

Agisoft Metashape

Processing Report
03 October 2022



Survey Data

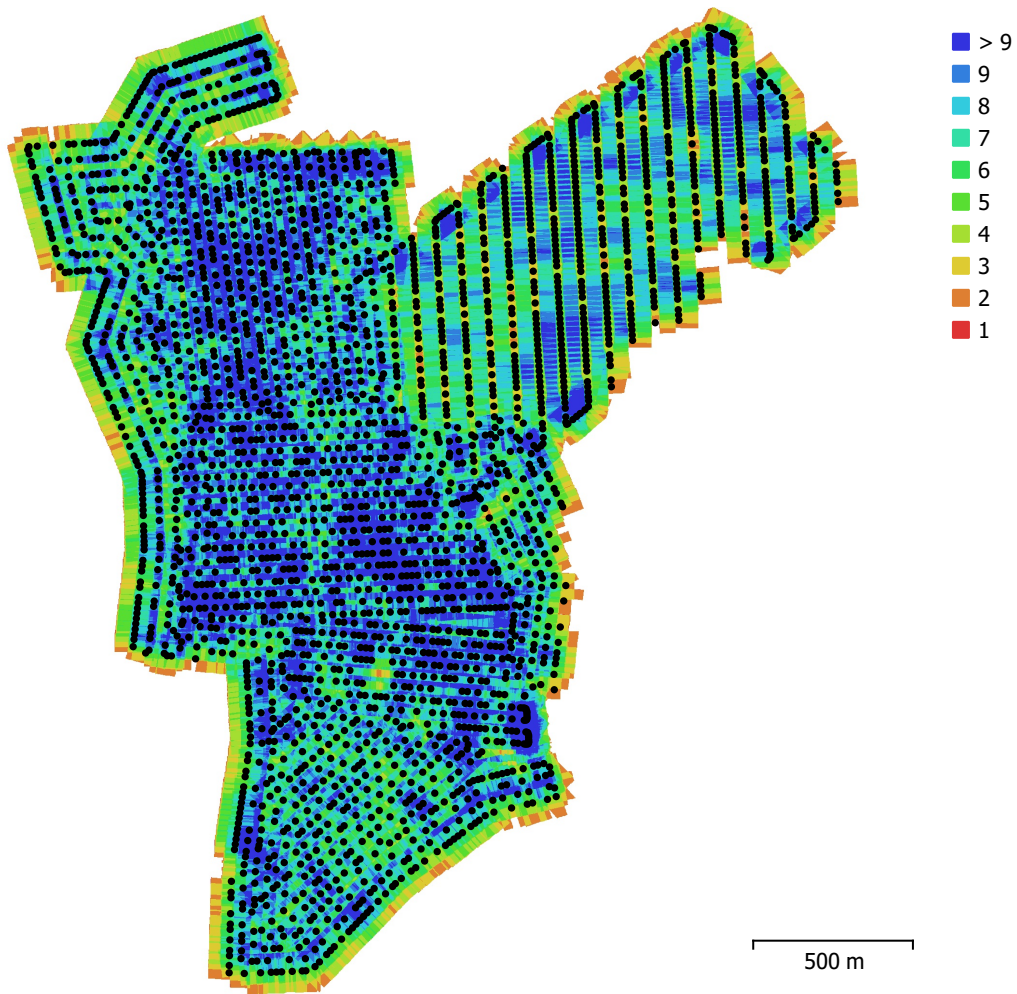


Fig. 1. Camera locations and image overlap.

Number of images:	7,231	Camera stations:	2,913
Flying altitude:	127 m	Tie points:	8,164,944
Ground resolution:	1.51 cm/pix	Projections:	22,370,123
Coverage area:	4.18 km ²	Reprojection error:	0.249 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
ZenmuseP1 (35mm)	8192 x 5460	35 mm	4.39 x 4.39 μ m	No

Table 1. Cameras.

