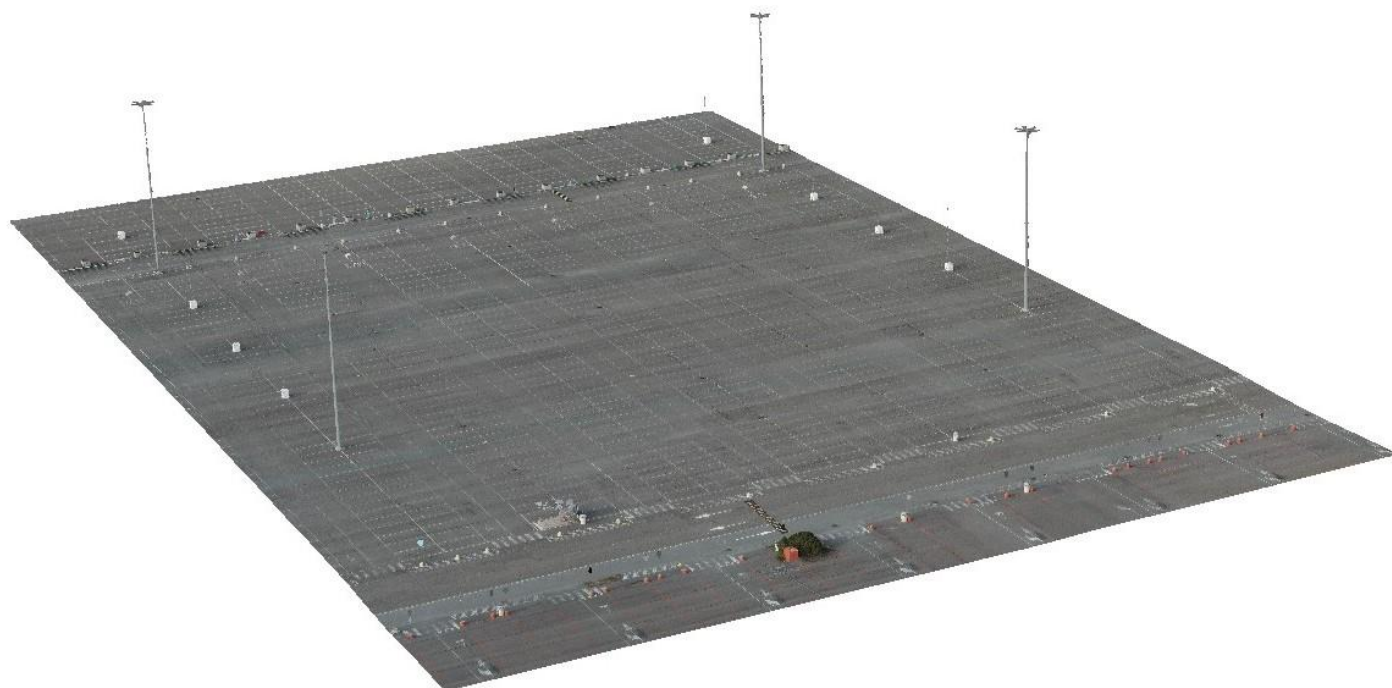




Report Processo di Elaborazione PPK

(Post Processing Kinematic)

“DJI Zenmuse P1-35mm”





Dati Rilievo sul Campo:

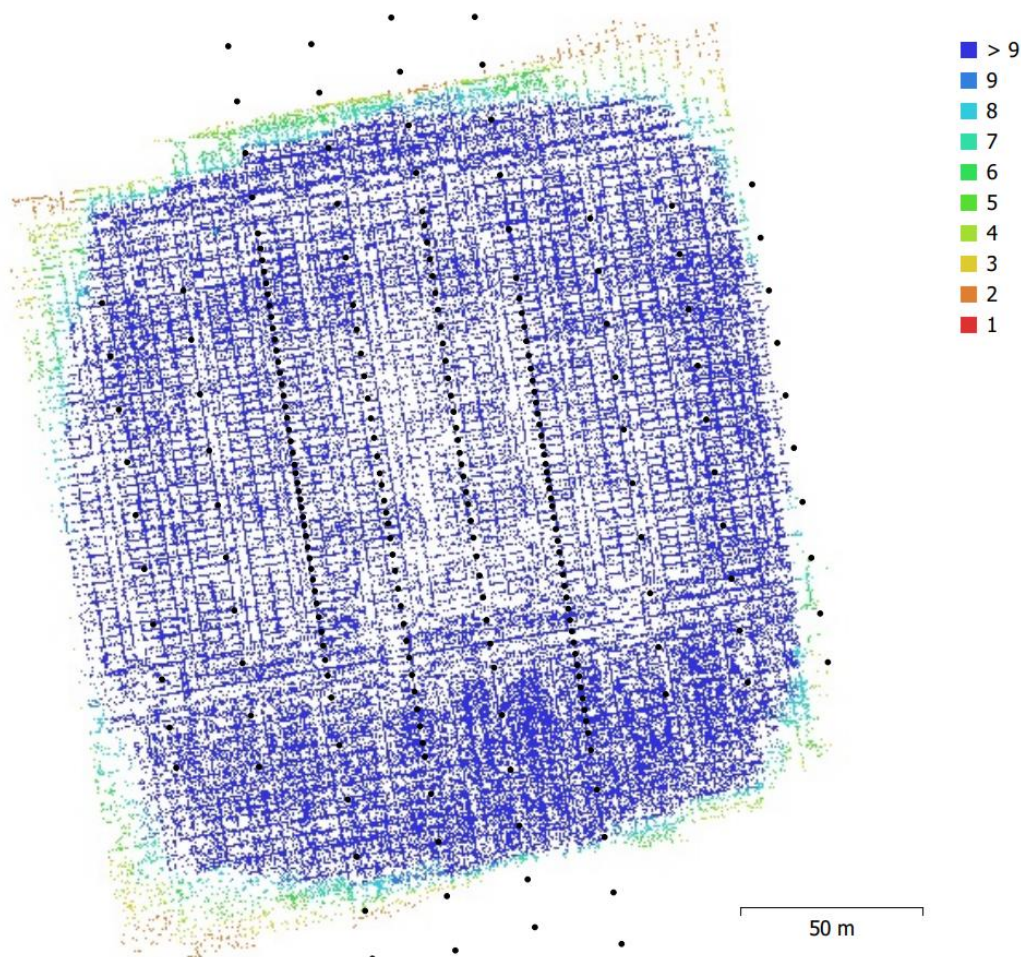


Fig. 1. Camera locations and image overlap.

Number of images:	224	Camera stations:	224
Flying altitude:	103 m	Tie points:	131,611
Ground resolution:	1.26 cm/pix	Projections:	1,130,756
Coverage area:	0.0162 km ²	Reprojection error:	1.07 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.



Dati di Calibrazione Camera:

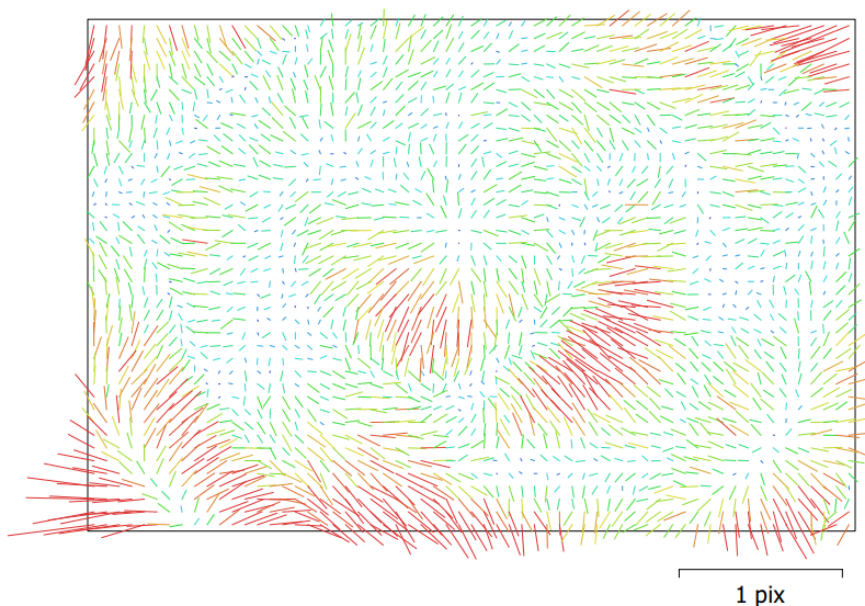


Fig. 2. Image residuals for ZenmuseP1 (35mm).

