5. List of Data Obtained

No.	Name of Document	Style	Published by
1	Estatisticas do Distritos	PDF	Instituto Nacional de Estatistica
2	Multiple Indicator Cluster Survey	PDF	Instituto Nacional de Estatistica
3	District Administration map, Gurue	Сору	Gurue district
4	District Administration map, Ile	Copy	Ile district
5	Strategic Development Plan for the Zambezia Province	PDF	Government of Zambezia Province
6	Potencial Opportunities of Zambezia	PDF	Government of Zambezia Province
7	Orcamento do Sector de Estradas para 2011	Copy	FE
8	Lei de Terras [1] 1997/19	PDF	Mozambican government
9	Politica de Reassentamento do Sector de Estradas	PDF	ANE
10	Resolution No. 10_95 on the National Land Policy	PDF	Mozambican government
11	Reglamnento Lei de tierras 98/66	PDF	Mozambican government
12	Sample report for RRP(Estudo de Viabilidade, Avaliacoes de Impacto Ambiental e Social, Desenho e Supervisao de Obras da Estrada Namialo a Metoro, Provincias de Nampula e Cabo Delgado, Mozambique)	Сору	ANE
13	Lei do Ambiente_1997/20	PDF	Mozambican government
14	Regulamento relativo ao Processo de Avaliação do Impacto Ambiental_2004/45	PDF	Mozambican government
15	Handbook on Environmental Assessment Legislation in the SADC Region(Extracted Mozambique)	PDF	Development Bank of Southern Africa and Southern African Institute for Environmental Assessment (SAIEA)
16	Programa nacional do meio ambiente95_5	PDF	Mozambican government
17	Resolucion 95/5, Politica Nacional de Ambiente	PDF	Mozambican government
18	Anexo Tecnico ao Regulamento da Lei de Tarras (Diploma ministorial No.29-A/2000)	PDF	FAO based on Mozambican government
19	Sample report for EIA(Estudo de Viabilidade, Avaliacoes de Impacto Ambiental e Social, Desenho e Supervisao de Obras da Estrada Namialo a Metoro, Provincias de Nampula e Cabo Delgado, Mozambique)	Сору	ANE
20	Sample report for Environmental Management Plan(Plano de gesion Ambiental do Project de Rehabilitacion da Estrada Namacurra-Rio Ligonha, Provincia da Zambezia)	Сору	ANE

No.	Name of Document	Style	Published by
21	Project Specification of Rehabilitation of the Road between Namacurra and Nampevo	Сору	Euro Fund
22	Final Report of Rehabilitation of Road N103 between Gurue and Magige in Zambezia Province	Сору	ANE
23	ANE's Design Standards (Draft)	Copy	ANE
24	Rainfall of Cuamba, Ile, Grue	Сору	Institute Nacional de Meteorologia
25	Temperature of Cuamba, Ile, Grue	Сору	Institute Nacional de Meteorologia
26	Seismic data of Zambezia Province	Сору	Ministerio dos recursos minerais

6. Other Relevant Data

6.1 Memorandum of Agreement at 1st Site Survey (19/Apr/2011)

Memorandum of Agreement

between

Outline Design Study Team and National Road Administration (ANE)

the Project for the Construction of Bridges between Ile and Cuamba

Both Parties agreed the following items based on the discussion on 19th April 2011.

- (1) The approach road for the bridge at the location of existing bridge shall be 50m at both side in principle and at the location parallel to the existing bridge shall be adjusted to the existing road as shown Figure-1.
- (2) Bridge length of each location are determined based on the maximum discharge of each river analyzed through the study and are summarized tentatively in Table-1.
- (3) The bridge widths are 9.6m for two lane bridge and 5.2m for one lane bridge as shown in Table-2 and Figure-2.
- (4) The ratio of embankment slope for the approach road shall be gentler than 1:1.5.
- (5) Ducts for accommodated public utilities such as optical fiber cables shall be taken into account in the design.
- (6) Vertical clearance over H.W.L shall be one meter.
- (7) Following standard will be applied for the study.
 - 1. Design Standard
 - > ANE's Design Standards (Draft)
 - > Code of Practice for the Design of Road Bridges and Culverts issued by
 - Design Specification for Highway Bridges issued by Japan Road Association (JRA)
 - > Technical Recommendations for Highways (South Africa)

In -

- Code of Practice for the Design of Highway Bridges and Culverts (TMH7 Part 3)
- Code of Practice for the Design of Foundation for Buildings (SABS 0161-1980)
- > Code of Practice for the Structural Use of Concrete (SABS 0100-1)
- > Code of Practice for Pile Foundations (SABS 088-1972)

2. Design Load

- Dead Load
 - Dead load specified by SATCC shall be applied.
- > Live Load
 - NA, NB, NC live load specified by SATCC shall be applied.
- > Other Load
 - Other load including seismic coefficient, wind shall be in accordance with ANE's Bridge Design Manual.

