

RELATÓRIO DE PROCESSAMENTO

SINOP-MT
06 July 2025



Survey Data

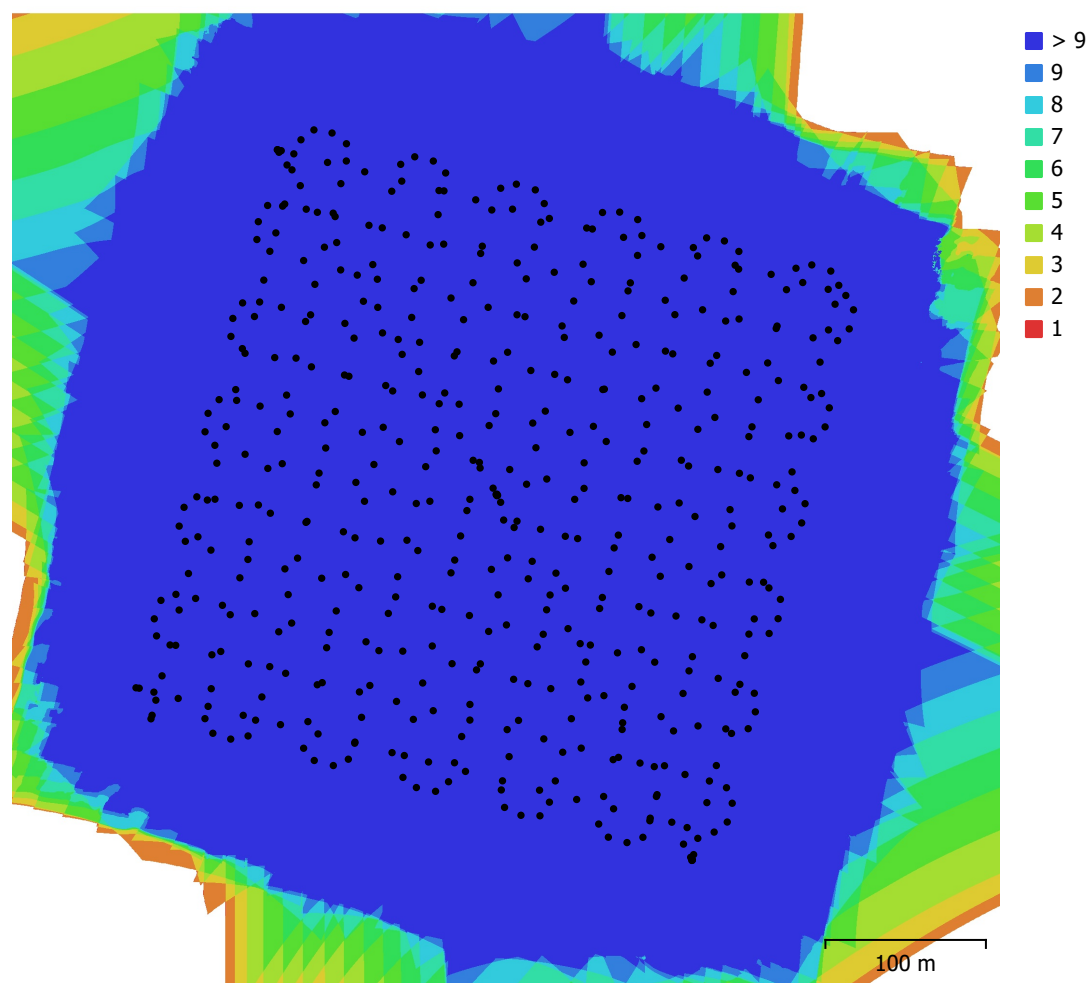


Fig. 1. Camera locations and image overlap.

