

Quality Report



Generated with Pix4Dmapper version 4.3.33



Important: Click on the different icons for:



Help to analyze the results in the Quality Report



Additional information about the sections



Click [here](#) for additional tips to analyze the Quality Report

Summary



Project	Flatstolprosjekt
Processed	2019-05-06 17:09:44
Camera Model Name(s)	FC330_3.6_4000x3000 (RGB)
Average Ground Sampling Distance (GSD)	2.16 cm / 0.85 in

Quality Check



Images	median of 70517 keypoints per image	
Dataset	233 out of 236 images calibrated (98%), all images enabled	
Camera Optimization	3.44% relative difference between initial and optimized internal camera parameters	
Matching	median of 25352.5 matches per calibrated image	
Georeferencing	yes, no 3D GCP	

Calibration Details



Number of Calibrated Images	233 out of 236
Number of Geolocated Images	236 out of 236



Initial Image Positions



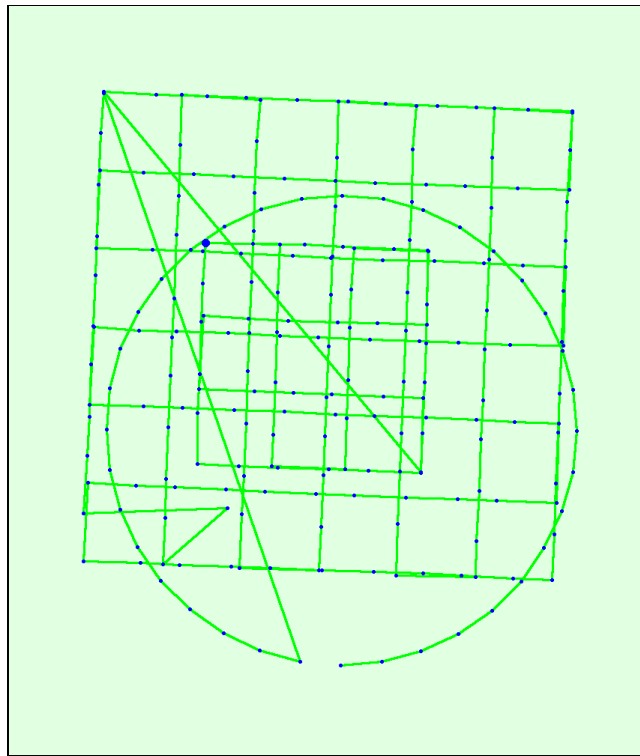


