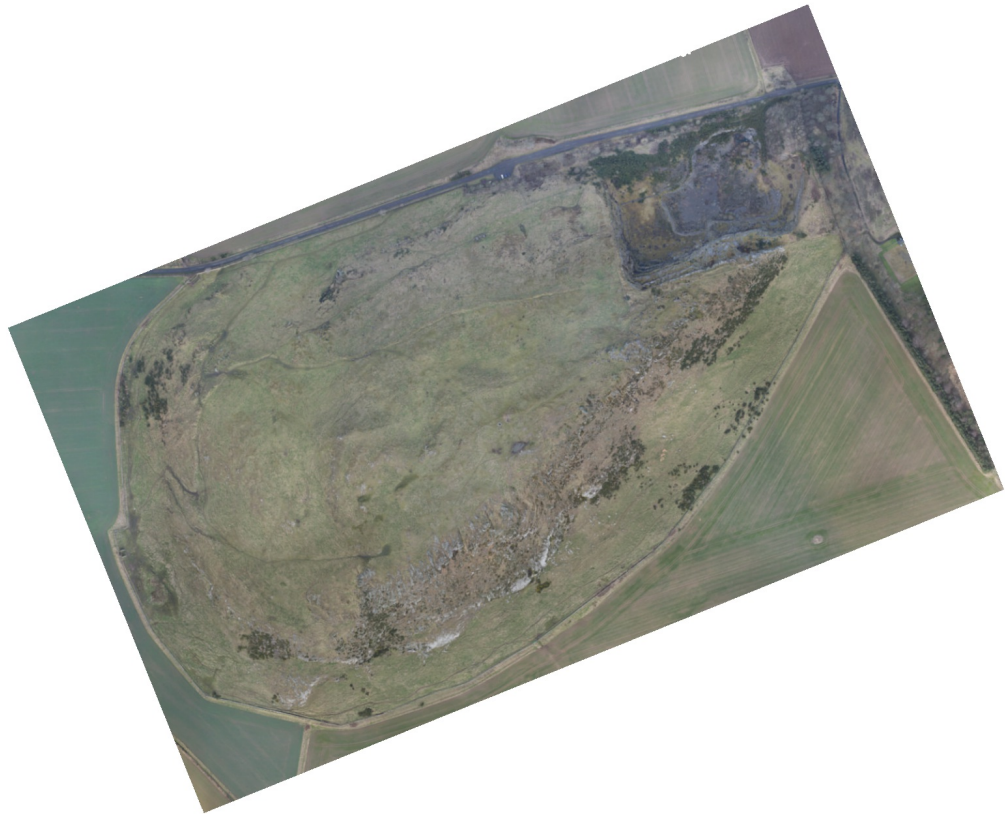


Agisoft PhotoScan

Processing Report
07 June 2019



Survey Data

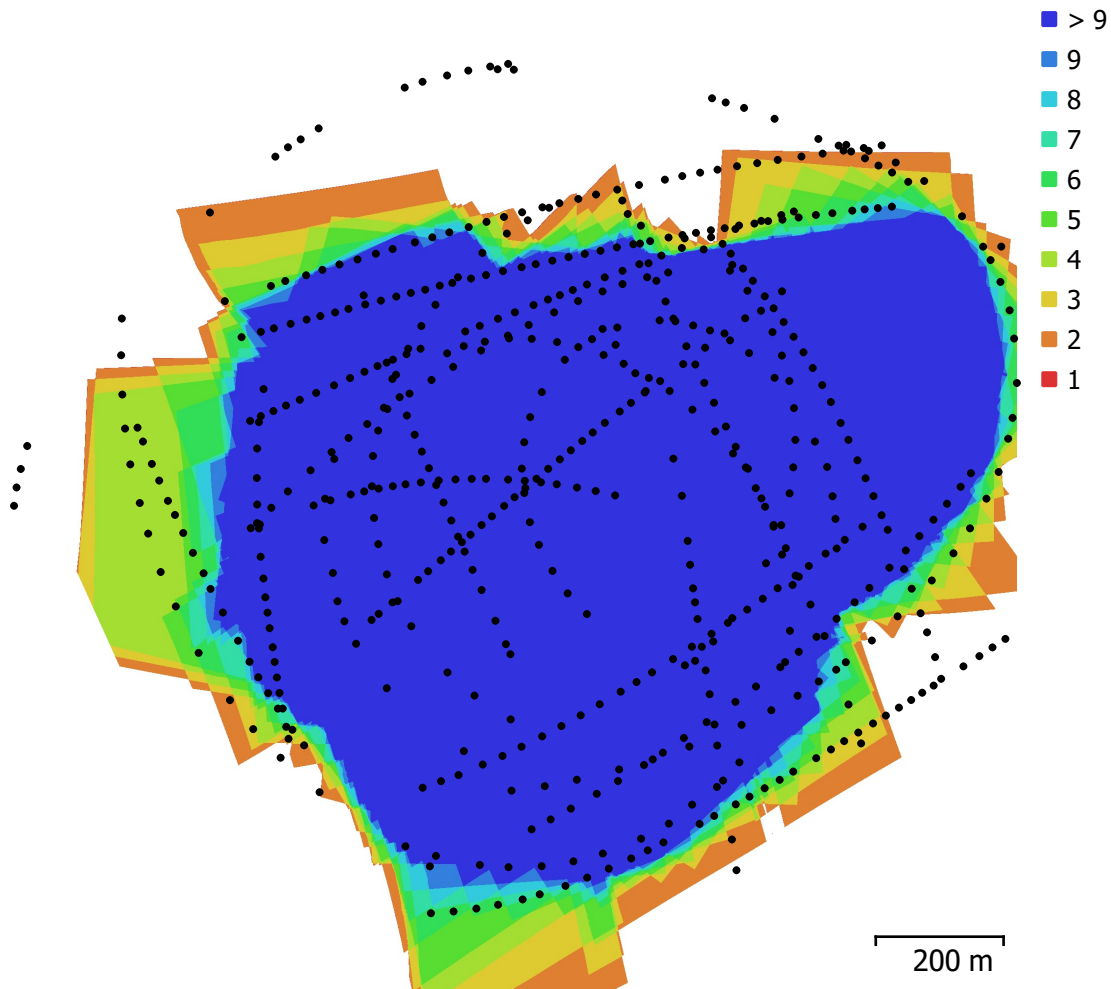


Fig. 1. Camera locations and image overlap.

Number of images:	567	Camera stations:	567
Flying altitude:	425 m	Tie points:	124,893
Ground resolution:	3.99 cm/pix	Projections:	1,608,181
