



REGIONE CALABRIA

DIPARTIMENTO INFRASTRUTTURE E LAVORI PUBBLICI

LAVORI DI RISTRUTTURAZIONE E COMPLETAMENTO DEL MOLO RICOVERO NATANTI DA DIPORTO DEL COMUNE DI DIAMANTE

PROGETTO DI FATTIBILITA' TECNICO-ECONOMICA

secondo le Linee Guida di cui all'art. 48, c. 7, del D.L. 77/2021, convertito nella L. 108/2021



RESPONSABILE UNICO DEL PROGETTO:

Ing. Michele Romano

Timbro e Firma:

RTP PROGETTAZIONE:

Terre Leggere S.r.l. (Capogruppo Mandataria)

Ing. R. Papa

Alphatech associazione tra professionisti (Mandante)

Ing. R. Chieffi

Geol. Federico Tarallo (Mandante)

Ing. Antonio Cibelli (Mandante)

Timbro e Firma:

Data: Ottobre 2024

Titolo:

REPORT
RILIEVO FOTOGRAMMETRICO

Elaborato:

EG.11

Scala: ---

REV	DATA	DESCRIZIONE	REDATTO	CONTROLLATO	APPROVATO
00	Ottobre 2024	Emissione	A. Cibelli	R. Chieffi	R. Papa



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LAVORI DI RISTRUTTURAZIONE E COMPLETAMENTO DEL
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Indagini a supporto della Progettazione di Fattibilità Tecnico-Economica



PARAMETRI GEODETICI E CARTOGRAFICI

DATUM : ETRS 89
PROIEZIONE : U.T.M.

ZONA : UTM 33N
FALSO EST: 500000
FALSO NORD: 0
MERIDIANO: 15° E
FATTORE DI SCALA: 0.9996



Atlantis Soc. Coop. Via dei Cantieri, 75 Molo Nord 90142 Palermo
info@atlantispalermo.com
P.Iva C.Fisc. Reg.Imprese: IT04513990822 - Rea: PA201241

REV.	DATA	DESCRIZIONE	DISEGNATO	CONTROLLATO	APPROVATO
	08/07/2024	Report rilievo fotogrammetrico	L. Scalici		G.Curatolo