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

 **Computed Image/GCPs/Manual Tie Points Positions**



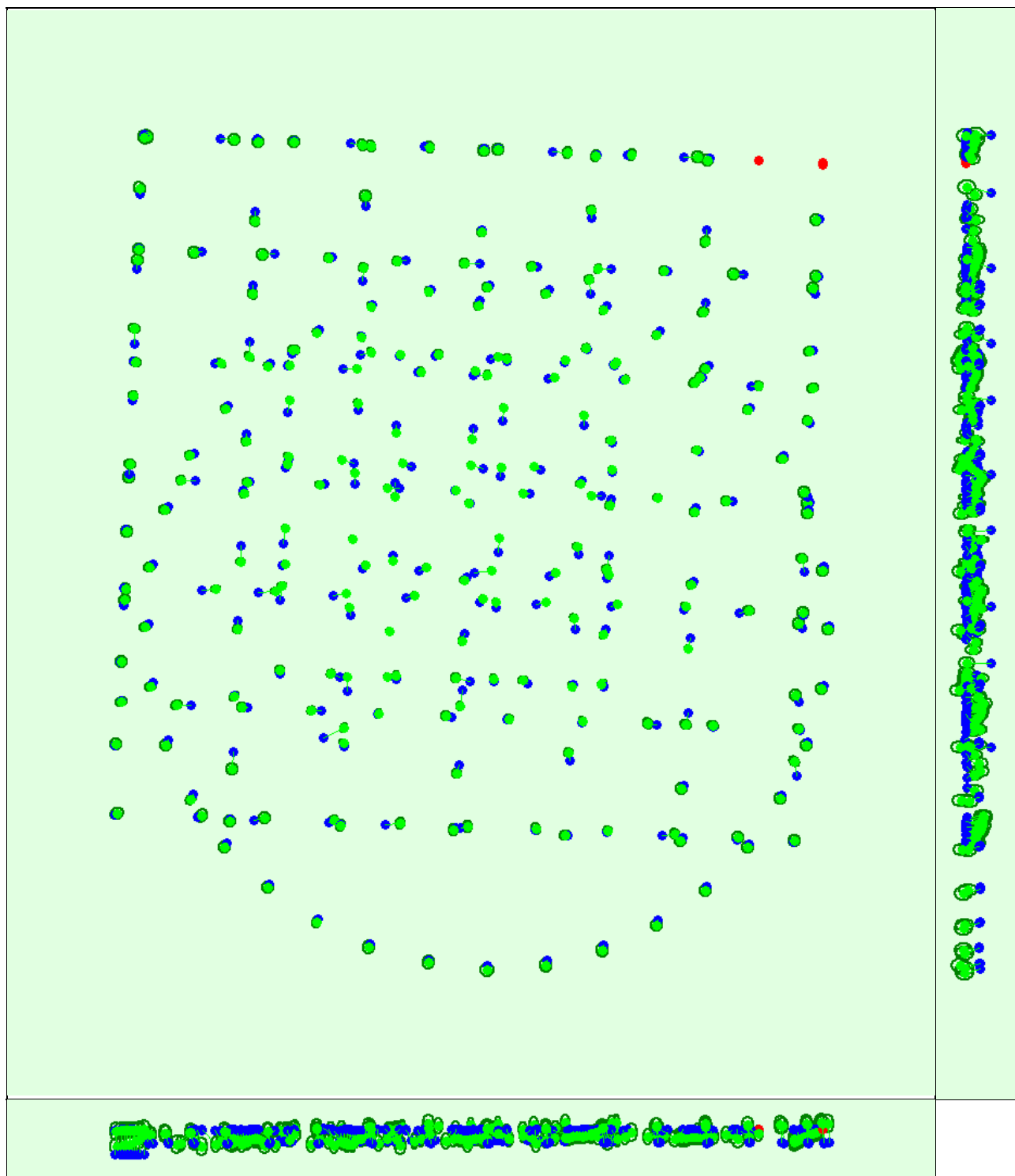


Figure 3: Offset between initial (blue dots) and computed (green dots) image positions as well as the offset between the GCPs initial positions (blue crosses) and their computed positions (green crosses) in the top-view (XY plane), front-view (XZ plane), and side-view (YZ plane). Red dots indicate disabled or uncalibrated images. Dark green ellipses indicate the absolute position uncertainty of the bundle block adjustment result.

🔍 Absolute camera position and orientation uncertainties



	X[m]	Y[m]	Z[m]	Omega [degree]	Phi [degree]	Kappa [degree]
Mean	0.131	0.131	0.218	0.071	0.070	0.069
Sigma	0.021	0.022	0.016	0.012	0.006	0.023

Bundle Block Adjustment Details



Number of 2D Keypoint Observations for Bundle Block Adjustment	6028566
Number of 3D Points for Bundle Block Adjustment	2414365
Mean Reprojection Error [pixels]	0.193

