

Quality Report



Generated with Pix4Denterprise version 4.5.6



Important: Click on the different icons for:



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Additional information about the sections



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Summary



Project	Proyecto Corregido
Processed	2024-08-01 10:12:40
Camera Model Name(s)	FC6510_8.8_5472x3648 (RGB)
Average Ground Sampling Distance (GSD)	1.02 cm / 0.40 in
Area Covered	0.007 km ² / 0.6820 ha / 0.00 sq. mi. / 1.6862 acres

Quality Check



Images	median of 7100 keypoints per image	
Dataset	38 out of 38 images calibrated (100%), all images enabled	
Camera Optimization	0.88% relative difference between initial and optimized internal camera parameters	
Matching	median of 3899.64 matches per calibrated image	
Georeferencing	yes, 4 GCPs (4 3D), mean RMS error = 0.003 m	

Preview

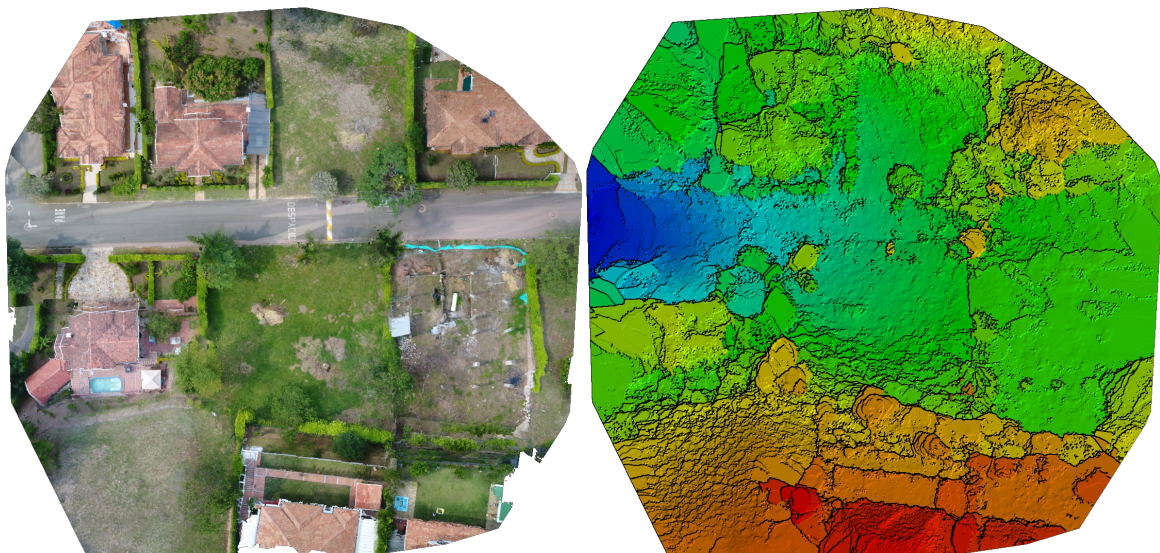


Figure 1: Orthomosaic and the corresponding sparse Digital Surface Model (DSM) before densification.

