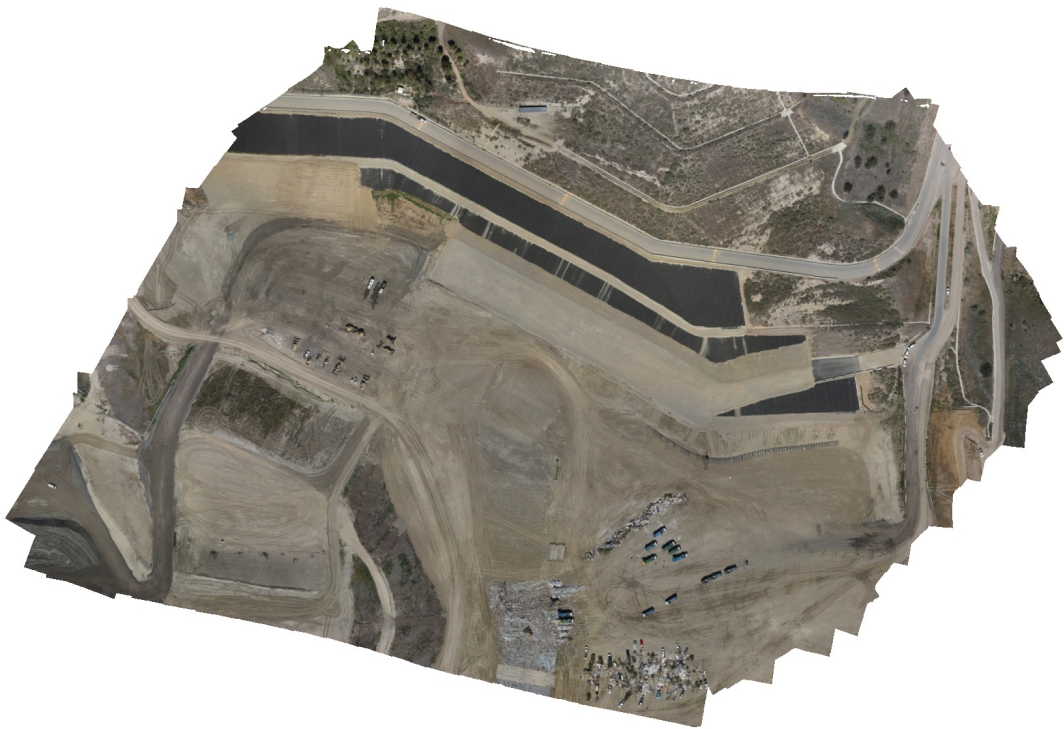


2022

Processing Report
14 March 2022



Survey Data

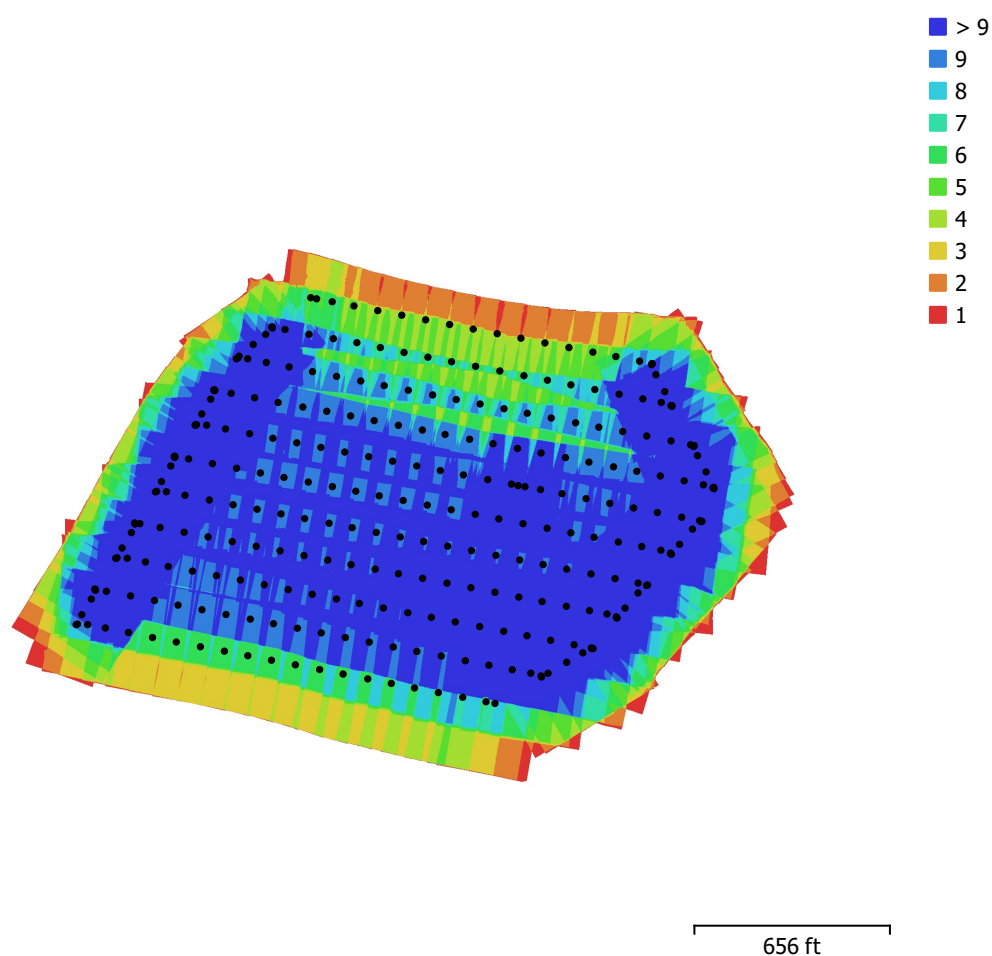


Fig. 1. Camera locations and image overlap.

Number of images:	293	Camera stations:	293
Flying altitude:	397 ft	Tie points:	191,919
Ground resolution:	0.0471 ft/pix	Projections:	1,137,012
Coverage area:	3.45e+05 yd ²	Reprojection error:	0.545 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