3. Basic Concept for Design

- > High Water Level
 - High water level will be determined based on the hydrological study in the outline design study.
- > Bridge Type

Pre stressed concrete bridge and/or Reinforcement Concrete bridge will be adopted for the Project.

Mr. Junji Yasui

Chief Consultant

JICA Preparatory Survey Team

(Outline Design Study)

Mr. Ismael Sulemane

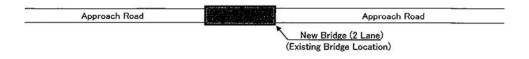
Director of Projects

National Road Administration

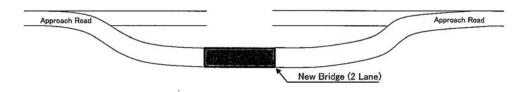
The Republic of Mozambique

Figure-1 Proposed Bridge Location (Tentative)

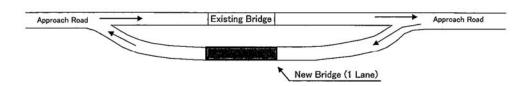
Type-A (No.3, No.5, No.6, No.7, No.8, No.9, No.10)



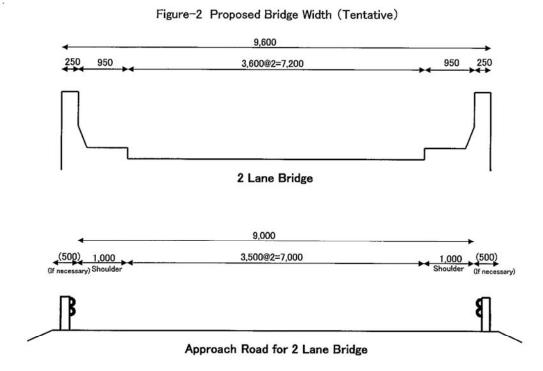
Type-B (No.1, No.11, No.12, No.13)

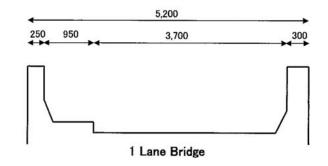


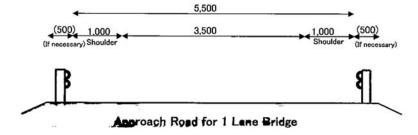
Type-C (No.2, No.4)



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Table- 2 Proposed Bridge Plan (Tentative)

	Bridge Name	Existing Bridge	Bridge			Proposed Plan			
	9	Length	Width	Type	٦	Length	Span	Width	Lane
No.1	Mutabasse	95.0	5.1	Prestressed Concrete	105	35+35+35=105	ဗ	9.6	2
No.2	Muliquela	0.99	5.1	Prestressed Concrete	07	35+35=70	2	5.2	-
No.3	Matacasse	15.0	4.2	Reinforced Concrete	12	15	-	9.6	2
No.4	Lua	37.0	5.1	Prestressed Concrete	35	35	-	5.2	-
No.5	Ualasse	15.0	4.2	Reinforced Concrete	15	15	-	9.6	2
No.6	Licungo	35.0	5.2	Prestressed Concrete	35	35	-	9.6	2
No.7	Nivaco	6.2	7.1	Reinforced Concrete	12	15	-	9.6	2
No.8	Matsitse	15.0	4.2	Reinforced Concrete	30	15+15=30	-	9.6	2
No.9	Namisagua	18.0	4.2	Reinforced Concrete	30	15+15=30	2	9.6	2
No.10	No.10 Nuhusse	24.0	4.2	Reinforced Concrete	30	15+15=30	2	9.6	2
No.11 Lurio	Lurio	55.0	3.8	Prestressed Concrete	07	35+35=70	က	9.6	2
No.12	No.12 Muassi	10.0	5.2	Reinforced Concrete	15	15	-	9.6	2
No.13	No.13 Namutimbua	20.0	4.2	Reinforced Concrete	30	15+15=30	2	9.6	2



6.2 Memorandum of Agreement at 2nd Site Survey (02/Nov/2011)

Memorandum of Agreement between

Outline Design Study Team and National Road Administration (ANE)

on

the Project for the Construction of Bridges between Ile and Cuamba

Both Parties agreed the following items based on the discussion on 1st November 2011.