ZenmuseP1 (35mm)

224 images

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	P1	P2
F	8203.6	0.022	1.00	-0.06	0.04	-0.37	0.36	-0.33	-0.06	0.02
Cx	-46.5573	0.024		1.00	-0.00	-0.02	0.03	-0.03	0.91	-0.01
Cy	-1.09922	0.018			1.00	0.00	0.00	-0.00	-0.00	0.79
K1	-0.0486338	2.4e-05				1.00	-0.97	0.92	-0.04	-0.00
K2	0.0209864	0.00015					1.00	-0.98	0.04	0.00
K3	-0.102627	0.00027						1.00	-0.05	-0.00
P1	-0.00236108	9.3e-07							1.00	-0.00
P2	0.000774936	7.3e-07								1.00

Table 2. Calibration coefficients and correlation matrix.



Posizione Camere:

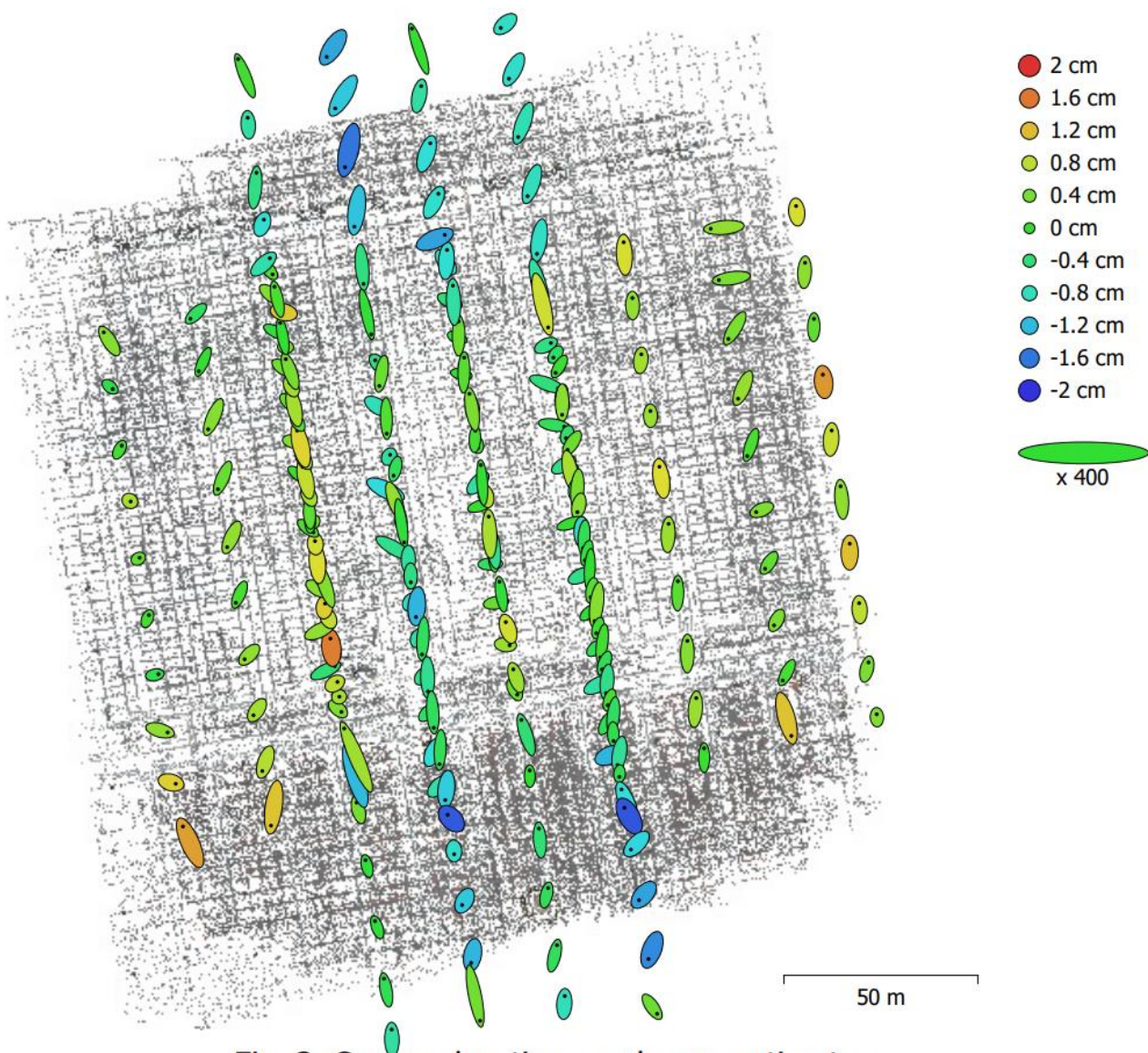


Fig. 3. Camera locations and error estimates.

