# Barrio San Vicente

**Processing Report**

**20 December 2021**

# Survey Data

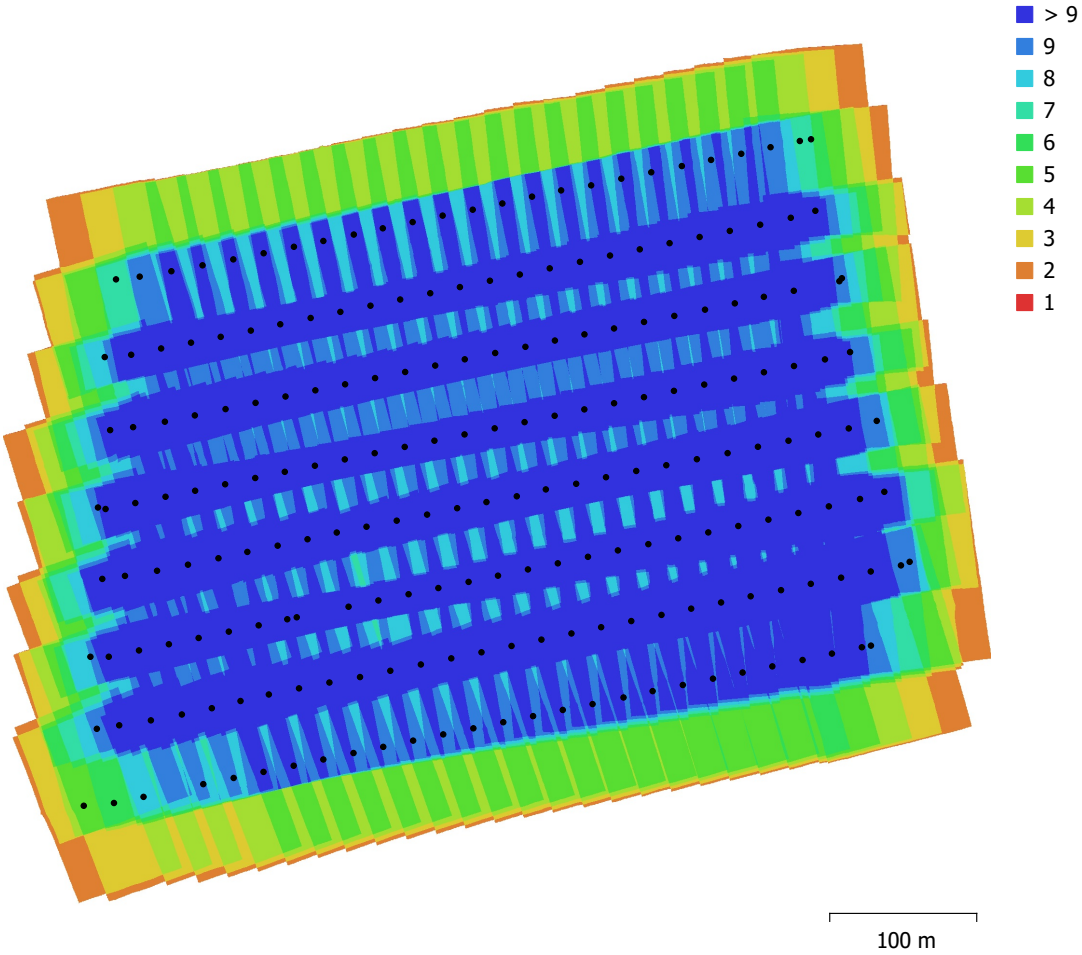


Fig. 1. Camera locations and image overlap.

| | | | |
|---|---|---|---|
| Number of images: | 214 | Camera stations: | 214 |
| Flying altitude: | 98.7 m | Tie points: | 202,979 |
| Ground resolution: | 2.63 cm/pix | Projections: | 824,401 |
| Coverage area: | 0.296 km² | Reprojection error: | 0.692 pix |

| Camera Model | Resolution | Focal Length | Pixel Size | Precalibrated |
|---|---|---|---|---|
| FC6310 (8.8mm) | 4864 x 3648 | 8.8 mm | 2.61 x 2.61 µm | No |

Table 1. Cameras.

