

# Kolosseum

Processing Report  
28 January 2022



# Survey Data

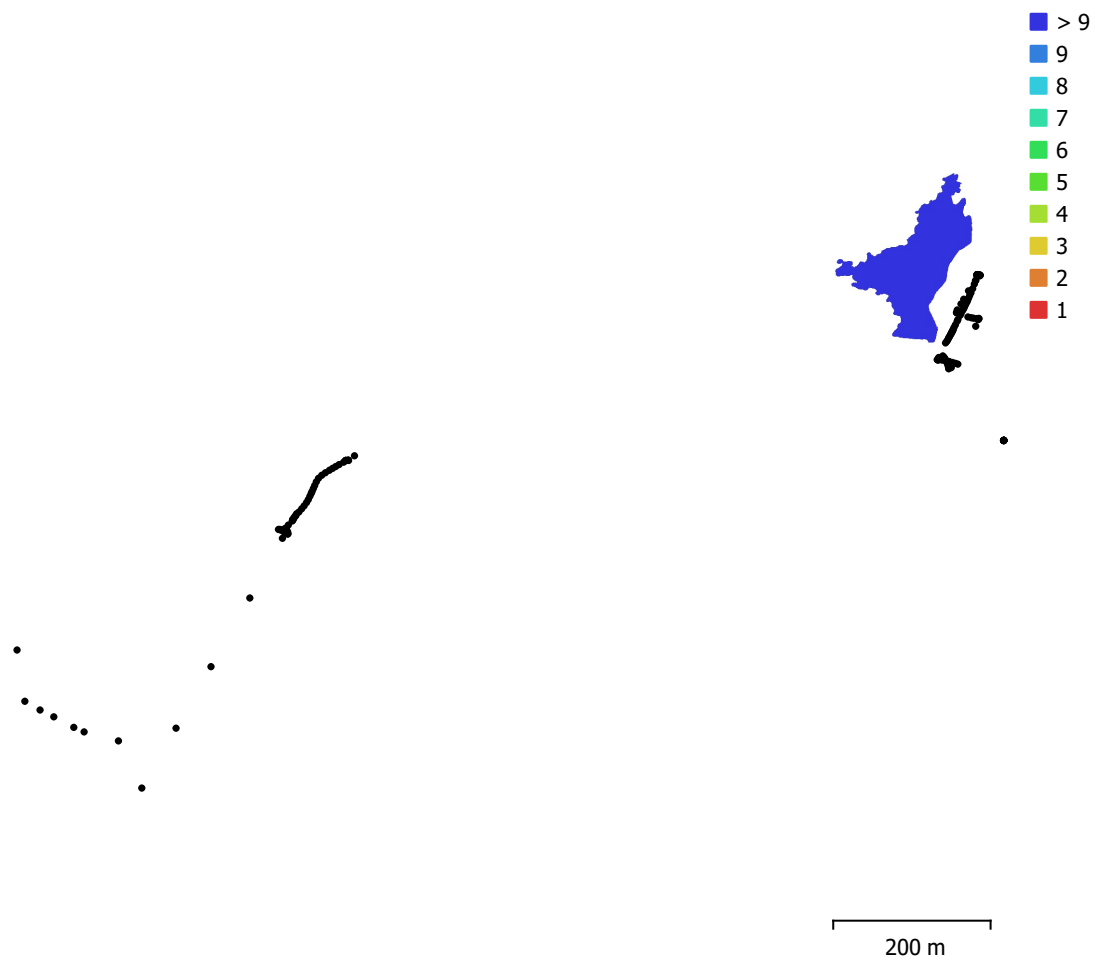


Fig. 1. Camera locations and image overlap.

Number of images:	171	Camera stations:	170
Flying altitude:	181 m	Tie points:	66,581
Ground resolution:	1.97 cm/pix	Projections:	287,709
Coverage area:	0.0145 km <sup>2</sup>	Reprojection error:	0.535 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
FC2103 (4.5mm)	4056 x 3040	4.5 mm	1.6 x 1.6 $\mu$ m	No

Table 1. Cameras.