Calibration Details



Number of Calibrated Images	38 out of 38
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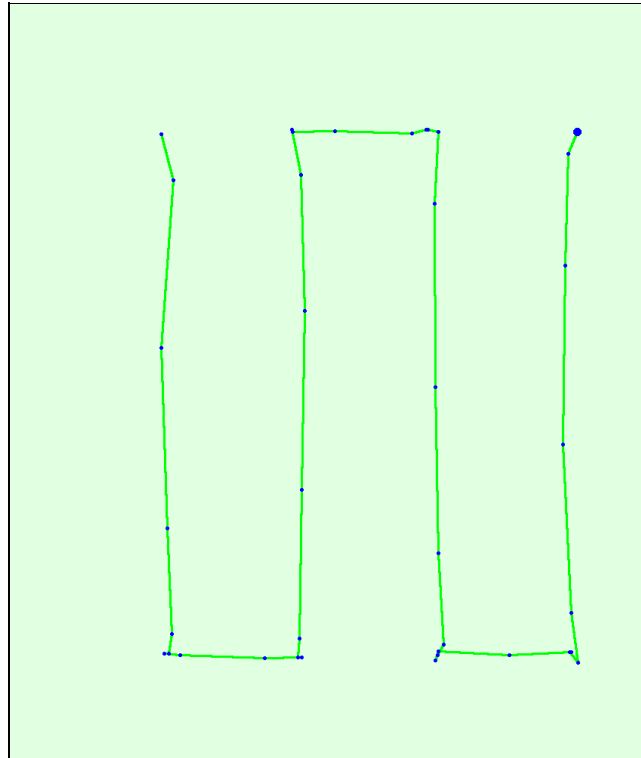
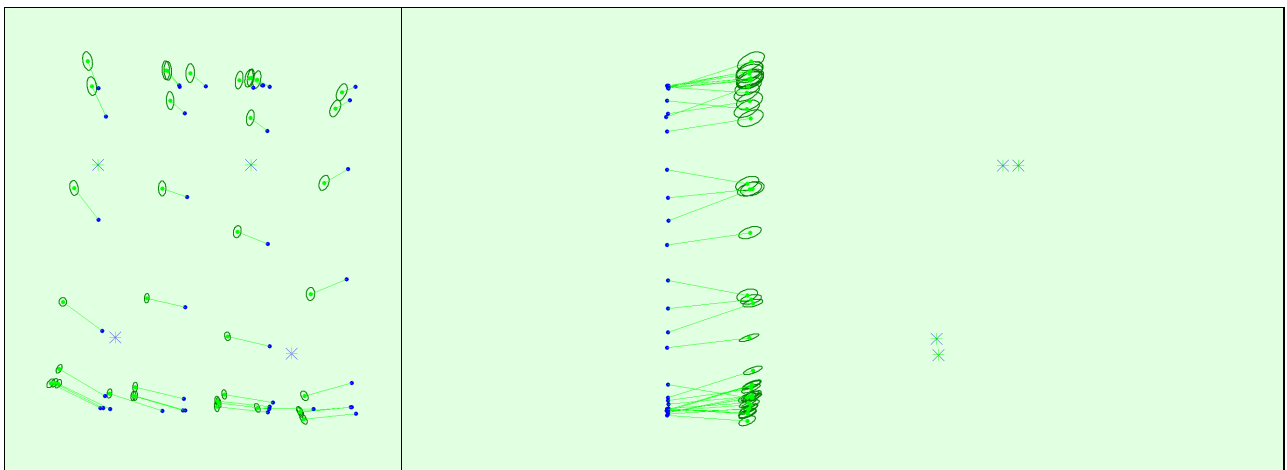
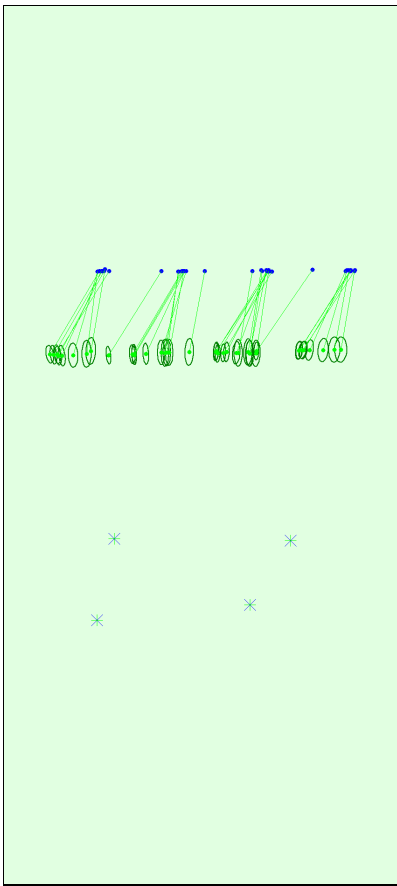


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.





