

Sander_2022-10-20_H20T_80m_Wide

Processing Report
01 July 2024



Survey Data

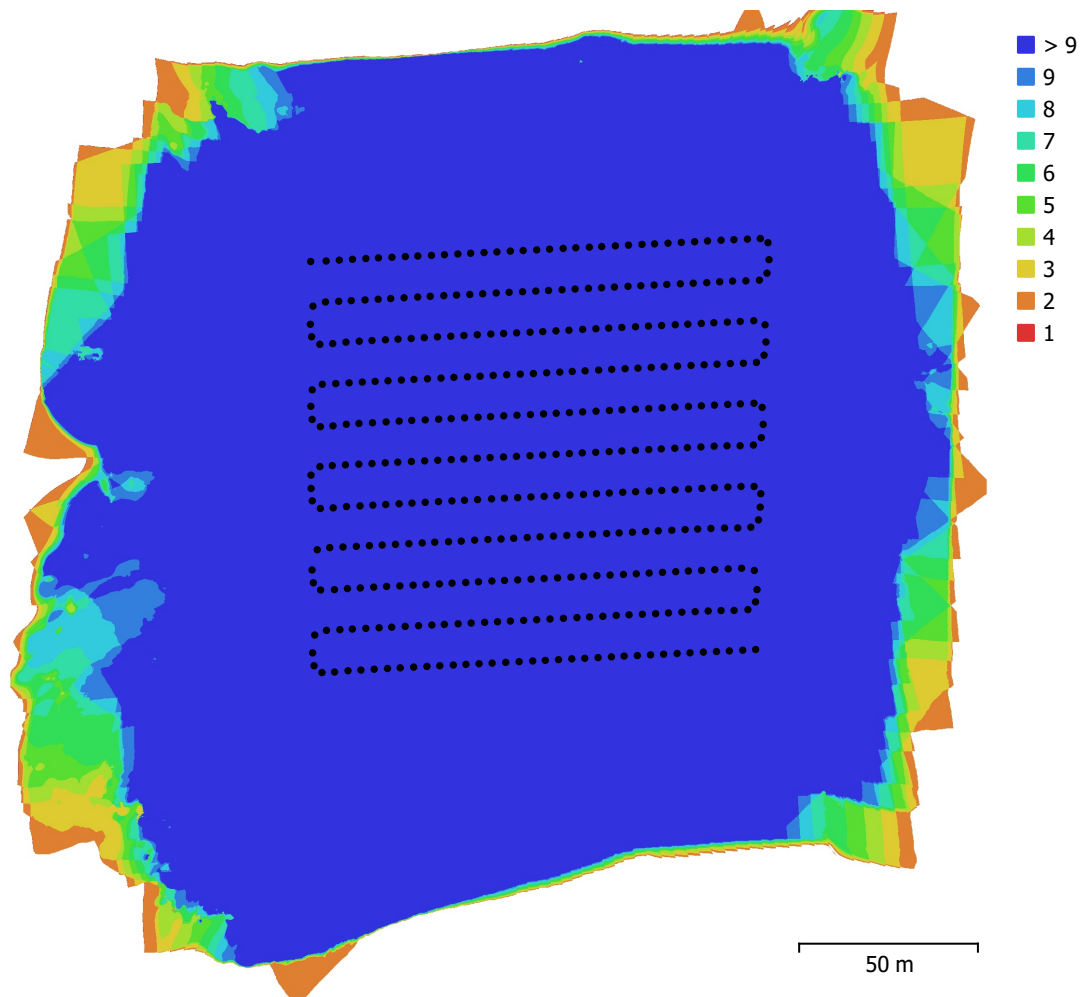


Fig. 1. Camera locations and image overlap.

Number of images:	402	Camera stations:	402
Flying altitude:	84.3 m	Tie points:	131,853
Ground resolution:	2.85 cm/pix	Projections:	951,839
Coverage area:	0.0597 km ²	Reprojection error:	1.47 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
ZH20T (4.5mm)	4056 x 3040	4.5 mm	1.6 x 1.6 μ m	No

Table 1. Cameras.