SCALA



Data rilievo: 13 giugno 2024

M/Barca: **Atlantis PA3897**

FILE :
10_Rilievo fotogrammetrico

N° Carta:
10

Diamante

Processing Report Rilievo Fotogrammetrico Diamante

18 July 2024



Survey Data

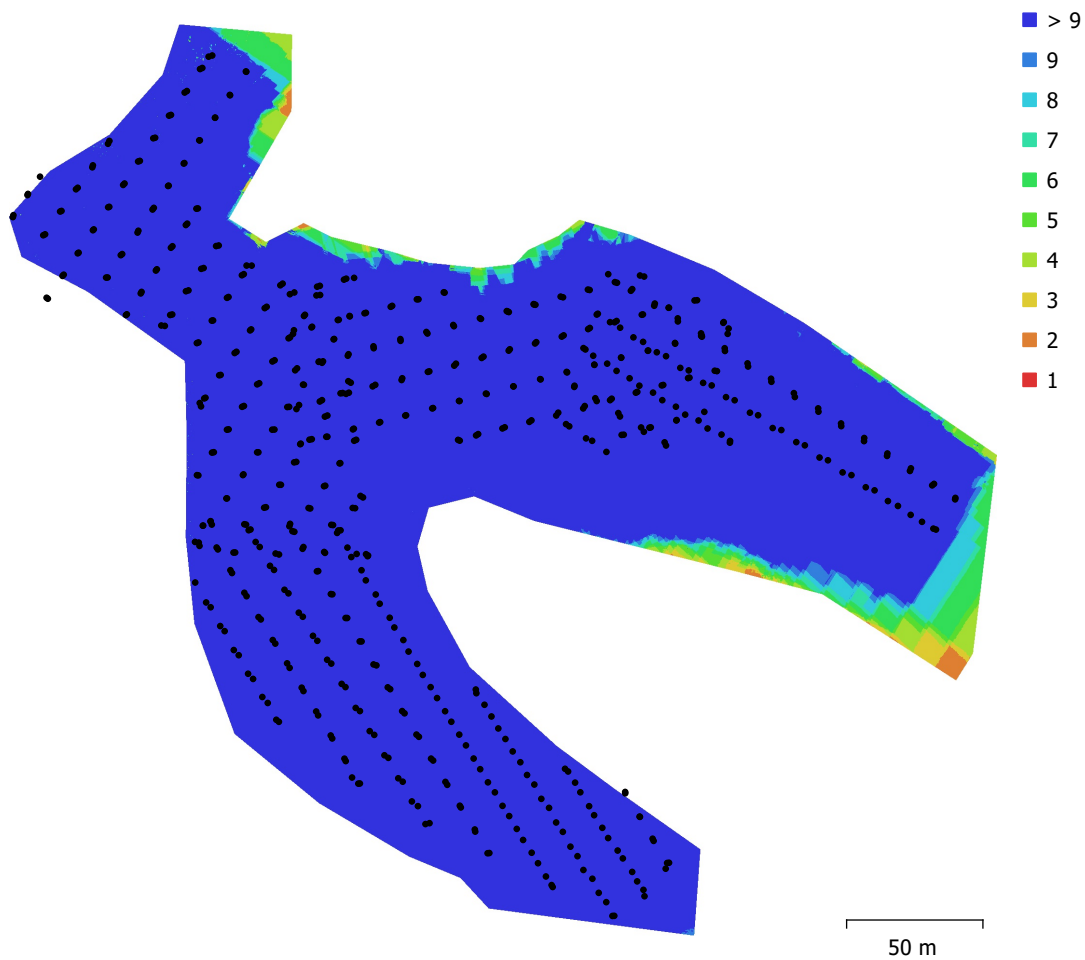


Fig. 1. Camera locations and image overlap.

Number of images:	615	Camera stations:	606
Flying altitude:	54.9 m	Tie points:	424,591
Ground resolution:	9.17 mm/pix	Projections:	1,600,818
Coverage area:	0.0502 km ²	Reprojection error:	1.78 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
FC8482 (6.7mm)	8056 x 4528	6.7 mm	unknown	No

Table 1. Cameras.

Camera Calibration

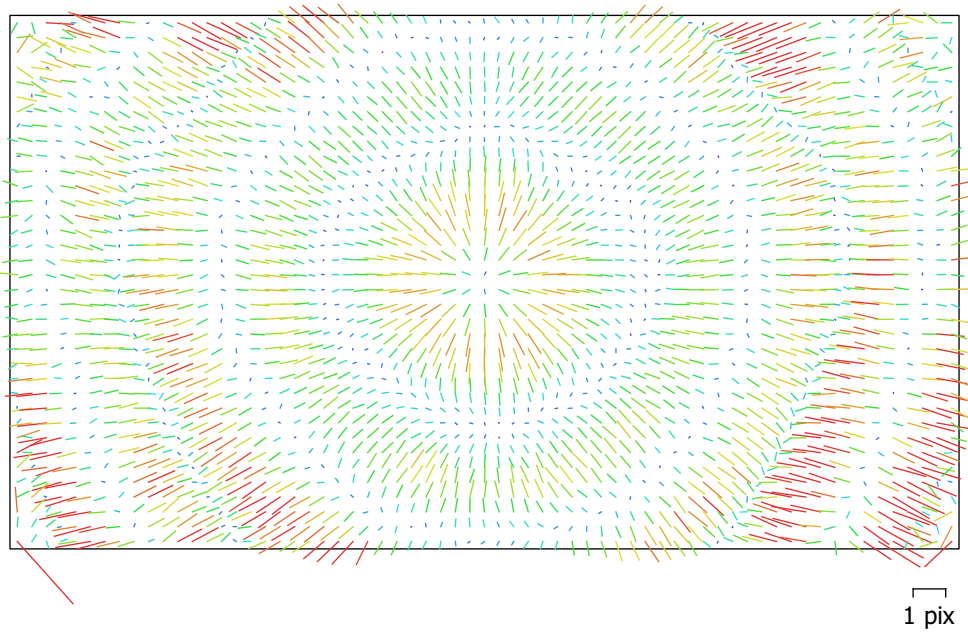


Fig. 2. Image residuals for FC8482 (6.7mm).

