

Noosa Main Beach survey - P4RTK 21Feb2019

**Processing Report
01 May 2020**



Survey Data

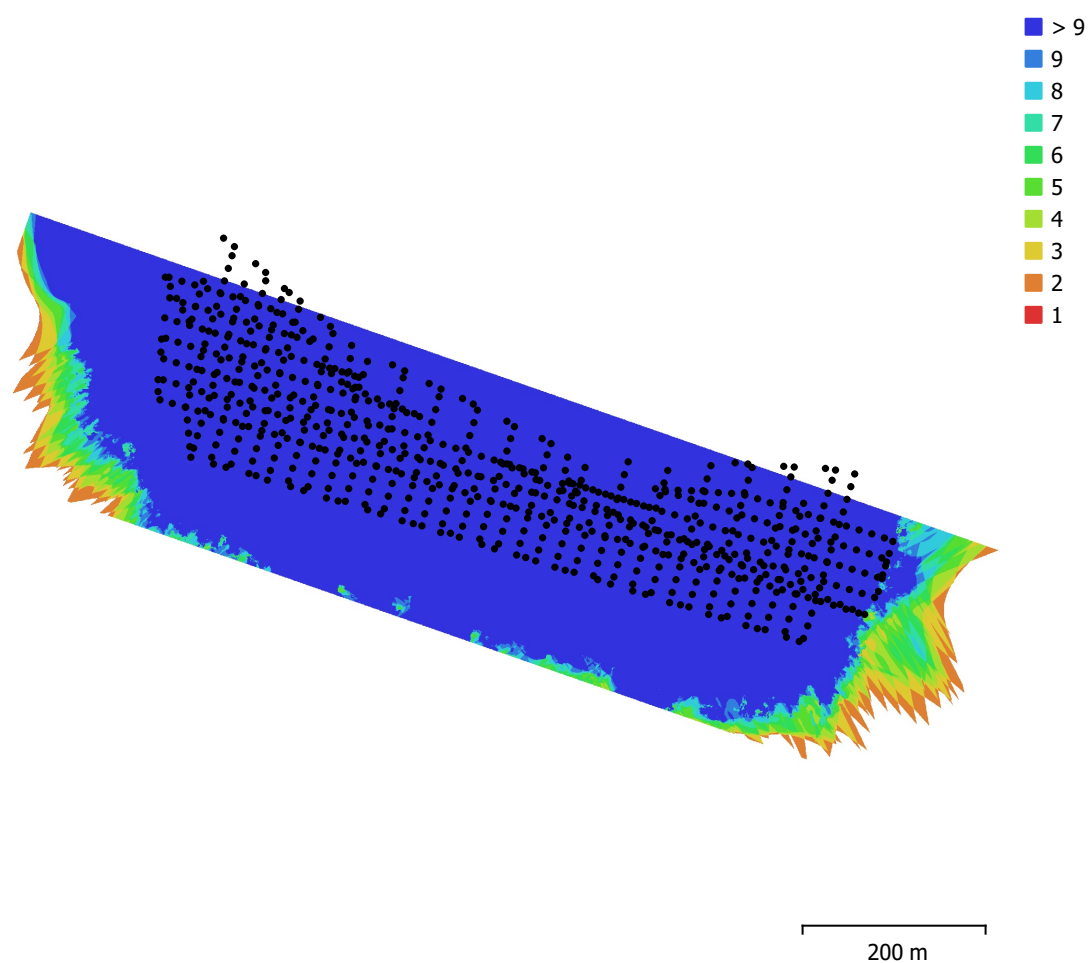


Fig. 1. Camera locations and image overlap.

Number of images:	833	Camera stations:	732
Flying altitude:	94.2 m	Tie points:	435,205
Ground resolution:	2.27 cm/pix	Projections:	1,205,696
Coverage area:	0.291 km ²	Reprojection error:	0.204 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
FC6310R (8.8mm)	5472 x 3648	8.8 mm	2.41 x 2.41 μm	No

Table 1. Cameras.

