

Quality Report



Generated with Pix4Dmapper Pro version 3.3.13 Preview



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	DSL D Rose Gardens - 180ft
Processed	2017-06-26 19:21:18
Camera Model Name(s)	FC6310_8.8_5472x3648 (RGB)
Average Ground Sampling Distance (GSD)	1.43 cm / 0.56 in
Area Covered	0.1286 km ² / 12.8619 ha / 0.0497 sq. mi. / 31.7988 acres
Time for Initial Processing (without report)	02h:53m:42s

Quality Check



Images	median of 43576 keypoints per image	
Dataset	1117 out of 1117 images calibrated (100%), all images enabled	
Camera Optimization	0.51% relative difference between initial and optimized internal camera parameters	
Matching	median of 15852.9 matches per calibrated image	
Georeferencing	yes, 10 GCPs (10 3D), mean RMS error = 0.026 ft	

Preview

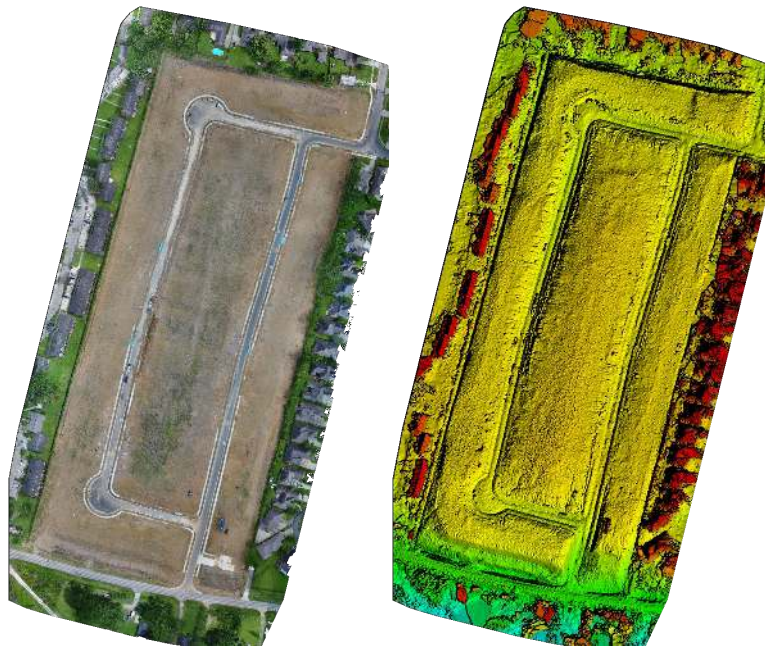


Figure 1: Orthomosaic and the corresponding sparse Digital Surface Model (DSM) before densification.

Calibration Details



Number of Calibrated Images	1117 out of 1117
Number of Geolocated Images	1117 out of 1117

