

4. 討議議事録 (M/D)

4-1 現地調査 I

**MINUTES OF DISCUSSIONS
ON PREPARATORY SURVEY
ON THE PROJECT FOR TRAINING HEALTH WORKERS IN NACALA
IN THE REPUBLIC OF MOZAMBIQUE**

In response to a request from the Government of the Republic of Mozambique (hereinafter referred to as "Mozambique"), the Government of Japan decided to conduct a Preparatory Survey on the Project for training health workers in Nacala (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA dispatched a Preparatory Survey Team (hereinafter referred to as "the Team") to Mozambique, which is headed by Mr. Yoshiharu Yoneyama, Deputy Director-General, Human Development Department, JICA, and is scheduled to stay in the country from August 4 to September 4, 2014.

The Team held discussions with the officials concerned of the Government of Mozambique and conducted field surveys at the study area.

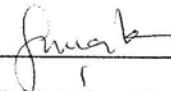
In the course of discussions and field surveys, both parties confirmed the main items described on the attached sheets. The Team will proceed to further works and prepare the Preparatory Survey Report.

Maputo, August 14, 2014



Mr. Yoshiharu Yoneyama

Leader
Preparatory Survey Team
Japan International Cooperation Agency
Japan



Dr. Celia M. de Deus Goncalves

National Director
Directorate of Planning and Cooperation
Ministry of Health
Government of Mozambique

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve health services in Mozambique through increasing the number and the quality of health workers through construction of a Health Science Institute of Nacala and supply with necessary equipment to start training.

2. Project site

The Project site is located in Nacala-Porto District in Nampula Province, Mozambique as shown in Annex-1.

3. Responsible and Implementing Agency

The responsible and implementing agency is Directorate of Planning and Cooperation in the Ministry of Health (hereinafter referred to as "MoH").

Organization charts of the above Agency are shown in Annex-2.

4. Items requested by the Government of Mozambique

The lists of requested items and its priority finally agreed upon between the Government of Mozambique and the Team are shown in Annex 3 (facilities) and Annex 4 (equipment). JICA will assess the appropriateness of the request with the following criteria and will recommend to the Government of Japan for approval.

- Technical Feasibility
- Economic and Financial Viability
- Manageable and Administrative Competence of Organization Concerned
- Financial Allocation by Japanese side
- No duplication of similar support by Development Partners

5. Japan's Grant Aid Scheme

5-1. The Mozambique side understands the Japan's Grant Aid Scheme explained by the Team, as described in Annex-5.

5-2. The Mozambique side will take necessary measures, as described in Annex-6, for smooth implementation of the Project, which constitutes the condition for the Japanese Grant Aid to be implemented.

6. Schedule of the Study

6-1. The consultants will proceed to further studies in Mozambique until September 4, 2014.

6-2. JICA will prepare the draft report in Portuguese and dispatch a mission team for the purpose of explaining the report's contents in February, 2015.

6-3. In an event that the contents of the report is accepted in principle by the Government of Mozambique, JICA will complete the final report and send it to the Government of Mozambique by the end of July, 2015.

6-4. The above schedule is tentative and subject to change.



7. Other relevant issues

7-1. Budget Allocation

Both sides agreed that the Mozambican side promised to secure and allocate sufficient budget in order to operate and maintain the constructed facilities, regardless of any possible transfer of their administrative control within the context of decentralization.

7-2. Staff Assignment for the Constructed Facilities

Both sides agreed that the Mozambican side promised to assign the appropriate number of teaching staff for training, as well as administrative and technical personnel for operations and maintenance to the constructed facilities within the fiscal year of 2018.

7-3. Training Courses Commencing in the Constructed Facilities in 2018

Both sides agreed that the following 11 courses shall be held in the constructed facilities from 2018: general nurse, midwife, general medical technician, public health nurse, clinical laboratory technician, pharmacist, psychotherapist, physiotherapist, nutritionist, radiology technician, and dental technician.

7-4. Sustainable Employment of the Graduates

Both sides agreed that the Government of Mozambique ensures the allocation of sufficient budget for stable work force employment of future graduates and health workers, whose numbers are expected to increase for years to come.

7-5. Project Title

Both sides agreed to modify the project title from "the Project for training health workers in Nacala" to "the Project for Construction of a Health Science Institute in Nacala".

