

Addendum to Pre-Bid meeting for “LIDAR Data Survey for Palau”, January 15, 2020

January 30, 2020

After the “LIDAR Data Survey for Palau” Pre-bid Meeting held on January 15, 2020, reconsiderations were made from advice provided to PALARIS and UNDP. These changes were based on communications from potential vendors and post meeting discussions with partner agencies. These reconsideration involve the three subjects below that were discussed at the pre-bid meeting.

- 1. High Resolution Digital Color Imagery (Aerial Imagery)**
- 2. Quality Control (QC)**
- 3. Control Points**

The main reason for the reconsideration of advice given, is to develop products that would be more beneficial for use by the Republic of Palau.

1. High Resolution Digital Color Imagery (Aerial Imagery)

Advice provided during Pre-bid meeting

In the pre bid meeting and minutes of the meeting it was implied that the collection of aerial imagery was optional and would be considered supplementary information. If collected, imagery should have a resolution of 1 meter.

Updated Terms

The collection of aerial imagery will be required for the project. Image resolution should be at resolution of 25cm to 50 cm. General specifications can be found in the “Deliverables” section of the Terms of Reference.

2. Quality control

Advice provided during Pre-bid meeting

Independent check points for the purpose of Quality control is optional. Benchmarks will be provided by PALARIS and Bureau of Lands and Surveys will be used for QC. Though, not clearly stated in the discussion, there was the idea that local survey agencies would conduct the QC to reduce costs.

Updated Terms

The collection of independent checkpoints will be required to ensure Quality Control as indicated in the Terms of Reference. Upon review of current benchmarks, the number of benchmarks and the spatial spread of these benchmarks across the islands may not be enough to ensure proper quality/correction of the data. Also, there have been indications that some of these benchmarks may be incorrect. A list of benchmarks, including elevation, is provided in Annex 1. A map indicating the location of benchmarks is presented in Annex 2.

Due to distance and access to some islands in Palau, the placement of QC points may be prohibitive (The island groups of Sonsorol and Hatohebei). In this case, resulting products we will have to rely on best available data.

As indicated in the TOR a QC/QA report will be required ensure quality of data collected.

3. Classification

Advice provided during Pre-bid meeting

The classification is related some secondary activities that our office is involved. Though not mentioned in the pre-bid conference, we are interested delineating hydrological features (streams, rivers, lakes).

Updated Terms

In the Request for the Proposal a minimum of 6 classes were identified. Based on advice familiar with the landscape of Palau and lidar surveys and required information needs for upcoming projects, we have decided to modify the classification scheme to the following:

Code	Point Cloud Classification Scheme
1*	Unclassified/non-ground classification
2	Bare-earth ground (DEM)
3	Low vegetation (0-0.3m)
4	Medium vegetation (0.0-2m)
5	High vegetation (2m>)
6	Building or Structures (Buildings, houses, sheds and etc.)
9	Water (Rivers, streams, lakes and etc)

The change in classification scheme takes into consideration the landscape of Palau which includes large areas of land which are undeveloped and have very high canopy cover, which may prevent LIDAR penetration to the ground.

PALAU GPS PROJECT 2008 & 2009
Horizontal Datum - NAD83 /WGS84

Station Name	Latitude			Longitude (East)			Ellipsoid HT meters (m)
	D	M	Seconds	D	M	Seconds	
BAB 01	07	21	46.46032 N	134	30	21.89508 E	79.877
BAB 01 BS	07	21	49.54541 N	134	30	29.57367 E	70.158
BAB 07	07	24	36.71657 N	134	30	43.44717 E	81.206
BAB 08	07	24	57.57943 N	134	31	13.46761 E	111.29
BAB 10	07	25	56.26172 N	134	31	44.11833 E	147.689
BAB 12	07	27	04.68134 N	134	31	55.29024 E	85.77
BAB 13	07	27	25.92425 N	134	31	47.36899 E	109.549
BAB 14	07	27	55.22769 N	134	31	46.61790 E	72.488
BAB 18	07	29	49.36643 N	134	32	40.36921 E	71.357
BAB 20	07	30	47.27855 N	134	32	40.63645 E	72.555
BAB 21	07	31	25.98821 N	134	33	00.67965 E	72.796
BAB 22	07	31	48.84127 N	134	33	20.16487 E	98.464
BAB 23	07	32	42.85774 N	134	33	41.99777 E	146.661
BAB 24	07	33	03.25819 N	134	34	08.53031 E	166.574
BAB 27	07	33	46.45834 N	134	35	20.56024 E	217.53
BAB 30	07	35	31.03031 N	134	35	03.34647 E	173.555
BAB 32	07	36	26.01532 N	134	35	15.89747 E	107.962
BAB 34	07	35	46.59764 N	134	36	22.31039 E	174.088
BAB 36	07	36	29.83392 N	134	37	09.03969 E	111.941
BAB 36 BS	07	36	34.47057 N	134	37	18.08059 E	128.715
BAB 43	07	39	28.83352 N	134	38	22.06358 E	87.412
BAB 45	07	40	22.61941 N	134	38	05.43596 E	77.471
BAB 45 BS	07	40	26.10832 N	134	38	07.69463 E	73.068
BAB 46	07	40	57.80717 N	134	38	09.24953 E	93.737
BAB 46 BS	07	41	03.50417 N	134	38	04.72067 E	90.912
BAB 6	07	24	04.96838 N	134	30	32.82039 E	96.916
BIS	07	42	26.26767 N	134	37	49.19855 E	147.97
BIS BS	07	43	03.74945 N	134	37	22.00283 E	128.954
BM D1	07	19	37.97456 N	134	27	01.78640 E	70.537
BM DC	07	19	40.25989 N	134	27	01.20958 E	70.569
DAL 1	07	20	55.86382 N	134	27	53.46227 E	70.645
EAST 01	07	35	43.94386 N	134	36	59.78965 E	183.68
EAST 02	07	35	25.50116 N	134	37	25.99472 E	123.257
EAST 03	07	35	17.11808 N	134	37	35.84463 E	107.172
EAST 03 BS	07	35	18.23845 N	134	37	38.10393 E	108.767
EAST 04	07	34	51.00469 N	134	37	46.04039 E	69.849
EAST 06	07	34	00.67467 N	134	37	36.58941 E	124.838
EAST 07	07	33	21.74453 N	134	37	31.20029 E	119.294
EAST 08	07	32	32.98512 N	134	37	36.58697 E	73.133
EAST 09	07	32	03.81720 N	134	37	20.16225 E	68.038
EAST 10	07	31	32.09206 N	134	37	03.97646 E	68.473