Camera Calibration

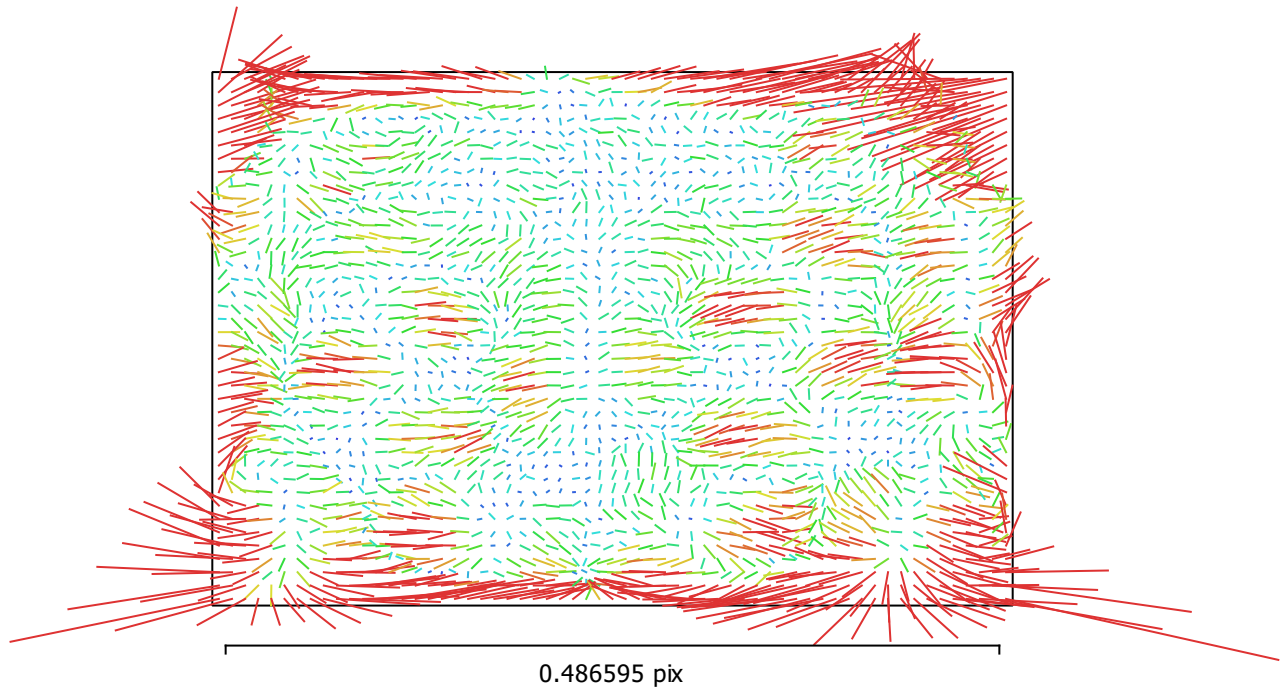


Fig. 2. Image residuals for ZenmuseP1 (35mm).

ZenmuseP1 (35mm)

7231 images, additional corrections

Type	Resolution	Focal Length	Pixel Size
Frame	8192 x 5460	35 mm	4.39 x 4.39 μm

	Value	Error	F	Cx	Cy	K1	K2	K3	K4	P1	P2
F	8185.83	0.18	1.00	-0.08	0.07	-0.37	0.35	-0.35	0.34	0.03	-0.01
Cx	-19.1004	0.032		1.00	-0.01	-0.03	0.03	-0.03	0.02	0.95	-0.00
Cy	0.0814463	0.03			1.00	0.01	-0.01	0.01	-0.01	-0.00	0.96
K1	-0.0454859	0.00014				1.00	-1.00	0.98	-0.96	-0.03	0.02
K2	0.0272763	0.0009					1.00	-1.00	0.98	0.03	-0.02
K3	-0.157253	0.0025						1.00	-1.00	-0.03	0.02
K4	0.105888	0.0026							1.00	0.03	-0.02
P1	-0.000176878	1.6e-06								1.00	-0.01
P2	0.000863275	1.6e-06									1.00

Table 2. Calibration coefficients and correlation matrix.