(1) ANE requests to change the abnormal live load NB24 to NB36 for designing bridges on the road. Incidentally, the carriage way width of the one-lane bridge shall be changed to 3.75 meter from 3.6 meter as shown in the following figure.

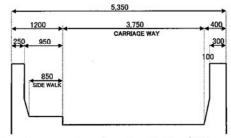


Figure 1. Typical cross section of one-lane bridge (Adjusted to NB load)

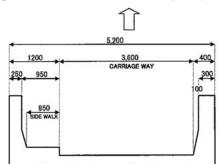


Figure 2. Typical cross section of one-lane bridge (Agreed at the previous meeting for signing technical memorandum on 19th Apr, 2011)

(2) ANE requests that the bridge name plates installed on the concrete handrails should be made from granite, marble or concrete.

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Chief Consultant

JICA Preparatory Survey Team

(Outline Design Study)

Mr. Ismael Sulemane

Director of Projects

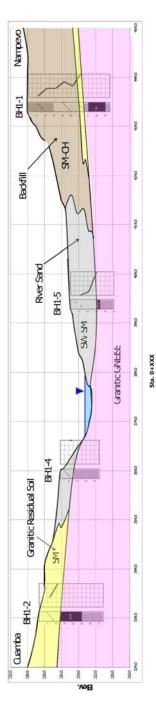
National Road Administration

The Republic of Mozambique

6.3 Geological Survey Result

6.3.1 Geological Profile

No.1 Mutabasse



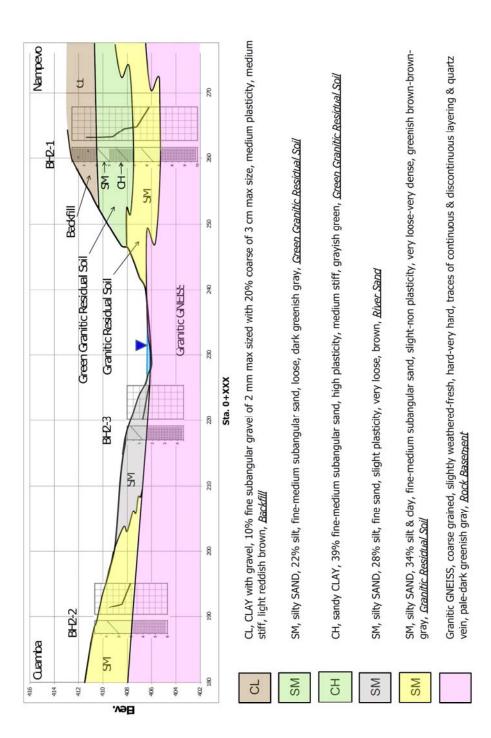
SM-CH, silty SAND-sandy CLAY, 28-52% silt & clay, fine-medium subangular sand, random fine-coarse subangular gravel, high plasticity in clay layer, medium dense, traces of decomposed muscovite, reddish brown, Backfill

SM, silty SAND, 21% silt, random fine subangular gravel, fine-medium subangular sand, traces of decomposed muscovite & layering, loose-very dense, reddish-SW-SM, SAND with silt-sity SAND, 10-30% silt, fine-medium subangular sand, very loose-very dense, well graded, dark brown-dark yellowish gray, River Sand

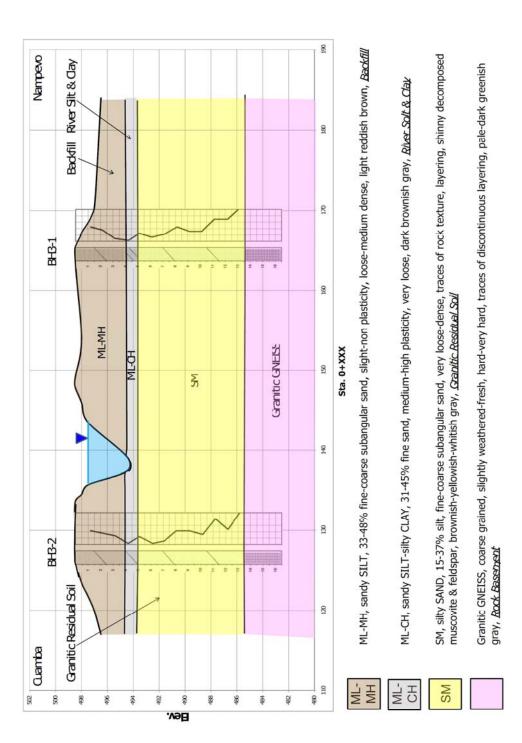
Granitic GNEIS5, coarse grained, slightly weathered-fresh, hard-very hard, traces of quartz vein and continuous layering, greenish gray, Rack Basenaed

