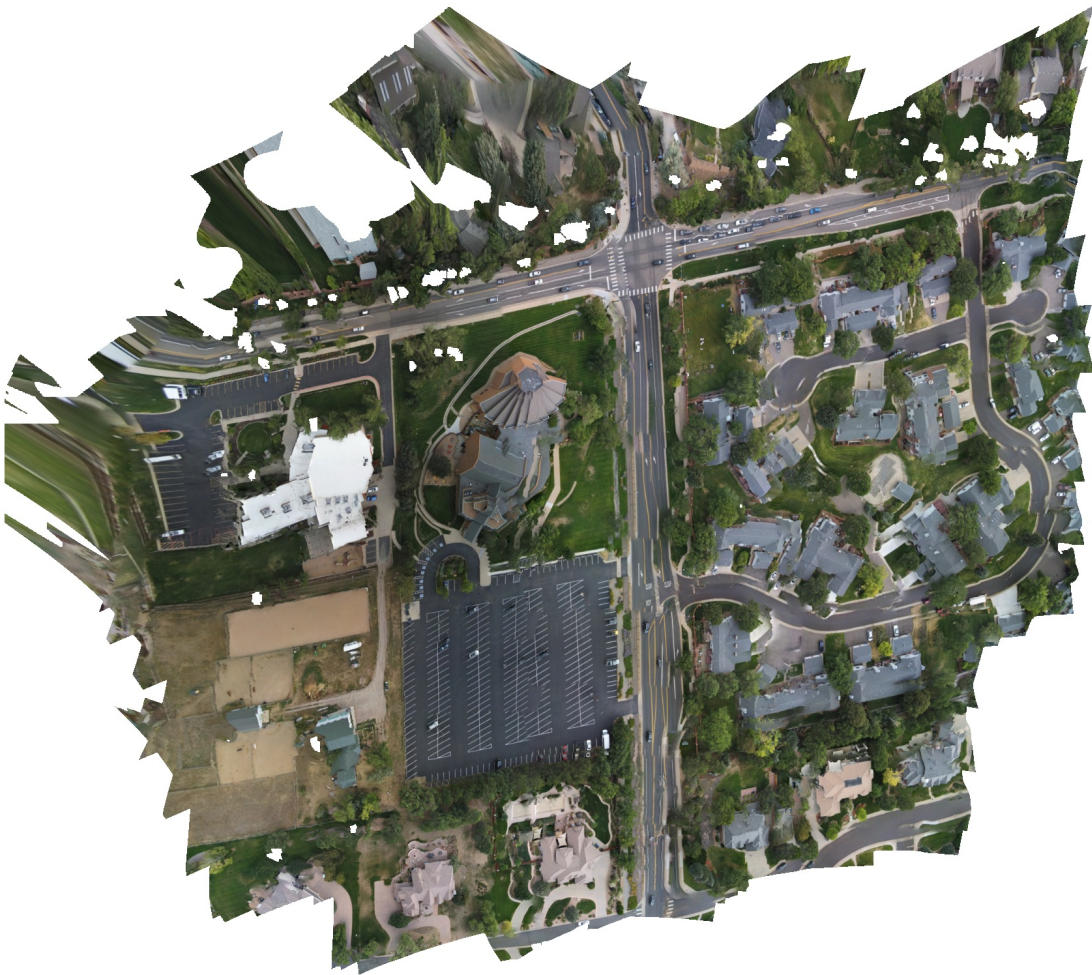


Agisoft Metashape photogrammetry by Bhavishya

Processing Report

01 December 2022



Survey Data

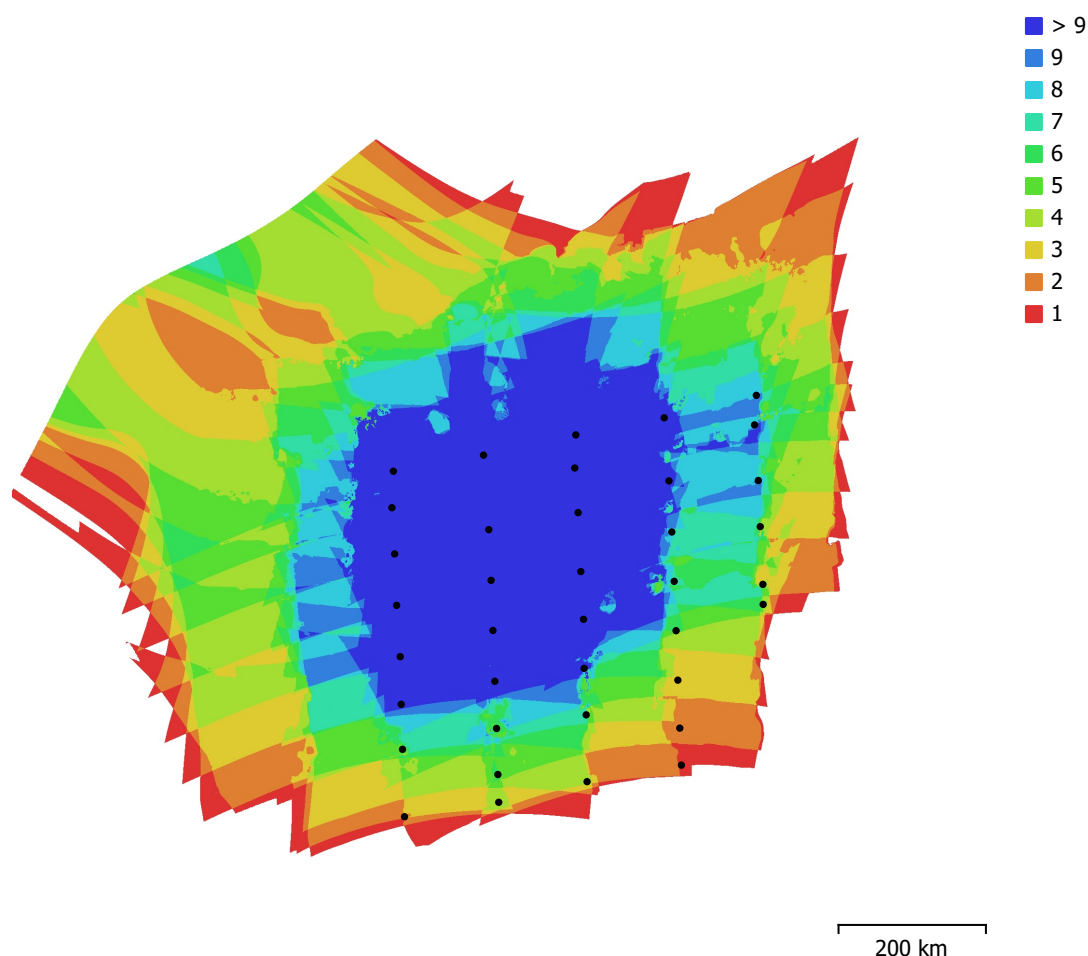


Fig. 1. Camera locations and image overlap.

Number of images:	38	Camera stations:	38
Flying altitude:	228 km	Tie points:	48,709