Camera Locations

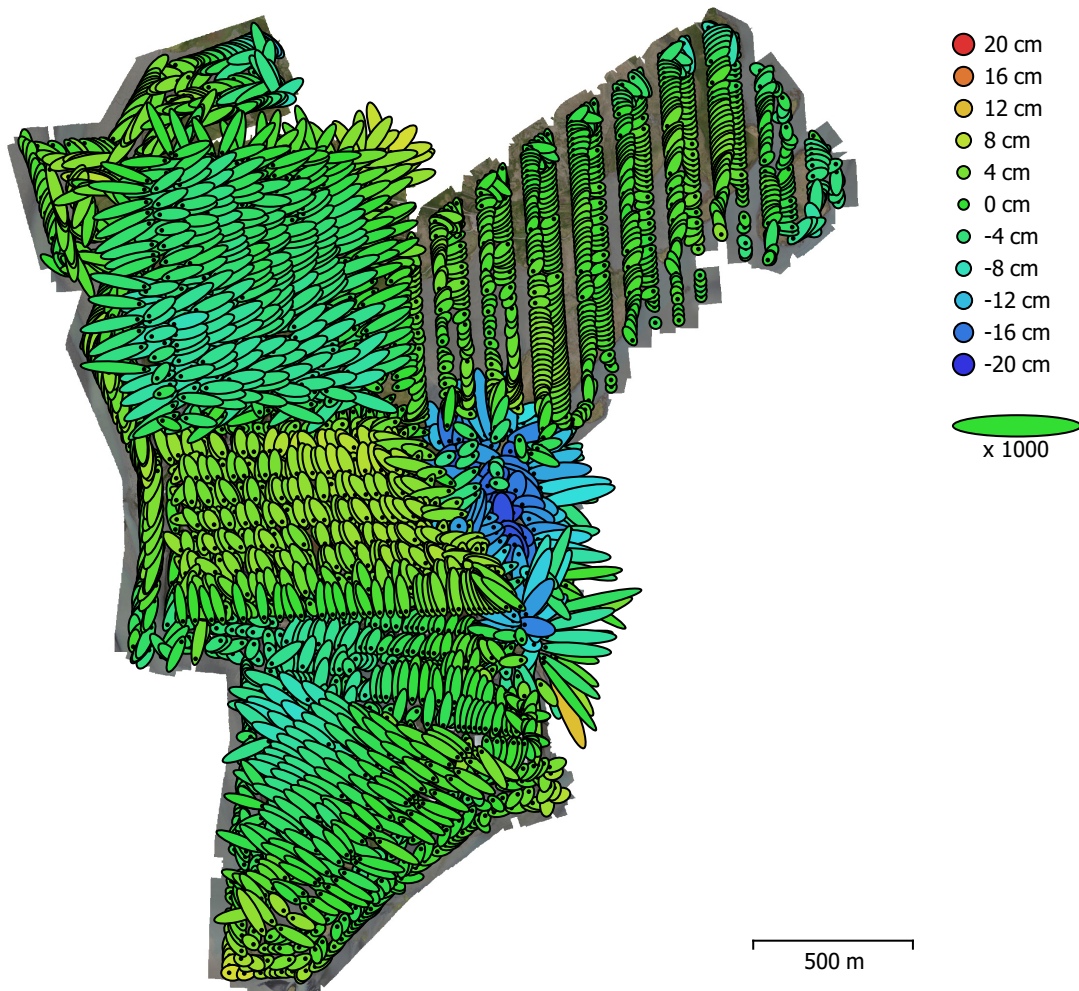


Fig. 3. Camera locations and error estimates.