Expected Shear Zone within Granitic GNEISS Basement

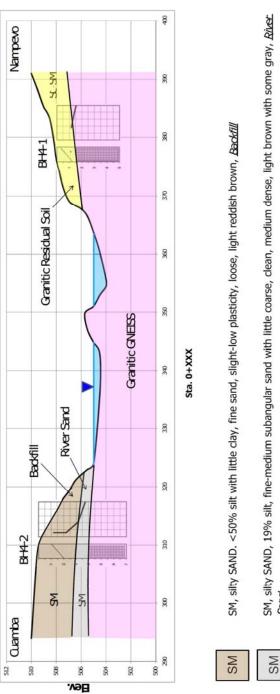
No.2 Muliquela



No.3 Matacasse



No.4 Lua



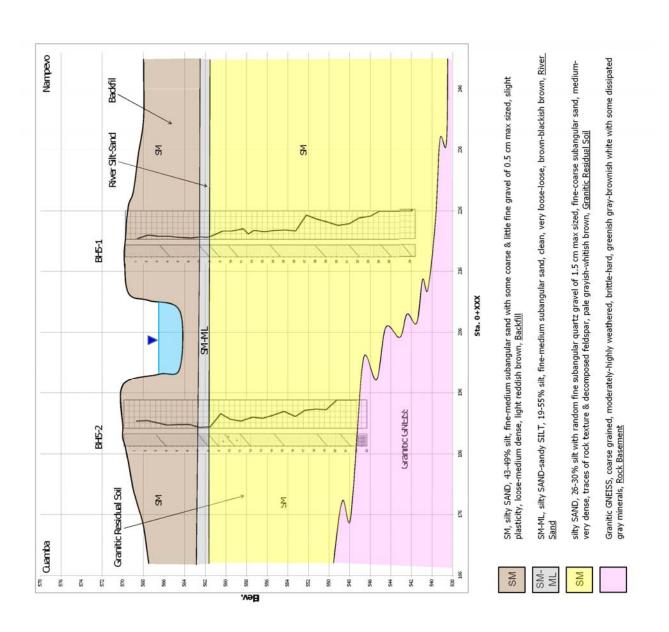
SM, silty SAND, 19% silt, fine-medium subangular sand with little coarse, dean, medium dense, light brown with some gray, <u>River.</u> Sand

SP-SM, SAND with silt & gravel, 10% silt, 20% angular gravel of schist, fine-medium subangular sand, traces of shinny decomposed muscovite, medium dense, dark brown, *Quast with Schist Residual Soil*