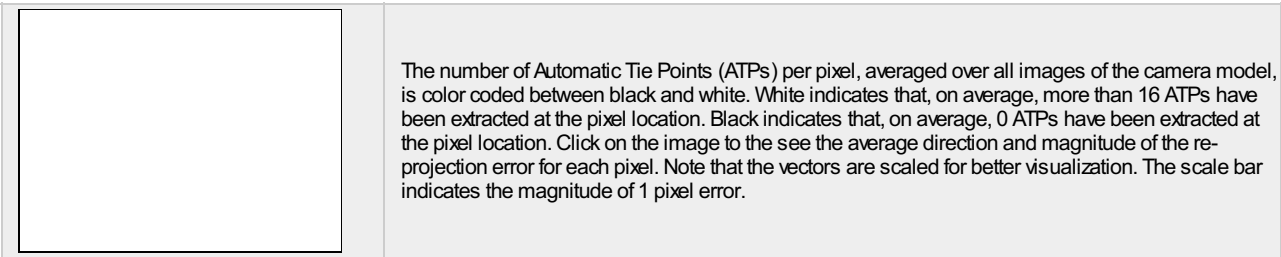
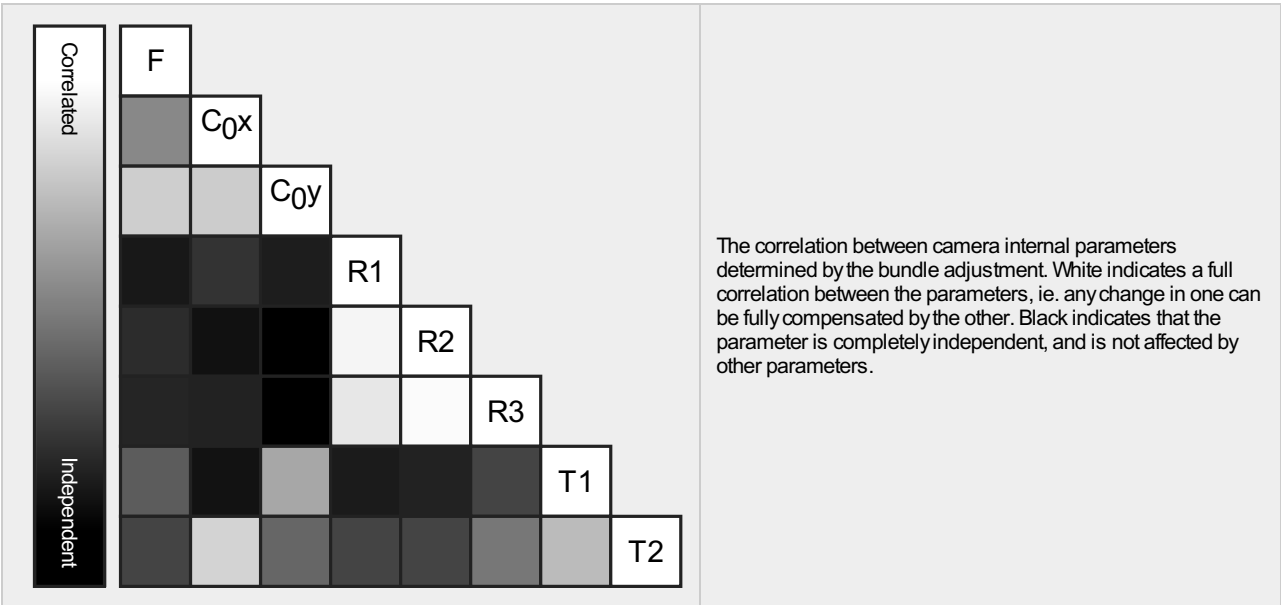
Internal Camera Parameters

FC330_3.6_4000x3000 (RGB). Sensor Dimensions: 6.317 [mm] x 4.738 [mm]



EXIF ID: FC330_3.6_4000x3000

	Focal Length	Principal Point x	Principal Point y	R1	R2	R3	T1	T2
Initial Values	2285.722 [pixel] 3.610 [mm]	2000.006 [pixel] 3.159 [mm]	1500.003 [pixel] 2.369 [mm]	-0.001	-0.002	0.000	-0.001	-0.001
Optimized Values	2364.543 [pixel] 3.734 [mm]	2069.555 [pixel] 3.269 [mm]	1519.960 [pixel] 2.401 [mm]	-0.003	-0.005	0.003	0.000	0.001
Uncertainties (Sigma)	0.125 [pixel] 0.000 [mm]	0.048 [pixel] 0.000 [mm]	0.080 [pixel] 0.000 [mm]	0.000	0.000	0.000	0.000	0.000



2D Keypoints Table



	Number of 2D Keypoints per Image	Number of Matched 2D Keypoints per Image
Median	70517	25353
Min	47761	3931
Max	79697	40139
Mean	68803	25874