Camera Calibration

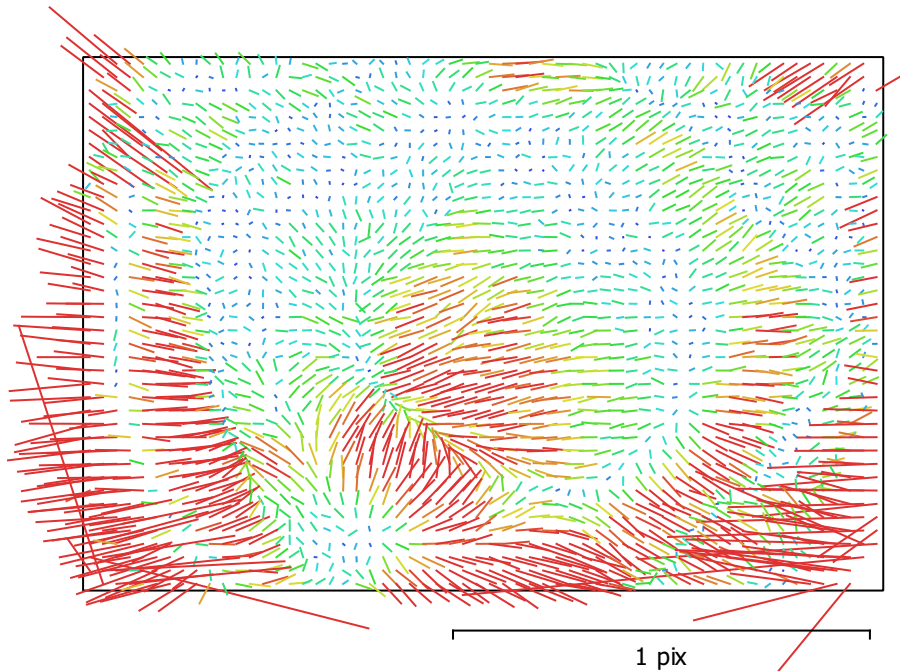


Fig. 2. Image residuals for FC6310R (8.8mm).

FC6310R (8.8mm)

833 images

Type
Frame

Resolution
5472 x 3648

Focal Length
8.8 mm

Pixel Size
2.41 x 2.41 μm

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	3634.12	0.013	1.00	-0.01	-0.71	-0.39	0.29	-0.26	-0.00	0.63
Cx	10.0778	0.014		1.00	0.05	0.04	-0.05	0.07	0.29	-0.00
Cy	7.95168	0.02			1.00	0.08	-0.03	0.03	0.05	-0.53
K1	-0.26665	8e-06				1.00	-0.96	0.90	0.05	-0.13
K2	0.107579	1.7e-05					1.00	-0.98	-0.06	0.04
K3	-0.0299206	1.1e-05						1.00	0.09	-0.05
P1	-0.000687151	3.3e-07							1.00	-0.04
P2	0.000305962	7.4e-07								1.00

Table 2. Calibration coefficients and correlation matrix.