Coverage area:	1.37 km ²	Reprojection error:	2.05 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
NIKON D800E (50 mm)	7360 x 4912	50 mm	4.88 x 4.88 μm	No

Table 1. Cameras.

Camera Calibration

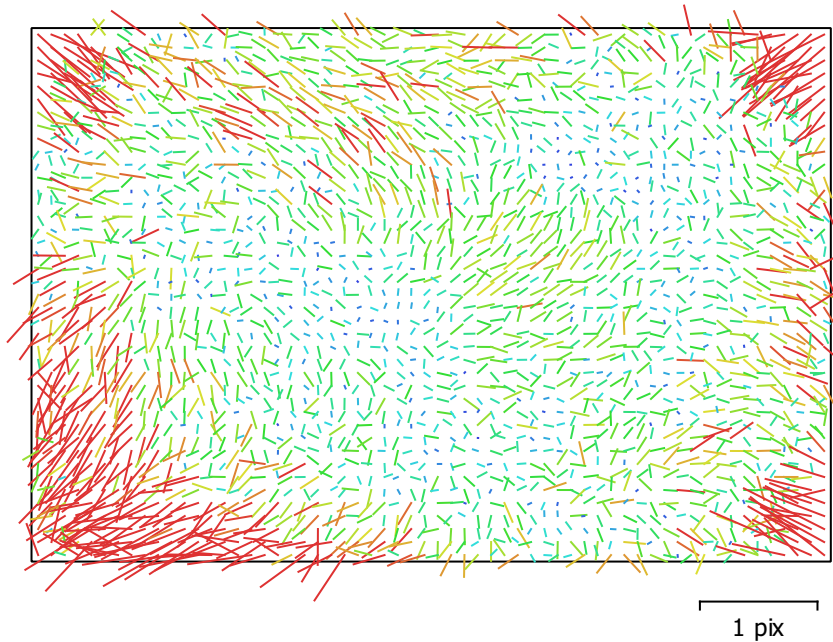


Fig. 2. Image residuals for NIKON D800E (50 mm).

