

# Firkanten

Processing Report  
31 January 2022



# Survey Data

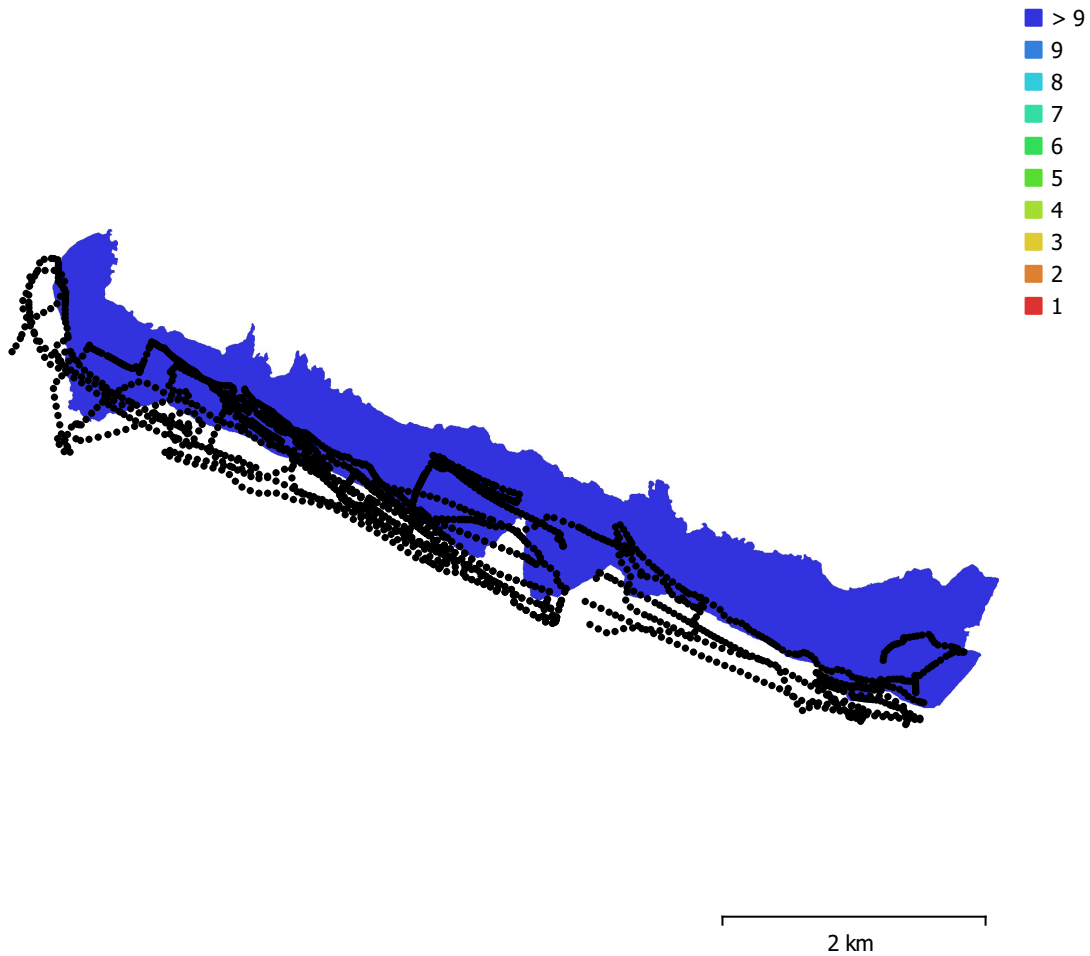


Fig. 1. Camera locations and image overlap.

Number of images:	2,258	Camera stations:	2,258
Flying altitude:	295 m	Tie points:	518,053
Ground resolution:	7.02 cm/pix	Projections:	4,813,800
Coverage area:	5.46 km <sup>2</sup>	Reprojection error:	1.31 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
L1D-20c (10.26mm)	5472 x 3648	10.26 mm	2.41 x 2.41 $\mu\text{m}$	No

Table 1. Cameras.