# Camera Calibration

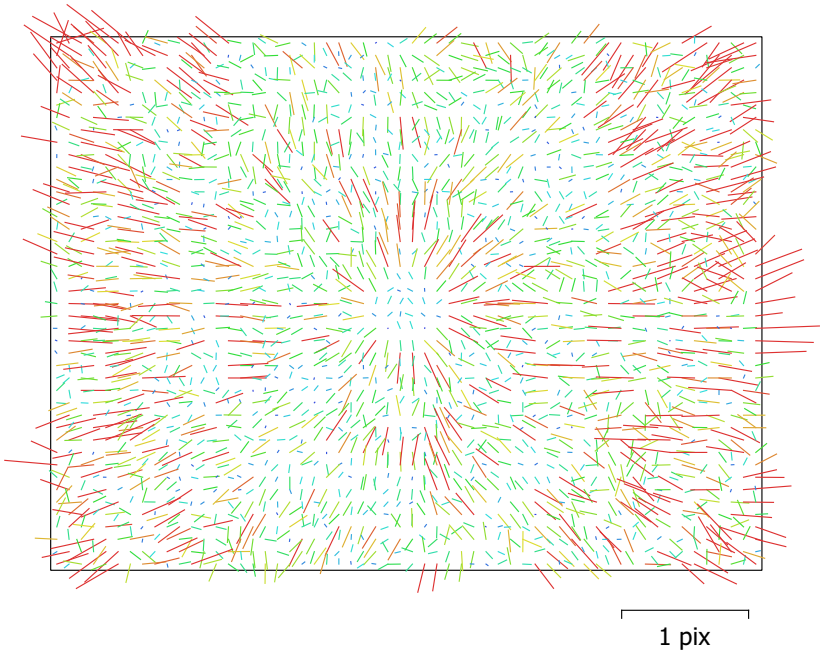


Fig. 2. Image residuals for FC6310 (8.8mm).

**FC6310 (8.8mm)**

214 images

| Type | Resolution | Focal Length | Pixel Size |
|---|---|---|---|
| **Frame** | **4864 x 3648** | **8.8 mm** | **2.61 x 2.61 µm** |

| | Value | Error | Cx | Cy | B1 | B2 | K1 | K2 | K3 | K4 | P1 | P2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **F** | **3372.58** | | | | | | | | | | | |
| **Cx** | **-10.858** | 0.046 | 1.00 | 0.02 | 0.09 | 0.07 | 0.01 | -0.01 | 0.01 | -0.01 | 0.29 | 0.00 |
| **Cy** | **12.5334** | 0.041 | | 1.00 | -0.07 | 0.05 | 0.01 | -0.01 | 0.01 | -0.01 | -0.02 | 0.34 |
| **B1** | **0.286844** | 0.016 | | | 1.00 | 0.08 | 0.00 | -0.01 | 0.01 | -0.01 | 0.01 | 0.01 |
| **B2** | **-0.557555** | 0.018 | | | | 1.00 | -0.00 | -0.00 | 0.00 | -0.00 | -0.00 | -0.04 |
| **K1** | **0.0159878** | 5e-05 | | | | | 1.00 | -0.97 | 0.93 | -0.88 | 0.00 | -0.00 |
| **K2** | **-0.0667886** | 0.00024 | | | | | | 1.00 | -0.99 | 0.96 | -0.01 | 0.00 |
| **K3** | **0.11158** | 0.00045 | | | | | | | 1.00 | -0.99 | 0.01 | -0.00 |
| **K4** | **-0.0629225** | 0.00029 | | | | | | | | 1.00 | -0.01 | 0.00 |
| **P1** | **-8.72018e-05** | 1.7e-06 | | | | | | | | | 1.00 | 0.01 |
| **P2** | **-0.000317912** | 1.7e-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) |
|---|---|---|---|---|
| 4.24232 | 1.11434 | 2.57061 | 4.38623 | 5.084 |

Table 3. Average camera location error.
X - Easting, Y - Northing, Z - Altitude.