NIKON D800E (50 mm)

567 images

Type	Resolution	Focal Length	Pixel Size
Frame	7360 x 4912	50 mm	4.88 x 4.88 μm

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	P1	P2
F	10544	0.22	1.00	-0.00	-0.28	-0.23	-0.02	-0.29	0.25	-0.23	-0.02	0.13
Cx	-24.2546	0.27		1.00	-0.01	-0.03	0.28	0.01	-0.01	0.00	0.86	0.03
Cy	-1.20672	0.19			1.00	-0.18	0.02	0.01	0.00	-0.01	0.01	0.51
B1	-3.87838	0.042				1.00	0.03	0.01	-0.04	0.05	-0.01	0.01
B2	5.61455	0.035					1.00	0.01	-0.01	0.01	0.08	-0.01
K1	-0.145819	0.00025						1.00	-0.97	0.92	-0.00	0.00
K2	0.18104	0.0031							1.00	-0.99	0.01	-0.00
K3	-0.170579	0.012								1.00	-0.02	-0.00
P1	0.000261998	6.3e-06									1.00	0.03
P2	0.000382887	5e-06										1.00

Table 2. Calibration coefficients and correlation matrix.

Camera Locations

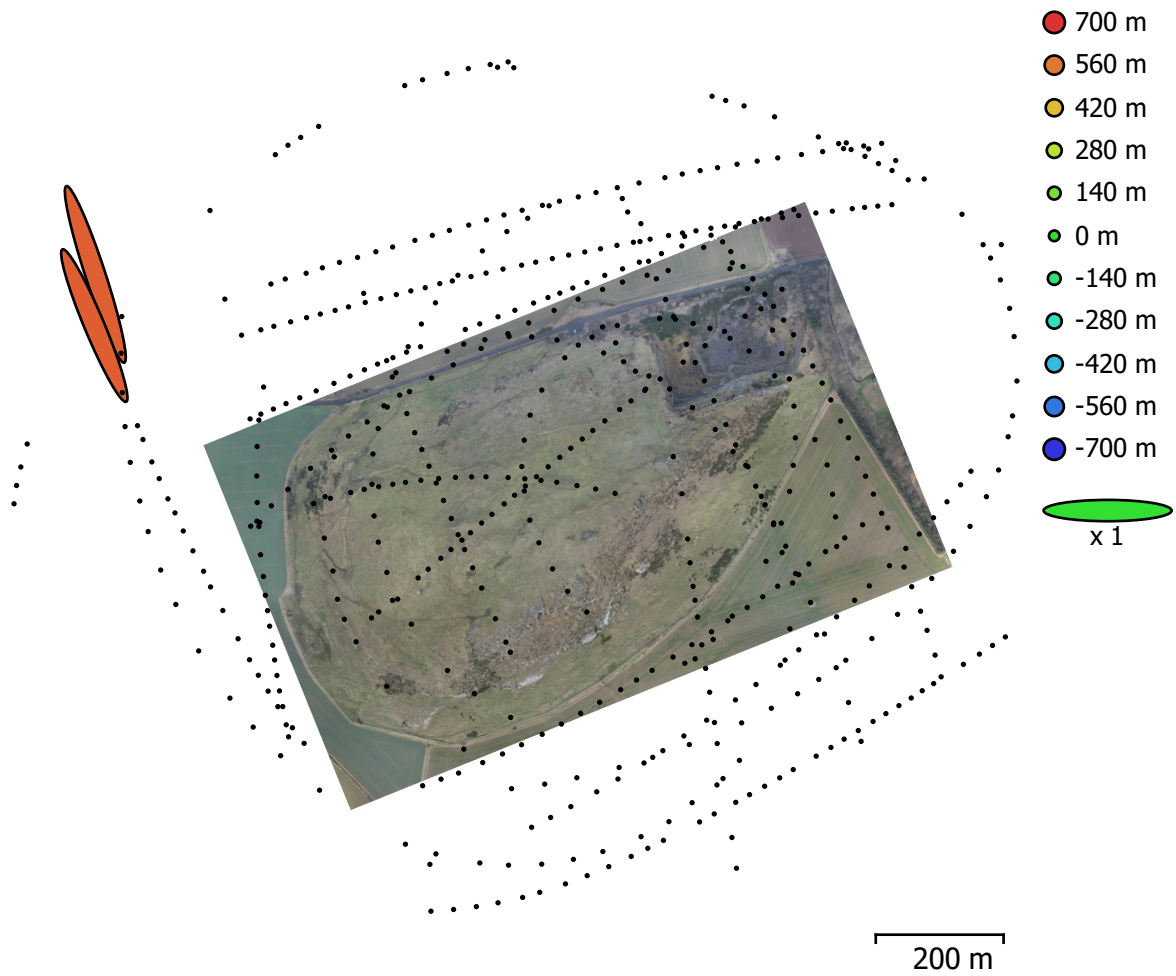


Fig. 3. Camera locations and error estimates.

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 (m)	Y error (m)	Z error (m)	XY error (m)	Total error (m)
84.2986	228.928	609.584	243.956	656.588

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

Ground Control Points

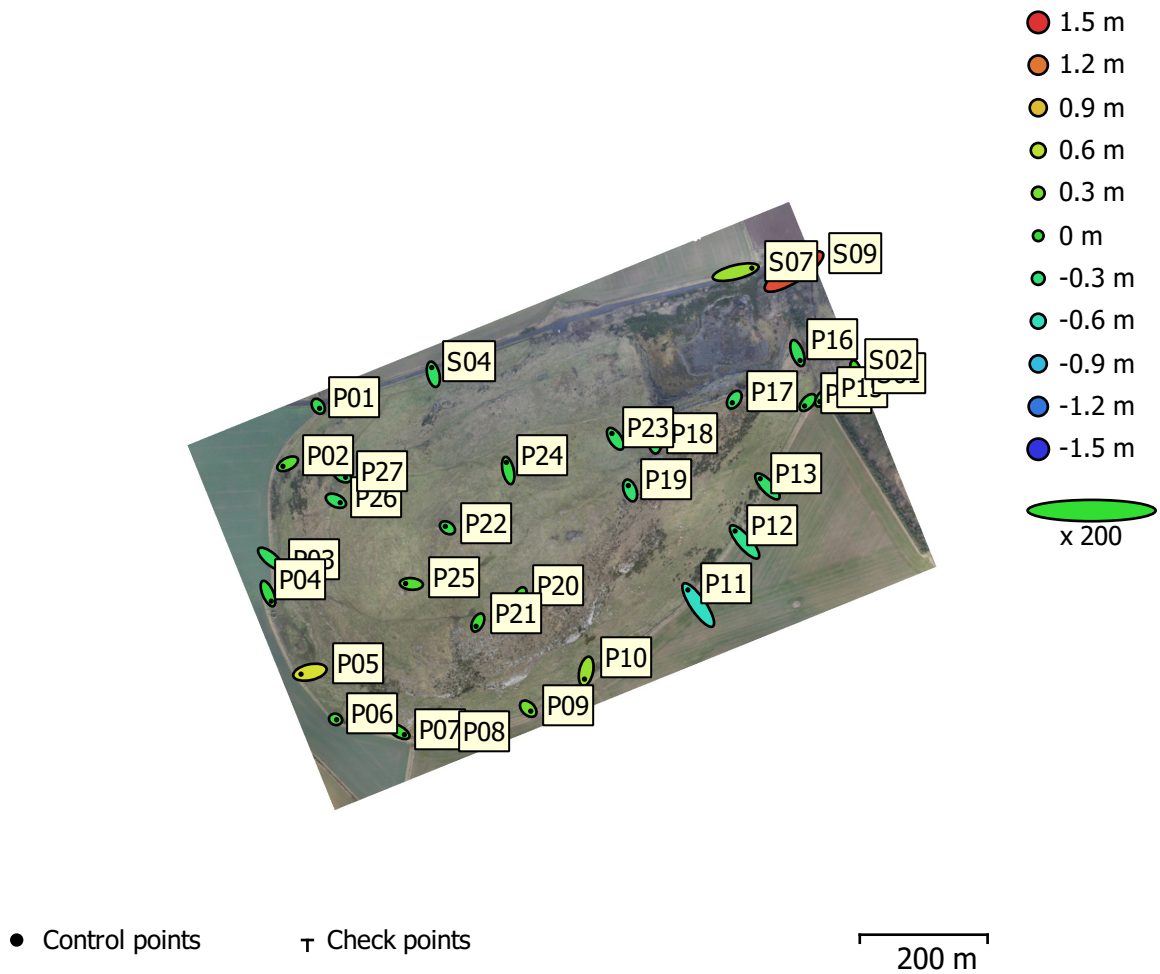


Fig. 4. GCP locations and error estimates.