Ground resolution:	60.7 m/pix	Projections:	130,576
Coverage area:	7.85e+05 km ²	Reprojection error:	38.4 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
Anafi (4mm)	5344 x 4016	4 mm	1.12 x 1.12 μm	No

Table 1. Cameras.

Camera Calibration

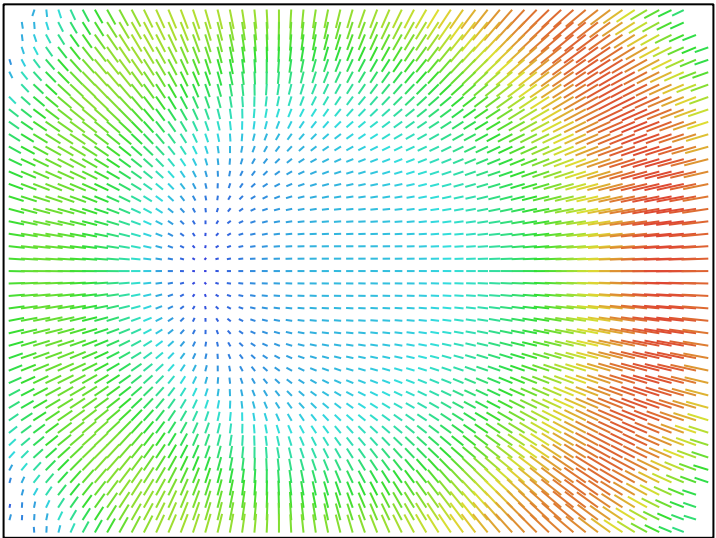


Fig. 2. Image residuals for Anafi (4mm). 142 pix

Anafi (4mm)

