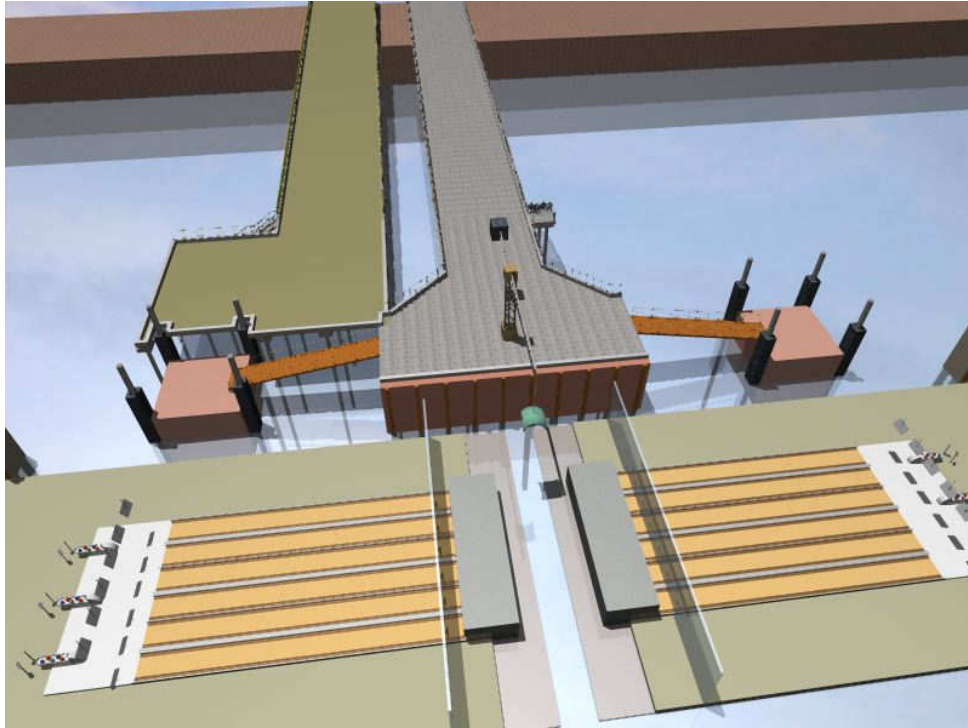


REPAIRS AND UPGRADING OF PELELEZA MOORING JETTY CONTRACT NO CKFS-P049



GROUND INVESTIGATION FACTUAL REPORT

26th MARCH 2013

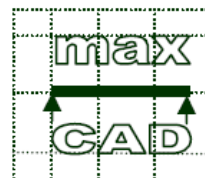
EMPLOYER:

Kenya Ferry Services Ltd
P. O. Box 96242 80110
Mombasa



ENGINEER

MAXCAD Consulting Engineers Ltd
P. O. Box 40482 80100
Mombasa



CONTRACTOR

Samar Construction Company Ltd
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- 1.0 Introduction
- 2.0 Drilling
- 3.0 Discussion drilling and field tests
- 4.0 Summary and conclusions

Appendices

1. INTRODUCTION

This report gives a factual summary of the Peleleza mooring jetty geotechnical and materials investigation carried out in December 2012 and March 2013.

The Peleleza mooring jetty site investigation comprised the drilling of 6 (Six) boreholes. These were to represent the following areas of construction and their UTM coordinates are indicated below

<u>BH ref</u>	<u>Island Jetty</u>	<u>Easting</u>	<u>Northings</u>
BH1	Along gangway of jetty	573213	9548940
BH2	Western outer dolphin	573222	9549022
BH3	Western inner dolphin	573244	9548994
BH4	Jetty head	573263	9548975
BH5	Eastern Inner dolphin	573279	9548955
BH6	Eastern outer dolphin.	573295	9548937

The equipment provided for the drilling for was a CS10 drilling rig mounted on a marine Jack-up. The drilling was by rotary drilling and the orientation for all the bore holes was vertical. The penetration method was by boring. The flashing system was by use of water.

Drilling for the BH1 and BH6 was carried using the CS10 drilling rig. However for the other BH locations it was not possible to use the jack up as the depths of water were at these BH locations were all in excess of 12m ACD. This was due to the fact that the legs of the jack were not long enough to provide a stable arrangement in view of the steep gradient of the sea bed.

An alternative jack-up was provided capable of being anchored at the locations but the weight of the CS10 drilling was in excess of the allowable weight. An alternative drilling was provided. This enabled the other BH locations to be drilled.

The information gathered during the field work is presented in the appendices to this report.

Large disturbed soil samples were continuously collected during the drilling processes. Small disturbed soil samples were collected at every SPT test. Standard Penetration Test (SPT) was conducted in all boreholes at an interval of 1.5m. Boreholes logs are attached in the Appendix. Water levels were measured daily at start of drilling and at the close of drilling.

Laboratory tests were carried out at the Ministry of Roads Regional Office in Mombasa. And are attached in the Appendices. Testing in the laboratory was carried out to BS 1377.