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 (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total (cm)
32	9.94521	9.40531	35.4592	13.6882	38.0095

Table 4. Control points RMSE.

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

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
P01	2.11319	-3.15153	-13.5337	14.0556	0.863 (41)
P02	-7.43489	-3.83539	15.699	17.7889	1.187 (43)
P03	11.5565	-9.7627	-20.3698	25.3731	0.733 (40)
P04	5.05754	-11.7603	-4.89997	13.7074	0.947 (31)
P05	-13.9016	-3.05248	71.9633	73.3573	1.052 (17)
P06	1.60004	-0.53705	8.08714	8.26138	1.317 (27)
P07	8.78748	-5.09675	4.44943	11.0903	0.883 (53)
P08	8.77847	-2.42408	13.3489	16.1595	0.885 (55)
P09	3.93434	-3.79031	27.445	27.9834	1.402 (57)
P10	-2.62564	-12.2502	43.8018	45.5583	1.731 (51)
P11	-16.1582	23.6699	-63.2592	69.4484	1.437 (57)
P12	-14.7838	17.1541	-38.8391	44.9589	1.354 (76)
P13	-11.2911	12.1065	-23.5006	28.746	1.139 (82)
P14	-4.94965	-5.37646	-8.43522	11.1606	0.954 (57)
P15	-4.47395	-5.65913	-7.10758	10.1272	1.064 (56)
P16	4.15984	-11.5587	-14.6974	19.1552	1.255 (48)
P17	-3.1019	-4.86085	-22.5913	23.3155	0.939 (56)
P18	-0.635843	6.59604	-21.5403	22.5365	1.155 (47)
P19	-2.75047	7.5205	-26.0197	27.2241	1.064 (47)
P20	-2.46672	-4.92229	3.41212	6.47736	0.997 (52)
P21	-2.91529	-5.96245	4.46062	7.99668	1.112 (51)
P22	-3.35887	2.15554	-10.1493	10.9058	1.163 (51)
P23	-5.3839	8.32605	-20.9309	23.1605	1.327 (53)
P24	-2.82372	12.7255	-6.84787	14.7243	1.278 (70)
P25	-8.98519	0.736869	14.0313	16.6779	1.845 (55)
P26	6.71589	-3.05285	-20.897	22.161	1.561 (70)
P27	5.07547	-3.05891	-18.4055	19.336	1.546 (64)
S01	-4.34249	-2.91581	0.799637	5.29137	1.615 (43)
S02	3.0267	-12.9747	5.51057	14.4177	0.980 (36)
S04	-2.50617	10.6047	-19.3007	22.1643	1.583 (62)
S07	25.2763	6.22045	46.2266	53.0518	2.114 (19)

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
S09	31.6152	20.1081	138.091	143.084	0.864 (18)
Total	9.94521	9.40531	35.4592	38.0095	1.275