Uncertainty ellipses 100x magnified

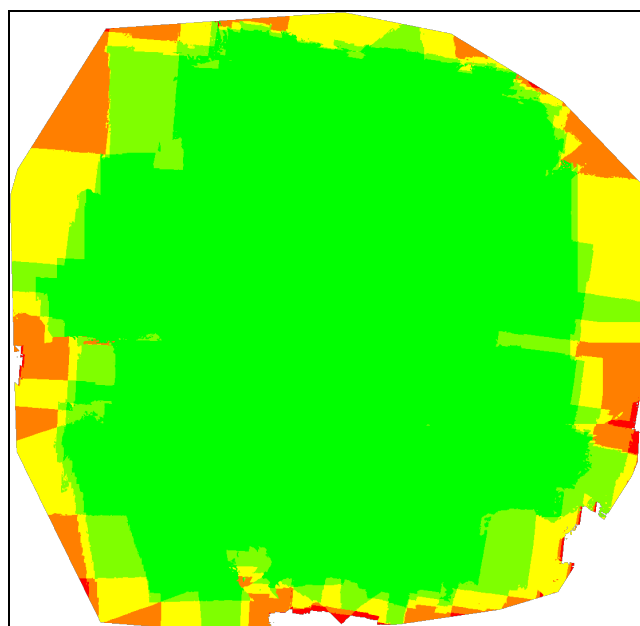
Figure 3: Offset between initial (blue dots) and computed (green dots) image positions as well as the offset between the GCPs initial positions (blue crosses) and their computed positions (green crosses) in the top-view (XY plane), front-view (XZ plane), and side-view (YZ plane). Dark green ellipses 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	0.006	0.010	0.017	0.015	0.011	0.004
Sigma	0.001	0.003	0.003	0.004	0.003	0.000

? Overlap



Number of overlapping images: 1 2 3 4 5+