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)
5.69793	5.08216	4.29361	7.6351	8.75955

Table 3. Average camera location error.

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

Ground Control Points

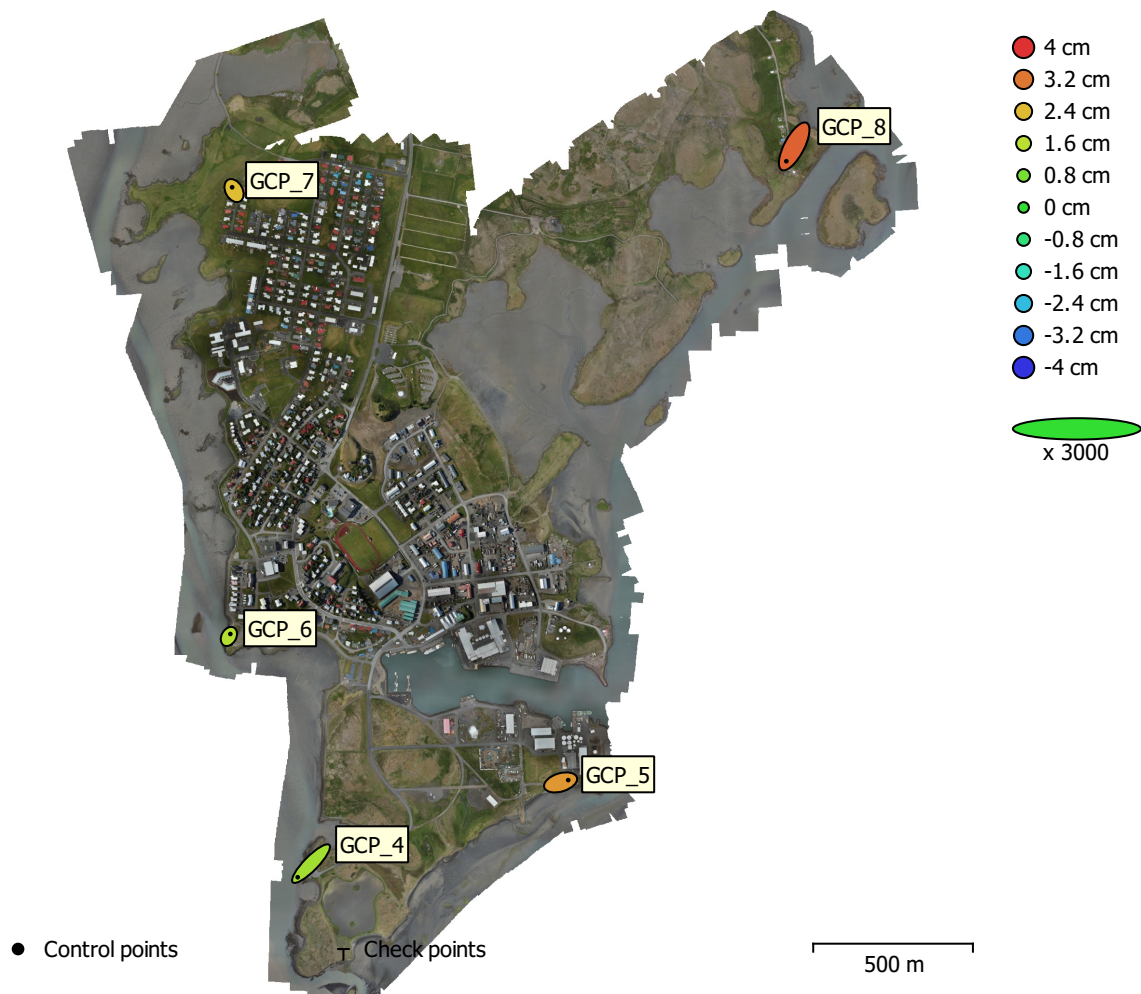


Fig. 4. GCP locations and error estimates.