FC8482 (6.7mm)

615 images

Type	Resolution	Focal Length	Pixel Size
Frame	8056 x 4528	6.7 mm	unknown
F:	5626.5		
Cx:	3.21102	B1:	-4.4637
Cy:	-33.152	B2:	-0.608437
K1:	0.173913	P1:	-7.28626e-005
K2:	-0.71774	P2:	-0.000208838
K3:	1.55841	P3:	0
K4:	-1.25173	P4:	0

Ground Control Points

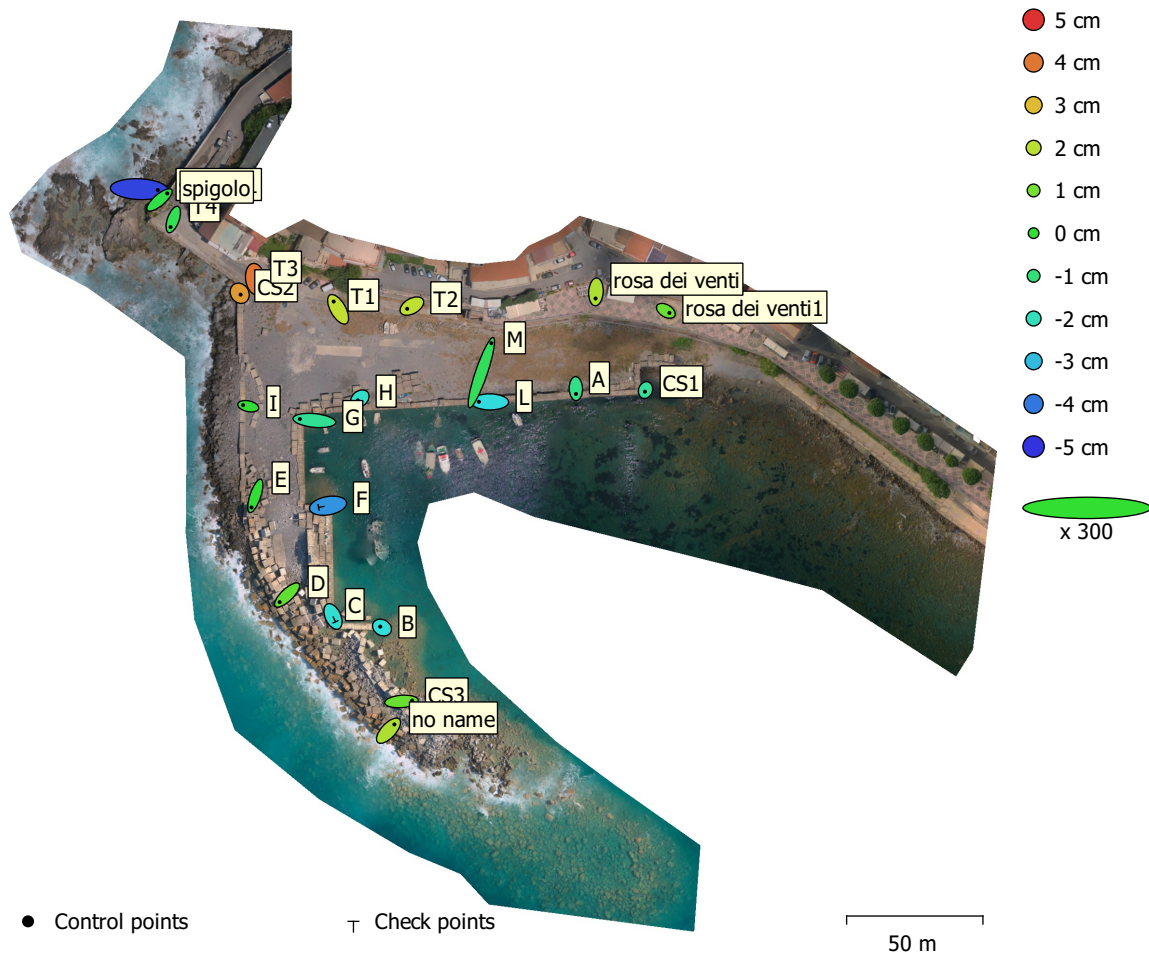


Fig. 3. GCP locations and error estimates.