ZenmuseP1 (35mm)	8192 x 5460	35 mm	4.39 x 4.39 μm	Yes

Table 1. Cameras.

Camera Calibration

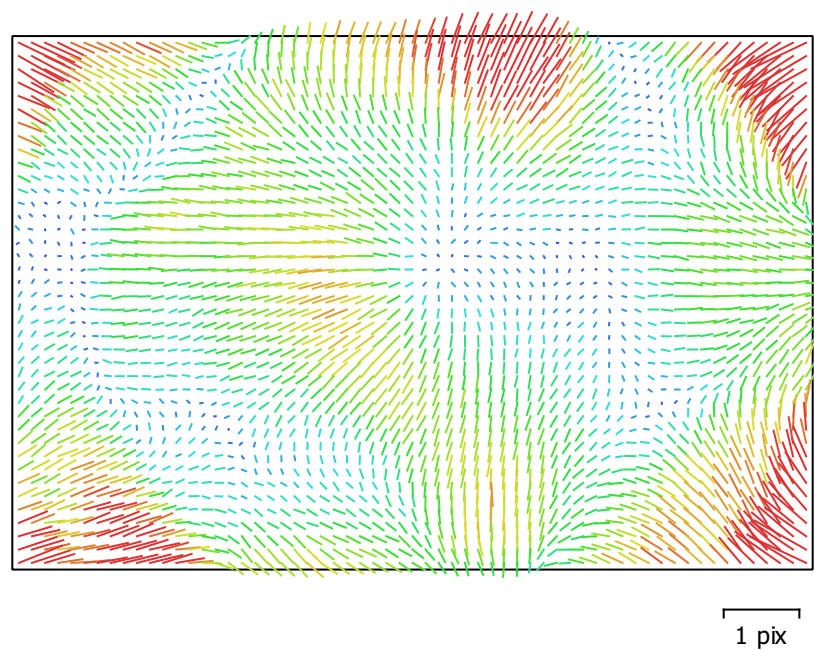


Fig. 2. Image residuals for ZenmuseP1 (35mm).

ZenmuseP1 (35mm)

293 images, precalibrated

Type	Resolution	Focal Length	Pixel Size
Frame	8192 x 5460	35 mm	4.39 x 4.39 μm
F:	8186.95		
Cx:	-30.1713	B1:	0
Cy:	12.9491	B2:	0
K1:	-0.0507822	P1:	-2.071e-05
K2:	0.0250825	P2:	0.00037501
K3:	-0.111068	P3:	0
K4:	0	P4:	0