Number of images:	508	Camera stations:	508
Flying altitude:	120 m	Tie points:	4,759,173
Ground resolution:	3.18 cm/pix	Projections:	21,911,605
Coverage area:	0.347 km²	Reprojection error:	1 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
M3E (12.29mm)	5280 x 3956	12.29 mm	3.36 x 3.36 µm	Yes

Table 1. Cameras.

Camera Calibration

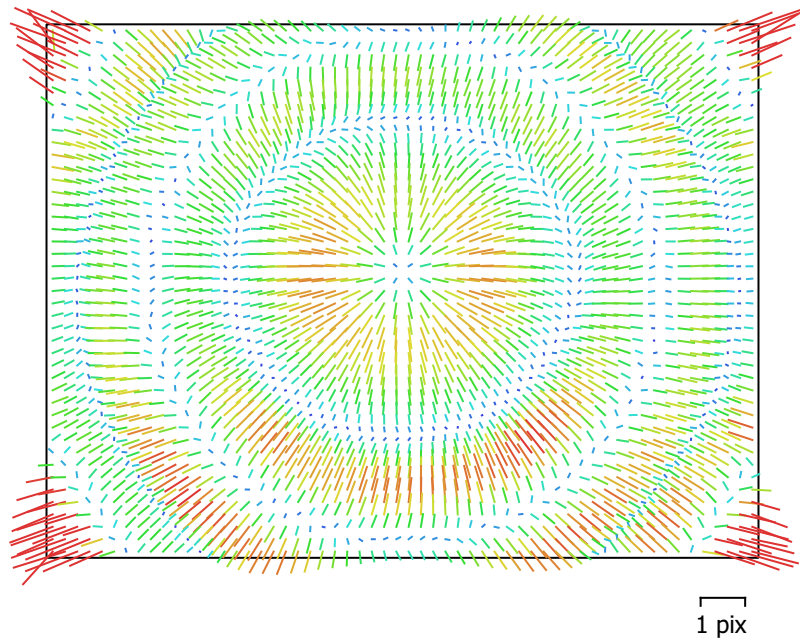


Fig. 2. Image residuals for M3E (12.29mm).

M3E (12.29mm)

508 images, precalibrated

Type	Resolution	Focal Length	Pixel Size
Frame	5280 x 3956	12.29 mm	3.36 x 3.36 μm

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	3717.62	0.022	1.00	0.04	-0.43	-0.19	0.06	-0.12	-0.02	0.39
Cx	6.58349	0.0081		1.00	-0.01	-0.02	0.01	-0.02	-0.47	0.02
Cy	-21.0231	0.011			1.00	0.09	0.00	0.02	0.01	-0.74
K1	-0.111297	5.5e-06				1.00	-0.93	0.86	0.00	-0.11
K2	0.00427635	1.4e-05					1.00	-0.98	0.01	0.00
K3	-0.016842	1.1e-05						1.00	-0.01	-0.02
P1	-0.000179479	2.9e-07							1.00	-0.01
P2	-5.55365e-05	3.7e-07								1.00

Table 2. Calibration coefficients and correlation matrix.