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)
5	1.62447	1.92772	2.43408	2.52092	3.50425

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)
GCP_4	-2.78294	-2.84231	1.30557	4.18665	1.710 (5)
GCP_5	1.59006	0.47958	2.83032	3.28162	1.709 (9)
GCP_6	0.298772	0.520271	1.50836	1.6233	1.667 (9)
GCP_7	-0.393249	0.696101	2.38619	2.51657	1.238 (10)
GCP_8	-1.63632	-3.0849	3.45536	4.9126	1.845 (8)
Total	1.62447	1.92772	2.43408	3.50425	1.627

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

Digital Elevation Model

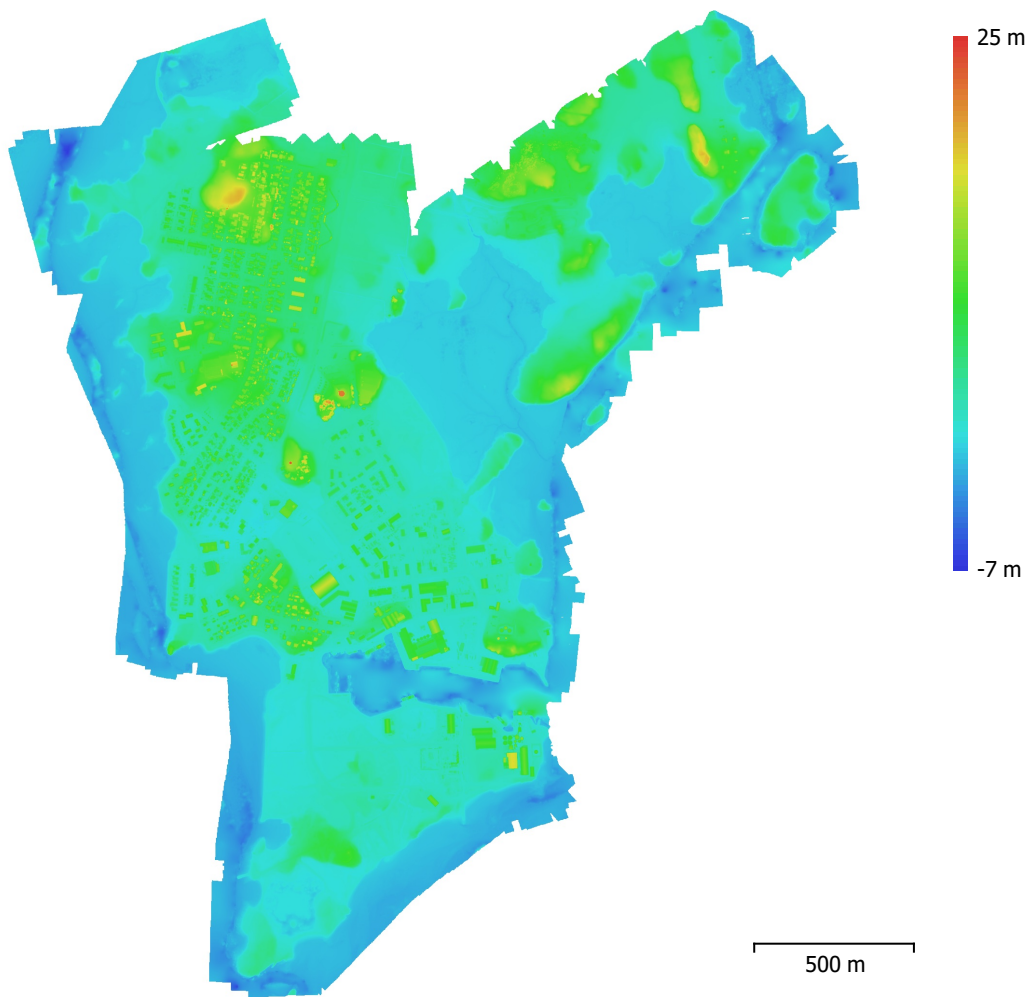


Fig. 5. Reconstructed digital elevation model.