38 images

Type	Resolution	Focal Length	Pixel Size
Fisheye	5344 x 4016	4 mm	1.12 x 1.12 μm
F:	3571.43		
Cx:	0	B1:	0
Cy:	0	B2:	0
K1:	0	P1:	0
K2:	0	P2:	0
K3:	0	P3:	0
K4:	0	P4:	0

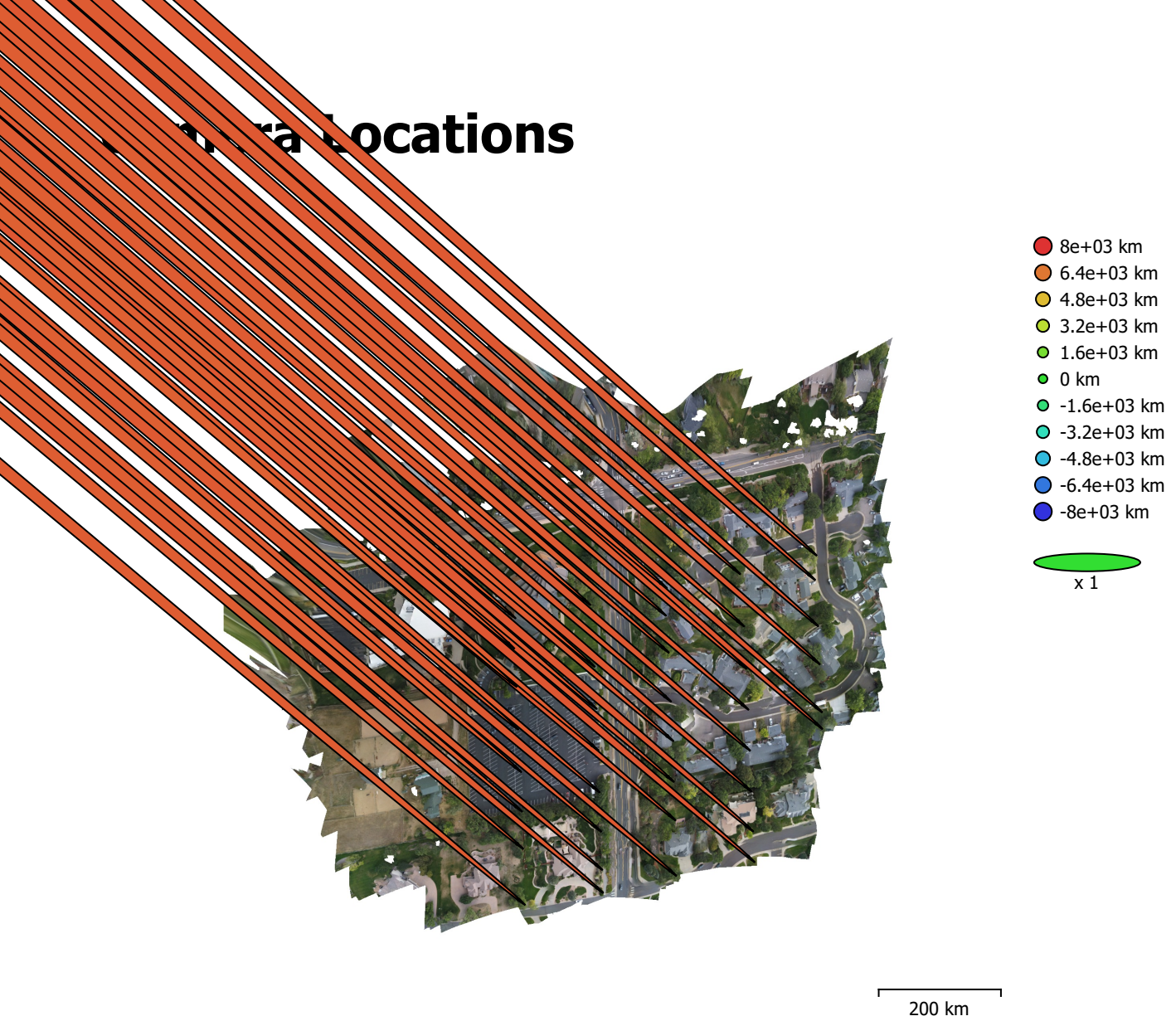


Fig. 3. Camera locations and error estimates.