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)
0.527979	1.24384	0.664215	1.35126	1.50568

Table 3. Average camera location error.

X - Longitude, Y - Latitude, Z - Altitude.



Orientazione Camere:

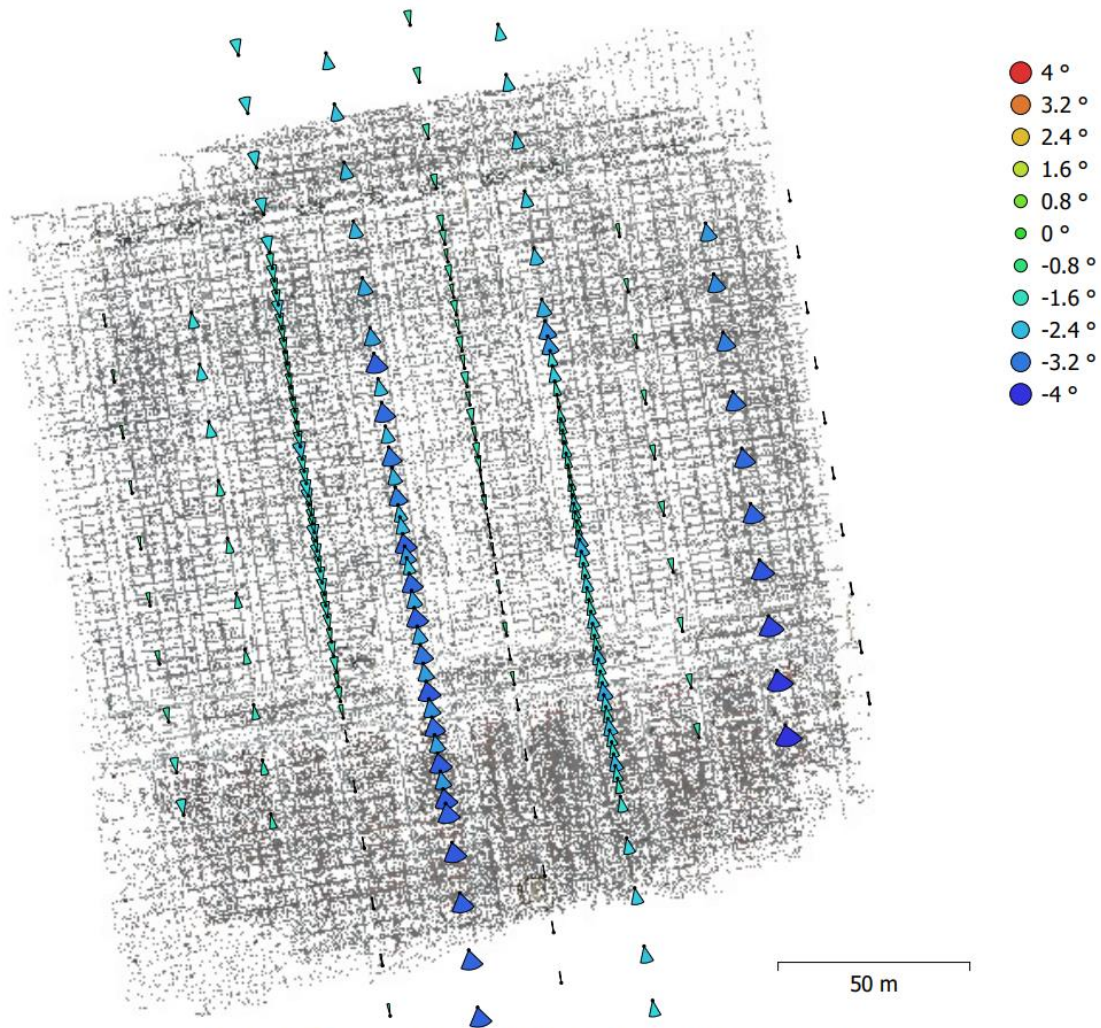


Fig. 4. Camera orientations and error estimates.
Arcs represent yaw error estimates.

Yaw error (°)	Pitch error (°)	Roll error (°)	Total error (°)
1.96056	0.582504	0.999653	2.27649

Table 4. Average camera rotation error.