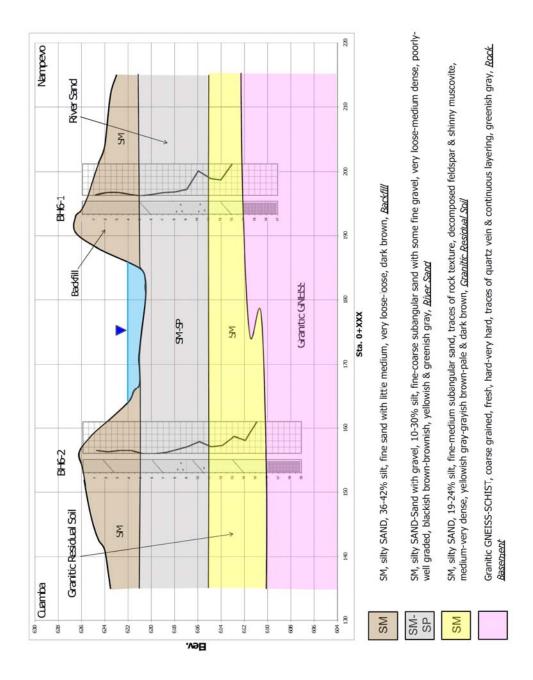
SC-SM

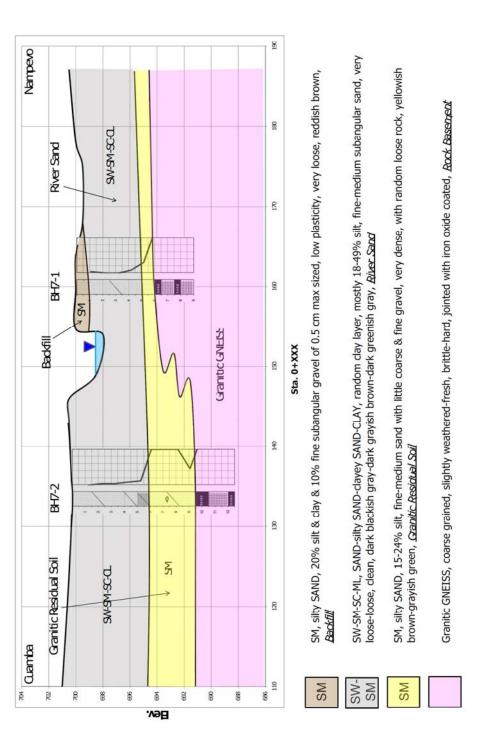
Granitic GNEISS, coarse grained, fresh, very hard, traces of discontinuous layering, greenish-dark gray, Rock Basement

No.5 Ualasse

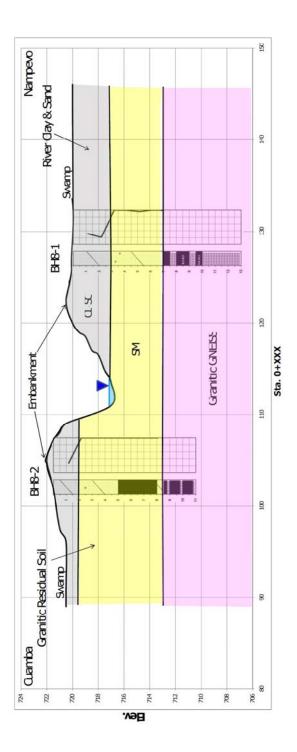


No.6 Licungo





No.8 Matsitse



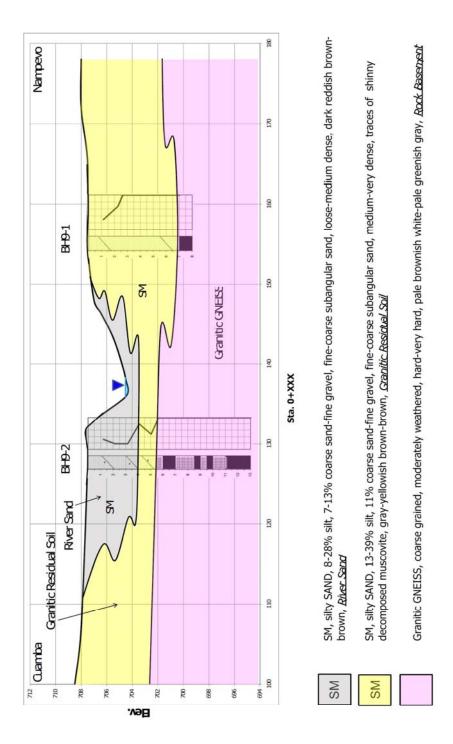
CL-SC, sandy CLAY-clayey SAND, 37-50% clay, fine-medium subangular sand, low-medium plasticity, medium dense, grayishblackish brown, Alluvial Clay & Sand

CL-SC SM

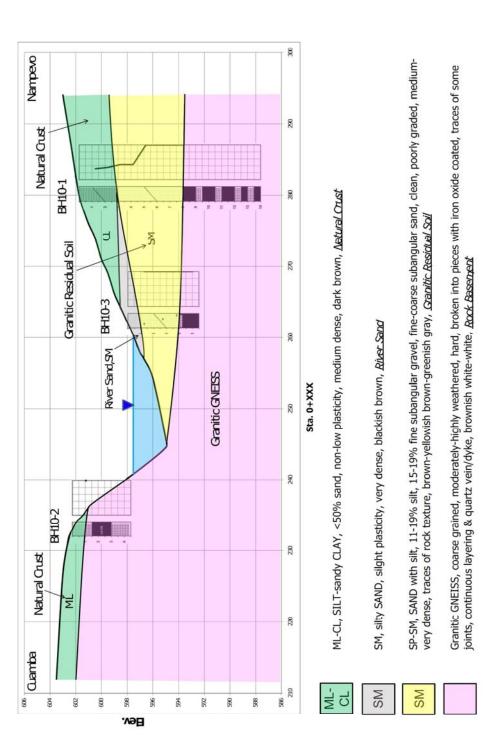
SM, silty SAND, 15-28% silt, 15-17% fine gravel, fine-coarse subangular sand, very dense, traces of rock texture, shinny decomposed muscovite & feldspar, light-yellowish brown, <u>Granitic Residual Soil</u>