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 (km)	Y error (km)	Z error (km)	XY error (km)	Total error (km)
4770.54	4078.41	7050.56	6276.26	9439.37

Table 2. Average camera location error.

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

Ground Control Points

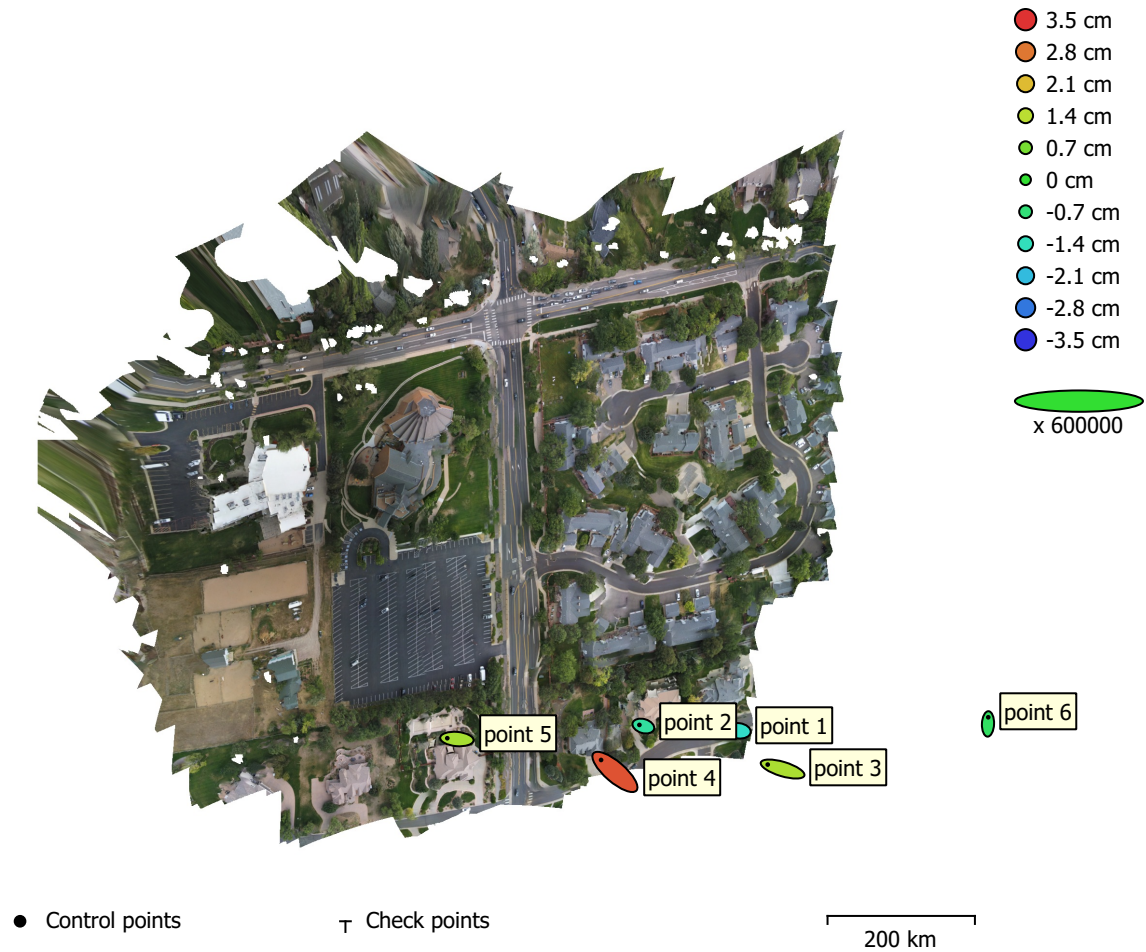


Fig. 4. GCP locations and error estimates.