Punti di Controllo a terra:

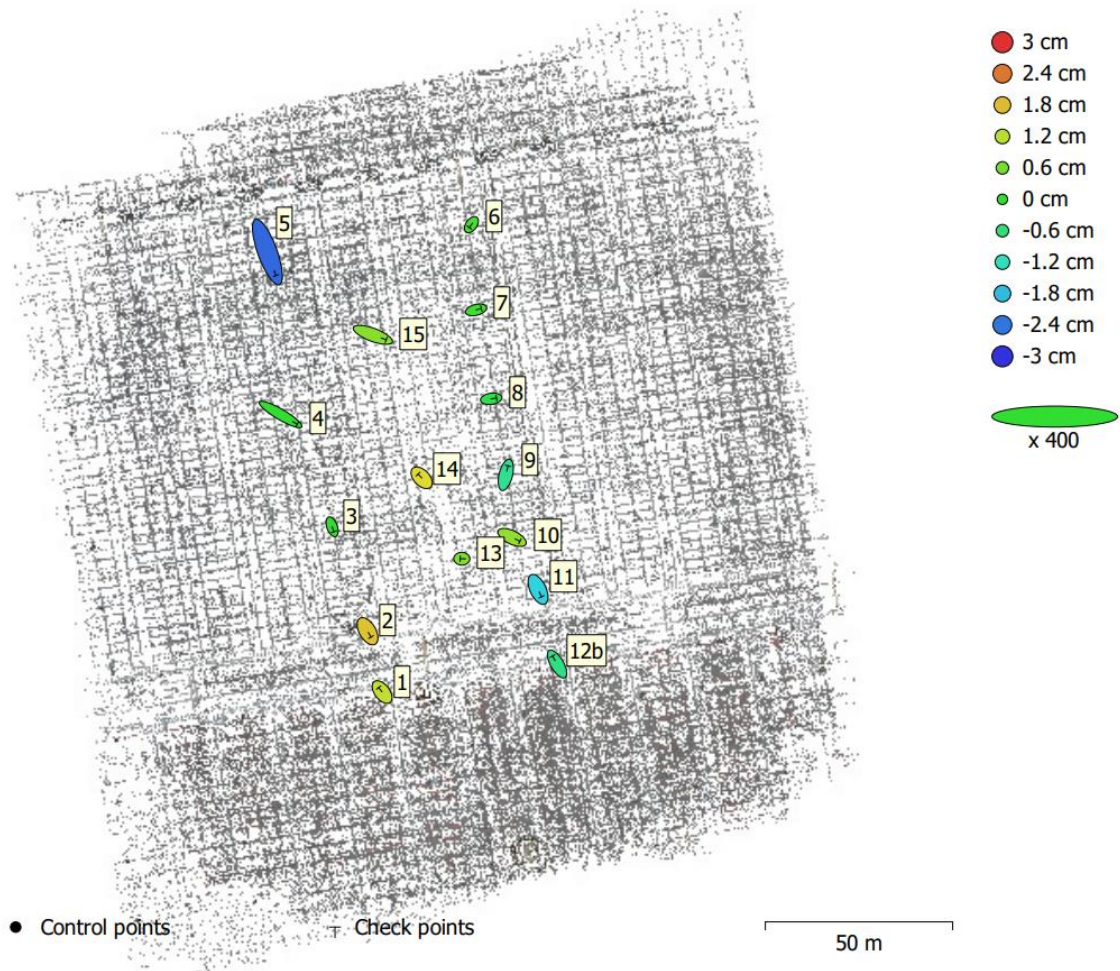


Fig. 5. GCP locations and error estimates.

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)
15	0.93222	1.08761	1.12466	1.43246	1.82121

Table 5. Check points RMSE.

X - Longitude, Y - Latitude, Z - Altitude.



Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
1	-0.457267	0.597483	1.29535	1.498	0.280 (5)
2	0.462842	-0.780641	1.73241	1.95573	0.102 (5)
3	0.24123	-0.64826	-0.0106598	0.69177	0.196 (7)
4	2.22737	-1.30639	-0.0153315	2.58227	0.261 (5)
5	1.14585	-3.15414	-2.51874	4.1959	0.228 (7)
6	-0.283778	-0.388117	0.180581	0.513589	0.220 (5)
7	0.708071	0.183488	0.114949	0.740437	0.204 (7)
8	0.696146	0.0972113	-0.205485	0.732321	0.155 (6)
9	0.302555	1.20882	-0.858403	1.51316	0.318 (7)
10	1.04163	-0.502684	0.851404	1.43617	0.477 (5)
11	0.466002	-0.98515	-1.59264	1.92981	0.275 (6)
13	-0.218861	0.00681164	0.679349	0.713766	0.368 (5)
14	-0.477245	0.492638	1.52091	1.66842	0.292 (5)
15	1.77752	-0.663361	0.759986	2.04382	0.259 (5)
12b	-0.619989	1.06796	-0.714733	1.4268	0.247 (6)
Total	0.93222	1.08761	1.12466	1.82121	0.268

Table 6. Check points.