Camera Calibration

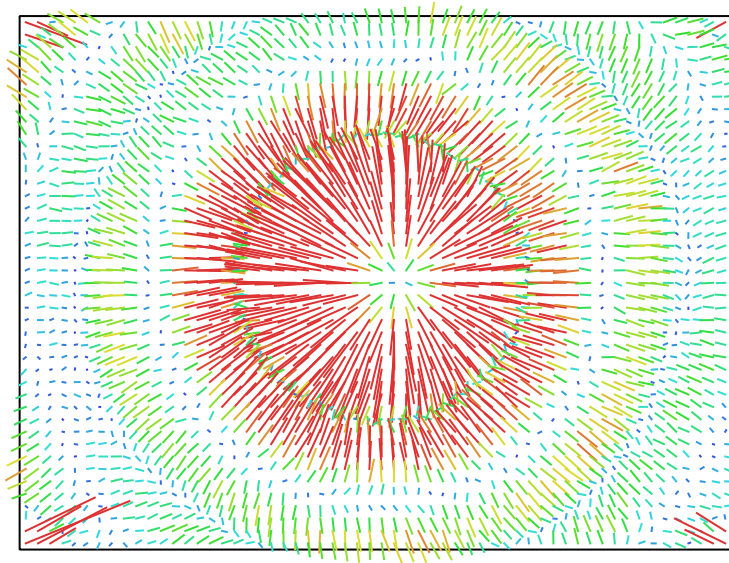


Fig. 2. Image residuals for ZH20T (4.5mm). 1 pix

ZH20T (4.5mm)

402 images

Type	Resolution	Focal Length	Pixel Size
Frame	4056 x 3040	4.5 mm	1.6 x 1.6 μm

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	K4	P1	P2
F	2959.37	1.5	1.00	0.25	0.63	-0.11	0.05	0.79	-0.91	0.88	-0.84	-0.07	-0.25
Cx	24.7284	0.024		1.00	0.24	-0.14	0.00	0.21	-0.23	0.22	-0.20	0.29	-0.08
Cy	-19.9766	0.028			1.00	-0.08	-0.05	0.51	-0.58	0.56	-0.53	-0.04	-0.00
B1	-1.88191	0.0095				1.00	-0.01	-0.07	0.09	-0.08	0.08	0.14	0.03
B2	-0.0363823	0.0087					1.00	0.03	-0.04	0.04	-0.04	-0.05	0.08
K1	0.202001	0.00026						1.00	-0.94	0.93	-0.92	-0.01	-0.13
K2	-0.703471	0.0016							1.00	-1.00	0.98	0.06	0.22
K3	0.749137	0.0026								1.00	-0.99	-0.07	-0.22
K4	-0.303746	0.0015									1.00	0.07	0.21
P1	0.000131169	2.2e-06										1.00	0.02
P2	1.38246e-05	1.9e-06											1.00

Table 2. Calibration coefficients and correlation matrix.