EAST 10 A	07	31	28.22451 N	134	37	03.64496 E	68.347
EAST 10 B	07	31	45.23748 N	134	37	06.75687 E	71.13
EAST 11	07	31	03.04456 N	134	36	37.60965 E	101.589
EAST 12	07	30	18.46801 N	134	36	50.37127 E	114.148
EAST 13	07	29	45.38331 N	134	36	45.05155 E	100.141
EAST 14	07	29	47.30271 N	134	36	09.12025 E	128.502
EAST 15	07	29	20.57063 N	134	35	51.90949 E	98.732
EAST 16	07	29	02.55143 N	134	35	23.60863 E	118.431
EAST 18	07	28	04.15621 N	134	34	50.47037 E	104.72
EAST 20	07	27	09.68694 N	134	34	43.91530 E	73.79
EAST 22	07	26	10.46487 N	134	34	37.72678 E	141.751
EAST 23	07	25	45.94374 N	134	34	34.70017 E	153.446
EAST 24	07	25	11.70373 N	134	34	32.67531 E	171.464
EAST 25	07	24	45.87855 N	134	34	14.82209 E	171.794
EAST 26	07	24	25.29512 N	134	34	13.85901 E	176.231
EAST 27	07	24	09.00976 N	134	33	58.75304 E	173.376
EAST 28	07	23	31.06104 N	134	33	55.78804 E	145.711
EAST 28 A	07	23	29.45717 N	134	33	54.21098 E	145.517
EAST 28 B	07	23	25.95798 N	134	33	47.71502 E	144.022
EAST 30	07	23	01.15794 N	134	33	21.36992 E	92.977
EAST 31	07	22	35.77120 N	134	33	17.16337 E	75.167
EAST 31 A	07	22	37.84274 N	134	33	19.98958 E	75.624
EAST 32	07	22	20.09587 N	134	33	01.97218 E	122.655
EAST 33	07	22	05.94257 N	134	32	40.95578 E	107.989
EAST 35	07	21	59.53669 N	134	31	58.27631 E	109.898
EAST 37	07	21	52.44422 N	134	31	25.85385 E	70.373
EAST 37 BS	07	21	54.19308 N	134	31	24.22669 E	70.832
EAST 38	07	21	42.78870 N	134	31	10.64028 E	92.716
EAST 4 BS	07	34	55.74437 N	134	37	46.07285 E	69.661
IMEONG	07	31	33.47204 N	134	31	15.16019 E	123.273
IMEONG BS	07	31	49.51484 N	134	31	56.52522 E	119.028
INT 1	07	20	35.11519 N	134	28	01.34263 E	78.883
INT 2	07	20	29.35345 N	134	28	13.43735 E	79.665
INT 3	07	20	30.46787 N	134	28	24.98470 E	82.476
INT 4	07	20	44.60102 N	134	29	18.15063 E	108.118
MAGACHIN	07	41	18.95256 N	134	37	59.95737 E	132.644
MAL1	07	20	26.64050 N	134	27	43.57526 E	73.353
MAN 1	07	21	24.93078 N	134	28	00.99247 E	69.936
MD 01	07	20	09.56775 N	134	28	07.41789 E	70.134
MD 02	07	20	16.79976 N	134	27	57.18249 E	69.872
NGAT	07	28	15.49864 N	134	31	42.08546 E	123.292
PCR 15	07	29	13.25025 N	134	35	28.96331 E	127.295
PCR 2	07	22	58.72509 N	134	33	29.99699 E	115.985
PCR 51	07	29	05.77258 N	134	32	08.93661 E	111.292
PCR 51 BS	07	29	09.96176 N	134	32	04.90561 E	110.653
PCR 65	07	21	53.29137 N	134	31	53.01838 E	131.525
POST OFFICE FLAGPOLE	07	20	32.41867 N	134	28	34.28096 E	82.608