7-6. Agreed Items for Facilities and Equipment

- 1) Both sides acknowledged that some items agreed as highest priority (A) may not be recommended to the Government of Japan for approval after careful assessment with the criteria stated above.
- 2) Both sides agreed that the item listed as B+ in Annex 3 (four class rooms for the facilities) is of high priority and should be considered to be included in the project. JICA will assess the appropriateness of the item and decide whether it to be included for the recommendation to the Government of Japan.

7-7. Undertakings by the Mozambican side

- 1) MoH agreed to submit the Environmental Impact Assessment to Ministry of Coordination of Environmental Affairs and acquire their certificate by the middle of January 2014, prior to the beginning of the draft explanation mission. The copy of the certificate shall be submitted to JICA through JICA Mozambique office.
- 2) MoH confirmed the implementation department and the procedures for exemption of custom duty and internal tax. MoH agreed to allocate sufficient budget for every Mozambican fiscal year from 2015 to 2017 by completing the necessary procedure by July of the previous year.
- 3) MoH agreed to take necessary procedures to obtain building permits before notification of the work.
- 4) MoH agreed to take necessary measures for the infrastructure works as follows;
 - (i) Authorization of construction permit for the Project prior to the commencement of the works.

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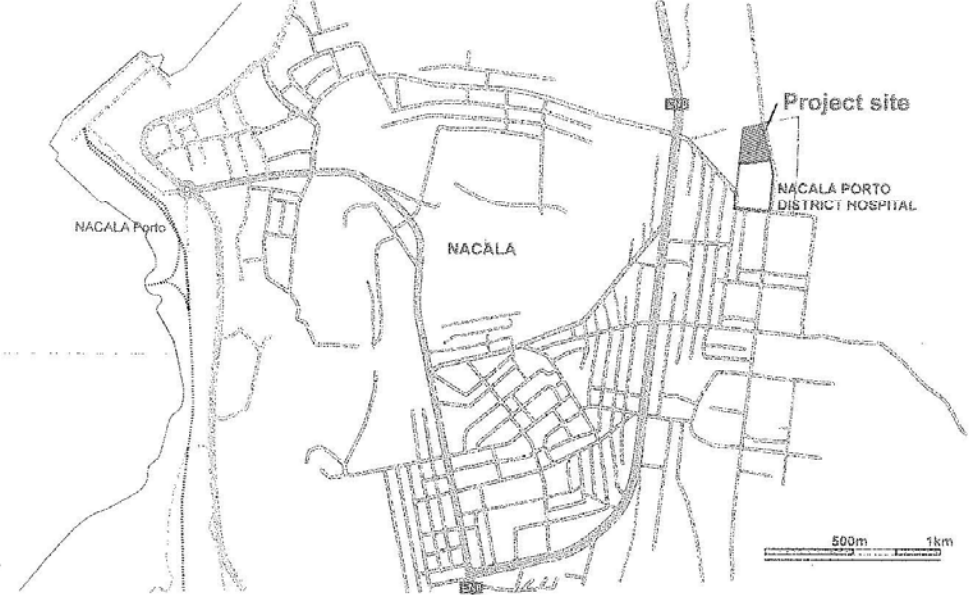
- (ii) Completion of site clearance prior to the commencement of the works.
- (iii) Completion of installing water supply, as well as electric supply and communication services to the Project site by the end of April, 2016.

- Annex-1 Location Map of the Project sites
- Annex-2 Organization Chart of Ministry of Health
- Annex-3 Facility List
- Annex-4 Equipment List
- Annex-5 Japan's Grant Aid
- Annex-6 Major Undertakings to be Taken by Each Government