# Camera Calibration

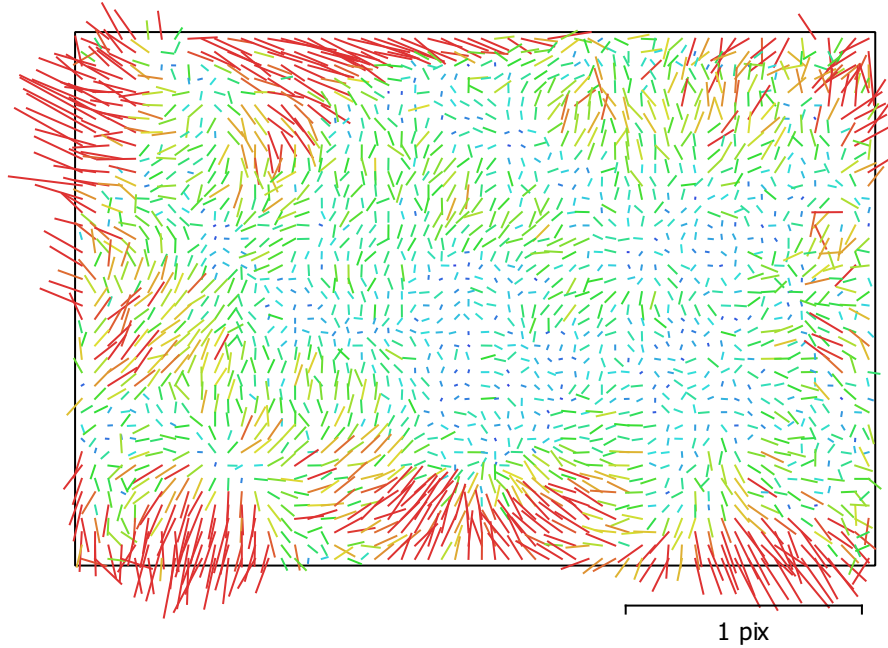


Fig. 2. Image residuals for L1D-20c (10.26mm).

## L1D-20c (10.26mm)

2258 images

Type	Resolution	Focal Length	Pixel Size
<b>Frame</b>	<b>5472 x 3648</b>	<b>10.26 mm</b>	<b>2.41 x 2.41 <math>\mu</math>m</b>

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	K4	P1	P2
<b>F</b>	<b>4349.98</b>	0.052	1.00	0.04	0.03	-0.59	-0.10	-0.11	0.13	-0.12	0.11	0.00	0.06
<b>Cx</b>	<b>0.720578</b>	0.064		1.00	-0.03	-0.02	0.40	0.01	-0.00	0.00	-0.00	0.91	0.04
<b>Cy</b>	<b>-44.215</b>	0.076			1.00	-0.62	-0.08	-0.01	-0.01	0.01	-0.02	0.02	0.58
<b>B1</b>	<b>-3.14639</b>	0.051				1.00	0.05	-0.01	0.01	-0.01	0.01	-0.00	-0.20
<b>B2</b>	<b>-20.5178</b>	0.04					1.00	0.00	-0.00	0.00	-0.00	0.23	-0.01
<b>K1</b>	<b>0.00430827</b>	4.7e-05						1.00	-0.97	0.92	-0.87	0.01	-0.03
<b>K2</b>	<b>0.0120942</b>	0.00033							1.00	-0.99	0.96	-0.01	-0.01
<b>K3</b>	<b>0.0251514</b>	0.00093								1.00	-0.99	0.01	0.02
<b>K4</b>	<b>-0.0717209</b>	0.00088									1.00	-0.00	-0.02
<b>P1</b>	<b>0.00117641</b>	4e-06										1.00	0.04
<b>P2</b>	<b>-0.00293021</b>	2.6e-06											1.00

Table 2. Calibration coefficients and correlation matrix.