# Ground Control Points


Fig. 4. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

| Count | X error (mm) | Y error (mm) | Z error (mm) | XY error (mm) | Total (mm) |
|---|---|---|---|---|---|
| 5 | 3.27309 | 3.34775 | 6.71275 | 4.68194 | 8.18422 |

Table 4. Control points RMSE.
X - Easting, Y - Northing, Z - Altitude.

| Label | X error (mm) | Y error (mm) | Z error (mm) | Total (mm) | Image (pix) |
|---|---|---|---|---|---|
| 1 | 2.71224 | 0.252554 | -5.31714 | 5.97428 | 0.612 (7) |
| 2 | 2.85134 | -3.72671 | 7.3445 | 8.71551 | 0.856 (8) |
| 3 | 1.6499 | 5.34863 | 8.85605 | 10.4766 | 0.851 (8) |
| 4 | -5.74491 | 1.50207 | -6.95135 | 9.14229 | 0.893 (9) |
| 5 | -1.53401 | -3.34976 | -4.04233 | 5.46941 | 0.372 (15) |
| **Total** | **3.27309** | **3.34775** | **6.71275** | **8.18422** | **0.707** |

Table 5. Control points.

X - Easting, Y - Northing, Z - Altitude.

# Digital Elevation Model

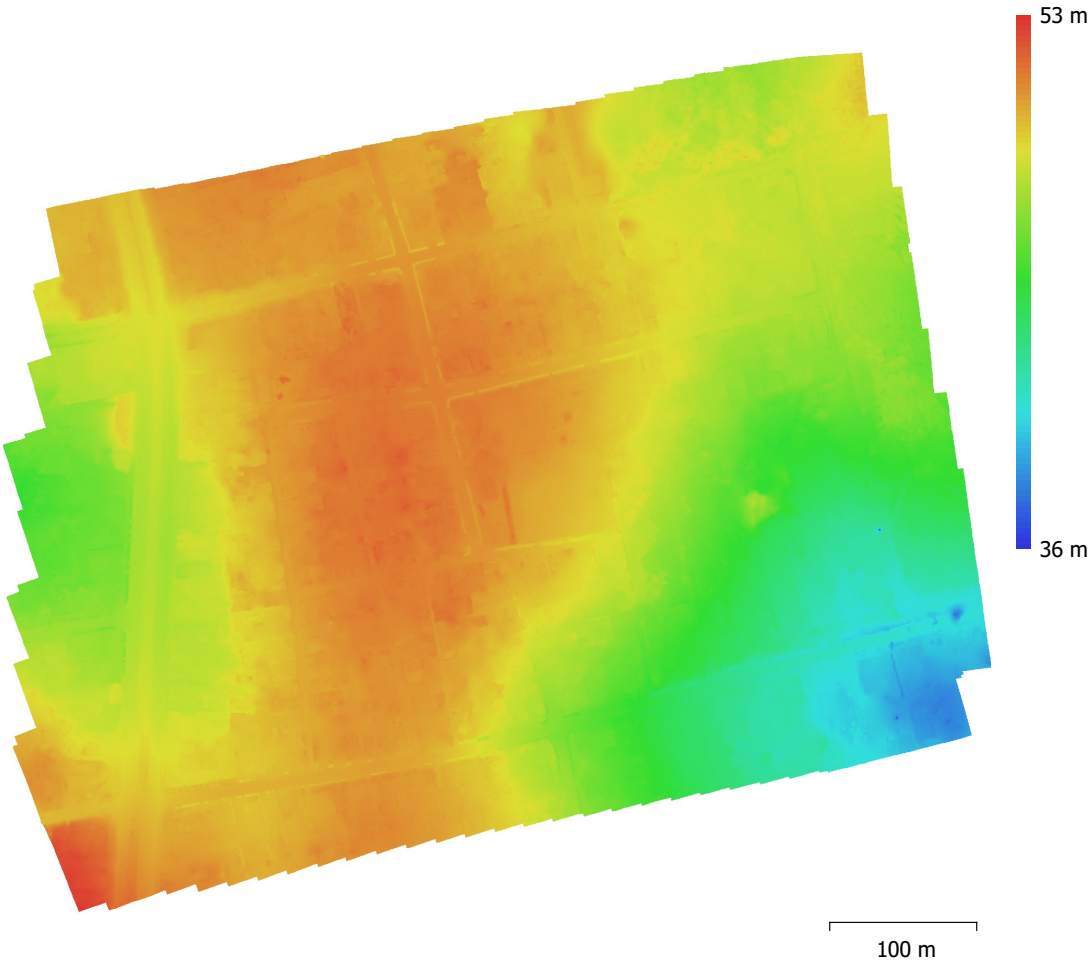


Fig. 5. Reconstructed digital elevation model.