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)
6	4.28595	2.66887	1.67463	5.04899	5.31946

Table 3. Control points RMSE.

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

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
point 1	-1.93726	0.243889	-1.53183	2.48172	8454.040 (12)
point 2	-1.78779	0.518969	-1.11178	2.16831	8964.463 (10)
point 3	-6.72944	2.02	1.23178	7.13324	8933.412 (13)
point 4	-6.25923	5.40155	3.17646	8.8569	9711.649 (8)
point 5	-4.33473	0.366944	1.18361	4.50837	8380.802 (4)
point 6	0.117632	3.00279	-0.485474	3.04405	8659.641 (11)
Total	4.28595	2.66887	1.67463	5.31946	8865.961

Table 4. Control points.
X - Longitude, Y - Latitude, Z - Altitude.

Digital Elevation Model

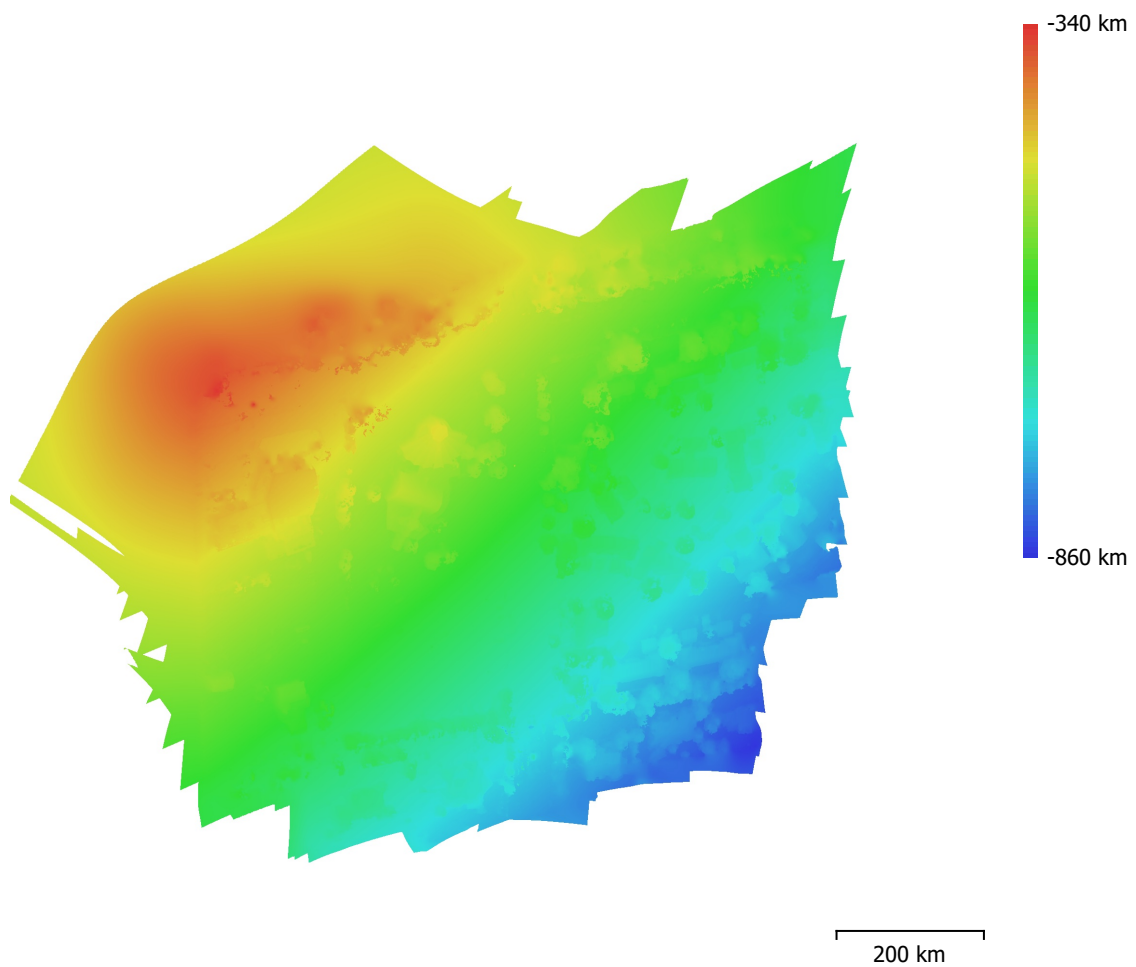


Fig. 5. Reconstructed digital elevation model.