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

Digital Elevation Model

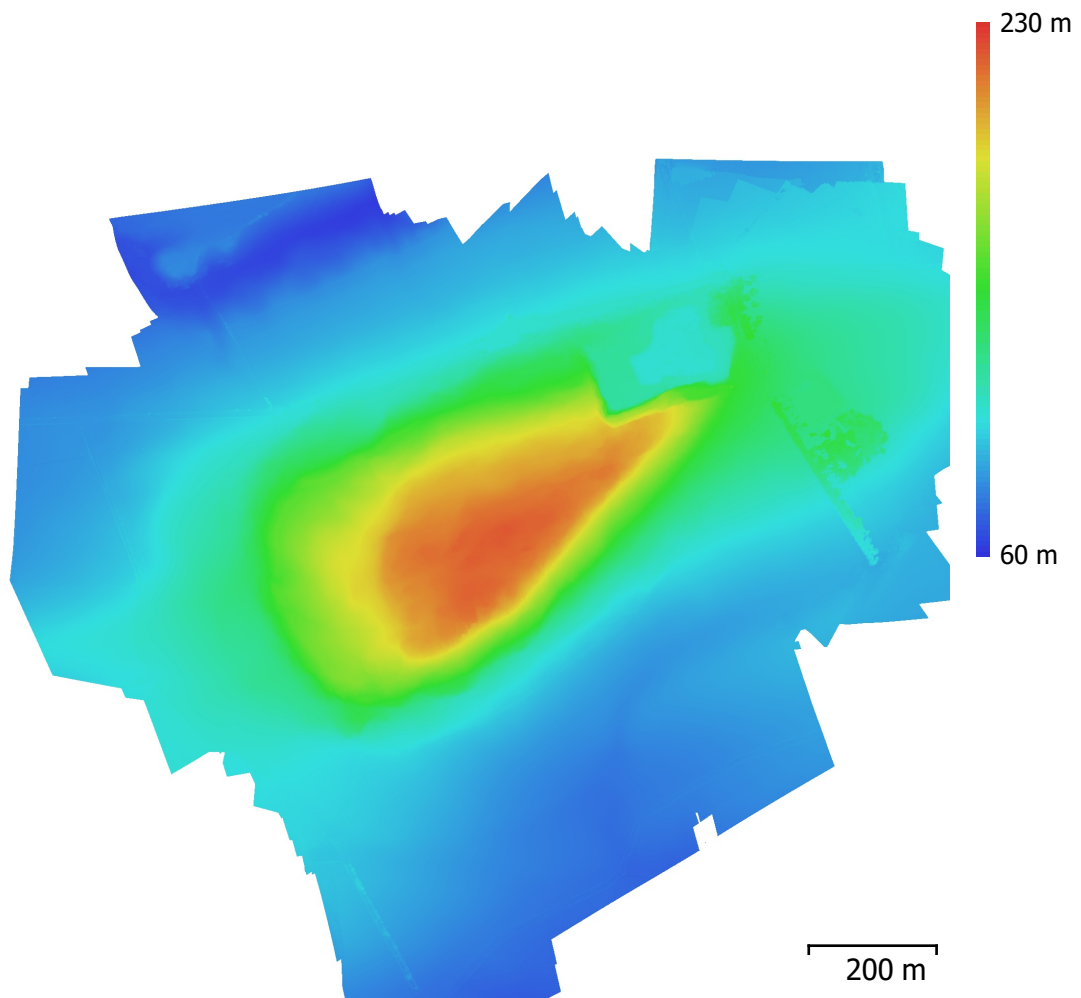


Fig. 5. Reconstructed digital elevation model.

Resolution: 7.97 cm/pix
Point density: 157 points/m²

Processing Parameters

General

Cameras	567
Aligned cameras	567
Markers	32

Shapes

Polygons	1
Coordinate system	WGS 84 (EPSG::4326)
Coordinate system	OSGB 1936 / British National Grid (EPSG::27700)
Rotation angles	Yaw, Pitch, Roll

Point Cloud

Points	124,893 of 162,409
RMS reprojection error	0.377916 (2.04873 pix)
Max reprojection error	8.96172 (47.5787 pix)
Mean key point size	6.00011 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	16.6739

Alignment parameters

Accuracy	Medium
Generic preselection	Yes
Reference preselection	Yes
Key point limit	40,000
Tie point limit	3,000
Adaptive camera model fitting	Yes
Matching time	2 hours 59 minutes
Alignment time	8 minutes 36 seconds

Optimization parameters

Parameters	f, b1, b2, cx, cy, k1-k3, p1, p2
Optimization time	55 seconds

Dense Point Cloud

Points	410,903,068
Point colors	3 bands, uint8

Reconstruction parameters

Quality	High
Depth filtering	Mild
Depth maps generation time	5 days 19 hours
Dense cloud generation time	4 days 11 hours

Model

Faces	81,874,882
Vertices	40,949,980
Vertex colors	3 bands, uint8

Reconstruction parameters

Surface type	Height field
Source data	Dense
Interpolation	Enabled
Quality	High
Depth filtering	Mild
Face count	82,180,605
Processing time	33 minutes 35 seconds

Orthomosaic

Size	31,195 x 29,170
Coordinate system	OSGB 1936 / British National Grid (EPSG::27700)
Colors	3 bands, uint8

Reconstruction parameters

Blending mode	Mosaic
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Surface
Enable color correction
Enable hole filling
Processing time

Mesh
No
Yes
52 minutes 31 seconds

Software

Version
Platform

1.4.3 build 6529
Windows 64