Camera Locations

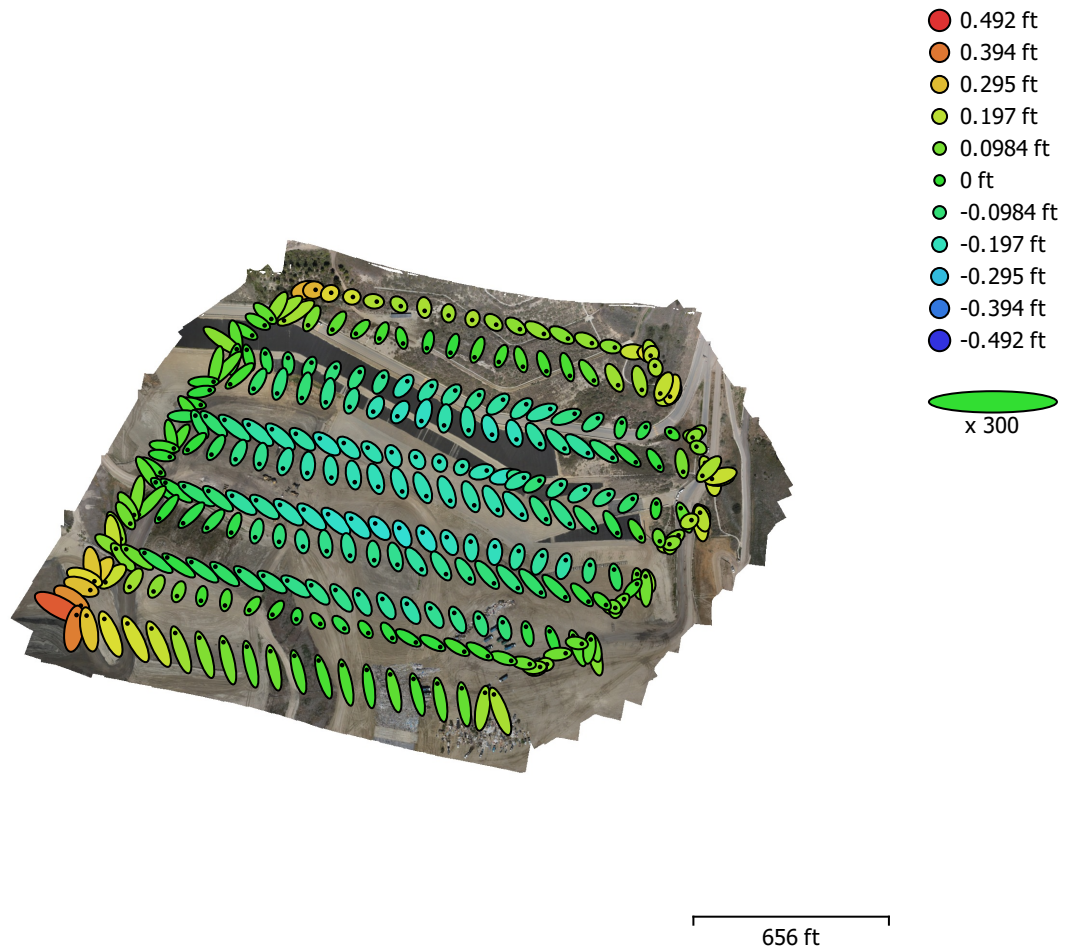


Fig. 3. Camera locations and error estimates.

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 (ft)	Y error (ft)	Z error (ft)	XY error (ft)	Total error (ft)
0.120241	0.169057	0.140116	0.207457	0.250342

Table 2. Average camera location error.

X - Longitude, Y - Latitude, Z - Altitude.