Camera Locations

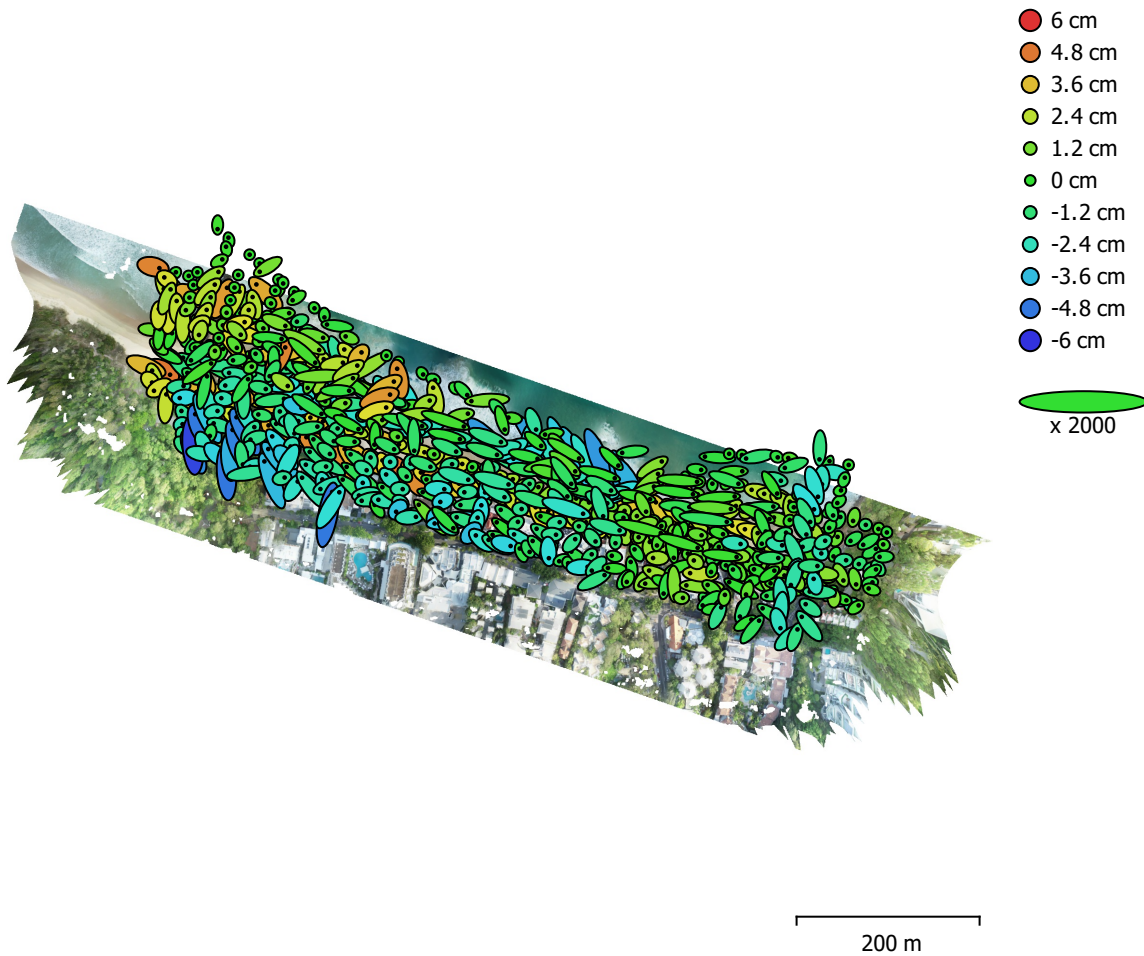


Fig. 3. Camera locations and error estimates.

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 (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total error (cm)
0.754843	0.643582	1.95218	0.991961	2.18975

Table 3. Average camera location error.