# Camera Calibration

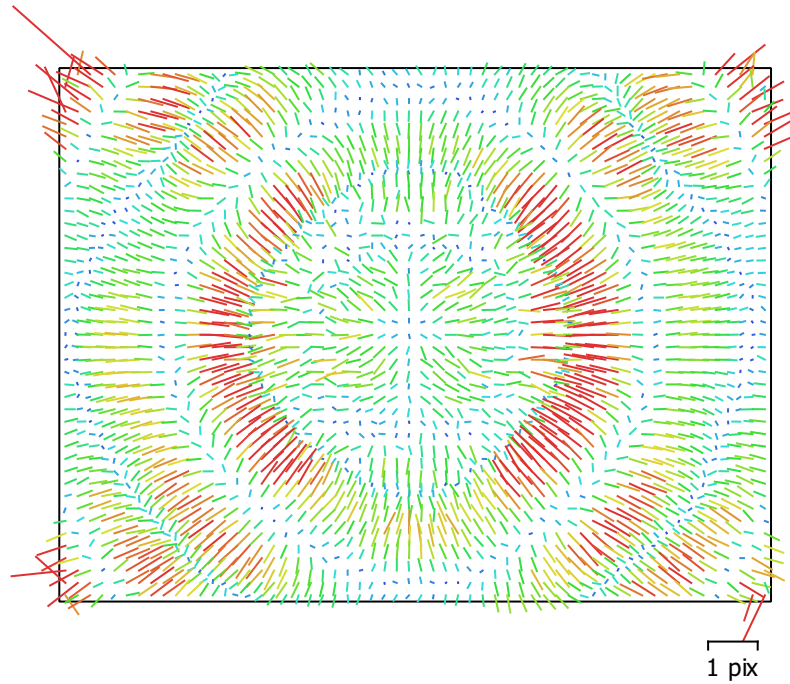


Fig. 2. Image residuals for FC2103 (4.5mm).

## FC2103 (4.5mm)

171 images

Type  
Frame

Resolution  
**4056 x 3040**

Focal Length  
**4.5 mm**

Pixel Size  
**1.6 x 1.6  $\mu$ m**

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
<b>F</b>	<b>2953.5</b>	0.047	1.00	-0.04	-0.23	-0.02	-0.01	0.03	-0.04	0.11
<b>Cx</b>	<b>-24.778</b>	0.04		1.00	-0.01	0.02	-0.01	0.01	0.72	0.01
<b>Cy</b>	<b>3.90707</b>	0.05			1.00	-0.05	0.02	-0.02	0.02	0.32
<b>K1</b>	<b>0.160684</b>	5e-05				1.00	-0.97	0.92	0.01	-0.04
<b>K2</b>	<b>-0.519333</b>	0.00015					1.00	-0.98	-0.01	-0.03
<b>K3</b>	<b>0.346009</b>	0.00014						1.00	0.00	0.04
<b>P1</b>	<b>-0.000868737</b>	3.4e-06							1.00	0.01
<b>P2</b>	<b>-0.00045842</b>	4.1e-06								1.00

Table 2. Calibration coefficients and correlation matrix.

