

# Agisoft PhotoScan1

Processing Report  
12 April 2018



# Survey Data

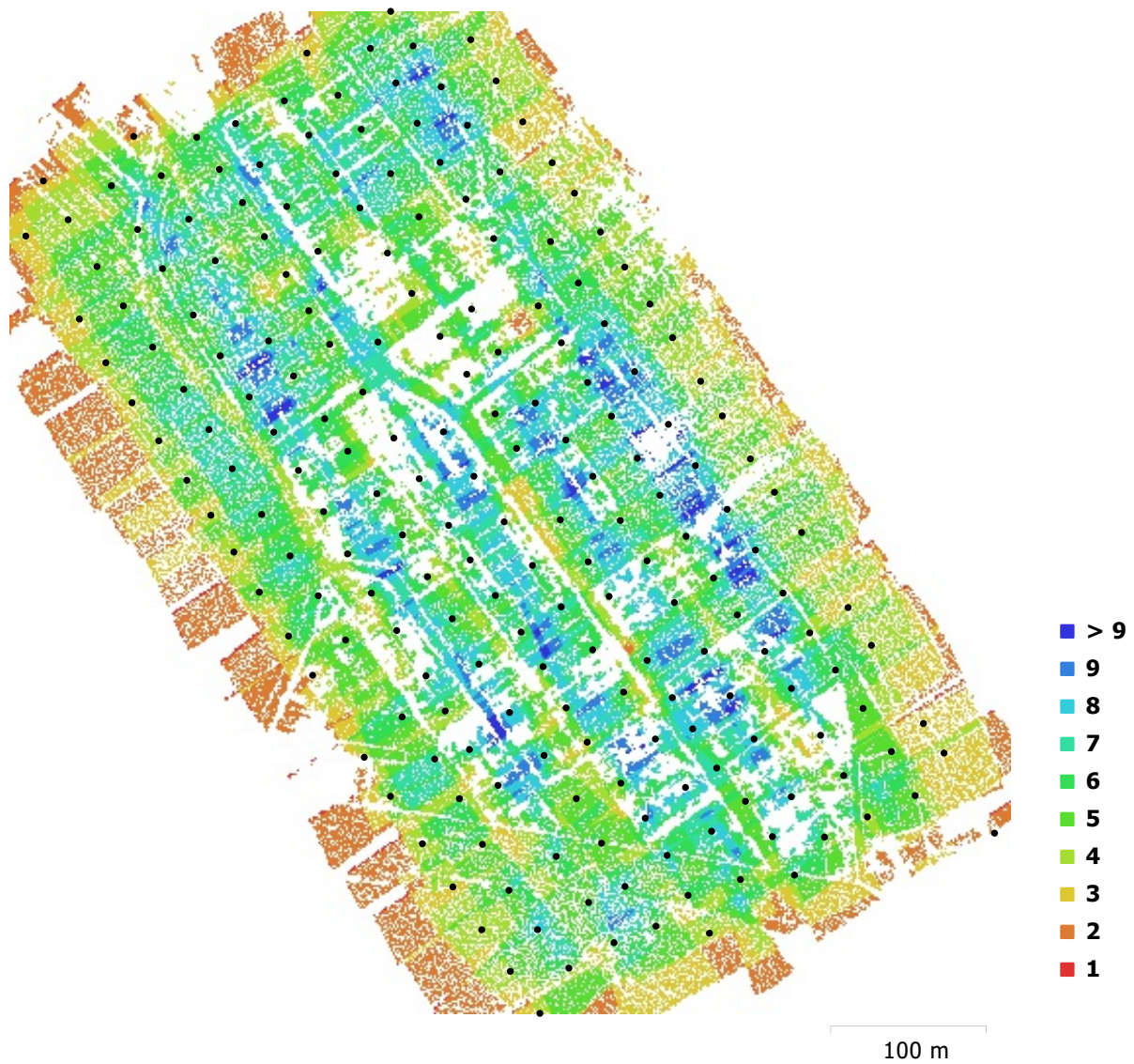


Fig. 1. Camera locations and image overlap.

Number of images:	209	Camera stations:	209
Flying altitude:	100 m	Tie points:	237,068
Ground resolution:	2 cm/pix	Projections:	820,432
Coverage area:	0.158 km <sup>2</sup>	Reprojection error:	0.989 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
Canon EOS M (22 mm)	5184 x 3456	22 mm	4.38 x 4.38 $\mu\text{m}$	No

Table 1. Cameras.