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

Camera Orientations

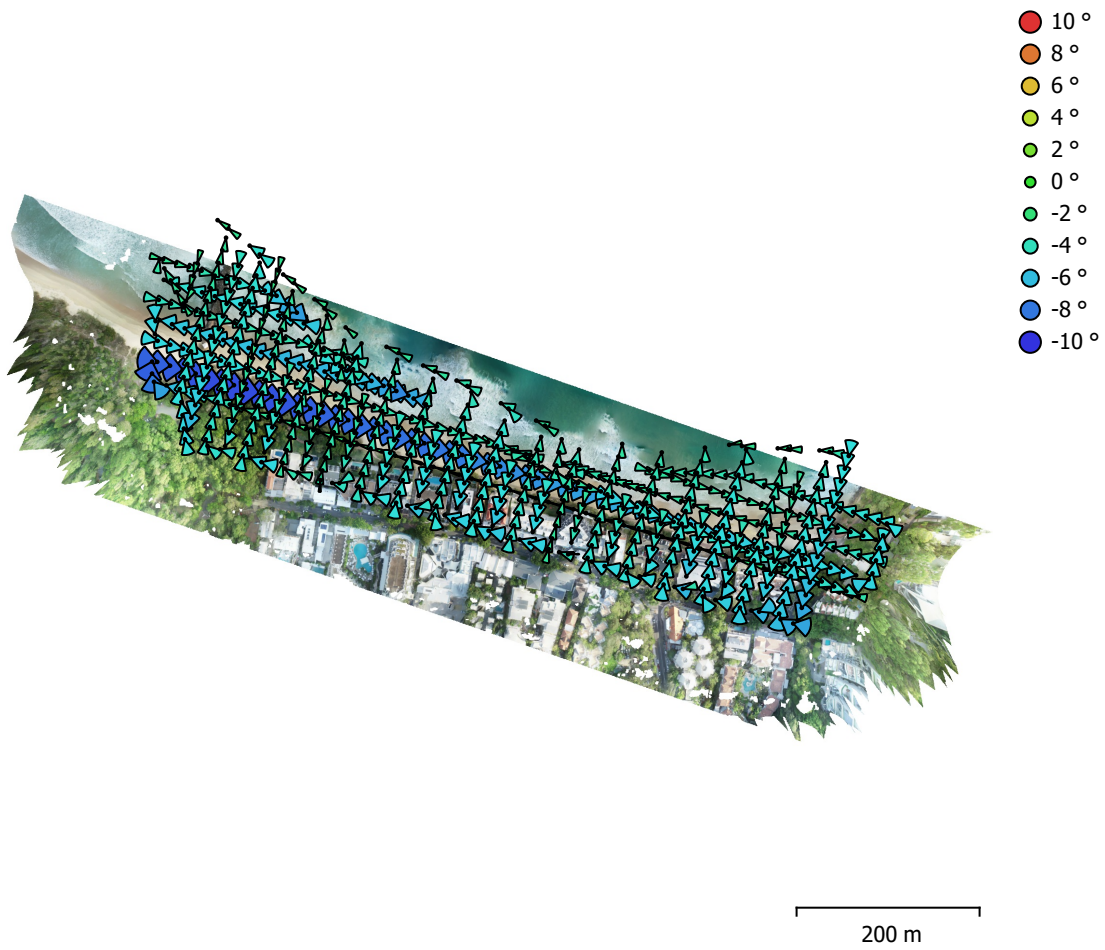


Fig. 4. Camera orientations and error estimates.
Arcs represent yaw error estimates.

Yaw error (°)	Pitch error (°)	Roll error (°)	Total error (°)
4.53873	0.319806	0.648522	4.59597

Table 4. Average camera rotation error.