Camera Locations

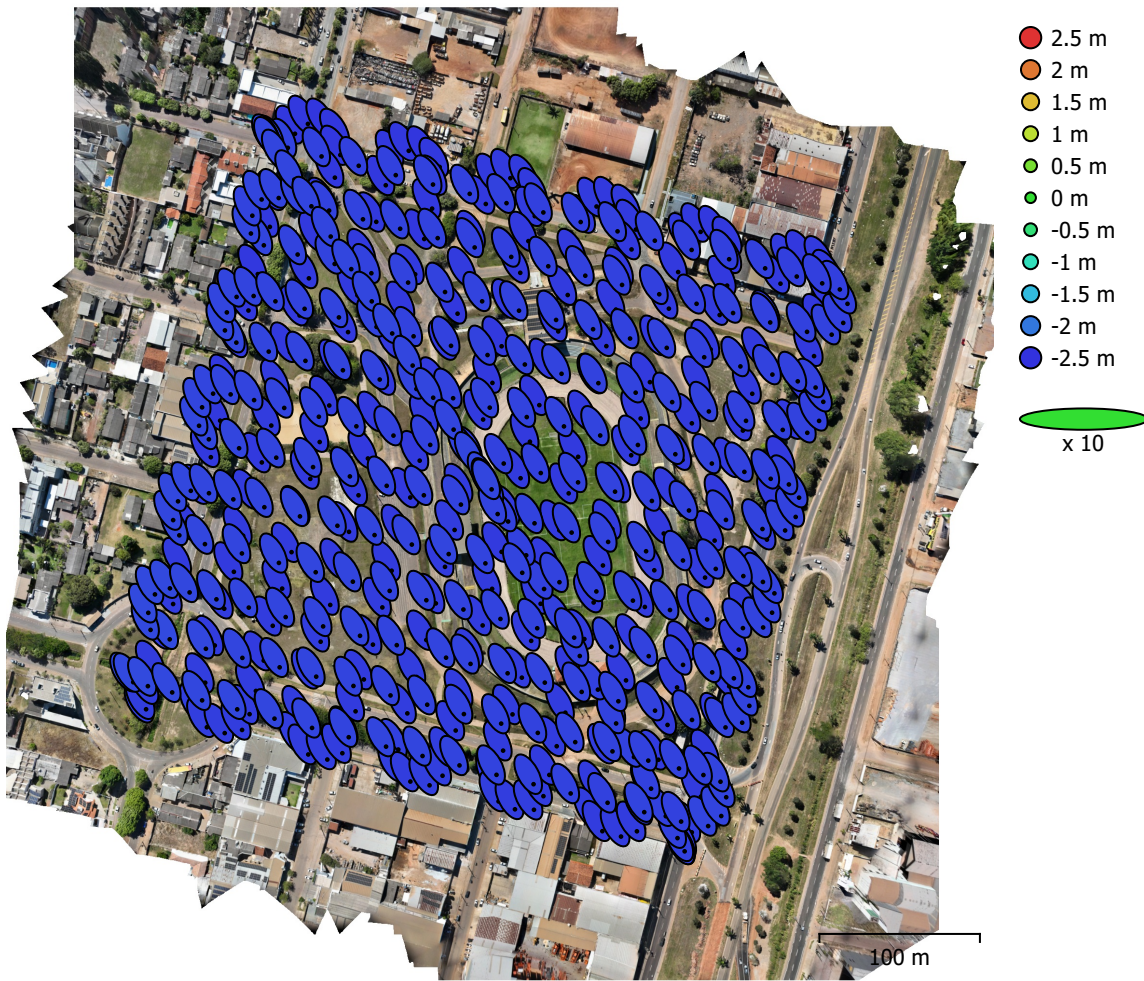


Fig. 3. Camera locations and error estimates.

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)
0.679755	1.22609	2.40679	1.40191	2.78532

Table 3. Average camera location error.