# Camera Calibration

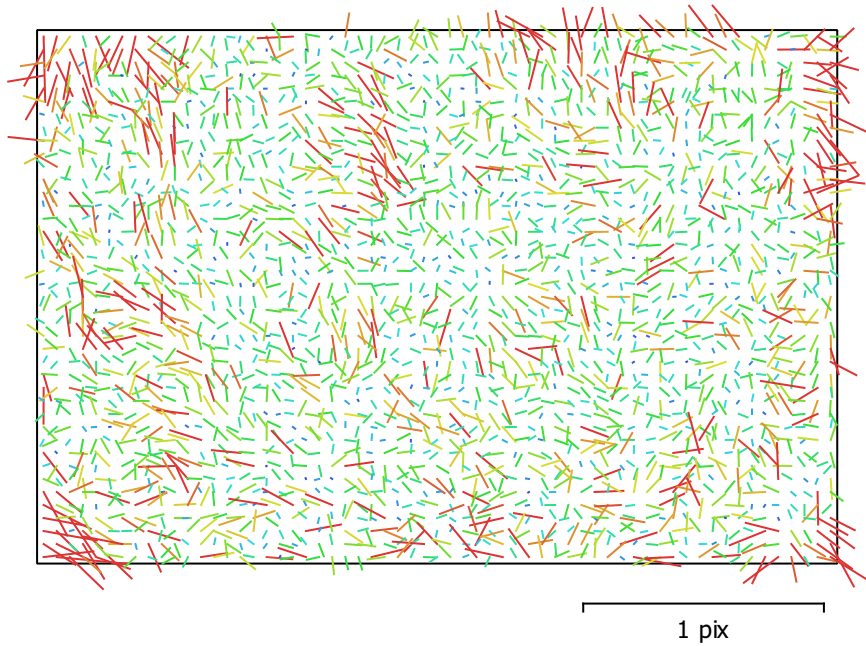


Fig. 2. Image residuals for Canon EOS M (22 mm).

## Canon EOS M (22 mm)

209 images

Type	Resolution	Focal Length	Pixel Size
<b>Frame</b>	<b>5184 x 3456</b>	<b>22 mm</b>	<b>4.38 x 4.38 <math>\mu\text{m}</math></b>

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	P1	P2
<b>F</b>	<b>5008.08</b>	0.16	1.00	-0.28	0.75	0.06	0.07	-0.18	0.17	-0.15	0.03	-0.02
<b>Cx</b>	<b>44.834</b>	0.058		1.00	-0.24	-0.06	-0.02	0.01	-0.02	0.02	0.87	-0.02
<b>Cy</b>	<b>6.24399</b>	0.064			1.00	0.12	0.05	-0.02	0.03	-0.03	-0.00	0.52
<b>B1</b>	<b>-3.44967</b>	0.032				1.00	0.02	-0.01	0.02	-0.02	-0.01	0.07
<b>B2</b>	<b>-1.89875</b>	0.026					1.00	-0.01	0.01	-0.01	-0.01	0.00
<b>K1</b>	<b>-0.011953</b>	0.0001						1.00	-0.97	0.92	-0.01	0.02
<b>K2</b>	<b>0.0864542</b>	0.0006							1.00	-0.98	0.00	-0.00
<b>K3</b>	<b>-0.150084</b>	0.0011								1.00	0.01	-0.00
<b>P1</b>	<b>0.00013669</b>	4.4e-06									1.00	-0.05
<b>P2</b>	<b>-0.000444559</b>	3.3e-06										1.00

Table 2. Calibration coefficients and correlation matrix.