Initial Image Positions

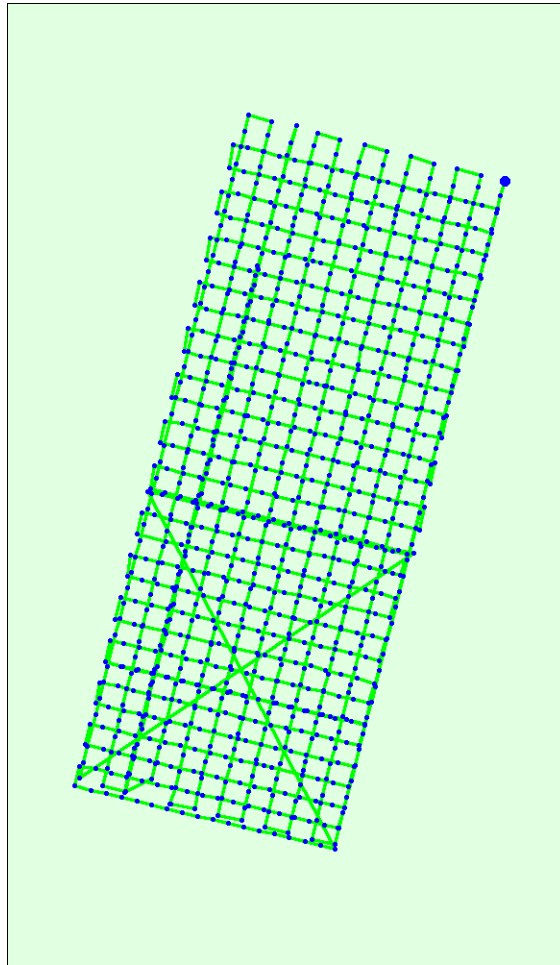
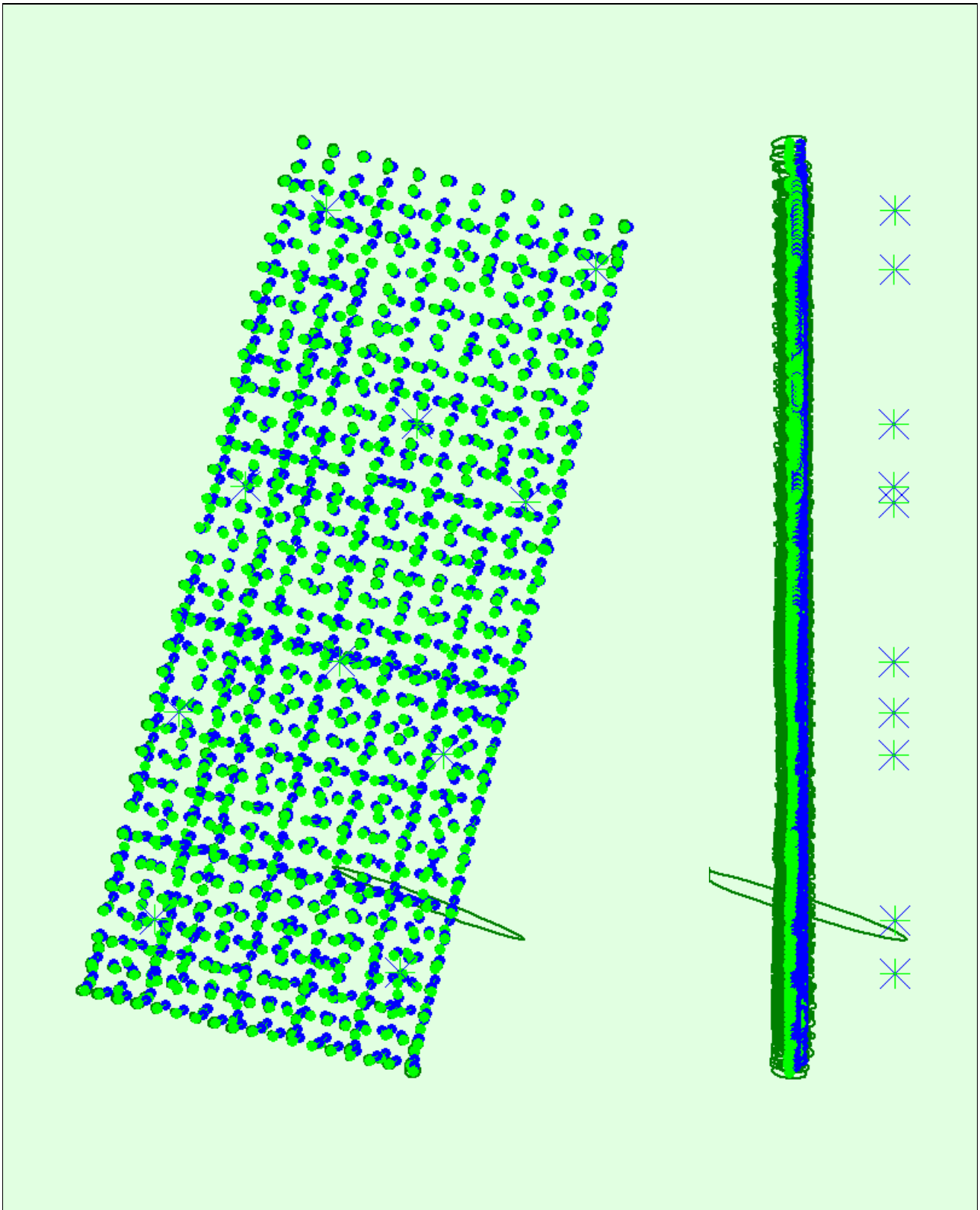