X - Longitude, Y - Latitude, Z - Altitude.



Modello di Elevazione Digitale:

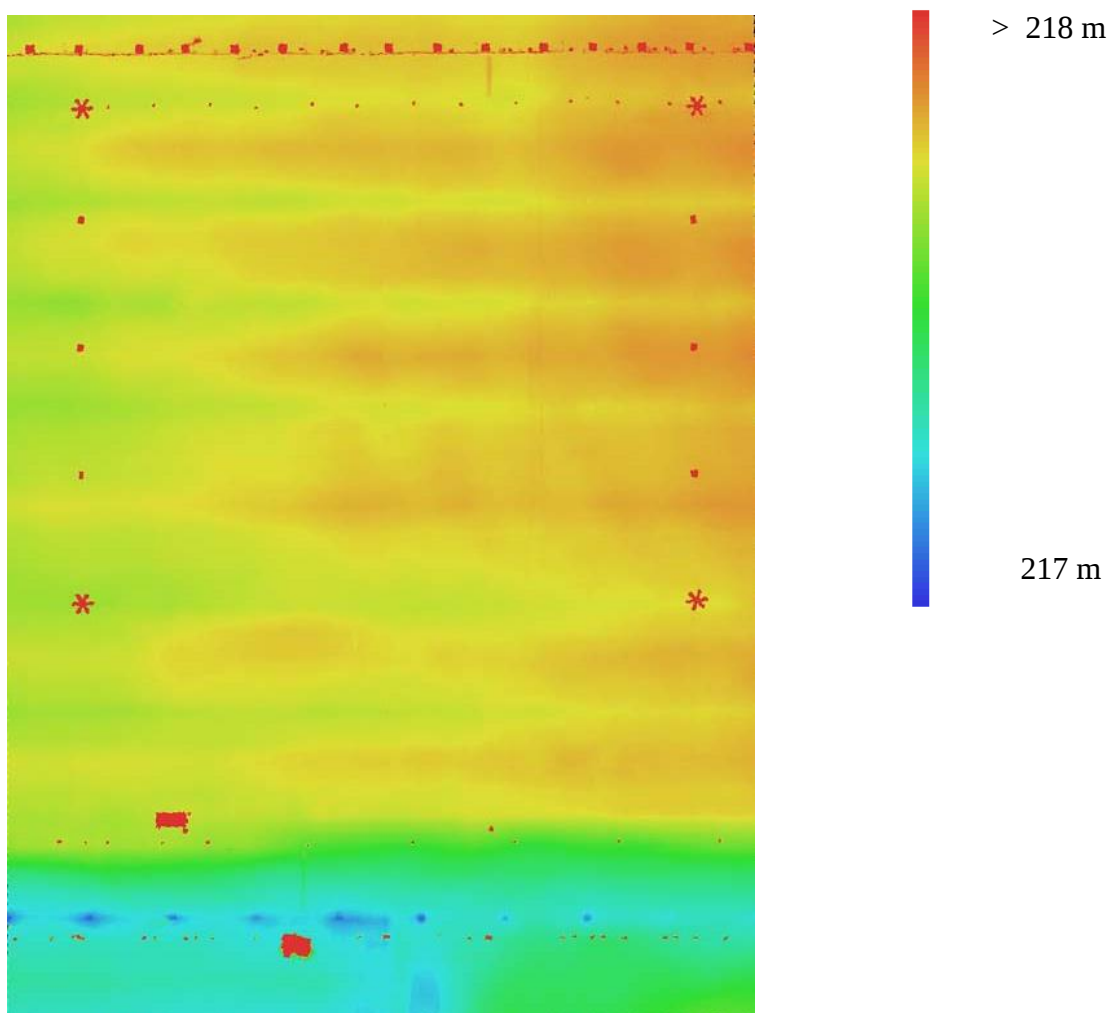


Fig. 4. Reconstructed digital elevation model.

Resolution: 4.89 cm/pix
Point density: 419 points/m²