# Camera Locations

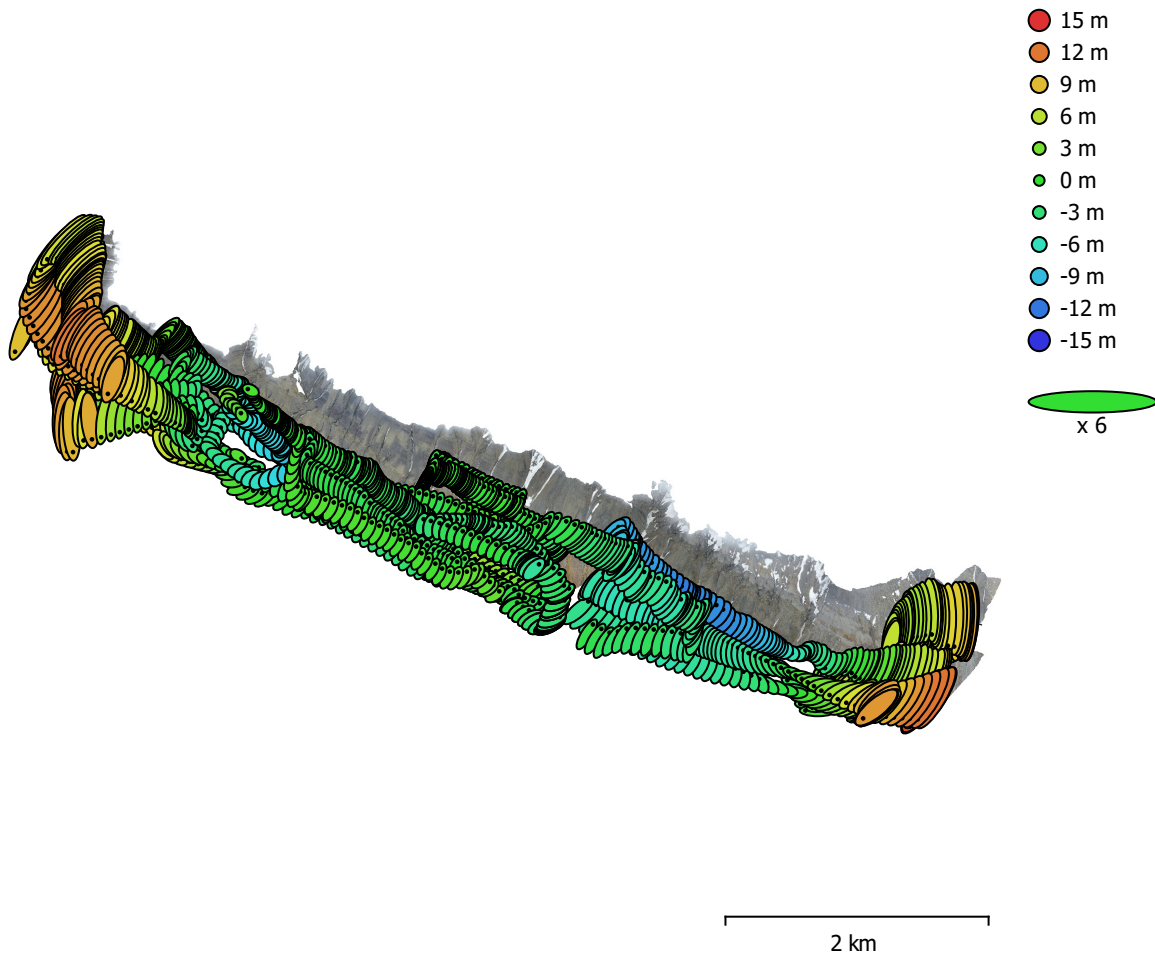


Fig. 3. Camera locations and error estimates.

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 (m)	Y error (m)	Z error (m)	XY error (m)	Total error (m)
14.0585	23.9274	4.49301	27.7517	28.1131

Table 3. Average camera location error.