3D Points from 2D Keypoint Matches

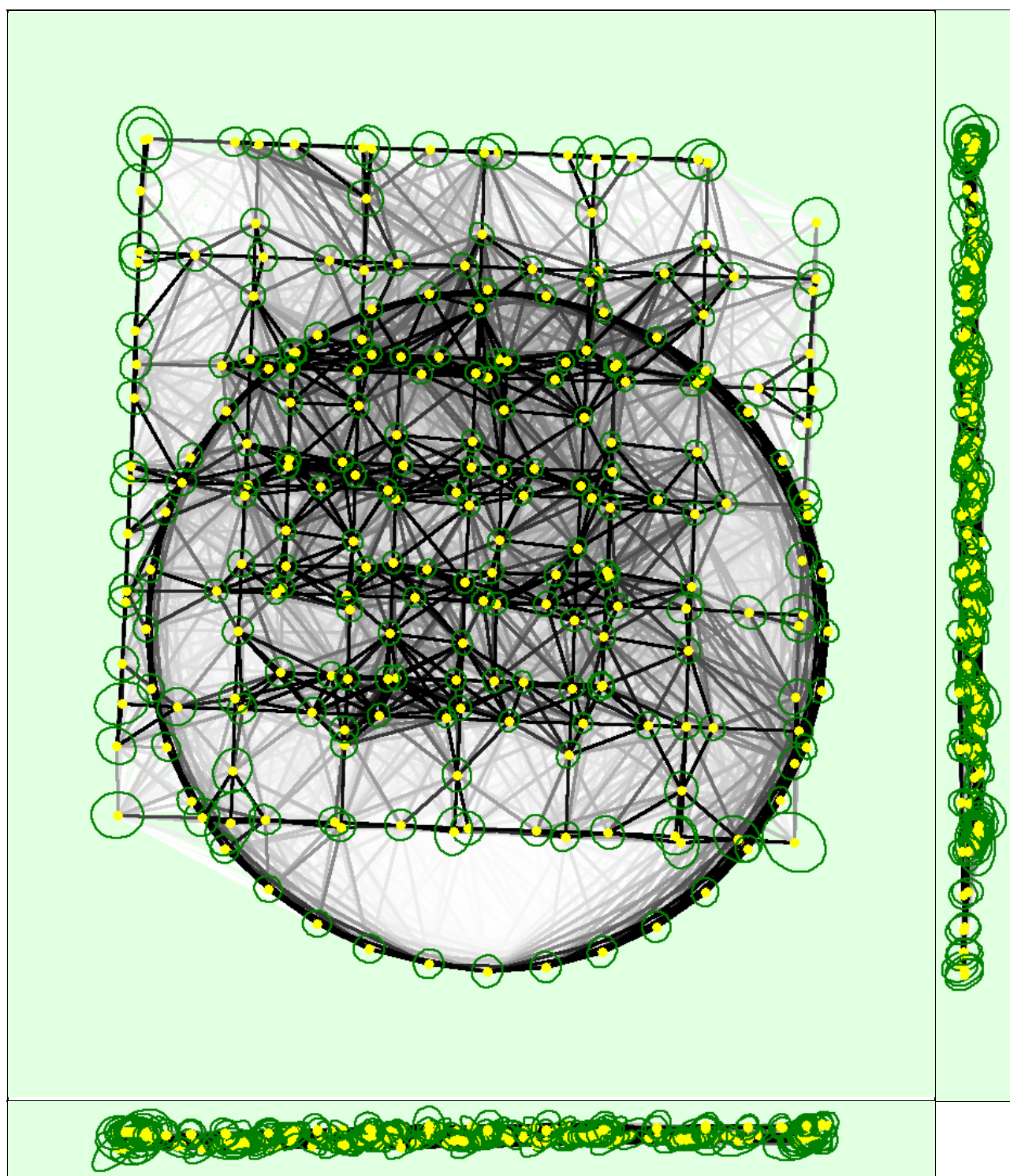


	Number of 3D Points Observed
--	------------------------------

In 2 Images	1792484
In 3 Images	378090
In 4 Images	123782
In 5 Images	51845
In 6 Images	25840
In 7 Images	14393
In 8 Images	8714
In 9 Images	5471
In 10 Images	3739
In 11 Images	2723
In 12 Images	1812
In 13 Images	1289
In 14 Images	945
In 15 Images	705
In 16 Images	520
In 17 Images	388
In 18 Images	305
In 19 Images	248
In 20 Images	199
In 21 Images	173
In 22 Images	129
In 23 Images	119
In 24 Images	104
In 25 Images	89
In 26 Images	58
In 27 Images	51
In 28 Images	36
In 29 Images	19
In 30 Images	25
In 31 Images	11
In 32 Images	17
In 33 Images	13
In 34 Images	12
In 35 Images	3
In 36 Images	3
In 37 Images	3
In 38 Images	3
In 39 Images	2
In 41 Images	2
In 43 Images	1

2D Keypoint Matches





Uncertainty ellipses 1000x magnified

Number of matches

25	222	444	666	888	1111	1333	1555	1777	2000

Figure 5: Computed image positions with links between matched images. The darkness of the links indicates the number of matched 2D keypoints between the images. Bright links indicate weak links and require manual tie points or more images. Dark green ellipses indicate the relative camera position uncertainty of the bundle block adjustment result.