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

Ground Control Points

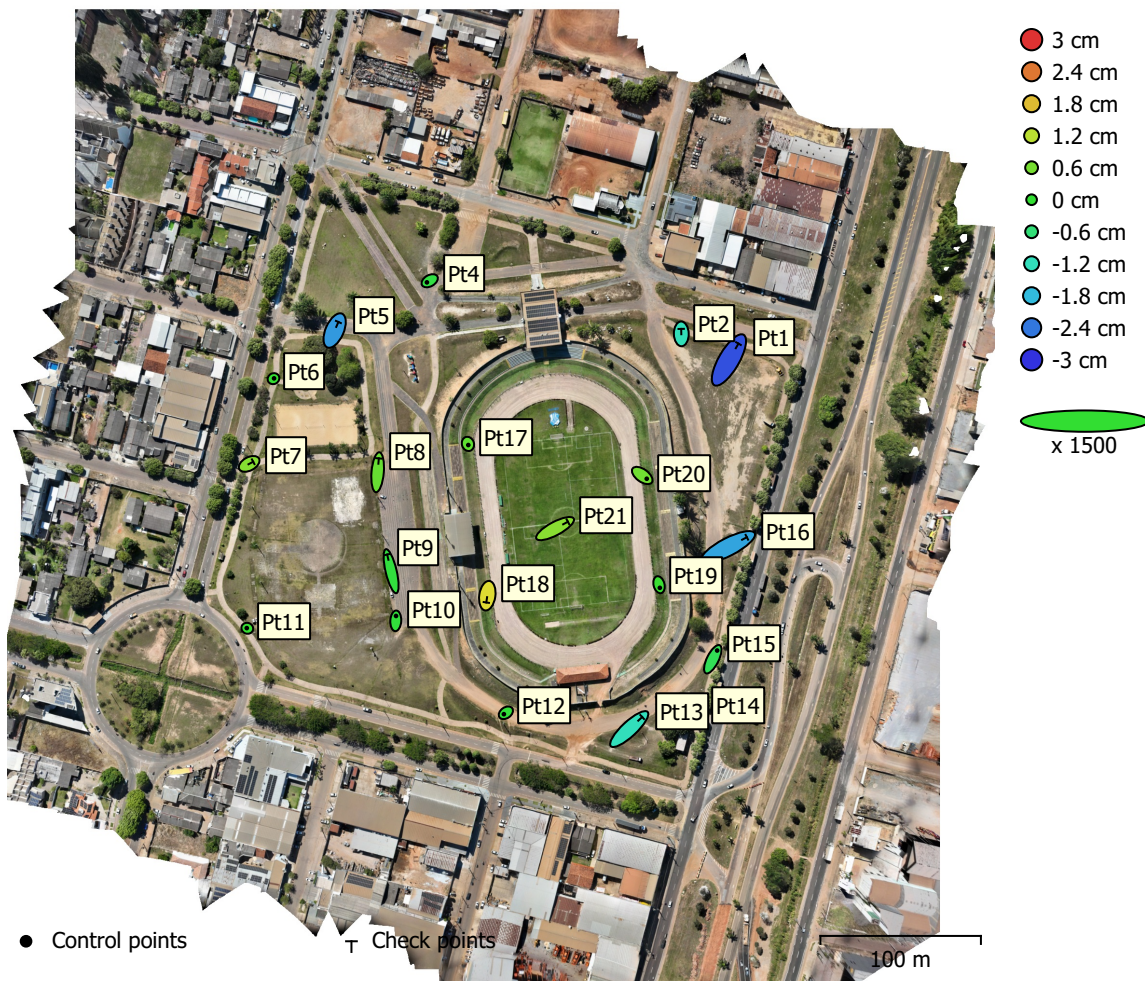


Fig. 4. GCP locations and error estimates.

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	0.192518	0.295735	0.251967	0.352877	0.433601

Table 4. Control points RMSE.

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

Count	X error (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total (cm)
10	0.752083	0.898406	1.49703	1.17165	1.90102

Table 5. Check points RMSE.

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

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
Pt4	-0.232852	-0.134886	-0.151246	0.30869	0.895 (69)
Pt6	0.0466615	0.0246745	0.0174735	0.0556008	0.673 (58)
Pt10	0.0211753	0.404022	-0.0709691	0.410754	0.833 (53)
Pt11	-0.0429949	0.0159621	0.0478052	0.0662472	0.626 (50)
Pt12	-0.16368	-0.115177	-0.0479765	0.205813	0.669 (55)
Pt14	0.0856053	0.051799	-0.213804	0.236058	0.656 (44)
Pt15	0.362689	0.725433	-0.307622	0.867426	0.745 (58)
Pt17	0.0301461	-0.0931305	0.397153	0.409038	0.655 (66)
Pt19	0.067626	-0.259705	0.072811	0.278068	0.708 (67)
Pt20	0.375224	-0.271989	0.546531	0.716567	0.760 (55)
Total	0.192518	0.295735	0.251967	0.433601	0.731

Table 6. Control points.
X - Easting, Y - Northing, Z - Altitude.