2. DRILLING

2.1 Peleleza Jetty

Geotechnical investigation was carried out at the Bore hole locations of BH1 to BH6 in order to obtain the site sub soil condition at jetty locations of the gang way, jetty head and dolphins.

The boreholes were drilled using the light percussion method of drilling as described in table below.

The actual coordinates and elevations of the BH's were as follows

BH ref	Northings	Easting	Elevation of sea Bed
BH1	9548941.329	573209.460	+0.284m
BH6	9548910.898	573309.047	-7.810m
BH3	9548993.258	573306.188	-6.924m
BH2	9549027.334	573229.218	-9.846m
BH4	9548959.283	573285.743	-12.33m
BH5	9548948.661	573289.918	-11.53m

Borehole no 1.

Bore hole no 1 was drilled to a depth of 25.5m below the sea bed. The drilling was undertaken in 3 days.

The soils stratification was mainly sandy material with isolated embedment of soft weathered coral boulders. The number of large disturbed samples collected was 8 and small disturbed samples collected were 11. No cohesive stratum was met and no undisturbed samples were obtained.

SPT tests were done at intervals of 1.5m. A total of ten (10) SPT tests were carried out at 1.5m intervals of penetration. The SPT N values ranged from N = 4 to N = 31 and are shown in the appendix attached .

Borehole no 6.

Bore hole no 6 was drilled to a depth of 24.81m below the sea bed. The drilling was undertaken in 3 days.

The soils stratification was mainly sandy material with isolated embedment of soft weathered coral boulders. From 21 to 24m a soft weathered coral bed was encountered.

The number of large disturbed samples collected was ten (10) and small disturbed samples collected were nine (9). No cohesive stratum was met and no undisturbed samples were obtained.

SPT tests were done at intervals of 1.5m. A total of ten (10) SPT tests were carried out at 1.5m intervals of penetration. The SPT N values ranged from N = 4 to N = 25 and are shown in the appendix attached

Borehole no 3.

Bore hole no 3 was drilled to a depth of 15.5m below the sea bed. The drilling was undertaken in 3 days.

The soils stratification was mainly sandy material with isolated embedment of soft weathered coral boulders. The number of large disturbed samples collected were ten (10) and small disturbed samples collected were nine (9). No cohesive stratum was met and no undisturbed samples were obtained.

SPT tests were done at intervals of 1.5m. A total of nine (9) SPT tests were carried out at 1.5m intervals of penetration. The SPT N values ranged from N = 1 to N = 17 and are shown in the appendix attached.

Borehole no 2.

Bore hole no2 was drilled to a depth of 14.5m below the sea bed. The drilling was undertaken in 3 days.

The soils stratification was mainly sandy material with isolated embedment of soft weathered coral boulders. The number of large disturbed samples collected were ten our (10) and small disturbed samples collected were nine (9). No cohesive stratum was met and no undisturbed samples were obtained.

SPT tests were done at intervals of 1.5m. A total of nine (9) SPT tests were carried out at 1.5m intervals of penetration. The SPT N values ranged from N = 4 to N = 27 and are shown in the appendix attached.

Borehole no 4.

Bore hole no 4 was drilled to a depth of 15.7m below the sea bed. The drilling was undertaken in 2 days.

The soils stratification was mainly sandy material with isolated embedment of soft weathered coral boulders. The number of large disturbed samples collected were ten our (10) and small disturbed samples collected were nine (9). No cohesive stratum was met and no undisturbed samples were obtained.

SPT tests were done at intervals of 1.5m. A total of nine (9) SPT tests were carried out at 1.5m intervals of penetration. The SPT N values ranged from N = 3 to N = 33 and are shown in the appendix attached.

Borehole no 5.

Bore hole no 5 was drilled to a depth of 12.59m below the sea bed. The drilling was undertaken in 3 days.

The soils stratification was mainly sandy material with isolated embedment of soft weathered coral boulders. The number of large disturbed samples collected were ten our (10) and small disturbed samples collected were nine (9). No cohesive stratum was met and no undisturbed samples were obtained.

SPT tests were done at intervals of 1.5m. A total of nine (9) SPT tests were carried out at 1.5m intervals of penetration. The SPT N values ranged from N = 5 to N = 23 and are shown in the appendix attached.

The preliminary bore hole logs and schedule of samples for testing are shown the appendices.

2.2 Setting out BH locations

During the drilling the locations of the bore holes were established to UTM coordinates and the depths of the sea bed established relative to Admiralty Chart Datum. Two TBMs were used to establish the coordinates and elevations of the sea bed to ACD. The datum were

Datum	Northing	Easting	Elevation
TBM 1 at start of Jetty	9548890.887	573172.522	9.91m
TBM 2 at center of Jetty	9548935.232	573223.867	6.704m

See drawing for the location of the TBMS

3. DISCUSSION ON DRILLING AND FIELD TESTS

3.1 Drilling and soil stratum

Reference should be made to the appendix showing the preliminary bore hole logs and photographs of core boxes throughout this discussion.