ROR 1	07	20	42.81735 N	134	29	00.61673 E	86.013
ROR 2	07	20	41.44470 N	134	29	33.80180 E	129.175
ROR 4	07	21	23.02189 N	134	29	51.46057 E	70.079
ROR 4 BS	07	21	33.56387 N	134	29	58.35416 E	70.358
SK-1	07	21	24.68709 N	134	27	31.10088 E	70.298
STATION 7 B	07	41	44.87730 N	134	37	29.71880 E	139.335
TAN 1	07	20	21.05349 N	134	27	26.98316 E	72.373
TECC	07	21	07.94590 N	134	28	44.28088 E	69.884

PALAU LEVEL NETWORK 2009

Bench Mark Name	Orthometric HT (meters)
184 1275 BM 1	1.535
184 1275 BM 3	1.913
184 1275 BM 4	1.969
BAB 1	11.405
BAB 2	2.813
BAB 3	15.882
BAB 4	1.771
BAB 5	3.422
BAB 6	27.852
BAB 7	12.771
BAB 8	42.905
BAB 9	119.683
BAB 10	79.232
BAB 11	21.662
BAB 12	17.507
BAB 13	41.224
BAB 14	4.154
BAB 15	13.734
BAB 16	40.030
BAB 17	26.726
BAB 18	3.222
BAB 19	7.872
BAB 20	4.473
BAB 21	4.964
BAB 22	30.602
BAB 23	78.841
BAB 24	98.882
BAB 25	67.594
BAB 26	109.393
BAB 27	150.175
BAB 28	167.162
BAB 29	140.899
BAB 30	106.198
BAB 31	35.487
BAB 32	40.751
BAB 33	111.799
BAB 34	107.154
BAB 35	73.640
BAB 36	45.314
BAB 37	103.200
BAB 38	63.484
BAB 39	92.623
BAB 40	45.672
BAB 41	4.389
BAB 42	51.153
BAB 43	21.559

PALAU LEVEL NETWORK 2009 (Cont)

Bench Mark Name	Orthometric HT (meters)
BAB 44	43.046
BAB 45	11.438
BAB 46	27.711
BAB EAST BASE	46.296
BENCH MARK 7	1.530
BMDC	1.838
DAL 1	2.009
EAST 1	116.712
EAST 2	56.578
EAST 3	40.391
EAST 4	3.276
EAST 5	6.690
EAST 6	58.179
EAST 7	52.742
EAST 8	6.462
EAST 9	1.401
EAST 10	1.554
EAST 11	34.472
EAST 12	47.115
EAST 13	32.954
EAST 14	61.219
EAST 15	31.196
EAST 16	50.957
EAST 17	44.912
EAST 18	37.046
EAST 18	37.046
EAST 19	26.447
EAST 20	6.163
EAST 21	27.296
EAST 22	74.066
EAST 23	85.711
EAST 24	103.826
EAST 25	103.882
EAST 26	108.511
EAST 27	105.372
EAST 28	77.941
EAST 29	55.699
EAST 30	25.078
EAST 31	7.585
EAST 32	54.729
EAST 33	39.996
EAST 34	53.261
EAST 35	41.816
EAST 36	52.384
EAST 36 A	12.773
EAST 37	2.113
EAST 38	24.263

PALAU LEVEL NETWORK 2009

Bench Mark Name	Orthometric HT (meters)
EAST 39	14.103
EAST 40	2.016
FK	62.602
FLA 1	10.707
INT 1	10.164
INT 2	11.227
INT 3	14.011
INT 4	39.763
LIAN	56.142
MAL 01	4.654
MAN 1	1.280
NO 6	1.387
PCR 13	85.282
PCR 15	59.808
PCR 2	48.104
PCR 51	43.177
PCR 65	63.426
POST OFFICE FLAGPOLE	14.076
R 10	33.655
R 9	47.651
ROR 1	17.457
ROR 2	60.737
ROR 3	20.240
ROR 4	1.702
ROR 5	2.366
ROY 1	1.934
SKL 1	1.549
T DOCK	1.039
T DOCK EEC	1.268
TAN 1	3.643
UHA2	1.949

Note: The elevations were determined by holding
Tidal Bench Mark 184 1275 BM 4 fixed to the
Mean Sea Level (MSL) elevations determined by USGS in
1970 of 1.968m.

Notes for Annex 1

The information presented in Annex 1 is based on a leveling project, conducted in 2008-2009, for the main Koror islands and Babeldoab Island.

Additional control points are available for other inhabited islands, including Kayangel, Peleliu and Angaur. These control points are based on local coordinate system and are not presented here.

PALAU

MAP KEY

- ★ Primary Tidal Station
- ▲ 2008 & 209 GPS Points
- 2009 Leveled Benchmarks
- 1970 BenchMarks