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

Computed Image/GCPs/Manual Tie Points Positions

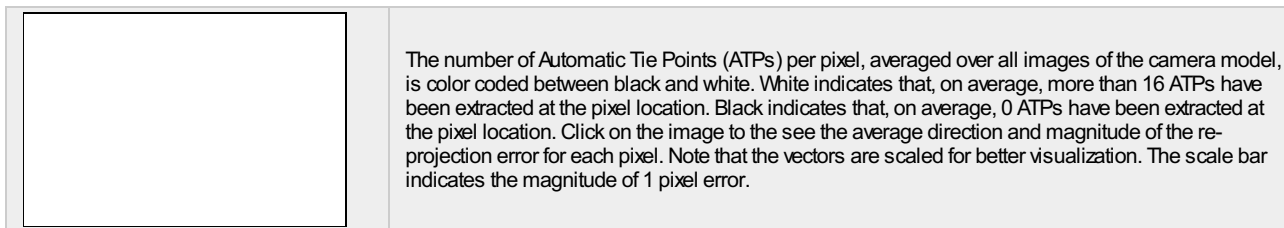
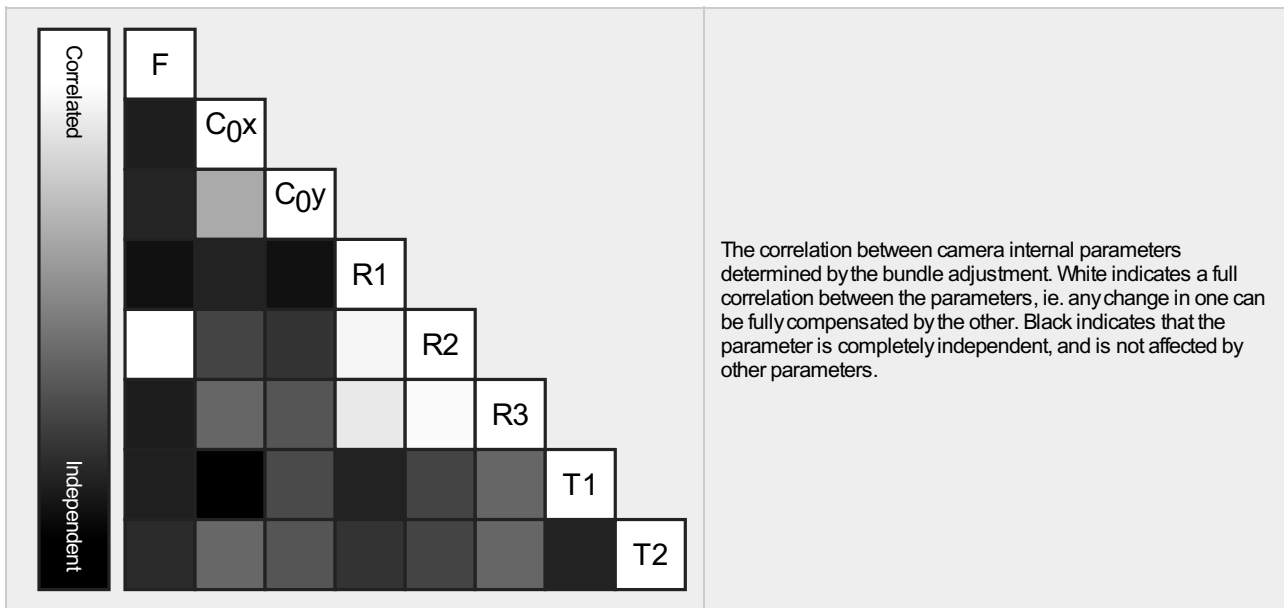




Uncertainty ellipses 500x magnified

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.