Resolution: 7 cm/pix
Point density: 204 points/m²

Processing Parameters

General

Cameras	7231
Aligned cameras	2913
Markers	5

Shapes

LineString	460
Coordinate system	ISN2016_LCC
Rotation angles	Yaw, Pitch, Roll

Point Cloud

Points	8,164,944 of 14,591,911
RMS reprojection error	0.11089 (0.249115 pix)
Max reprojection error	0.3 (1.18402 pix)
Mean key point size	2.22573 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.98049

Alignment parameters

Accuracy	High
Generic preselection	Yes
Reference preselection	Source
Key point limit	60,000
Key point limit per Mpx	1,000
Tie point limit	0
Exclude stationary tie points	No
Guided image matching	No
Adaptive camera model fitting	No
Matching time	31 minutes 48 seconds
Matching memory usage	3.82 GB
Alignment time	39 minutes 49 seconds
Alignment memory usage	4.53 GB

Optimization parameters

Parameters	f, cx, cy, k1-k4, p1, p2
Fit additional corrections	Yes
Adaptive camera model fitting	No
Optimization time	8 minutes 33 seconds
Date created	2022:09:26 12:25:31
Software version	1.8.2.0
File size	1.20 GB

Depth Maps

Count	2911
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Depth maps generation parameters

Quality	High
Filtering mode	Mild
Max neighbors	16
Processing time	6 hours 2 minutes
Memory usage	8.97 GB
Date created	2022:09:26 20:35:56
Software version	1.8.2.0
File size	40.03 GB

Dense Point Cloud

Points	4,675,693,232
Point colors	3 bands, uint8
Depth maps generation parameters	
Quality	High
Filtering mode	Mild
Max neighbors	16
Processing time	6 hours 2 minutes
Memory usage	8.97 GB
Dense cloud generation parameters	
Processing time	6 hours 59 minutes
Memory usage	14.97 GB
Date created	2022:09:27 03:35:24
Software version	1.8.2.0
File size	66.08 GB
Model	
Faces	485,943,937
Vertices	243,008,944
Vertex colors	3 bands, uint8
Depth maps generation parameters	
Quality	High
Filtering mode	Mild
Max neighbors	16
Processing time	6 hours 2 minutes
Memory usage	8.97 GB
Reconstruction parameters	
Surface type	Arbitrary
Source data	Depth maps
Interpolation	Enabled
Strict volumetric masks	No
Processing time	6 hours 43 minutes
Memory usage	56.07 GB
Date created	2022:09:27 14:42:16
Software version	1.8.2.0
File size	10.86 GB
DEM	
Size	71,615 x 81,232
Coordinate system	ISN2016_LCC
Reconstruction parameters	
Source data	Mesh
Interpolation	Enabled
Processing time	3 hours 53 minutes
Memory usage	33.55 GB
Date created	2022:09:28 15:33:05
Software version	1.8.2.0
File size	4.40 GB
Orthomosaic	
Size	76,100 x 88,300
Coordinate system	ISN2016_LCC
Colors	3 bands, uint8
Reconstruction parameters	
Blending mode	Mosaic
Surface	DEM
Enable hole filling	Yes
Enable ghosting filter	No
Processing time	41 minutes 55 seconds
Memory usage	3.55 GB

Date created	2022:09:30 08:58:33
Software version	1.8.2.0
File size	32.74 GB

System

Software name	Agisoft Metashape Professional
Software version	1.8.2 build 14127
OS	Windows 64 bit
RAM	127.76 GB
CPU	12th Gen Intel(R) Core(TM) i9-12900K
GPU(s)	NVIDIA GeForce RTX 3070 Ti