The boreholes logs indicate that the site soils stratum consists of fine silty sand on the upper stratum and medium to coarse sands with the presence of isolated weathered soft coral boulders on subsequent layers. No Coral rock stratum was encountered in BH 1 and 3. In BH6 from 21m to 25m weak highly weathered coral rock was encountered. The general soil profile is as shown in the preliminary bore hole logs and is summarised as follows:

BH1

0.0 - 12m	brownish grey fine to medium grained sand
12.m – 19.5m	Brownish medium to coarse grained sand
19.5m – 25.57m	coarse grained sand with isolated deposits of coral boulders

BH3

0.0-3.45m	Greyish fine grained silty sand
3.45m – 9m	light brown fine to medium grained sand
9m to 15m	Brownish medium to coarse grained sands with weathered soft coral boulders

BH6

0.0 – 5.8m	brownish grey fine to medium grained clayey sand
5.8m – 7.8m	Brownish grey highly weathered soft coral stone
7.8m – 11.6m	brownish grey fine grained sand
11.6m – 14.3m	Soft coral deposits in coarse sand
14.3m – 17.3m	coarse grained sand
17.3m – 211.8m	coarse sand with soft coral deposits
21.8m – 24.8m	highly weathered soft to firm coral rock core sample obtained.

BH2

0.0 - 12m	brownish grey fine to medium grained sand
12.m – 19.5m	Brownish medium to coarse grained sand
19.5m – 25.57m	coarse grained sand with isolated deposits of coral boulders

BH4

0.0-3.45m	Greyish fine grained silty sand
3.45m – 9m	light brown fine to medium grained sand
9m to 15m	Brownish medium to coarse grained sands with weathered soft coral boulders

BH 5

0.0-3.45m	Greyish fine grained silty sand
3.45m – 9m	light brown fine to medium grained sand
9m to 15m	Brownish medium to coarse grained sands with weathered soft coral boulders

Photographs of the sample boxes are shown in the appendices.

3.2 Field Tests

The Standard penetration test indicates a very weak SAND stratum between ground surface and 10m depth. However between 12 -25m the soil strength increases relatively. The stratum generally indicated the presence of isolated weathered soft coral rock. The table below indicates the SPT N values for the Bore holes

BH1		BH6		BH3	
Depth below sea bed	N value	Depth below sea bed	N value	Depth below sea bed	N value
1.9m -2.35m	N= 4	1.5m-1.95m	N=4	1.5m-1.95m	N=1
3.9m-4.35m	N= 5	3.5m-3.95m	N=5	3.0m-3.45m	N= 4
5.9m-6.35m	N=35	5.5m-5.95m	N=8	4.5m-4.95m	N=4
7.85m-8.3m	N=8	7.5m-7.95m	N=12	6.0m-6.45m	N= 7
9.8m-10.25m	N=7	9.5m-9.95m	N=15	7.5m-7.95m	N=10
11.75m-12.2m	N=31	11.5m-13.95m	N=16	9.0m-9.45m	N=10
13.8m-14.25m	N=7	13.5m-13.95m	N=16	10.5m-10.95m	N=15
15.75m-16.2m	N= 10	15.5m-15.95m	N=8	12.0m-12.45m	N=16
17.75m-18.2m	N=12	17.5m-17.95m	N=25	13.5m-13.95m	N=17
23.75m-24.2m	N=5	19.5m-19.95m	N=11		
No of tests	10		10		9

BH2		BH4		BH5	
Depth below sea bed	N value	Depth below sea bed	N value	Depth below sea bed	N value
1.5m-1.95m	N=4	1.5m-1.95m	N=3	1.5m-1.95m	N=5
3.0m-3.45m	N= 3	3.0m-3.45m	N= 4	3.0m-3.45m	N= 4
4.5m-4.95m	N=7	4.5m-4.95m	N=8	4.5m-4.95m	N=7
6.0m-6.45m	N= 9	6.0m-6.45m	N= 12	6.0m-6.45m	N= 7
7.5m-7.95m	N=10	7.5m-7.95m	N=18	7.5m-7.95m	N=12
9.0m-9.45m	N=18	9.0m-9.45m	N=15	9.0m-9.45m	N=10
10.5m-10.95m	N=15	10.5m-10.95m	N=19	10.5m-10.95m	N=19
12.0m-12.45m	N=19	12.0m-12.45m	N=21	12.0m-12.45m	N=13
13.5m-13.95m	N=27	13.5m-13.95m	N=33	13.5m-13.95m	N=23
No of tests	9		9		9

3.3 Discussion Laboratory test results

Laboratory test results are still awaited

(a) Grading and Atterberg Limits

The following samples were submitted to the laboratory from which tests on Grading and atterberg limits will be carried out.