Ground Control Points

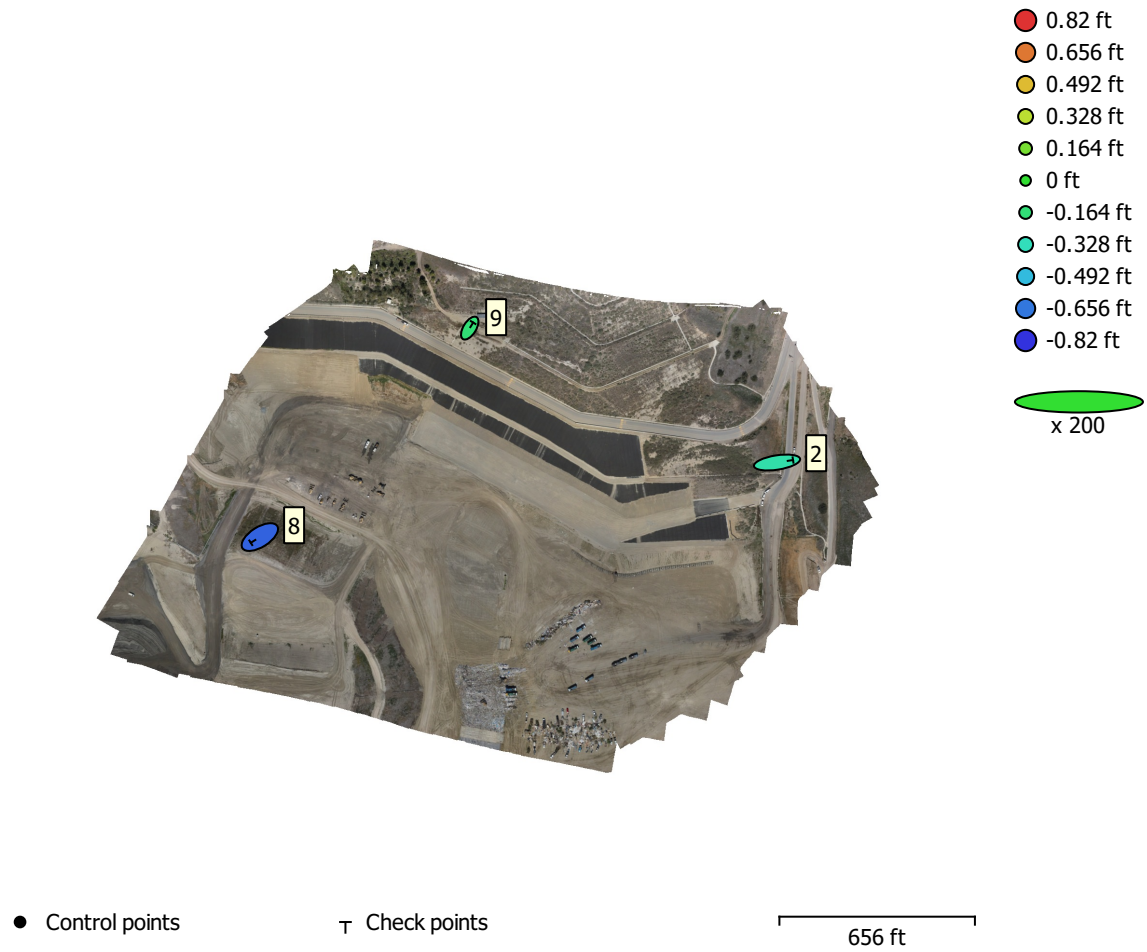


Fig. 4. GCP locations and error estimates.

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 (ft)	Y error (ft)	Z error (ft)	XY error (ft)	Total (ft)
3	0.361872	0.161619	0.449241	0.396323	0.599074

Table 3. Check points RMSE.

X - Longitude, Y - Latitude, Z - Altitude.

Label	X error (ft)	Y error (ft)	Z error (ft)	Total (ft)	Image (pix)
2	0.536298	0.083324	-0.283818	0.612463	0.465 (4)
8	-0.303234	-0.192081	-0.706435	0.792399	0.230 (4)
9	0.11527	0.185807	-0.160782	0.271408	0.097 (4)
Total	0.361872	0.161619	0.449241	0.599074	0.305

Table 4. Check points.
X - Longitude, Y - Latitude, Z - Altitude.