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
Pt1	0.791841	1.35987	-2.73969	3.15945	0.604 (68)
Pt2	-0.00935656	0.412256	-1.17235	1.24276	0.513 (64)
Pt5	0.312764	0.709037	-2.10355	2.24176	0.603 (64)
Pt7	0.333541	0.178219	0.730893	0.822931	0.523 (50)
Pt8	0.0973515	1.15185	0.457284	1.24312	0.506 (36)
Pt9	-0.32859	1.38317	-0.104216	1.42548	0.567 (59)
Pt13	1.07573	0.999495	-1.19999	1.89636	0.666 (40)
Pt16	1.5504	0.799299	-2.00491	2.6575	0.628 (58)
Pt18	-0.0835884	-0.562728	1.52314	1.62592	0.554 (70)
Pt21	1.06524	0.56849	0.756338	1.42477	0.470 (61)
Total	0.752083	0.898406	1.49703	1.90102	0.566

Table 7. Check points.
X - Easting, Y - Northing, Z - Altitude.

Digital Elevation Model

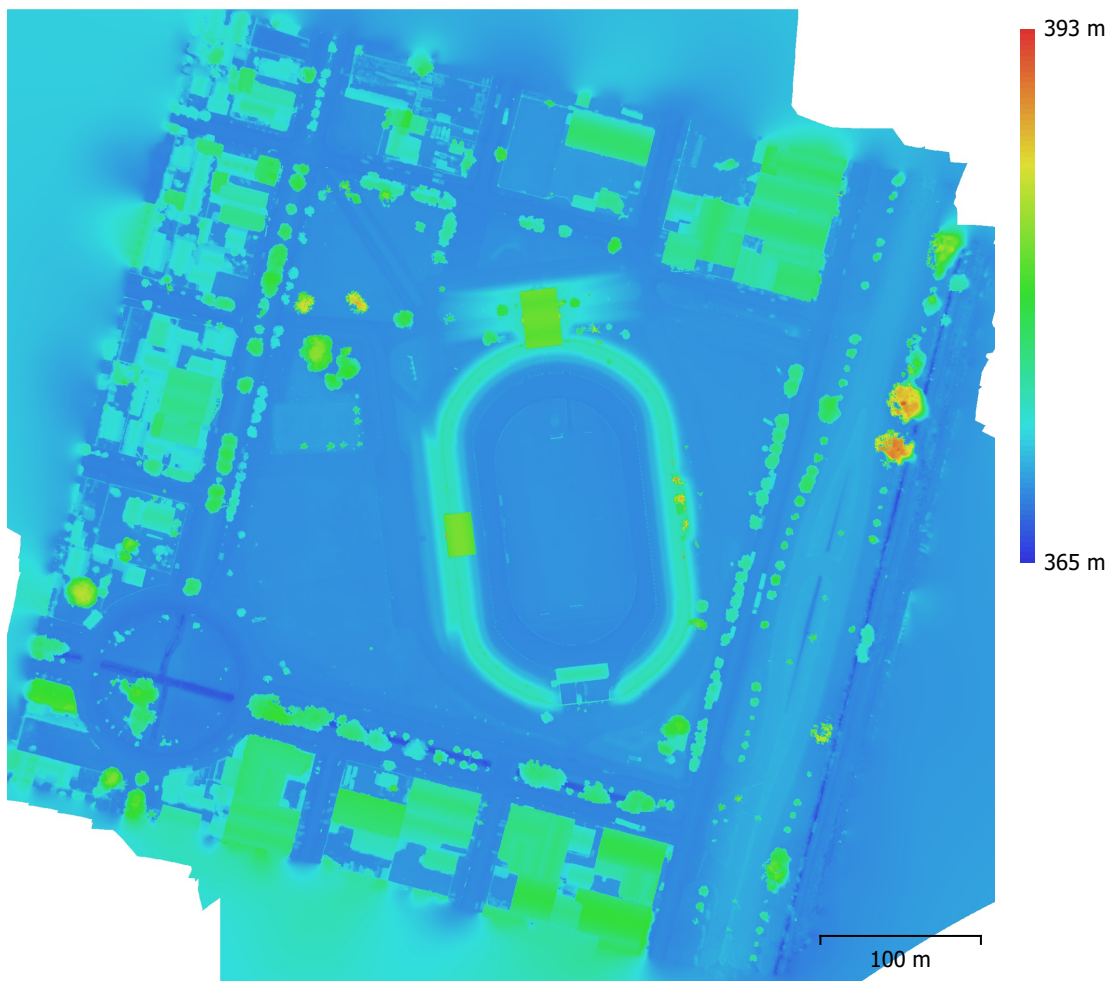


Fig. 5. Reconstructed digital elevation model.

Resolution: 6.37 cm/pix
Point density: 247 points/m²

Processing Parameters

General

Cameras	508
Aligned cameras	508
Markers	20
Coordinate system	SIRGAS 2000 / UTM zone 21S (EPSG::31981)
Rotation angles	Omega, Phi, Kappa

Tie Points

Points	4,759,173 of 5,393,621
RMS reprojection error	0.240001 (1.00387 pix)
Max reprojection error	1.00405 (75.5472 pix)
Mean key point size	3.95035 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	5.20362

Alignment parameters

Accuracy	High
Generic preselection	Yes
Reference preselection	Source
Key point limit	125,000
Key point limit per Mpx	1,000
Tie point limit	150,000
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Exclude corners	No
Matching time	2 hours 0 minutes
Matching memory usage	3.47 GB
Alignment time	39 minutes 14 seconds
Alignment memory usage	6.53 GB

Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	No