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)
21	1.80798	1.98735	2.08461	2.6867	3.40058

Table 2. Control points RMSE.

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

Count	X error (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total (cm)
2	1.69119	0.973451	3.00306	1.95134	3.58136

Table 3. Check points RMSE.

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

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
CS1	-0.135396	-0.383088	-1.49557	1.54978	0.480 (72)
A	0.0367212	-1.30593	-1.23409	1.79716	0.486 (58)
CS3	2.60532	0.206198	0.795114	2.73174	0.337 (30)
no name	1.43611	1.54139	1.78843	2.76347	0.300 (37)
CS2	0.218771	-0.327498	3.48112	3.50333	1.274 (30)
T3	0.2295	-1.51153	4.0315	4.31166	0.948 (33)
rosa dei venti1	0.871146	-0.518861	0.765734	1.27061	0.431 (47)
I	-1.26555	0.269246	-0.0485378	1.29479	0.511 (42)
E	-0.950884	-2.82516	-0.042756	2.9812	0.717 (47)
G	-3.55143	0.349394	-1.42598	3.84294	0.709 (56)
T1	-1.08049	1.8961	2.10041	3.02892	0.925 (44)
T2	-1.14086	-0.654776	2.08286	2.46345	0.622 (42)
L	-2.64894	0.0191504	-2.55881	3.68303	0.372 (43)
H	-0.48008	-0.400243	-2.18571	2.27332	0.839 (55)
M	2.44656	7.19738	-0.569618	7.62314	0.458 (49)
D	-1.82086	-1.73984	0.669348	2.60588	0.469 (41)
B	-0.436722	0.234943	-2.40627	2.45684	0.267 (29)
rosa dei venti	-0.0963039	-1.6247	1.79699	2.42448	0.414 (46)
T4	-0.662634	-1.8602	-0.460882	2.02777	0.530 (37)
spigolo1	4.53129	-0.193893	-4.74054	6.56071	0.992 (31)
spigolo	1.89935	1.62058	-0.346953	2.52075	0.974 (25)
Total	1.80798	1.98735	2.08461	3.40058	0.652

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

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
F	-2.31371	-0.410175	-3.57796	4.28057	0.973 (52)
C	0.605787	-1.31414	-2.28801	2.7072	0.440 (42)
Total	1.69119	0.973451	3.00306	3.58136	0.781

Table 5. Check points.
X - Longitude, Y - Latitude, Z - Altitude.