Bore hole	Bag samples	Total
Peleleza BH 1	B1, B3, B5, B7, B8, B10, B12, B18,	8
Peleleza BH6	B1, B3, B5, B7, B9, B11, B13, B15, B17, B19	10
Peleleza BH3	B1, B3, B5,B7, B9, B11, B13, B15, B17, B19	10
Peleleza BH2	B1, B3, B5, B7, B9, B11, B13, B15, B17, B19	10
Peleleza BH4	B1, B3, B5,B7, B9, B11, B13, B15, B17, B19	10
Peleleza BH5	B1, B3, B5, B7, B8, B10, B12, B18,	8

(b) Natural moisture content, Bulk and Dry Density

The following samples were submitted to the laboratory from which MC, bulk and dry density will be done.

Bore hole	Jar samples	Total no
Peleleza BH 1	D2, D4, D9, D11 D13 D15, D17 D19, D20	9
Peleleza BH6	D2, D4, D6, D8, D10, D12, D16, D187, D20	9
Peleleza BH3	D2, D4, D6, D8, D10, D12, D14, D16, D18	9
Peleleza BH2	D2, D4, D9, D11 D13 D15, D17 D19, D20	9
Peleleza BH4	D2, D4, D6, D8, D10, D12, D16, D187, D20	9
Peleleza BH5	D2, D4, D6, D8, D10, D12, D16, D187, D20	9

The samples were submitted to the Regional materials Laboratory Mombasa Ministry of Roads.

4.0 Bearing capacity of soils

The bearing capacity of the site soils is computed using standard penetration test data and laboratory test results

Computation of allowable foundation pressure based on standard penetration test (SPT) data

The allowable foundation pressure on the site soils are computed using standard Penetration test data and *Bowles* equation for surface loaded footing with settlement limited to approximately 25mm. Uncorrected SPT N-values are used to calculate soil bearing capacity since blow counts obtained from all the boreholes indicate a relative density of soil being less than 0.5.

(Ref J.E. Bowles Foundation Analysis and Design.)

Therefore

$$q_{all} = N/0.08[(\beta+0.3)/\beta]^2 \text{ kN/m}^2$$

where N= SPT N-value

B= Foundation width in meters

The allowable foundation pressures for a foundation with width B=5.0 m at various depths shall be computed using SPT results and Bowles equation. Friction resistance shall be ignored in the evaluation.