Figure 4: Number of overlapping images computed for each pixel of the orthomosaic. Red and yellow areas indicate low overlap for which poor results may be generated. Green areas indicate an overlap of over 5 images for every pixel. Good quality results will be generated as long as the number of keypoint matches is also sufficient for these areas (see Figure 5 for keypoint matches).

Bundle Block Adjustment Details

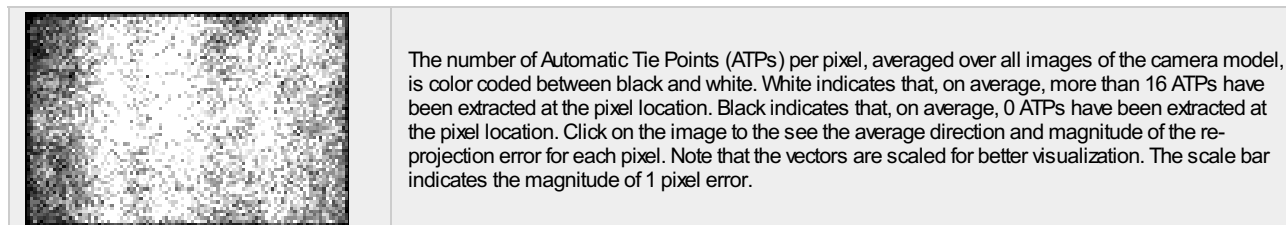
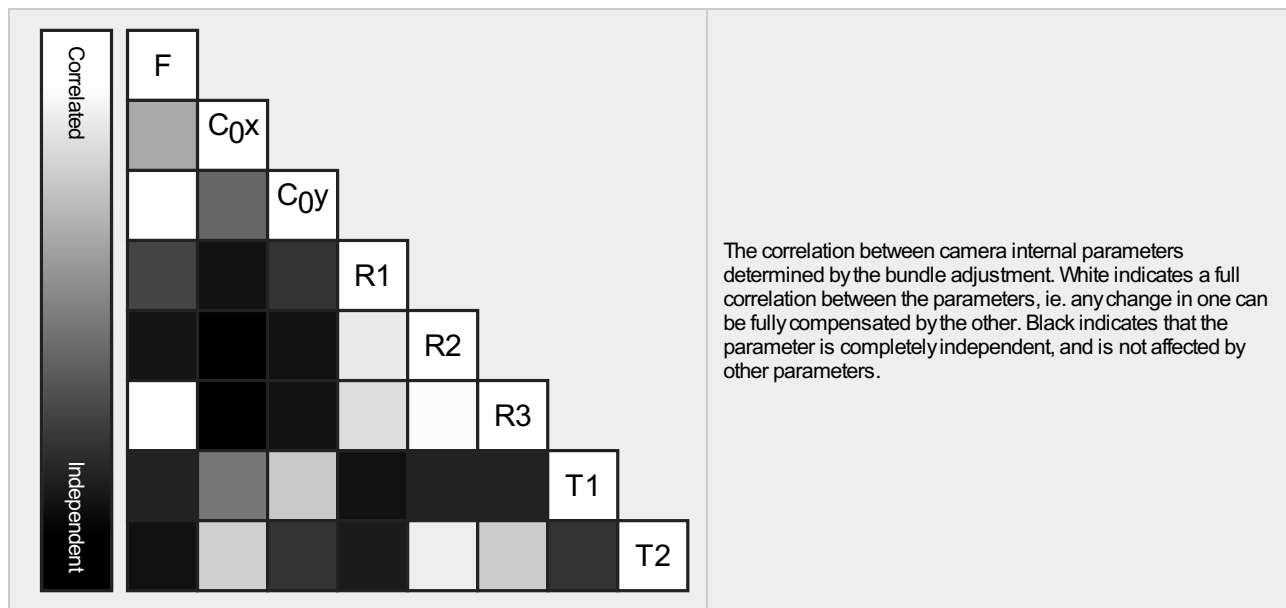
Number of 2D Keypoint Observations for Bundle Block Adjustment	140009
Number of 3D Points for Bundle Block Adjustment	45568
Mean Reprojection Error [pixels]	0.087