Ground Control Points

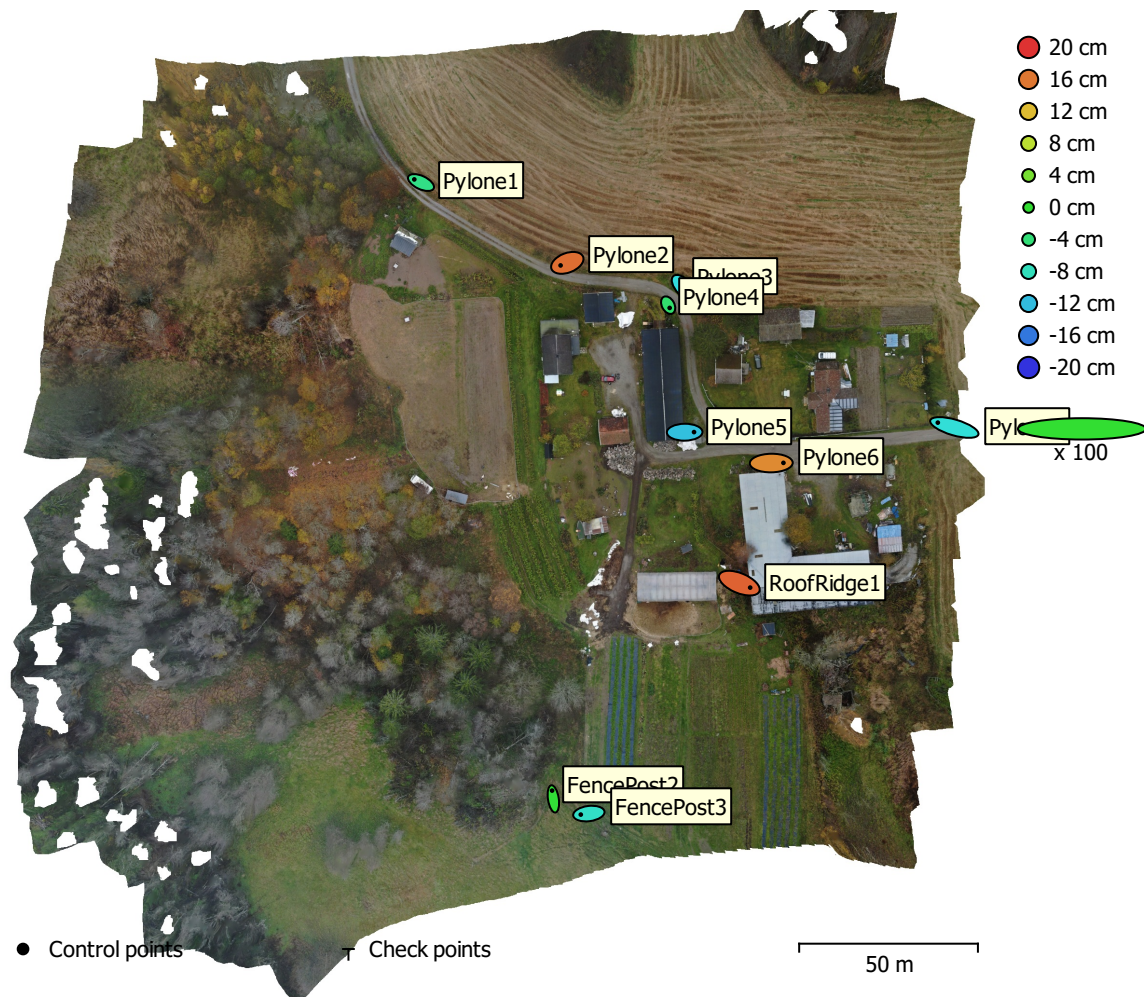


Fig. 3. GCP locations and error estimates.

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)
10	5.04586	2.30481	11.108	5.54733	12.4161

Table 3. Control points RMSE.

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

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
Pylone1	-3.74734	1.74545	-4.90432	6.41416	0.698 (12)
Pylone2	-3.75873	-1.44139	16.5381	17.021	0.911 (11)
Pylone3	2.99985	-3.18587	-10.1091	11.0156	1.178 (10)
Pylone4	0.853153	-1.55393	-3.43305	3.86373	1.873 (9)
Pylone5	5.23492	0.063391	-11.7085	12.8257	1.797 (8)
Pylone6	6.81281	0.104084	14.8585	16.3463	0.728 (10)
Pylone7	-9.23234	2.70281	-9.62992	13.6116	0.754 (2)
FencePost2	-0.708574	4.63957	-0.248586	4.69995	0.380 (10)
FencePost3	-4.51637	-0.57213	-8.61175	9.741	0.637 (8)
RoofRidge1	6.0626	-2.50198	17.2485	18.4534	0.725 (9)
Total	5.04586	2.30481	11.108	12.4161	1.071

Table 4. Control points.
X - Easting, Y - Northing, Z - Altitude.