Relative camera position and orientation uncertainties



	X[m]	Y[m]	Z[m]	Omega [degree]	Phi [degree]	Kappa [degree]
Mean	0.004	0.004	0.003	0.005	0.004	0.003
Sigma	0.001	0.001	0.001	0.002	0.002	0.001

Geolocation Details



Absolute Geolocation Variance



Min Error [m]	Max Error [m]	Geolocation Error X [%]	Geolocation Error Y [%]	Geolocation Error Z [%]
-	-15.00	0.00	0.00	0.00
-15.00	-12.00	0.00	0.00	0.00
-12.00	-9.00	0.00	0.00	0.00
-9.00	-6.00	0.00	0.00	4.29
-6.00	-3.00	6.01	5.15	24.46
-3.00	0.00	36.05	42.49	11.16
0.00	3.00	54.08	47.64	41.20
3.00	6.00	3.86	4.72	18.88
6.00	9.00	0.00	0.00	0.00
9.00	12.00	0.00	0.00	0.00
12.00	15.00	0.00	0.00	0.00
15.00	-	0.00	0.00	0.00
Mean [m]		0.000005	-0.000006	0.000031
Sigma [m]		1.531214	1.529028	3.371997
RMS Error [m]		1.531214	1.529028	3.371997

Min Error and Max Error represent geolocation error intervals between -1.5 and 1.5 times the maximum accuracy of all the images. Columns X, Y, Z show the percentage of images with geolocation errors within the predefined error intervals. The geolocation error is the difference between the initial and computed image positions. Note that the image geolocation errors do not correspond to the accuracy of the observed 3D points.

Relative Geolocation Variance



Relative Geolocation Error	Images X [%]	Images Y [%]	Images Z [%]
[-1.00, 1.00]	99.57	100.00	100.00
[-2.00, 2.00]	100.00	100.00	100.00
[-3.00, 3.00]	100.00	100.00	100.00
Mean of Geolocation Accuracy [m]	5.000000	5.000000	10.000000
Sigma of Geolocation Accuracy [m]	0.000000	0.000000	0.000000

Images X, Y, Z represent the percentage of images with a relative geolocation error in X, Y, Z.

Geolocation Orientational Variance	RMS [degree]
Omega	2.295
Phi	4.146
Kappa	8.225

Geolocation RMS error of the orientation angles given by the difference between the initial and computed image orientation angles.

Initial Processing Details



System Information



Hardware	CPU: Intel(R) Core(TM) i7-2600 CPU @ 3.40GHz RAM: 8GB GPU: AMD Radeon HD 5450 (Driver: 15.201.1151.1008)
Operating System	Windows 10 Education, 64-bit

Coordinate Systems



Image Coordinate System	WGS 84 (EGM 96 Geoid)
Output Coordinate System	WGS 84 / UTM zone 32N (EGM96 Geoid)

Processing Options



Detected Template	3D Models
Keypoints Image Scale	Full, Image Scale: 1
Advanced: Matching Image Pairs	Free Flight or Terrestrial
Advanced: Matching Strategy	Use Geometrically Verified Matching: no
Advanced: Keypoint Extraction	Targeted Number of Keypoints: Automatic
Advanced: Calibration	Calibration Method: Standard Internal Parameters Optimization: All External Parameters Optimization: All Rematch: Auto, yes

Point Cloud Densification details



Processing Options



Image Scale	multiscale, 1/2 (Half image size, Default)
Point Density	Optimal
Minimum Number of Matches	3
3D Textured Mesh Generation	yes
3D Textured Mesh Settings:	Resolution: Medium Resolution (default) Color Balancing: no
LOD	Generated: no
Advanced: 3D Textured Mesh Settings	Sample Density Divider: 1
Advanced: Image Groups	group1
Advanced: Use Processing Area	yes
Advanced: Use Annotations	yes

Results



Number of Generated Tiles	1
Number of 3D Densified Points	17235083
Average Density (per m ³)	492.59

DSM, Orthomosaic and Index Details



Processing Options



DSM and Orthomosaic Resolution	1 x GSD (2.16 [cm/pixel])
DSM Filters	Noise Filtering: yes Surface Smoothing: yes, Type: Sharp
Raster DSM	Generated: yes Method: Inverse Distance Weighting Merge Tiles: yes
Orthomosaic	Generated: yes Merge Tiles: yes GeoTIFF Without Transparency: no Google Maps Tiles and KML: no