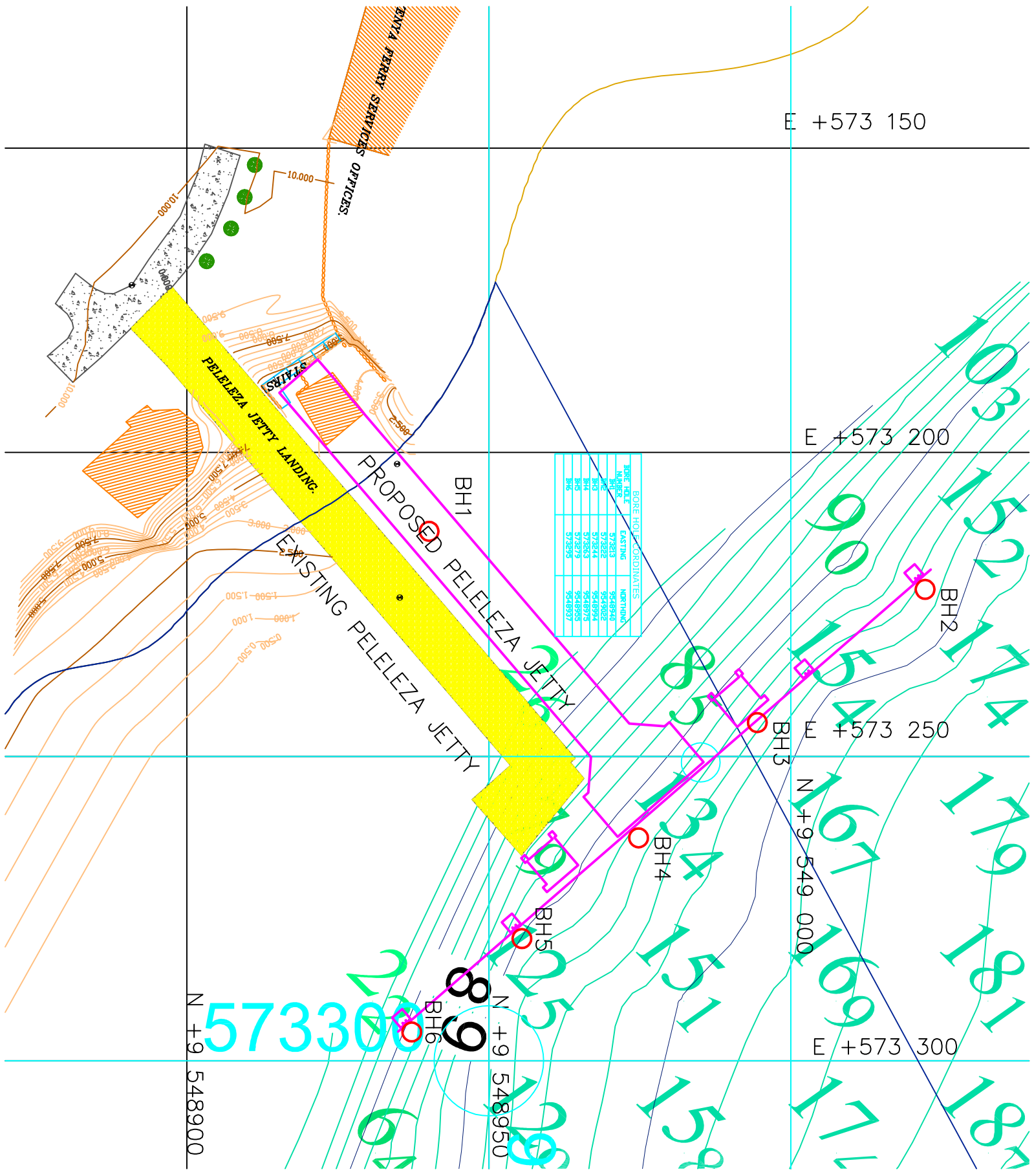
5.0 Summary and conclusions

The factual report represents the detailed procedure adopted in carrying out the geotechnical investigation for the Peleleza mooring jetty. The data obtained will be used in the final engineering report in evaluating the ground conditions and qualify the suitability of the proposed foundation arrangement or recommend alternatives.