Initial Values	3668.759 [pixel] 8.604 [mm]	2736.001 [pixel] 6.417 [mm]	1823.999 [pixel] 4.278 [mm]	0.003	-0.008	0.008	-0.000	0.000
Optimized Values	3649.772 [pixel] 8.560 [mm]	2740.595 [pixel] 6.427 [mm]	1820.354 [pixel] 4.269 [mm]	0.001	-0.007	0.007	-0.001	0.001
Uncertainties (Sigma)	1.098 [pixel] 0.003 [mm]	0.065 [pixel] 0.000 [mm]	0.058 [pixel] 0.000 [mm]	0.000	0.000	0.000	0.000	0.000



? 2D Keypoints Table



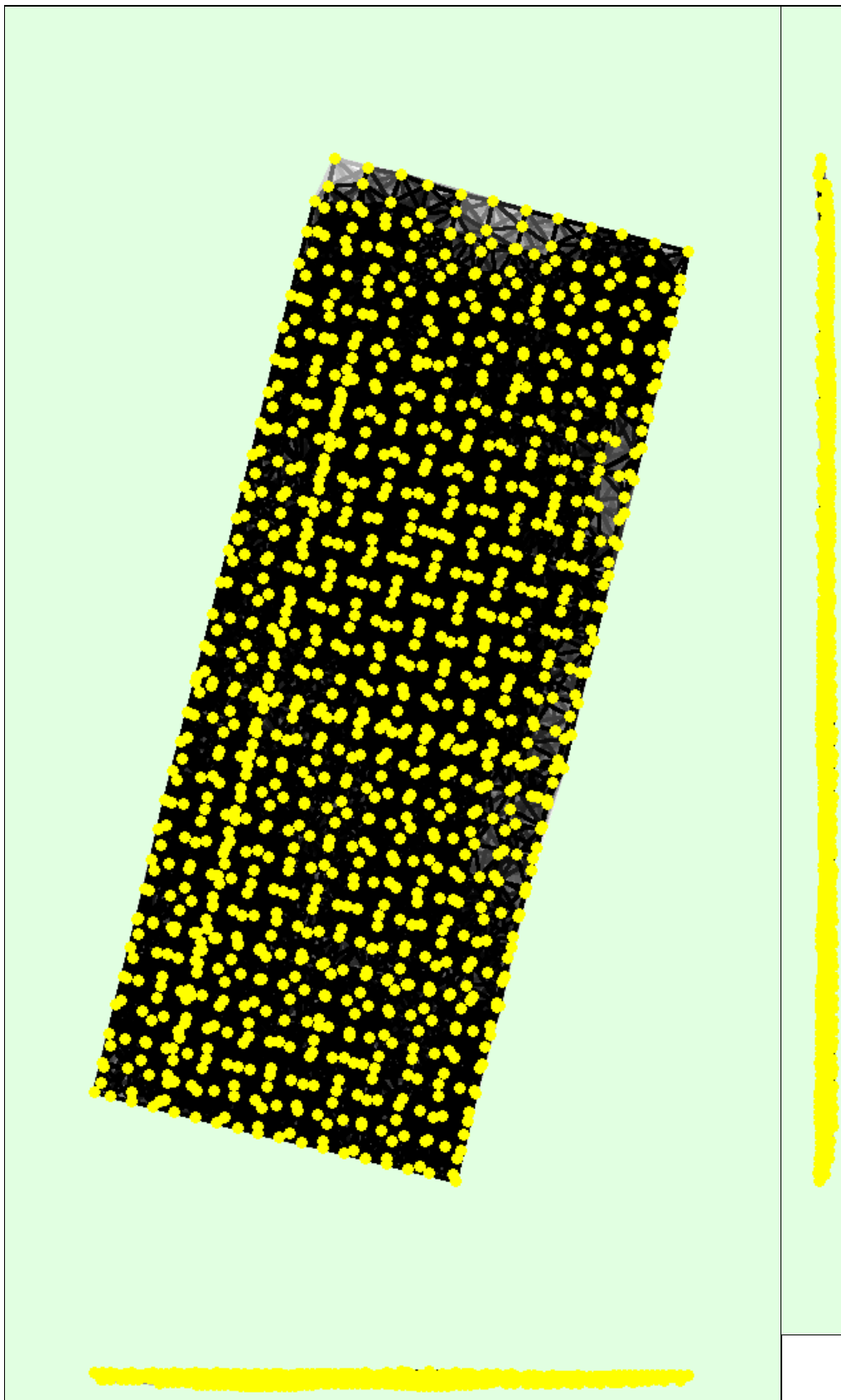
	Number of 2D Keypoints per Image	Number of Matched 2D Keypoints per Image
Median	43576	15853
Min	27885	264
Max	80772	30942
Mean	44830	16007