| | |
|---|---|
| Resolution: | 5.26 cm/pix |
| Point density: | 361 points/m² |

# Processing Parameters

| | |
|---|---|
| **General** | |
| Cameras | 214 |
| Aligned cameras | 214 |
| Markers | 5 |
| Coordinate system | WGS 84 / UTM zone 21S EGM08 |
| Rotation angles | Yaw, Pitch, Roll |
| **Point Cloud** | |
| Points | 202,979 of 221,955 |
| RMS reprojection error | 0.189209 (0.692383 pix) |
| Max reprojection error | 0.743319 (47.6698 pix) |
| Mean key point size | 3.03148 pix |
| Point colors | 3 bands, uint8 |
| Key points | No |
| Average tie point multiplicity | 4.15322 |
| **Alignment parameters** | |
| Accuracy | High |
| Generic preselection | No |
| Reference preselection | Source |
| Key point limit | 40,000 |
| Tie point limit | 4,000 |
| Exclude stationary tie points | Yes |
| Guided image matching | No |
| Adaptive camera model fitting | Yes |
| Matching time | 21 minutes 13 seconds |
| Matching memory usage | 1.42 GB |
| Alignment time | 5 minutes 42 seconds |
| Alignment memory usage | 145.58 MB |
| **Optimization parameters** | |
| Parameters | b1, b2, cx, cy, k1-k4, p1, p2 |
| Adaptive camera model fitting | Yes |
| Optimization time | 5 seconds |
| Software version | 1.7.2.12070 |
| File size | 19.37 MB |
| **Depth Maps** | |
| Count | 214 |
| **Depth maps generation parameters** | |
| Quality | High |
| Filtering mode | Aggressive |
| Processing time | 2 hours 41 minutes |
| Memory usage | 4.03 GB |
| Software version | 1.7.2.12070 |
| File size | 1.29 GB |
| **Dense Point Cloud** | |
| Points | 140,689,861 |
| Point colors | 3 bands, uint8 |
| **Depth maps generation parameters** | |
| Quality | High |
| Filtering mode | Aggressive |
| Processing time | 2 hours 41 minutes |
| Memory usage | 4.03 GB |

| | |
|---|---|
| **Dense cloud generation parameters** | |
| Processing time | 14 minutes 4 seconds |
| Memory usage | 4.97 GB |
| **Ground points classification parameters** | |
| Max angle (°) | 15 |
| Max distance (m) | 0.2 |
| Cell size (m) | 50 |
| Classification time | 6 minutes 51 seconds |
| Classification memory usage | 5.43 GB |
| Software version | 1.7.2.12070 |
| File size | 1.98 GB |
| **DEM** | |
| Size | 19,168 x 16,615 |
| Coordinate system | WGS 84 / UTM zone 21S EGM08 |
| **Reconstruction parameters** | |
| Source data | Dense cloud |
| Interpolation | Enabled |
| Processing time | 3 minutes 20 seconds |
| Memory usage | 334.07 MB |
| Software version | 1.7.2.12070 |
| File size | 424.53 MB |
| **Orthomosaic** | |
| Size | 25,522 x 22,188 |
| Coordinate system | WGS 84 / UTM zone 21S EGM08 |
| Colors | 3 bands, uint8 |
| **Reconstruction parameters** | |
| Blending mode | Mosaic |
| Surface | DEM |
| Enable hole filling | Yes |
| Enable ghosting filter | No |
| Processing time | 8 minutes 22 seconds |
| Memory usage | 1.76 GB |
| Software version | 1.7.2.12070 |
| File size | 4.40 GB |
| **System** | |
| Software name | Agisoft Metashape Professional |
| Software version | 1.7.2 build 12070 |
| OS | Windows 64 bit |
| RAM | 63.93 GB |
| CPU | Intel(R) Core(TM) i7-9700F CPU @ 3.00GHz |
| GPU(s) | Radeon(TM) RX 460 Graphics (Baffin) |