APPENDICES

Appendix A

Location of Bore holes



E +573 150

E +573 200

E +573 250

E +573 300

N +9 5733000

N +9 548950

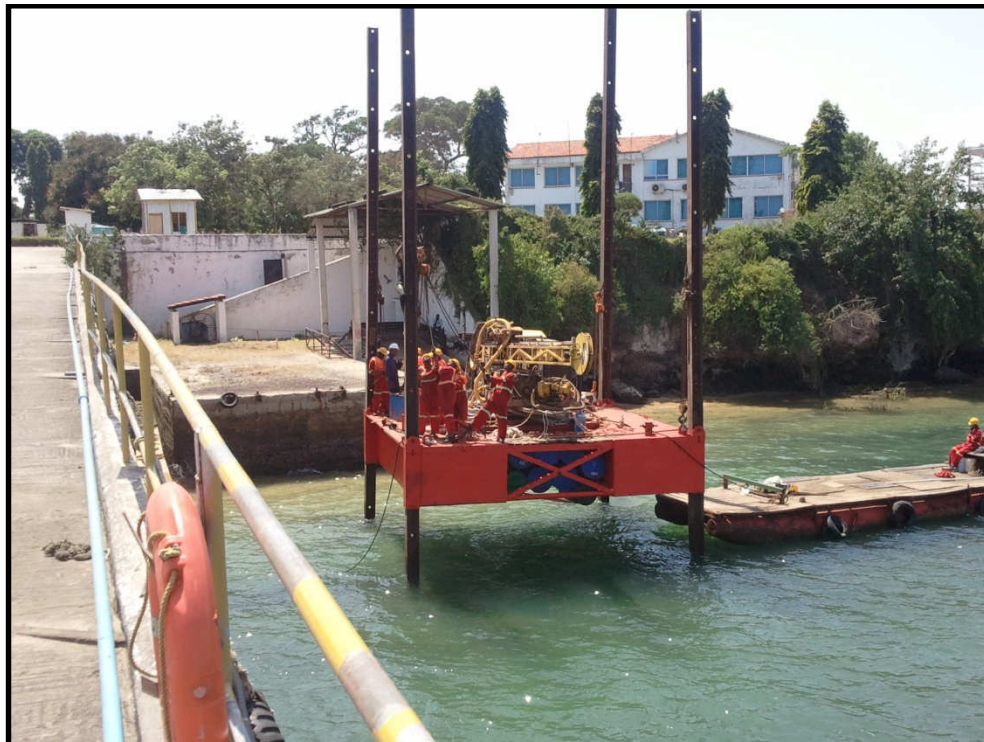
N +9 549 000

Appendix B

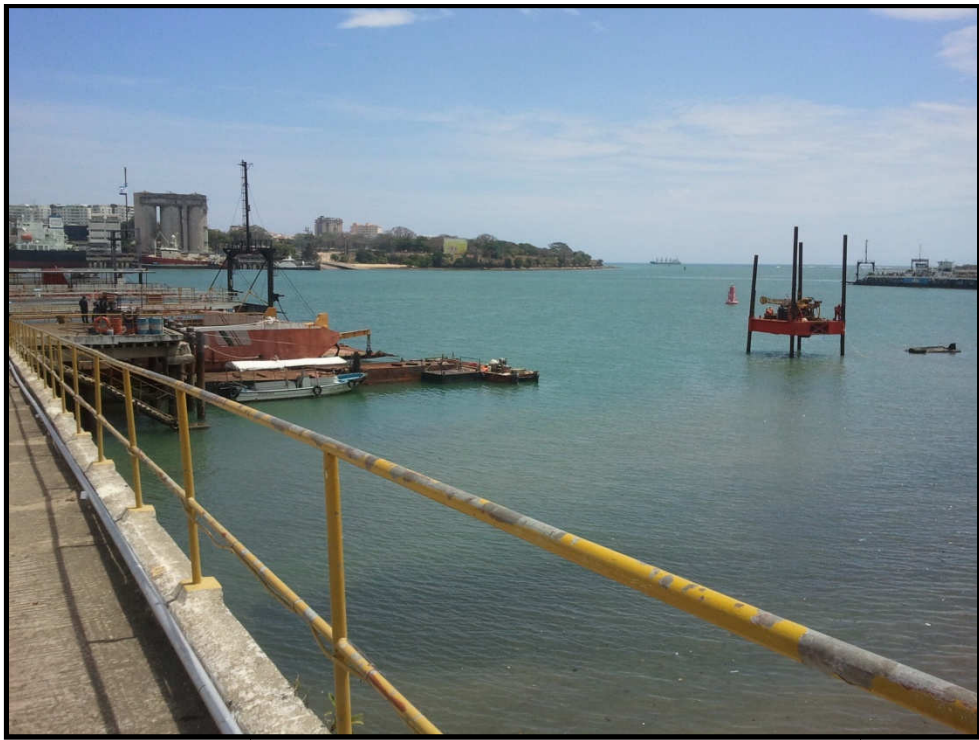
Progress Photographs



GEOTECHNICAL DRILLING AT BH 1 LOCATION



GEOTECHNICAL DRILLING SETTING UP AT BH 1 LOCATION



GEOTECHNICAL DRILLING AT BH 6 LOCATION



GEOTECHNICAL DRILLING AT BH 3 LOCATION

Appendix C

Field Bore Hole logs



SITE INVESTIGATION REPORT

DAILY PRELIMINARY BOREHOLE LOG

BH ref

BH1

Foundation Piling Ltd P.O. Box 48525 00100 Nairobi Tel: +254 2 2054656 Fax: +254 2 4445228	Project	Repairs and upgrading to peleleza mooring jetty	Client	Kenya Ferry Services	Grid coordinates	UTM zone
	Location	Peleleza jetty	Engineer	Maxcad Consulting Engineers	E 573209.460 N548941.327	35
	Method	Rotary drilling with HW casing 101mm diameter	elevation GI/ sea bed	0.284 CD	Report Date	15-Jan
					Sheet	2 of 2

Section no	Sample		Core run m	TCR	FI	Legend	Depth below sea bed m	Elev Level CD m	Description
	Label/No	Depth m CD							
	B1	-0.112m to -1.62m							Loose medium to fine grained brown silt sand SPT N=4
	D2	-1.62m to -2.07m							
	B3	-2.07m to -3.57m							Meduim grained brownish sand
	D4	-3.57m to -4.02m							
	B5	-4.02m to -5.52m							meduim to fine grained brownish sand N=5
		-5.52m to -5.97m							meduim to fine grained brownish sand with deposits of weathered soft coral stone N=35
	B7	-6.07m to -8.02m							
	B8	-8.02m to -9.52m							Meduim grained brownish sand N =7
	D9	-9.52m to -9.97m							
	B10	-9.97 to -11.47m							Meduim grained brownish sand N =31
	D11	-11.47 to -11.92m							
	B12	-11.92m to -13.52m							meduim to fine grained brownish sand with isolated deposits of soft coral stone N=7
	D13	-13.52m to -13.97m							
		-13.97m to -15.47m							meduim to fine grained brownish sand N=10
	D15	-15.47m to -16.97m							
		-15.99m to -17.45							Meduim to coarse grained brownish sand N =12
	D17	-17.45 to -17.92m							
	B18	-17.92 to -19.42m							
		-18.45 to -21.45							coarse grained sand with deposits of soft coral N=9
	D19	-21.47m to -21.92m							
		-21.92m to -23.47m							
	D20	-23.47m to -23.92m							N=13
		-23.92m to -25.57m							

LEGEND

GL: ground level; CD Admiralty Chart Datum; B: bulk distrubed sample; D: small disturbed sample; U: undisturbed sample; SPT: standard penetration test; TCR= total core recovery: total length of material recovered expressed as apercentage of core run; ; SCR: solid core recovery: total length of solid core expressed as a percentage of core run. FI: number of natural fractures over 1 meter length;



SITE INVESTIGATION REPORT

DAILY PRELIMINARY BOREHOLE LOG


BH ref

BH2

Foundation Piling Ltd P.O. Box 48525 00100 Nairobi Tel: +254 2 2054656 Fax: +254 2 4445228	Project	Repairs and upgrading to peleleza mooring jetty	Client	Kenya Ferry Services	Grid coordinates	UTM zone	
	Location	Peleleza jetty	Engineer	Maxcad Consulting Engineers	N 04° 02' 12.65" E 41° 49' 36.5"	35	
	Method	Rotary drilling with HW casing 101mm diameter	elevation GI/ sea bed		Report Date	24-Mar	Sheet