# Camera Locations

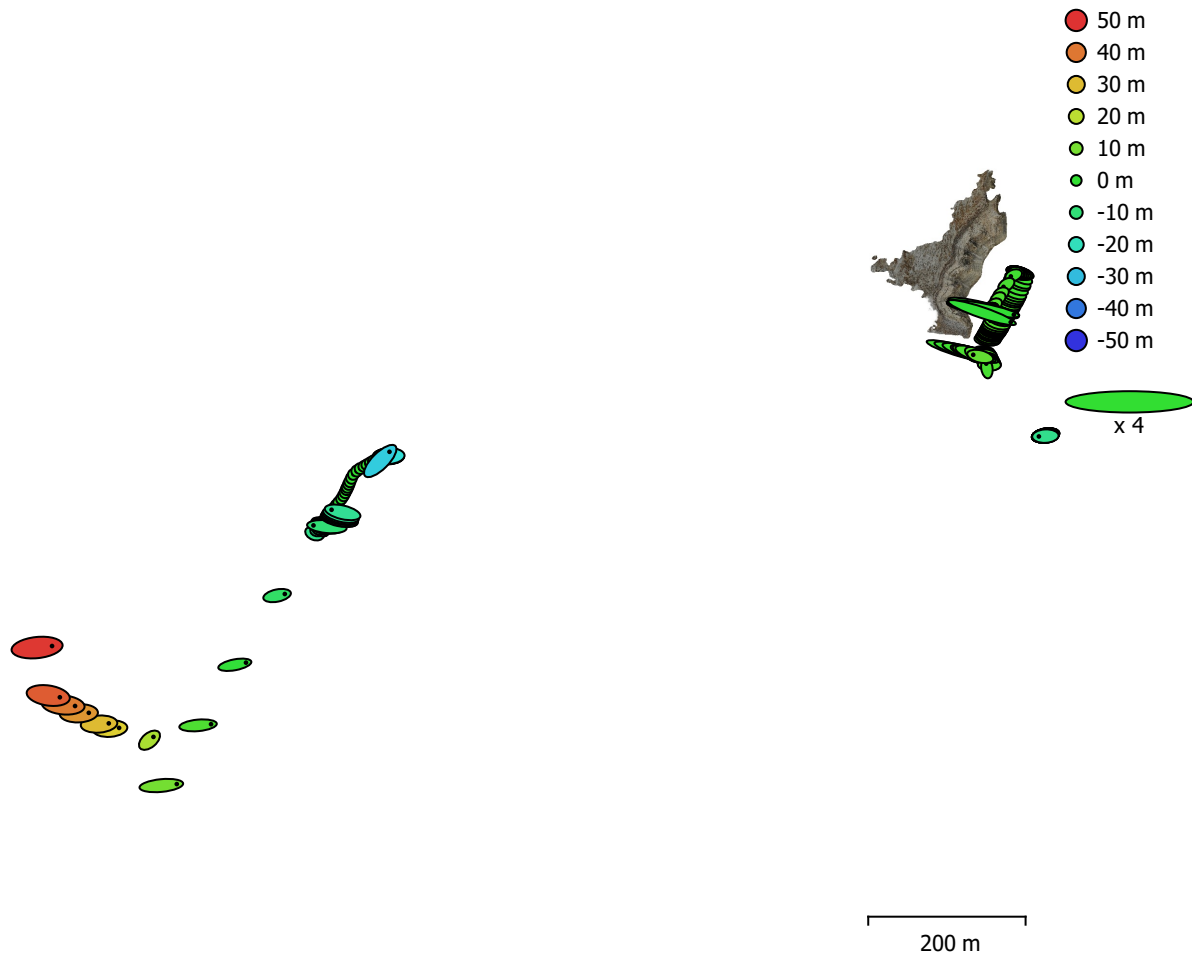


Fig. 3. Camera locations and error estimates.

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)
6.52557	1.65652	10.8188	6.73254	12.7426

Table 3. Average camera location error.

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

# Digital Elevation Model

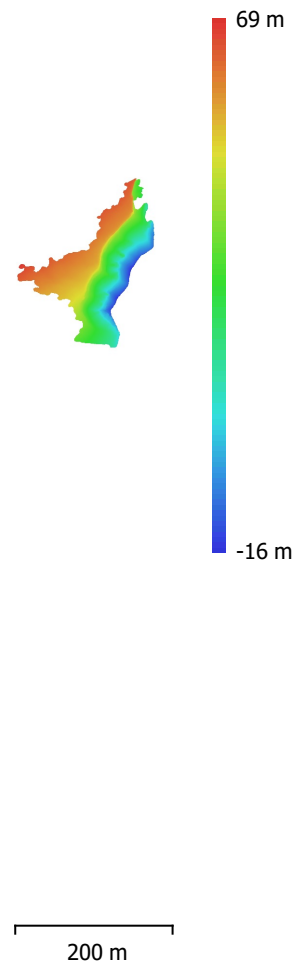


Fig. 4. Reconstructed digital elevation model.

Resolution: 7.89 cm/pix  
Point density: 161 points/m<sup>2</sup>

# Processing Parameters

## General

Cameras	171
Aligned cameras	170
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll

## Point Cloud

Points	66,581 of 858,747
RMS reprojection error	0.33765 (0.534949 pix)
Max reprojection error	0.699988 (2.87889 pix)
Mean key point size	1.59085 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	3.30131

## Alignment parameters

Accuracy	Highest
Generic preselection	Yes
Reference preselection	No
Key point limit	60,000
Tie point limit	0
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Matching time	7 minutes 55 seconds
Matching memory usage	1.20 GB
Alignment time	5 minutes 55 seconds
Alignment memory usage	314.74 MB

## Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	No
Optimization time	21 seconds
Software version	1.7.2.12040
File size	47.26 MB

## Depth Maps

Count	78
<b>Depth maps generation parameters</b>	
Quality	Medium
Filtering mode	Mild
Processing time	2 minutes 49 seconds
File size	78.63 MB

## Dense Point Cloud

Points	3,285,939
Point colors	3 bands, uint8
<b>Depth maps generation parameters</b>	
Quality	Medium
Filtering mode	Mild
Processing time	2 minutes 49 seconds
<b>Dense cloud generation parameters</b>	
Processing time	3 minutes 58 seconds
Software version	1.7.2.12040
File size	84.27 MB

**Model**

Faces	208,556
Vertices	105,831
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	2 minutes 49 seconds

**Reconstruction parameters**

Surface type	Arbitrary
Source data	Dense cloud
Interpolation	Enabled
Strict volumetric masks	No
Processing time	2 minutes 25 seconds
Memory usage	1.60 GB

**Texturing parameters**

Mapping mode	Generic
Blending mode	Mosaic
Texture size	4,096
Enable hole filling	Yes
Enable ghosting filter	Yes
UV mapping time	2 minutes 8 seconds
UV mapping memory usage	3.85 GB
Blending time	3 minutes 33 seconds
Blending memory usage	3.98 GB
Software version	1.7.2.12040
File size	158.07 MB

**Tiled Model**

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

Quality	Medium
Filtering mode	Mild
Processing time	2 minutes 49 seconds

**Reconstruction parameters**

Source data	Dense cloud
Tile size	256
Face count	Medium
Enable ghosting filter	No
Processing time	28 minutes 48 seconds
Memory usage	2.15 GB
Software version	1.7.2.12040
File size	91.64 MB

**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