Digital Elevation Model

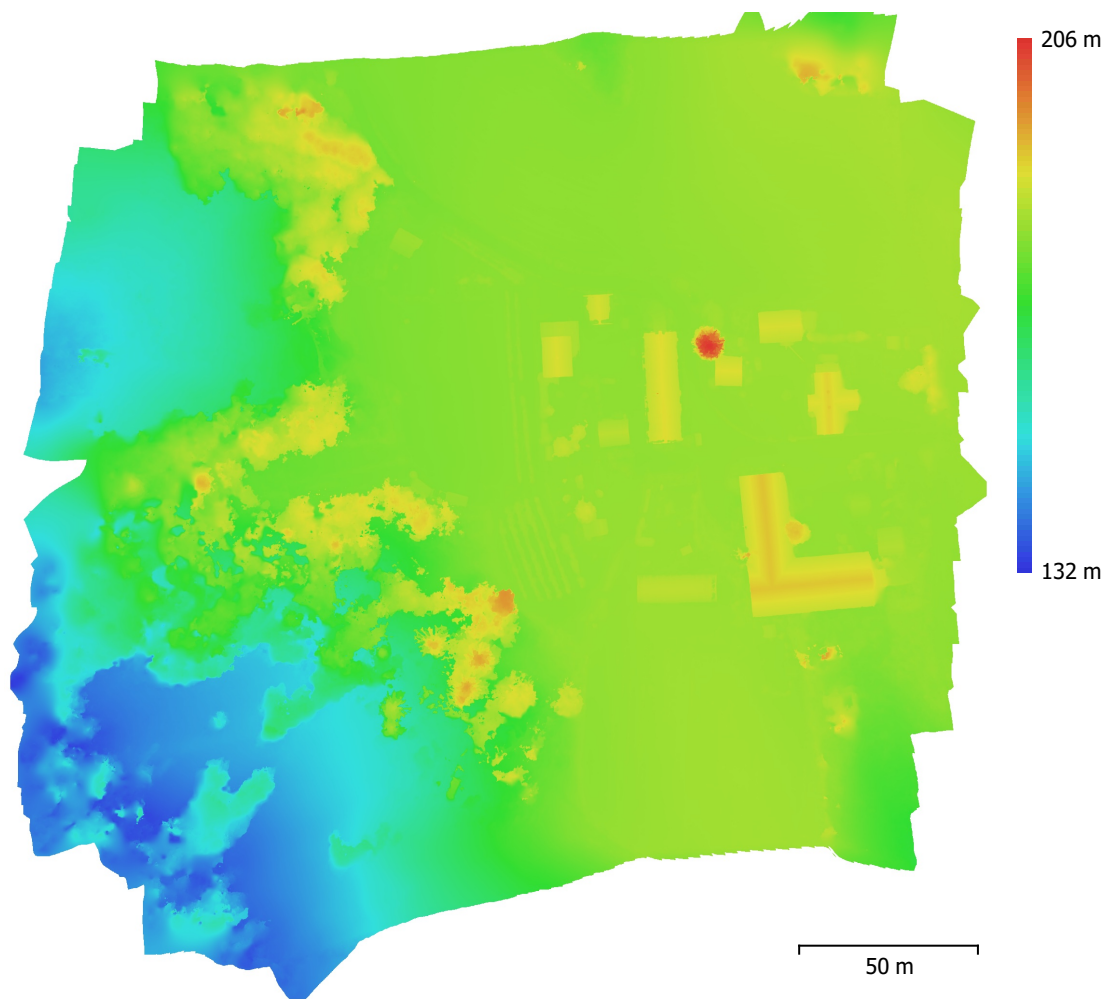


Fig. 4. Reconstructed digital elevation model.

Resolution: 5 cm/pix
Point density: 400 points/m²

Processing Parameters

General

Cameras	402
Aligned cameras	402
Markers	10
Coordinate system	ETRS89 / UTM zone 32N + NN2000 height (EPSG::5972)
Rotation angles	Yaw, Pitch, Roll

Tie Points

Points	131,853 of 155,548
RMS reprojection error	0.221725 (1.46619 pix)
Max reprojection error	2.2562 (37.6428 pix)
Mean key point size	6.17167 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	11.2866

Alignment parameters

Accuracy	High
Generic preselection	Yes
Reference preselection	Source
Key point limit	40,000
Key point limit per Mpx	1,000
Tie point limit	4,000
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	Yes
Matching time	1 minutes 36 seconds
Matching memory usage	748.25 MB
Alignment time	3 minutes 35 seconds
Alignment memory usage	1.10 GB

Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	Yes
Optimization time	14 seconds
Date created	2024:06:28 14:59:05
Software version	2.1.0.17532
File size	83.83 MB

Depth Maps

Count	402
-------	-----

Depth maps generation parameters

Quality	High
Filtering mode	Mild
Max neighbors	16
Processing time	9 minutes 30 seconds
Memory usage	4.36 GB
Date created	2024:06:28 16:17:42
Software version	2.1.0.17532
File size	1.72 GB

DEM

Size	5,455 x 5,529
Coordinate system	ETRS89 / UTM zone 32N + NN2000 height (EPSG::5972)

Depth maps generation parameters

Quality	High
Filtering mode	Mild
Max neighbors	16
Processing time	9 minutes 30 seconds
Memory usage	4.36 GB
Reconstruction parameters	
Source data	Depth maps
Interpolation	Enabled
Processing time	3 minutes 54 seconds
Memory usage	13.94 GB
Date created	2024:06:28 16:21:37
Software version	2.1.0.17532
File size	101.86 MB
Orthomosaic	
Size	10,880 x 11,040
Coordinate system	ETRS89 / UTM zone 32N + NN2000 height (EPSG::5972)
Colors	3 bands, uint8
Reconstruction parameters	
Blending mode	Mosaic
Surface	DEM
Enable hole filling	Yes
Enable ghosting filter	No
Processing time	3 minutes 37 seconds
Memory usage	2.06 GB
Date created	2024:06:28 16:27:19
Software version	2.1.0.17532
File size	6.34 GB
System	
Software name	Agisoft Metashape Professional
Software version	2.1.0 build 17532
OS	Windows 64 bit
RAM	127.15 GB
CPU	AMD Ryzen 9 7950X 16-Core Processor
GPU(s)	NVIDIA GeForce RTX 4080 SUPER