Internal Camera Parameters

FC6510_8.8_5472x3648 (RGB). Sensor Dimensions: 12.833 [mm] x 8.556 [mm]

EXIF ID: FC6510_8.8_5472x3648

	Focal Length	Principal Point x	Principal Point y	R1	R2	R3	T1	T2
Initial Values	3689.450 [pixel] 8.653 [mm]	2730.910 [pixel] 6.405 [mm]	1829.690 [pixel] 4.291 [mm]	0.003	-0.011	0.011	0.001	0.001
Optimized Values	3722.182 [pixel] 8.730 [mm]	2739.199 [pixel] 6.424 [mm]	1813.743 [pixel] 4.254 [mm]	0.003	-0.008	0.009	-0.001	0.001
Uncertainties (Sigma)	1.894 [pixel] 0.004 [mm]	0.269 [pixel] 0.001 [mm]	0.222 [pixel] 0.001 [mm]	0.000	0.001	0.001	0.000	0.000



2D Keypoints Table

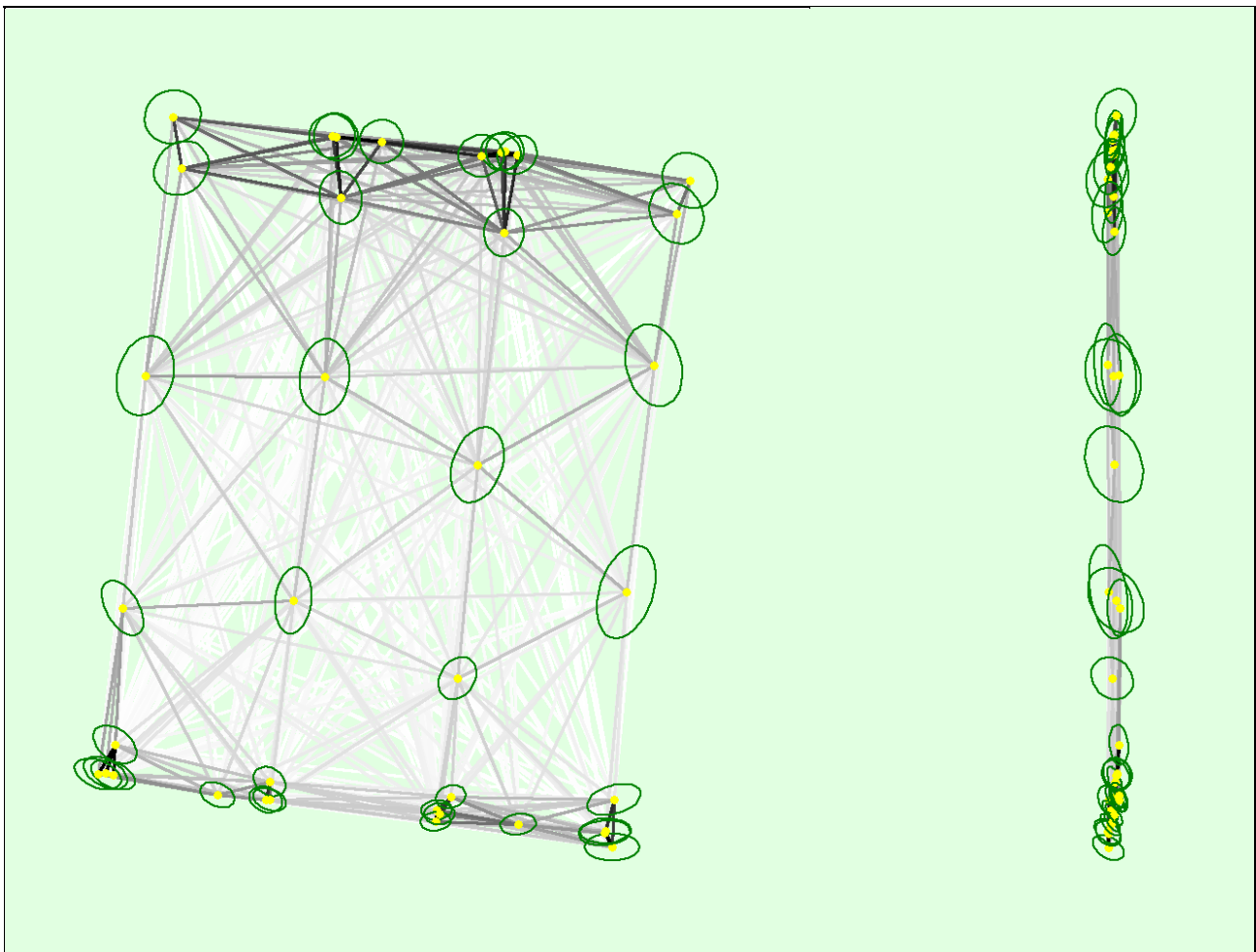
	Number of 2D Keypoints per Image	Number of Matched 2D Keypoints per Image
Median	7100	3900
Mn	6504	1689
Max	8436	5192
Mean	7111	3684

? 3D Points from 2D Keypoint Matches



	Number of 3D Points Observed
In 2 Images	26109
In 3 Images	9033
In 4 Images	4693
In 5 Images	1917
In 6 Images	1121
In 7 Images	720
In 8 Images	568
In 9 Images	356
In 10 Images	296
In 11 Images	214
In 12 Images	163
In 13 Images	128
In 14 Images	89
In 15 Images	51
In 16 Images	53
In 17 Images	27
In 18 Images	15
In 19 Images	8
In 20 Images	2
In 21 Images	3
In 22 Images	2