Resolution: 266 m/pix
Point density: 14.1 points/km²

Processing Parameters

General

Cameras	38
Aligned cameras	38
Markers	6
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll

Point Cloud

Points	48,709 of 55,223
RMS reprojection error	11.685 (38.4131 pix)
Max reprojection error	41.8895 (81.1426 pix)
Mean key point size	5.9633 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.75996

Alignment parameters

Accuracy	High
Generic preselection	Yes
Reference preselection	No
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	No
Matching time	1 minutes 38 seconds
Matching memory usage	805.80 MB
Alignment time	31 seconds
Alignment memory usage	81.05 MB
Date created	2022:11:30 10:39:56
Software version	1.8.4.14856
File size	3.60 MB

Depth Maps

Count	38
Depth maps generation parameters	
Quality	Medium
Filtering mode	Mild
Max neighbors	16
Processing time	55 minutes 19 seconds
File size	77.47 MB

Dense Point Cloud

Points	11,460,454
Point colors	3 bands, uint8
Depth maps generation parameters	
Quality	Medium
Filtering mode	Mild
Max neighbors	16
Processing time	55 minutes 19 seconds
Dense cloud generation parameters	
Processing time	51 seconds
Memory usage	1.99 GB

Date created	2022:11:30 19:48:02
Software version	1.8.3.14331
File size	152.01 MB
Model	
Faces	1,226,719
Vertices	613,811
Vertex colors	3 bands, uint8
Texture	4,296 x 4,296, 4 bands, uint8
Depth maps generation parameters	
Quality	Medium
Filtering mode	Mild
Max neighbors	16
Processing time	55 minutes 19 seconds
Reconstruction parameters	
Surface type	Arbitrary
Source data	Dense cloud
Interpolation	Enabled
Strict volumetric masks	No
Processing time	10 minutes 13 seconds
Memory usage	2.80 GB
Texturing parameters	
Mapping mode	Generic
Blending mode	Mosaic
Texture size	4,296
Enable hole filling	Yes
Enable ghosting filter	Yes
UV mapping time	3 minutes 5 seconds
UV mapping memory usage	2.50 GB
Blending time	1 minutes 26 seconds
Blending memory usage	2.86 GB
Date created	2022:11:30 13:25:00
Software version	1.8.4.14856
File size	78.44 MB
Tiled Model	
Texture	3 bands, uint8
Depth maps generation parameters	
Quality	Medium
Filtering mode	Mild
Max neighbors	16
Processing time	55 minutes 19 seconds
Reconstruction parameters	
Source data	Dense cloud
Tile size	256
Face count	Medium
Enable ghosting filter	No
Processing time	27 minutes 56 seconds
Memory usage	3.89 GB
Date created	2022:11:30 17:34:21
Software version	1.8.3.14331
File size	186.87 MB
DEM	
Size	6,750 x 6,652
Coordinate system	NAD83(HARN) (EPSG::4152)
Reconstruction parameters	
Source data	Dense cloud
Interpolation	Enabled

Processing time	14 seconds
Memory usage	265.75 MB
Date created	2022:12:01 05:05:40
Software version	1.8.3.14331
File size	56.46 MB
Orthomosaic	
Size	18,367 x 16,168
Coordinate system	NAD83(HARN) (EPSG::4152)
Colors	3 bands, uint8
Reconstruction parameters	
Blending mode	Mosaic
Surface	DEM
Enable hole filling	Yes
Enable ghosting filter	No
Processing time	3 minutes 5 seconds
Memory usage	1.86 GB
Date created	2022:12:01 05:08:21
Software version	1.8.3.14331
File size	795.68 MB
System	
Software name	Agisoft Metashape Professional
Software version	1.8.3 build 14331
OS	Windows 64 bit
RAM	7.78 GB
CPU	11th Gen Intel(R) Core(TM) i5-1135G7 @ 2.40GHz
GPU(s)	Intel(R) Iris(R) Xe Graphics