Granitic GNEISS-SCHIST, medium-coarse grained, moderately-highly weathered, brittle-hard, jointed, traces of continuous muscovite layering, whitish gray-grayish brown, Rock Basement

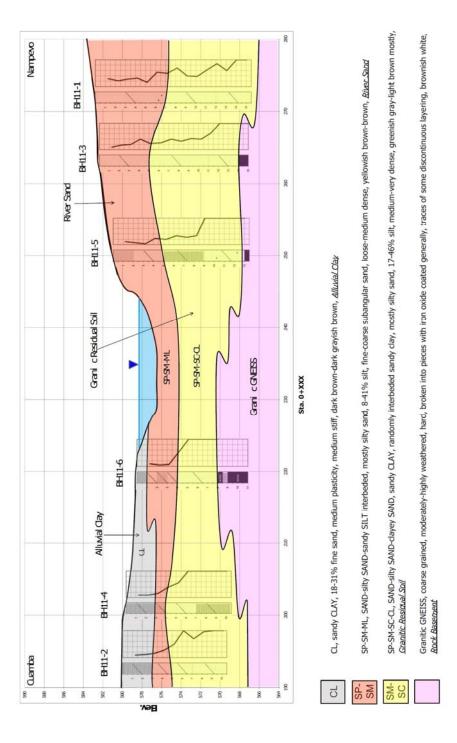
No.9 Namisagua



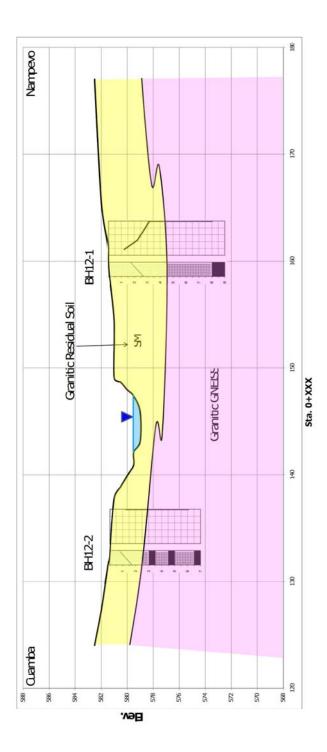
No.10 Nuhusse



No.11 Lurio



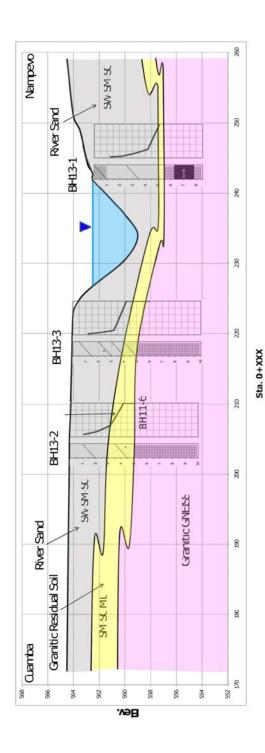
No.12 Muassi



SM, silty SAND, 26-30% silt with random fine subangular quartz gravel of 1.5 cm max sized, fine-coarse subangular sand, mediumvery dense, traces of rock texture & decomposed feldspar, pale grayish-whitish brown, Ganitic Residual Soil

Granitic GNEISS, coarse grained, moderately-highly weathered, brittle-hard, greenish gray-brownish white with some dissipated gray minerals, Rock Basenpent

No.13 Namutinbua



SW-SM-SC, SAND-silty & clayey SAND, , 7-30% silt, fine-coarse subangular sand, very loose-loose, well graded, dark brownish graydark grayish brown, River Sand

SW-SM SM-SC

SM-SC-ML, silty SAND-clayey SAND, SILT, 18-30% silt, fine-coarse subangular sand with some fine gravel, medium-very dense, traces of rock texture, brown-grayish & greenish brown, Granitic Residual Soil Granitic GNEISS, coarse grained, moderately weathered-fresh, brittle-very hard, jointed, traces of continuous layering, pale-dark greenish gray, Rock Basement