? 2D Keypoint Matches



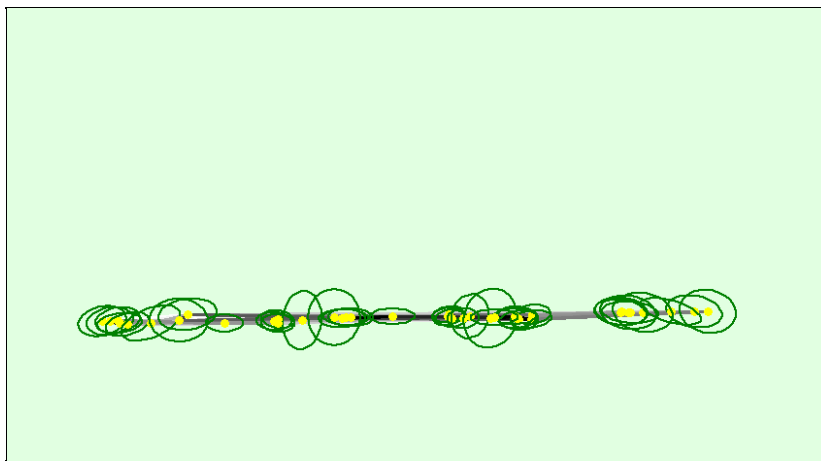


Figure 5: Computed image positions with links between matched images. The darkness of the links indicates the number of matched 2D keypoints between the images. Bright links indicate weak links and require manual tie points or more images. Dark green ellipses indicate the relative camera position uncertainty 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	0.003	0.002	0.017	0.013	0.004
Sigma	0.001	0.002	0.001	0.005	0.005	0.000

Geolocation Details

Ground Control Points

GCP Name	Accuracy XY/Z [m]	Error X [m]	Error Y [m]	Error Z [m]	Projection Error [pixel]	Verified/Marked
1 (3D)	0.020/ 0.020	0.001	0.010	-0.000	1.245	13 / 13
2 (3D)	0.020/ 0.020	0.004	-0.008	0.004	1.615	11 / 11
3 (3D)	0.020/ 0.020	-0.001	0.002	0.001	1.925	12 / 12
4 (3D)	0.020/ 0.020	-0.004	-0.005	0.002	1.534	6 / 6
Mean [m]		0.000113	-0.000426	0.001522		
Sigma [m]		0.002910	0.006689	0.001556		
RMS Error [m]		0.002912	0.006702	0.002177		

Localisation accuracy per GCP and mean errors in the three coordinate directions. The last column counts the number of calibrated images where the GCP has been automatically verified v.s. manually marked.

Absolute Geolocation Variance

Mn 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	0.00
-6.00	-3.00	31.58	7.89	0.00
-3.00	0.00	13.16	42.11	47.37

0.00	3.00	50.00	42.11	52.63
3.00	6.00	5.26	7.89	0.00
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]		5.433585	-1.565206	13.129970
Sigma [m]		2.655995	1.977509	0.262629
RMS Error [m]		6.047988	2.521986	13.132597

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.

Geolocation Bias	X	Y	Z
Translation [m]	5.433585	-1.565206	13.129970

Bias between image initial and computed geolocation given in output coordinate system.

 Relative Geolocation Variance



Relative Geolocation Error	Images X[%]	Images Y[%]	Images Z[%]
[-1.00, 1.00]	100.00	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	0.932
Phi	0.711
Kappa	15.563

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) i7-6700HQ CPU @2.60GHz RAM: 16GB GPU: Intel(R) HD Graphics 530 (Driver: 31.0.101.2112)
Operating System	Windows 10 Home Single Language, 64-bit

Coordinate Systems



Image Coordinate System	WGS 84 (EGM96 Geoid)
Ground Control Point (GCP) Coordinate System	MAGNA-SIRGAS / Colombia Bogota zone (EGM96 Geoid)
Output Coordinate System	MAGNA-SIRGAS / Colombia Bogota zone (EGM96 Geoid)

Processing Options



Detected Template	No Template Available
Keypoints Image Scale	Rapid, Image Scale: 0.25

Advanced: Matching Image Pairs	Aerial Grid or Corridor
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, 1/4 (Quarter image size, Fast)
Point Density	Low (Fast)
Minimum Number of Matches	3
3D Textured Mesh Generation	yes
3D Textured Mesh Settings:	Resolution: Medium Resolution (default) Color Balancing: yes
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	350343
Average Density (per m ³)	328.53

DSM, Orthomosaic and Index Details



Processing Options



DSM and Orthomosaic Resolution	4 x GSD (1.02 [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: yes
Grid DSM	Generated: yes, Spacing [cm]: 100
Raster DTM	Generated: yes Merge Tiles: yes
DTM Resolution	5 x GSD (1.02 [cm/pixel])
Contour Lines Generation	Generated: yes Contour Base [m]: 0 Elevation Interval [m]: 10 Resolution [cm]: 100 Minimum Line Size [vertices]: 20