? 3D Points from 2D Keypoint Matches



	Number of 3D Points Observed
In 2 Images	2431628
In 3 Images	883749
In 4 Images	434771
In 5 Images	246993
In 6 Images	151026
In 7 Images	100253
In 8 Images	70983
In 9 Images	51892
In 10 Images	39269
In 11 Images	30133
In 12 Images	24155
In 13 Images	19634
In 14 Images	16164
In 15 Images	13542
In 16 Images	11314
In 17 Images	9900

In 18 Images	8473
In 19 Images	7655
In 20 Images	6872
In 21 Images	5957
In 22 Images	5349
In 23 Images	4893
In 24 Images	4471
In 25 Images	3920
In 26 Images	3543
In 27 Images	3143
In 28 Images	2924
In 29 Images	2722
In 30 Images	2487
In 31 Images	2368
In 32 Images	2119
In 33 Images	1990
In 34 Images	1896
In 35 Images	1819
In 36 Images	1776
In 37 Images	1720
In 38 Images	1605
In 39 Images	1546
In 40 Images	1491
In 41 Images	1370
In 42 Images	1298
In 43 Images	1311
In 44 Images	1209
In 45 Images	1119
In 46 Images	1115
In 47 Images	1005
In 48 Images	911
In 49 Images	833
In 50 Images	612
In 51 Images	523
In 52 Images	483
In 53 Images	402
In 54 Images	314
In 55 Images	258
In 56 Images	208
In 57 Images	191
In 58 Images	153
In 59 Images	131
In 60 Images	108
In 61 Images	67
In 62 Images	54
In 63 Images	46
In 64 Images	31
In 65 Images	26
In 66 Images	7



Number of matches

25	222	444	666	888	1111	1333	1555	1777	2000
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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.

Geolocation Details

Ground Control Points



GCP Name	Accuracy XY/Z [ft]	Error X [ft]	Error Y [ft]	Error Z [ft]	Projection Error [pixel]	Verified/Marked
10 (3D)	0.020/ 0.020	0.010	0.025	-0.067	0.535	5 / 5
11 (3D)	0.020/ 0.020	0.016	-0.002	0.040	0.511	5 / 5
12 (3D)	0.020/ 0.020	-0.004	-0.009	-0.050	0.661	5 / 5
13 (3D)	0.020/ 0.020	-0.030	-0.043	0.052	0.311	5 / 5
14 (3D)	0.020/ 0.020	0.007	-0.008	0.071	0.646	5 / 5
15 (3D)	0.020/ 0.020	-0.019	-0.002	-0.004	0.579	5 / 5
16 (3D)	0.020/ 0.020	-0.011	0.015	0.053	0.281	5 / 5
17 (3D)	0.020/ 0.020	-0.003	0.008	-0.053	0.344	5 / 5
18 (3D)	0.020/ 0.020	0.012	0.010	0.021	0.498	5 / 5
19 (3D)	0.020/ 0.020	0.021	0.003	-0.023	0.436	5 / 5
Mean [ft]		-0.000211	-0.000176	0.003914		
Sigma [ft]		0.015581	0.017353	0.047866		
RMS Error [ft]		0.015582	0.017353	0.048026		

0 out of 1 check points have been labeled as inaccurate.