# Camera Locations

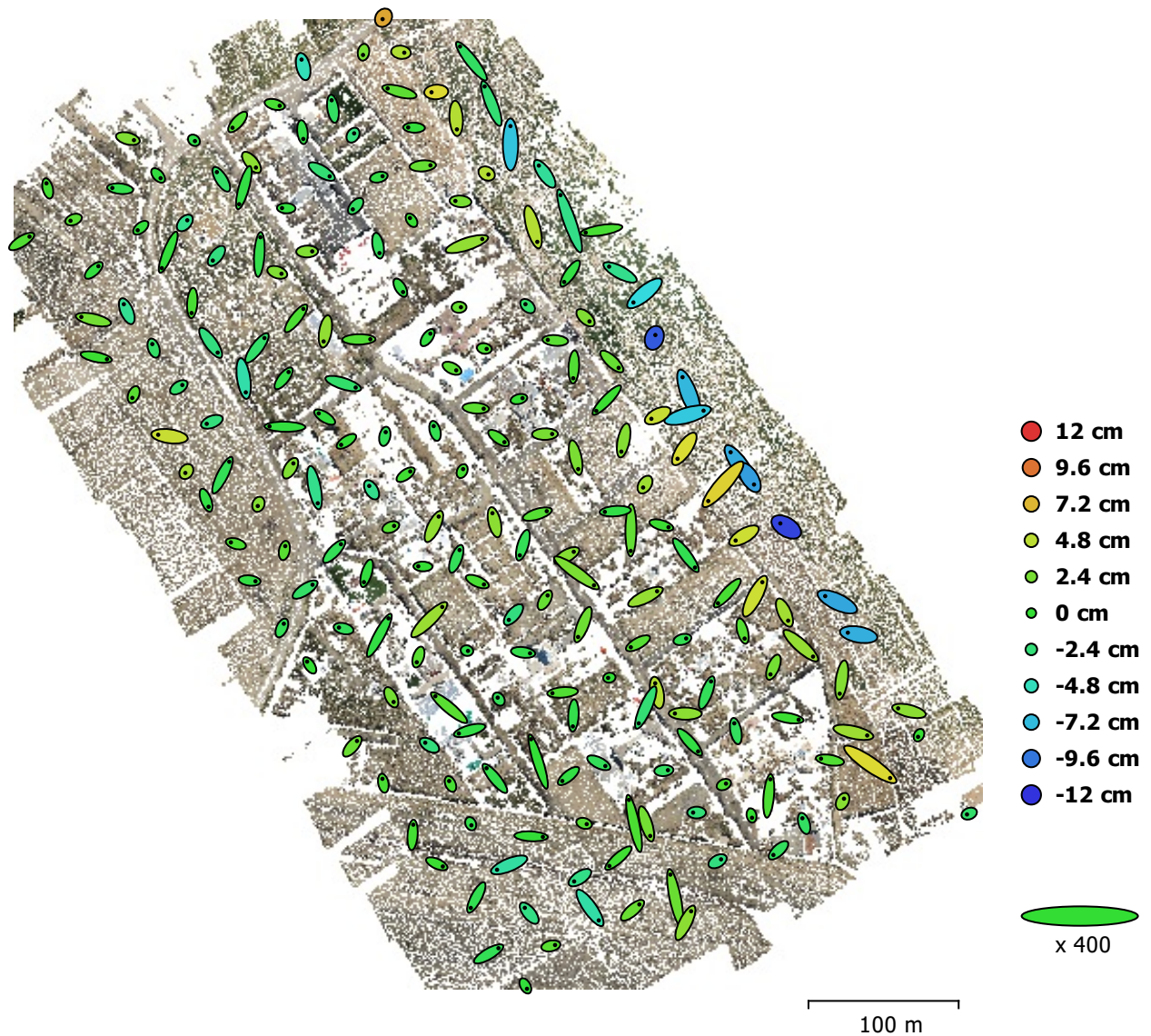


Fig. 3. Camera locations and error estimates.

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)
2.22916	2.67199	2.93766	3.47976	4.55396

Table 3. Average camera location error.