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

# Digital Elevation Model

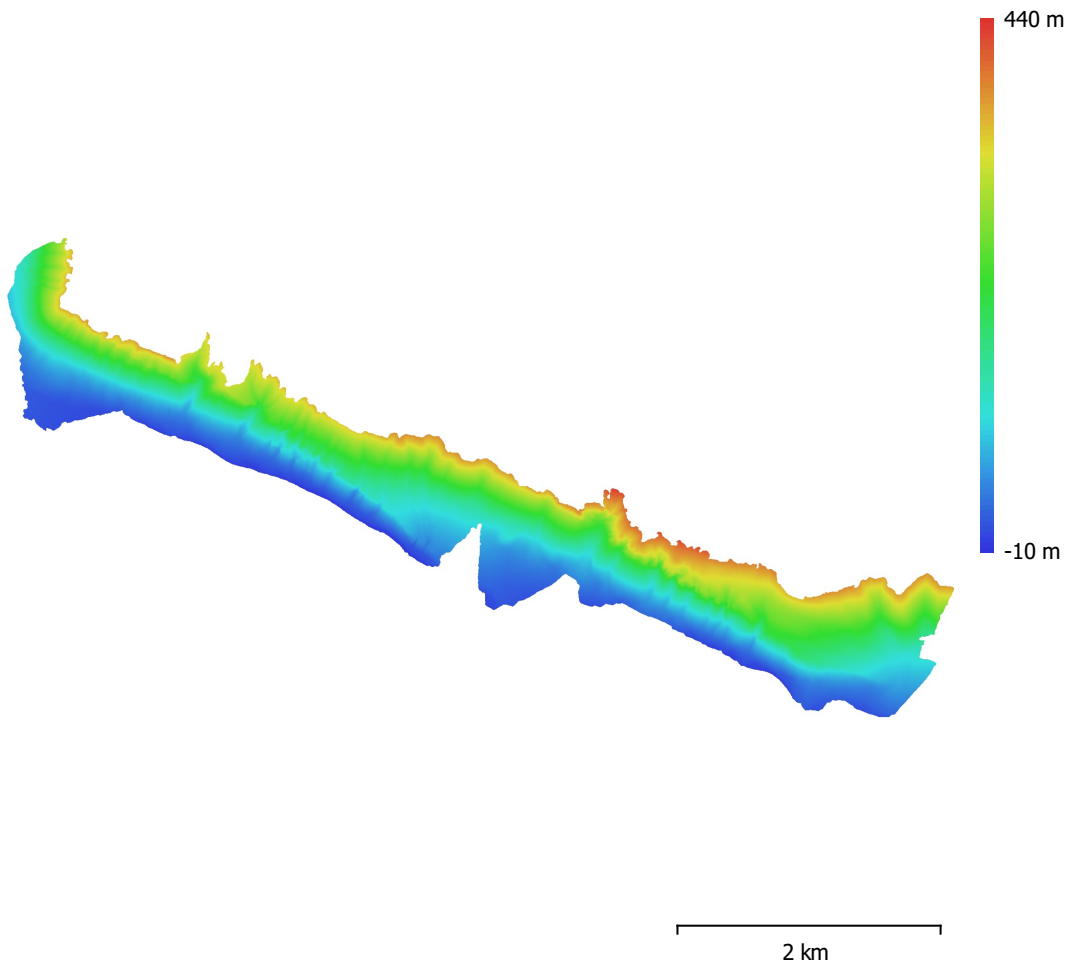


Fig. 4. Reconstructed digital elevation model.

Resolution: 31.8 cm/pix  
Point density: 9.9 points/m<sup>2</sup>

# Processing Parameters

## General

Cameras	2258
Aligned cameras	2258
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll

## Point Cloud

Points	518,053 of 895,815
RMS reprojection error	0.770747 (1.31444 pix)
Max reprojection error	2.49032 (81.2179 pix)
Mean key point size	1.50704 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	14.8104

## Alignment parameters

Accuracy	Highest
Generic preselection	No
Reference preselection	No
Key point limit	40,000
Tie point limit	4,000
Exclude stationary tie points	No
Guided image matching	No
Adaptive camera model fitting	Yes
Matching time	2 days 11 hours
Matching memory usage	7.83 GB
Alignment time	1 hours 14 minutes
Alignment memory usage	2.67 GB
Software version	1.7.2.12040
File size	217.16 MB

## Depth Maps

Count	2258
<b>Depth maps generation parameters</b>	
Quality	Medium
Filtering mode	Mild
Processing time	1 hours 59 minutes
Memory usage	2.34 GB
Software version	1.7.2.12040
File size	3.74 GB

## Dense Point Cloud

Points	83,409,216
Point colors	3 bands, uint8

## Depth maps generation parameters

Quality	Medium
Filtering mode	Mild
Processing time	1 hours 59 minutes
Memory usage	2.34 GB

## Dense cloud generation parameters

Processing time	5 hours 7 minutes
Memory usage	11.55 GB
Software version	1.7.2.12040
File size	1.78 GB

**Model**

Faces	5,558,556
Vertices	2,789,778
Vertex colors	3 bands, uint8
Texture	4,096 x 4,096 x 10, 4 bands, uint8

**Depth maps generation parameters**

Quality	Medium
Filtering mode	Mild
Processing time	1 hours 59 minutes
Memory usage	2.34 GB

**Reconstruction parameters**

Surface type	Arbitrary
Source data	Dense cloud
Interpolation	Enabled
Strict volumetric masks	No
Processing time	25 minutes 8 seconds
Memory usage	35.08 GB

**Texturing parameters**

Mapping mode	Generic
Blending mode	Mosaic
Texture size	4,096
Enable hole filling	Yes
Enable ghosting filter	Yes
UV mapping time	3 minutes 36 seconds
UV mapping memory usage	3.68 GB
Blending time	2 hours 59 minutes
Blending memory usage	6.91 GB
Software version	1.7.2.12040
File size	496.23 MB

**Tiled Model**

Texture	3 bands, uint8
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**Depth maps generation parameters**

Quality	Medium
Filtering mode	Mild
Processing time	1 hours 59 minutes
Memory usage	2.34 GB

**Reconstruction parameters**

Source data	Dense cloud
Tile size	256
Face count	Medium
Enable ghosting filter	No
Processing time	7 hours 29 minutes
Memory usage	4.91 GB
Software version	1.7.2.12040
File size	1.86 GB

**System**

Software name	Agisoft Metashape Professional
Software version	1.7.2 build 12040
OS	Windows 64 bit
RAM	127.78 GB
CPU	Intel(R) Core(TM) i9-9900K CPU @ 3.60GHz
GPU(s)	GeForce RTX 2080