Ground Control Points

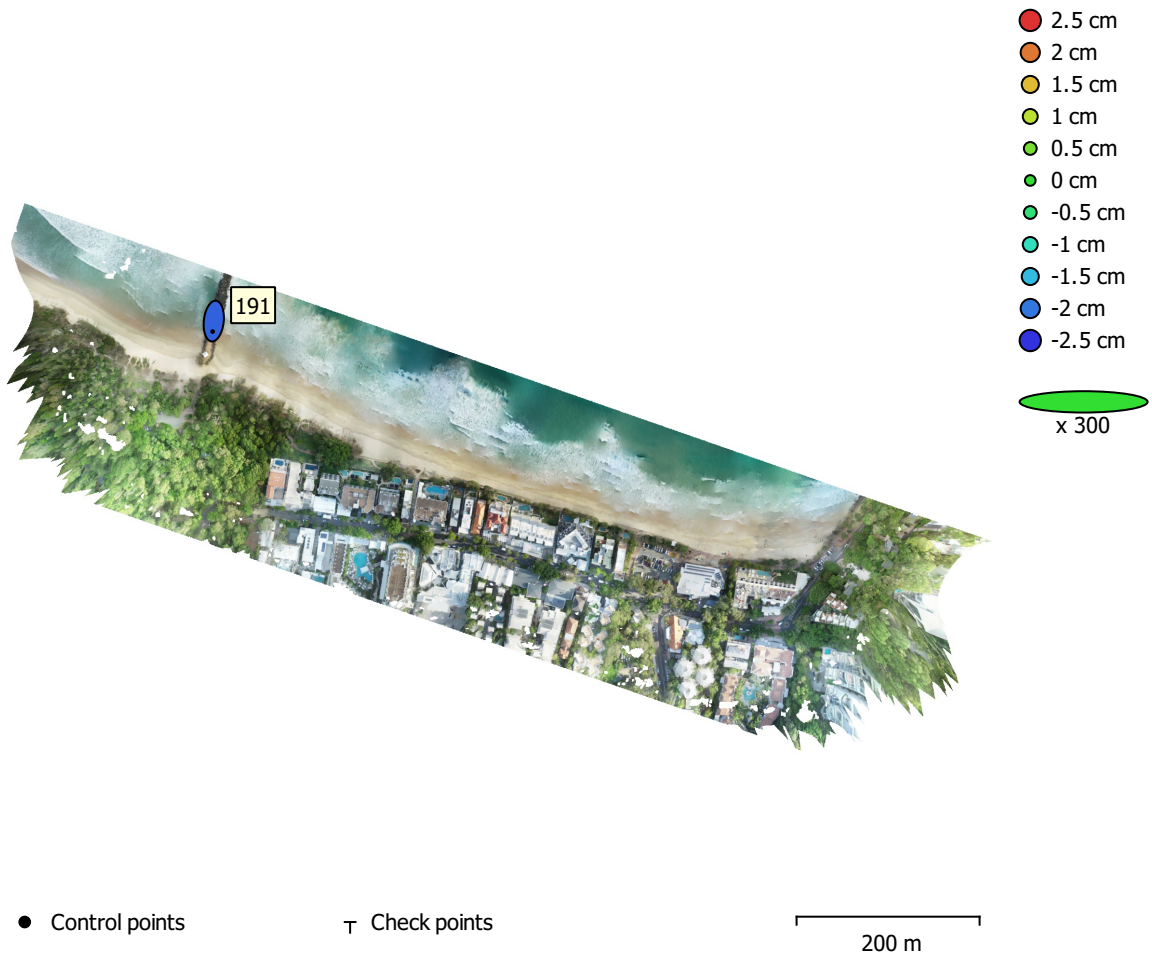


Fig. 5. GCP locations and error estimates.

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 (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total (cm)
1	0.838569	7.6333	2.16215	7.67922	7.9778

Table 5. Control points RMSE.

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

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
191	-0.838569	-7.6333	-2.16215	7.9778	0.355 (3)
Total	0.838569	7.6333	2.16215	7.9778	0.355

Table 6. Control points.
X - Easting, Y - Northing, Z - Altitude.