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

# Ground Control Points

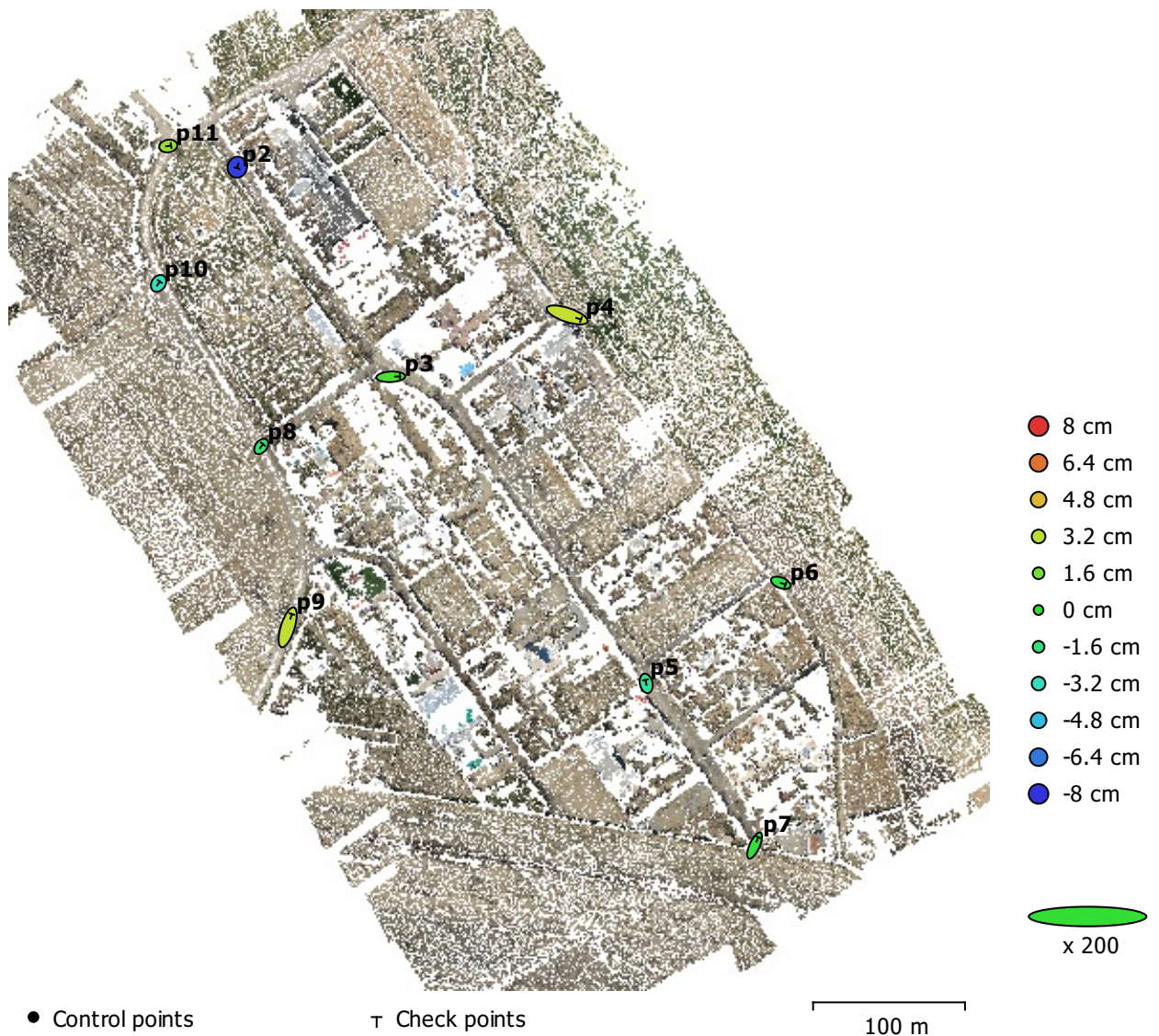


Fig. 4. GCP locations and error estimates.

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)
10	3.85231	3.56645	3.25978	5.24975	6.17949

Table 4. Check points RMSE.

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

<b>Label</b>	<b>X error (cm)</b>	<b>Y error (cm)</b>	<b>Z error (cm)</b>	<b>Total (cm)</b>	<b>Image (pix)</b>
p2	-0.17266	-0.595235	-7.7581	7.78282	1.027 (8)
p10	0.826998	1.20137	-3.31272	3.61958	1.195 (5)
p11	1.84398	0.29365	2.28367	2.94986	0.461 (5)
p3	6.04925	0.285162	0.598737	6.08549	1.649 (6)
p4	9.08083	-3.02972	3.34792	10.1415	1.025 (8)
p5	-0.531938	2.27157	-2.33262	3.29911	0.496 (4)
p6	3.11084	-1.21261	-0.625958	3.39699	1.192 (6)
p7	2.48352	5.50778	-0.208638	6.04542	0.472 (4)
p8	1.21411	1.51203	-1.44645	2.41919	0.963 (4)
p9	2.76264	8.76349	3.21694	9.73548	0.343 (6)
<b>Total</b>	<b>3.85231</b>	<b>3.56645</b>	<b>3.25978</b>	<b>6.17949</b>	<b>1.002</b>