Digital Elevation Model

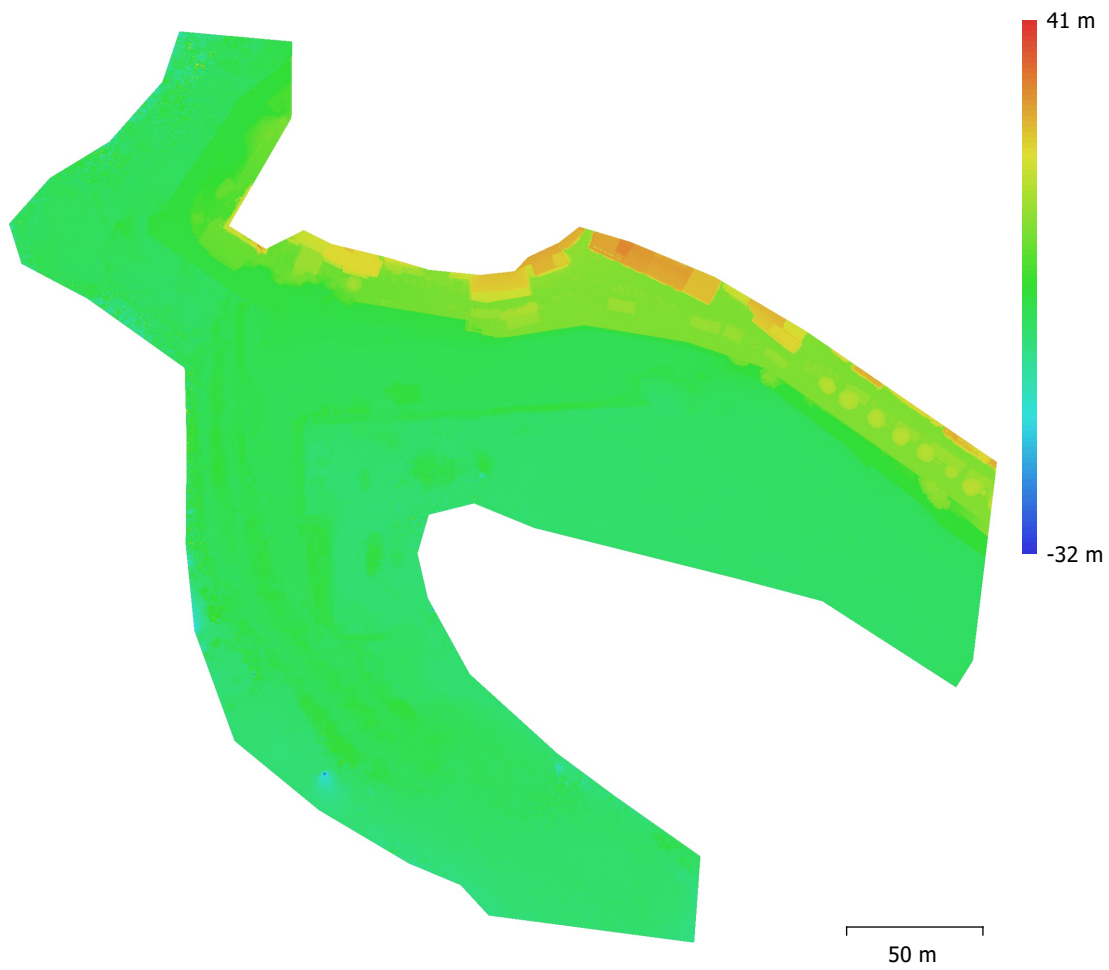


Fig. 4. Reconstructed digital elevation model.

Resolution: 1.83 cm/pix
Point density: 0.297 points/cm²

Processing Parameters

General

Cameras	615
Aligned cameras	606
Markers	23

Shapes

Polygons	1
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll

Point Cloud

Points	424,591 of 473,554
RMS reprojection error	0.300061 (1.77771 pix)
Max reprojection error	9.01575 (63.4411 pix)
Mean key point size	6.72308 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	4.24775

Alignment parameters

Accuracy	High
Generic preselection	Yes
Key point limit	40,000
Tie point limit	4,000
Adaptive camera model fitting	Yes
Matching time	31 minutes 2 seconds
Alignment time	3 minutes 26 seconds

Optimization parameters

Parameters	f, b1, b2, cx, cy, k1-k4, p1, p2
Adaptive camera model fitting	No
Optimization time	20 seconds

Depth Maps

Count	593
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Reconstruction parameters

Quality	High
Filtering mode	Mild
Processing time	2 hours 23 minutes

Dense Point Cloud

Points	303,096,682
Point colors	3 bands, uint8

Reconstruction parameters

Quality	High
Depth filtering	Mild
Depth maps generation time	2 hours 23 minutes
Dense cloud generation time	2 hours 53 minutes

DEM

Size	22,701 x 19,505
Coordinate system	WGS 84 (EPSG::4326)

Reconstruction parameters

Source data	Dense cloud
Interpolation	Enabled
Processing time	1 minutes 36 seconds

Orthomosaic

General

Size	40,942 x 37,571
Coordinate system	WGS 84 (EPSG::4326)
Colors	3 bands, uint8

Reconstruction parameters

Blending mode	Mosaic
Surface	DEM
Enable hole filling	Yes
Processing time	16 minutes 59 seconds

Software

Version	1.5.1 build 7618
Platform	Windows 64