Check Point Name	Accuracy XY/Z [ft]	Error X [ft]	Error Y [ft]	Error Z [ft]	Projection Error [pixel]	Verified/Marked
BM1	0.0200/0.0200	0.0075	0.0043	-0.4602	0.7773	5 / 5

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 vs. manually marked.

Absolute Geolocation Variance



Min Error [ft]	Max Error [ft]	Geolocation Error X [%]	Geolocation Error Y [%]	Geolocation Error Z [%]
-	-15.00	0.72	1.34	0.00
-15.00	-12.00	5.73	1.16	0.00
-12.00	-9.00	5.91	3.13	1.52
-9.00	-6.00	4.92	8.77	8.95
-6.00	-3.00	7.70	18.35	16.74
-3.00	0.00	14.86	20.95	29.54
0.00	3.00	30.53	18.53	15.85
3.00	6.00	18.35	13.34	12.26
6.00	9.00	5.19	4.03	9.58
9.00	12.00	4.39	5.46	5.55
12.00	15.00	1.34	3.31	0.00
15.00	-	0.36	1.61	0.00
Mean [ft]		4.299411	4.351565	-8.666144
Sigma [ft]		6.217140	6.275171	4.964342
RMS Error [ft]		7.558952	7.636354	9.987329

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 [ft]	4.299411	4.351565	-8.666145

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]	65.53	63.74	95.43
[-2.00, 2.00]	84.60	87.56	100.00
[-3.00, 3.00]	98.93	97.05	100.00

Mean of Geolocation Accuracy [ft]	5.000000	5.000000	10.000000
Sigma of Geolocation Accuracy [ft]	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	0.964
Phi	0.503
Kappa	6.268

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) Xeon(R) CPU E5-2670 v2 @ 2.50GHz RAM: 32GB GPU: RDPDD Chained DD (Driver: unknown), RDP Encoder Mirror Driver (Driver: unknown), RDP Reflector Display Driver (Driver: unknown)
Operating System	Windows Server 2008 R2 Standard, 64-bit

Coordinate Systems



Image Coordinate System	WGS84 (egm96)
Ground Control Point (GCP) Coordinate System	NAD_1983_StatePlane_Louisiana_South_FIPS_1702_Feet (-88.602ft)
Output Coordinate System	NAD_1983_StatePlane_Louisiana_South_FIPS_1702_Feet (-88.602ft)

Processing Options



Detected Template	No Template Available
Keypoints Image Scale	Full, Image Scale: 1
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 Lever-Arm Parameters Optimization: None Rematch: Auto, no Bundle Adjustment: Ceres

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
Time for Point Cloud Densification	02h:08m:33s
Time for 3D Textured Mesh Generation	44m:37s

Results



Number of Processed Clusters	2
Number of Generated Tiles	2
Number of 3D Densified Points	83815573
Average Density (per m ³)	53.79

DSM, Orthomosaic and Index Details



Processing Options



DSM and Orthomosaic Resolution	1 x GSD (1.43 [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
Raster DTM	Generated: yes Merge Tiles: yes
DTM Resolution	5 [cm/pixel]
Contour Lines Generation	Generated: yes Contour Base [ft]: 0 Elevation Interval [ft]: 1 Resolution [cm]: 5 Minimum Line Size [vertices]: 20
Time for DSM Generation	20m:57s
Time for Orthomosaic Generation	05h:20m:26s
Time for DTM Generation	01h:11m:11s
Time for Contour Lines Generation	11s