Section no	Sample		Core run m	TCR	FI	Legend	Depth below sea bed m	Elev Level CD m	Description
	Label/No	Depth m CD							
SPT N=9	B1	0m to 1.5m							Greyish fine silty sand
	D2	1.5m to 1.95m							
SPT N = 14	B3	2m to 3.5m							
	D4	3.5m to 3.95m							
SPT N = 4	B5	4m to 5.5m							Brownish medium to coarse grained sand with weathered soft coral boulders
	D6	5.5m to 5.95							
		6m to 7.5m							
		7.5m to 7.95m							
		8m to 9.5m							
		9.5m to 11m							
	11m to 12.5m							Brownish coarse grained sand with soft highly weathered coral boulders	
	12.5m to 14m								Brown Soft weathered coral boulders
	14m to 14.5m								

LEGEND	GL: ground level; CD Admiralty Chart Datum; B: bulk disturbed sample; D: small disturbed sample; U: undisturbed sample; SPT: standard penetration test; TCR= total core recovery: total length of material recovered expressed as a percentage of core run; ; SCR: solid core recovery: total length of solid core expressed as a percentage of core run. FI: number of natural fractures over 1 meter length;
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	SITE INVESTIGATION REPORT										
	DAILY PRELIMINARY BOREHOLE LOG							BH ref		BH3	
Foundation Piling Ltd P.O. Box 48525 00100 Nairobi Tel: +254 2 2054656 Fax:+254 2 4445228	Project		Repairs and upgrading to peleleza mooring jettv		Client		Kenya Ferry Services		Grid coordinates		UTM zone
	Location		Peleleza jetty		Engineer		Maxcad Consulting Engineers		N 04o 04' 48.5" E 39o 39' 35.3"		35
	Method		Rotary drilling with HW casing 101mm diameter		elevation GI/ sea bed		0		Report Date		20-Mar
								Sheet		2 of 2	
Section no	Sample		Core run m	TCR	FI	Legend	Depth below sea bed m	Elev Level CD m	Description		
	Label/No	Depth m CD									
SPT N=1	B1	0 m to 1.5m							Greyish fine grained silty sand		
	D2	1.5m to 1.95m									
	B3	1.5m to 3m									
SPT N = 4	D4	3.0 to 3.45m						Light brown fine to medium grained sand			
	B5	3m to 4.5m									
SPT N = 4	D6	4.5m to 4.95m									
	B7	4.5m to 5m									
SPT N = 7		5m to 6m									
	D8	6m to 6.45m									
SPT N = 10	B9	6m to 7.5m									
	D10	7.5m to 7.95m									
SPT N = 10	B11	7.5m to 9m						Brownish medium to coarse grained sand with weathered soft coral boulders			
	D12	9m to 9.45m									
SPT N = 15	B13	9m to 10.50m									
	D14	10.5m to 10.95m									
SPT N = 16	B15	10.5m to 12m									
	D16	12.0m to 12.45m									
SPT N = 17	B17	12.0m to 13.5m									
	D18	13.5m to 13.95m									
	B19	13.5m to 15.5m									

LEGEND	GL: ground level; CD Admiralty Chart Datum; B: bulk distrubed sample; D: small disturbed sample; U: undisturbed sample; SPT: standard penetration test; TCR= total core recovery: total length of material recovered expressed as apercentage of core run; ; SCR: solid core recovery: total length of solid core expressed as a percentage of core run. FI: number of natural fractures over 1 meter length;
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SITE INVESTIGATION REPORT

DAILY PRELIMINARY BOREHOLE LOG

BH ref

BH4

Foundation Piling Ltd P.O. Box 48525 00100 Nairobi Tel: +254 2 2054656 Fax: +254 2 4445228	Project	Repairs and upgrading to peleleza mooring jetty	Client	Kenya Ferry Services	Grid coordinates	UTM zone
	Location	Peleleza jetty	Engineer	Maxcad Consulting Engineers		35
	Method	Rotary drilling with HW casing 101mm diameter	elevation GI/ sea bed		Report Date	27-Mar
					Sheet	1

Section no	Sample		Core run m	TCR	FI	Legend	Depth below sea bed m	Elev Level CD m	Description
	Label/No	Depth m CD							
N = 1	B1	0 m to 1.5m							Greyish fine silty sand
	D2	1.5m to 1.95m							
	B3	1.5m to 3m							
N = 12	D4	3.0 to 3.45m							Brownish medium to coarse grained sand with weathered soft coral boulders
	B5	3m to 4.5m							
N = 13	D6	4.5m to 4.95m							Brownish corase grained sand with intermitent coral boulders
	B7	4.5m to 5m							
N = 14	D8	5.0m to 5.45m							Brown Soft weathered coral boulders
	B9	5.5m to 6m							
	D10	6m to 6.45m							
	B11	6.5m to 8m							
		8m to 8.5m							
		8.5m to 10m							
		10m to 11.5m							
		11.5m to 13m							
	13m to 14.5m								
	14.5m to 15.57m							Brownish coarse grained sand with weathered fractured soft coral boulders	

LEGEND

GL: ground level; CD Admiralty Chart Datum; B: bulk distrubed sample; D: small disturbed sample; U: undisturbed sample; SPT: standard penetration test; TCR= total core recovery: total length of material recovered expressed as apercentage of core run; ; SCR: solid core recovery: total length of solid core expressed as a percentage of core run. FI: number of natural fractures over 1 meter length;