Digital Elevation Model

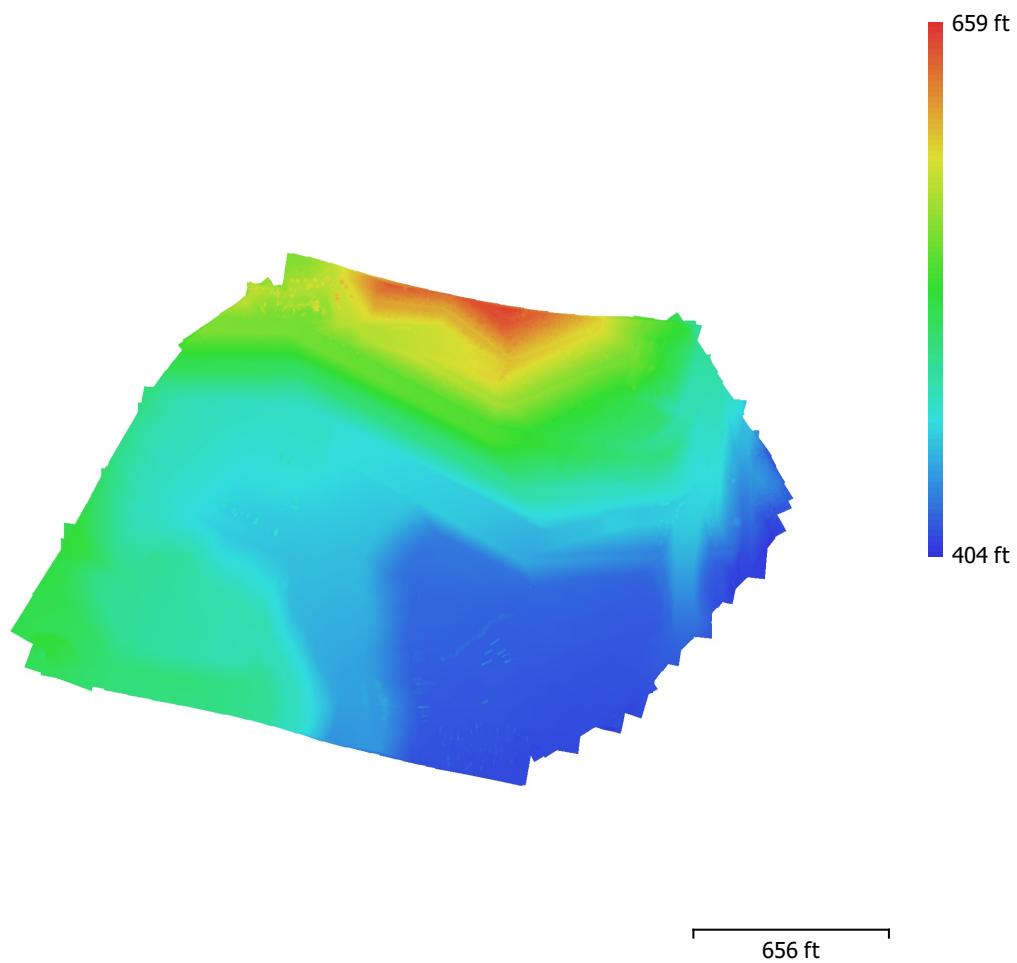


Fig. 5. Reconstructed digital elevation model.

Resolution: 0.188 ft/pix
Point density: 28.2 points/ft²

Processing Parameters

General

Cameras	293
Aligned cameras	293
Markers	3
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll

Point Cloud

Points	191,919 of 205,969
RMS reprojection error	0.185532 (0.545456 pix)
Max reprojection error	0.557985 (26.3566 pix)
Mean key point size	2.68257 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	6.11963

Alignment parameters

Accuracy	High
Generic preselection	Yes
Reference preselection	Source
Key point limit	40,000
Key point limit per Mpx	1,000
Tie point limit	4,000
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Matching time	3 minutes 47 seconds
Matching memory usage	2.77 GB
Alignment time	45 seconds
Alignment memory usage	225.87 MB
Date created	2022:03:14 12:32:17
Software version	1.7.5.13229
File size	24.25 MB

Depth Maps

Count	293
Depth maps generation parameters	
Quality	Medium
Filtering mode	Mild
Max neighbors	40
Processing time	19 minutes 29 seconds
Memory usage	5.23 GB
Date created	2022:03:14 12:55:47
Software version	1.7.5.13229
File size	1.07 GB

Dense Point Cloud

Points	96,167,986
Point colors	3 bands, uint8
Depth maps generation parameters	
Quality	Medium
Filtering mode	Mild
Max neighbors	40
Processing time	19 minutes 29 seconds

Memory usage	5.23 GB
Dense cloud generation parameters	
Processing time	18 minutes 27 seconds
Memory usage	11.91 GB
Date created	2022:03:14 13:14:15
Software version	1.7.5.13229
File size	1.35 GB
Model	
Faces	6,410,980
Vertices	3,205,599
Vertex colors	3 bands, uint8
Depth maps generation parameters	
Quality	Medium
Filtering mode	Mild
Max neighbors	40
Processing time	19 minutes 29 seconds
Memory usage	5.23 GB
Reconstruction parameters	
Surface type	Height field
Source data	Dense cloud
Interpolation	Extrapolated
Strict volumetric masks	No
Processing time	4 minutes 20 seconds
Memory usage	1.68 GB
Date created	2022:03:14 13:38:54
Software version	1.7.5.13229
File size	146.74 MB
Orthomosaic	
Size	69,623 x 54,680
Coordinate system	NAD83 / California zone 6 (ftUS) (EPSG::2230)
Colors	3 bands, uint8
Reconstruction parameters	
Blending mode	Mosaic
Surface	Mesh
Enable hole filling	Yes
Enable ghosting filter	No
Processing time	36 minutes 11 seconds
Memory usage	14.83 GB
Date created	2022:03:14 13:54:49
Software version	1.7.5.13229
File size	15.95 GB
System	
Software name	Agisoft Metashape Professional
Software version	1.7.5 build 13229
OS	Windows 64 bit
RAM	127.88 GB
CPU	AMD Ryzen Threadripper 2990WX 32-Core Processor
GPU(s)	Quadro RTX 5000