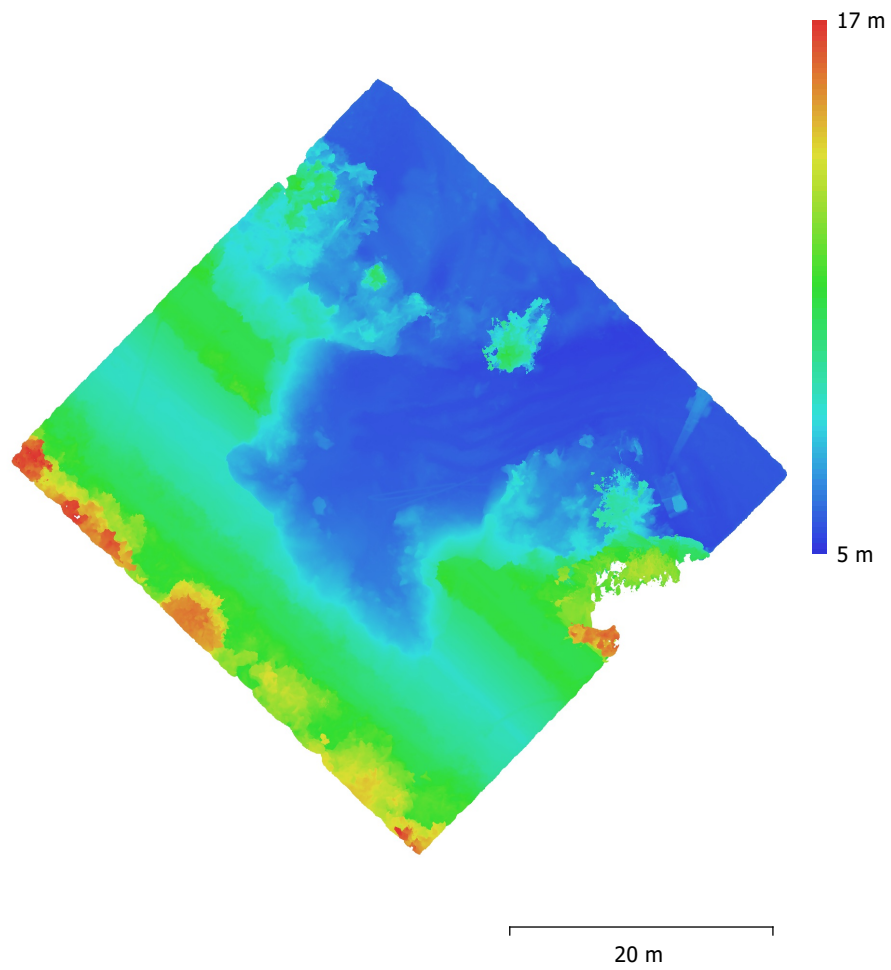


Fig. 5. Reconstructed digital elevation model.

Resolution: 9.68 mm/pix
Point density: 1.07 points/cm²

Processing Parameters

General

Cameras	214
Aligned cameras	213
Markers	10
Coordinate system	OSGB 1936 / British National Grid (EPSG::27700)
Rotation angles	Yaw, Pitch, Roll

Point Cloud

Points	143,954 of 173,091
RMS reprojection error	0.132099 (0.423792 pix)
Max reprojection error	1.23461 (42.5427 pix)
Mean key point size	3.05966 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	6.08201

Alignment parameters

Accuracy	High
Generic preselection	Yes
Reference preselection	Source
Key point limit	40,000
Tie point limit	4,000
Guided image matching	No
Adaptive camera model fitting	No
Matching time	2 minutes 55 seconds
Matching memory usage	1.71 GB
Alignment time	2 minutes 52 seconds
Alignment memory usage	147.28 MB

Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	No
Optimization time	7 seconds
Software version	1.6.3.10732

Depth Maps

Count	206
Depth maps generation parameters	
Quality	High
Filtering mode	Moderate
Processing time	1 hours 50 minutes
Software version	1.6.3.10732

Dense Point Cloud

Points	35,179,324
Point colors	3 bands, uint8

Depth maps generation parameters

Quality	High
Filtering mode	Moderate
Processing time	1 hours 50 minutes

Dense cloud generation parameters

Processing time	1 hours 3 minutes
Software version	1.6.3.10732

Model

Faces	2,214,426
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Vertices	1,115,870
Vertex colors	3 bands, uint8
Texture	8,192 x 8,192, 4 bands, uint8
Depth maps generation parameters	
Quality	High
Filtering mode	Moderate
Processing time	1 hours 50 minutes
Reconstruction parameters	
Surface type	Arbitrary
Source data	Dense cloud
Interpolation	Enabled
Strict volumetric masks	No
Processing time	31 minutes 47 seconds
Texturing parameters	
Mapping mode	Orthophoto
Blending mode	Mosaic
Texture size	8,192
Enable hole filling	Yes
Enable ghosting filter	Yes
UV mapping time	6 seconds
Blending time	3 minutes 49 seconds
Software version	1.6.3.10732
Orthomosaic	
Size	11,768 x 11,775
Coordinate system	OSGB 1936 / British National Grid (EPSG::27700)
Colors	3 bands, uint8
Reconstruction parameters	
Blending mode	Mosaic
Surface	Mesh
Enable hole filling	Yes
Processing time	7 minutes 20 seconds
Software version	1.6.3.10732
System	
Software name	Agisoft Metashape Professional
Software version	1.6.3 build 10732
OS	Windows 64 bit
RAM	190.63 GB
CPU	Intel(R) Xeon(R) Silver 4116 CPU @ 2.10GHz
GPU(s)	Quadro P4000