SITE INVESTIGATION REPORT

DAILY PRELIMINARY BOREHOLE LOG

BH ref

BH5

Foundation Piling Ltd P.O. Box 48525 00100 Nairobi Tel: +254 2 2054656 Fax: +254 2 4445228	Project	Repairs and upgrading to peleleza mooring jetty	Client	Kenya Ferry Services	Grid coordinates	UTM zone	
	Location	Peleleza jetty	Engineer	Maxcad Consulting Engineers	N 04° 02' 12.65" E 41° 49' 36.5"	35	
	Method	Rotary drilling with HW casing 101mm diameter	elevation GI/ sea bed		Report Date	24-Mar	Sheet

Section no	Sample		Core run m	TCR	FI	Legend	Depth below sea bed m	Elev Level CD m	Description
	Label/No	Depth m CD							
SPT N=9	B1	0m to 1.5m							Greyish fine silty sand
	D2	1.5m to 1.95m							
SPT N = 14	B3	2m to 3.5m							
	D4	3.5m to 3.95m							
SPT N = 4	B5	4m to 5.5m						Brownish medium to coarse grained sand with weathered soft coral boulders	
	D6	5.5m to 5.95							
		6m to 7.5m							
		7.5m to 7.95m							
		8m to 9.5m							
	9.5m to 11m						Brownish coarse grained sand with soft highly weathered coral boulders		
	11m to 12.9m								

LEGEND

GL: ground level; CD Admiralty Chart Datum; B: bulk disturbed sample; D: small disturbed sample; U: undisturbed sample; SPT: standard penetration test; TCR= total core recovery: total length of material recovered expressed as a percentage of core run; ; SCR: solid core recovery: total length of solid core expressed as a percentage of core run. FI: number of natural fractures over 1 meter length;



SITE INVESTIGATION REPORT

DAILY PRELIMINARY BOREHOLE LOG

BH ref BH6

Foundation Piling Ltd P.O. Box 48525 00100 Nairobi Tel: +254 2 2054656 Fax: +254 2 4445228	Project	Repairs and upgrading to peleleza mooring jettv	Client	Kenya Ferry Services	Grid coordinates	UTM zone
	Location	Peleleza jetty	Engineer	Maxcad Consulting Engineers	E 573309.047 N9548910.898	35
	Method	Rotary drilling with HW casing 101mm diameter	elevation GI/ sea bed	-1.81m CD	Report Date	20-Jan
					Sheet	2 of 2

Section no	Sample		Core run m	TCR	FI	Legend	Depth below sea bed m	Elev Level CD m	Description
	Label/No	Depth m CD							
	B1	-1.81m to -3.31m	1.5m						Light brown silty clay
	D2	-3.31m to -3.76m							dark brown fine grained clayey sand
	B3	-3.63m to -5.76m							brownish grey highly weathered soft coral stones
	D4	-5.76m to -5.76m							greyish fine grained clayey sand
	B5	-5.81m to -7.31m							brown fine grained sand
	D6	-7.31m to -7.76m							soft coral deposits in coarse sand
	B7	-7.81m to -9.31m							light brown medium to coarse sand
	D8	-9.31m to -9.76m							light brown medium to coarse sand with soft coral deposits
	B9	-9.81m to -11.31m							light brown medium to coarse sand with soft coral deposits
	D10	-11.31m to -11.76m							light brown medium to coarse sand with soft coral deposits
	B11	-11.81m to -13.31m							light brown medium to coarse sand with soft coral deposits
	D12	-13.31m to -13.76m							light brown medium to coarse sand with soft coral deposits
	B13	-13.81m to -14.31m							light brown medium to coarse sand with soft coral deposits
		-14.31m to -15.76m							light brown medium to coarse sand with soft coral deposits
	B15	-15.81m to -17.31m							light brown medium to coarse sand with soft coral deposits
	D16	-17.31m to -17.76m							light brown medium to coarse sand with soft coral deposits
	B17	-17.76m to -19.31m							light brown medium to coarse sand with soft coral deposits
	D18	-19.31m to -19.76m							light brown medium to coarse sand with soft coral deposits
	B19	-19.76m to -21.41m							light brown medium to coarse sand with soft coral deposits
	D20	-21.41m to -21.76m							light brown medium to coarse sand with soft coral deposits
		-21.81m - -24.11m						weathered soft to firm coral rock	
		-24.11m to -24.81m						firm coral rock	

LEGEND

GL: ground level; CD Admiralty Chart Datum; B: bulk disturbed sample; D: small disturbed sample; U: undisturbed sample; SPT: standard penetration test; TCR= total core recovery: total length of material recovered expressed as a percentage of core run; ; SCR: solid core recovery: total length of solid core expressed as a percentage of core run. FI: number of natural fractures over 1 meter length;

Appendix D

Core box pictorial representation



Peleleza Core Box BH1



Peleleza Core Box BH6



Peleleza Core box BH3





Appendix E

Laboratory Test results