Digital Elevation Model

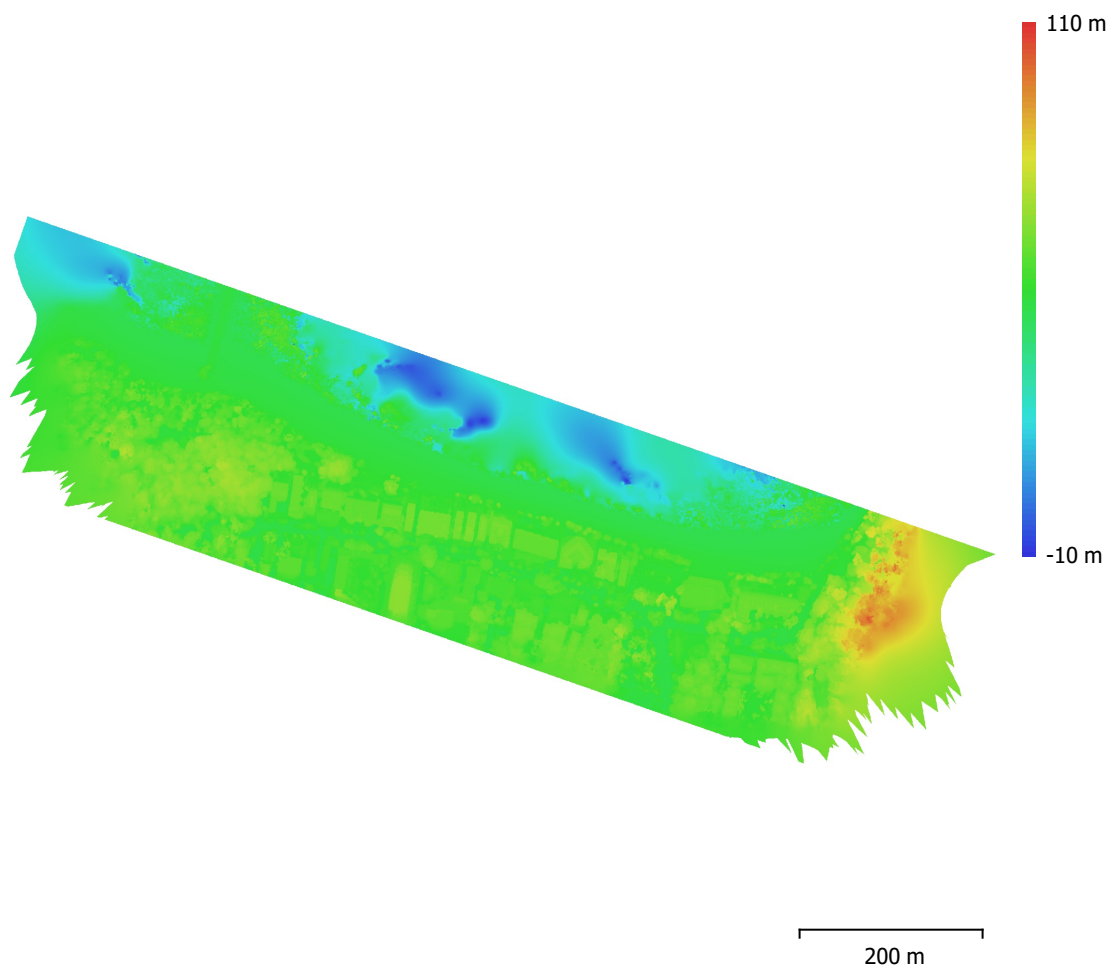


Fig. 6. Reconstructed digital elevation model.

Resolution: 4.53 cm/pix
Point density: 486 points/m²

Processing Parameters

General

Cameras	833
Aligned cameras	732
Markers	337
Coordinate system	GDA94 / MGA zone 56 (EPSG::28356)
Rotation angles	Yaw, Pitch, Roll

Point Cloud

Points	435,205 of 617,871
RMS reprojection error	0.122855 (0.204319 pix)
Max reprojection error	0.573493 (1.89996 pix)
Mean key point size	1.64464 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	3.34309

Alignment parameters

Accuracy	Highest
Generic preselection	Yes
Reference preselection	Yes
Key point limit	40,000
Tie point limit	4,000
Adaptive camera model fitting	No
Matching time	2 hours 18 minutes
Alignment time	16 minutes 19 seconds

Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	No
Optimization time	4 seconds

Depth Maps

Count	710
Depth maps generation parameters	
Quality	High
Filtering mode	Moderate
Processing time	41 minutes 54 seconds
Software version	1.6.2.10247

Dense Point Cloud

Points	229,750,408
Point colors	3 bands, uint8

Depth maps generation parameters

Quality	High
Filtering mode	Moderate
Processing time	41 minutes 54 seconds

Dense cloud generation parameters

Processing time	3 hours 9 minutes
Software version	1.6.2.10247

DEM

Size	26,234 x 14,362
Coordinate system	GDA94 / MGA zone 56 (EPSG::28356)

Reconstruction parameters

Source data	Dense cloud
Interpolation	Enabled

Processing time	3 minutes 10 seconds
Software version	1.6.2.10247
Orthomosaic	
Size	47,569 x 26,371
Coordinate system	GDA94 / MGA zone 56 (EPSG::28356)
Colors	3 bands, uint8
Reconstruction parameters	
Blending mode	Mosaic
Surface	DEM
Enable hole filling	Yes
Processing time	51 minutes 54 seconds
Software version	1.6.2.10247
System	
Software name	Agisoft Metashape Professional
Software version	1.6.2 build 10247
OS	Windows 64 bit
RAM	31.83 GB
CPU	Intel(R) Core(TM) i7-9700 CPU @ 3.00GHz
GPU(s)	GeForce RTX 2080 SUPER