Exclude corners	No
Optimization time	1 minutes 46 seconds
Date created	2025:07:04 23:46:54
Software version	2.1.2.18315
File size	552.69 MB

Point Cloud

Points	95,164,539
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Point attributes

Color	3 bands, uint8
Normal	

Point classes

Created (never classified)	95,164,539
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Depth maps generation parameters

Quality	High
Filtering mode	Aggressive
Max neighbors	16
Processing time	1 hours 28 minutes
Memory usage	7.76 GB

Point cloud generation parameters

Processing time	2 hours 37 minutes
Memory usage	13.93 GB
Date created	2025:07:05 04:58:12
Software version	2.1.2.18315
File size	1.36 GB

DEM

Size	9,659 x 9,509
Coordinate system	SIRGAS 2000 / UTM zone 21S (EPSG::31981)

Reconstruction parameters

Source data	Point cloud
Interpolation	Enabled
Processing time	52 seconds
Memory usage	309.48 MB
Date created	2025:07:06 06:53:46
Software version	2.1.2.18315
File size	292.03 MB

Orthomosaic

Size	19,317 x 19,017
Coordinate system	SIRGAS 2000 / UTM zone 21S (EPSG::31981)
Colors	3 bands, uint8

Reconstruction parameters

Blending mode	Mosaic
Surface	DEM
Enable hole filling	Yes
Enable ghosting filter	No
Processing time	10 minutes 1 seconds
Memory usage	2.38 GB
Date created	2025:07:06 07:00:12
Software version	2.1.2.18315
File size	4.97 GB

System

Software name	Agisoft Metashape Professional
Software version	2.1.2 build 18315
OS	Windows 64 bit
RAM	63.81 GB
CPU	11th Gen Intel(R) Core(TM) i7-11800H @ 2.30GHz
GPU(s)	NVIDIA GeForce RTX 3060 Laptop GPU

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