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

# Digital Elevation Model

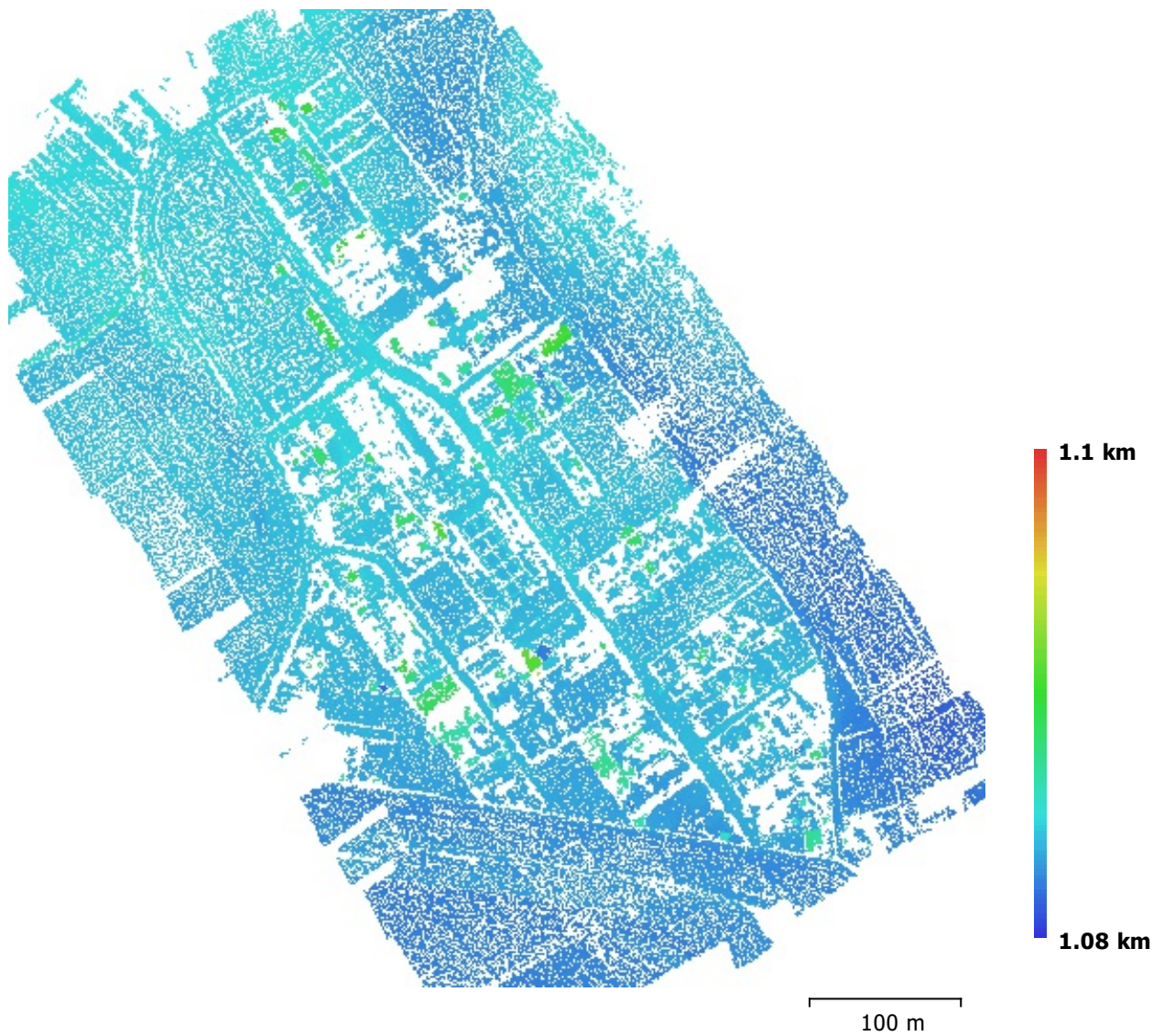


Fig. 5. Reconstructed digital elevation model.

Resolution: unknown

Point density: unknown

# Processing Parameters

## General

Cameras	209
Aligned cameras	209
Markers	10
Coordinate system	WGS 84 / UTM zone 39N (EPSG::32639)
Rotation angles	Omega, Phi, Kappa

## Point Cloud

Points	237,068 of 247,414
RMS reprojection error	0.171108 (0.988628 pix)
Max reprojection error	0.514245 (31.4741 pix)
Mean key point size	5.7348 pix
Effective overlap	3.51848

## Alignment parameters

Accuracy	Medium
Generic preselection	No
Reference preselection	Yes
Key point limit	40,000
Tie point limit	4,000
Adaptive camera model fitting	Yes
Matching time	25 minutes 43 seconds
Alignment time	1 minutes 49 seconds

## Software

Version	1.3.2 build 4164
Platform	Windows 64