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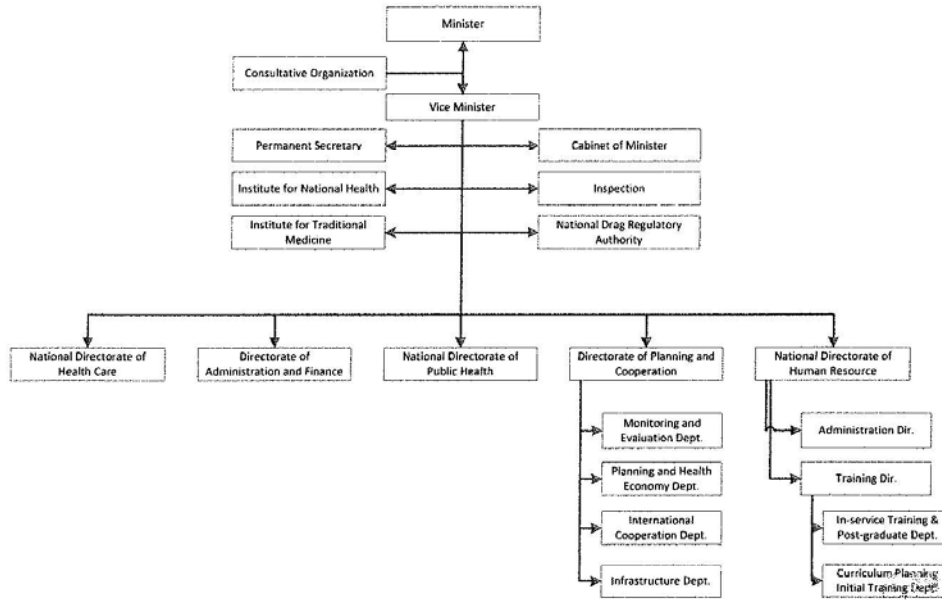
Annex-1 Location Map of the Project site



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Annex-2 Organization Chart of Ministry of Health



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Annex-3 Facility List

Priority	Component	Quantity	Capacity	Description
A	Classroom	8	30 Persons	Equipped with Projector
B+	Classroom	4	30 persons	Equipped with Projector
A	Administration block	1	32 persons	Three (3) independent rooms for director and two (2) deputy directors. Other rooms for departments, for reproduction, meeting, waiting and reception.
A	Teachers' room	1	60 persons	
	Multidisciplinary Laboratory	2	15 persons	
A	humanistic laboratory	2	30 persons	
	Dental Laboratory	1	30 persons	
A	Library	1	45 persons	Equipped with reception, book storage, and internet connection
A	PC room	1	30 persons	
A	Refectory and Kitchen	1	180 persons	Equipped with kiosk
B	Auditorium	1	240 persons	Multi-purpose flat floor
A	Female Dormitory	1	96 persons	8 persons per room
B	Female Dormitory	1	48 persons	8 persons per room
A	Male Dormitory	1	96 persons	8 persons per room
B	Male Dormitory	1	48 persons	8 persons per room
B	Teacher's house	4	-	1 family/house
C	Roofed parking facility	1	-	For the bus to be procured by the Project
A	Necessary building Service	-	-	Sanitary facility, Water supply and drainage system, Air conditioning and mechanical ventilation system, lighting and communication system

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Annex -4 EQUIPMENT LIST

No.	Name of Equipment	Q'ty	Priority
1	Stethoscope clinical	210	A
2	Stethoscope pinard	90	A
3	Sphygmomanometer	210	A
4	Clinical Thermometer	30	A
5	Otoscope	5	A
6	Reflex Hammer	5	A
7	Magnifying Glass	5	A
8	Ophthalmoscope	5	A
9	Spatula	30	A
10	Laryngoscope	5	A
11	Flashlight	30	A
12	Spirometer	5	A
13	Instrument set	5	A
14	Crank bed	10	A
15	Sterilizer (autoclave)	2	A
16	Sterilizer (hot air type)	1	A
17	Aspirator (manual type)	5	A
18	Aspirator (electrical type)	5	A
19	Resuscitation-bag set	5	A
20	Infant incubator	2	B
21	Examination lamp	5	A
22	Screen	10	A
23	Instrument table	5	A
24	Scale (for infant)	5	A
25	Scale (for adult)	5	A
26	Scale (for new-borne baby)	5	A
27	Height scale (for adult)	5	A
28	Height scale (for new-borne baby)	5	A
29	Soap	5	C
30	Brush for washing hands	10	C
31	Bucket with tap to conserve water	5	C
32	Full bed linen to cover mannequins	5	C
33	Garbage Pail	5	C
34	Tape	60	C
35	Disposable syringe	600	C
36	Portable cool box	60	C
37	Human skeleton model	2	A
38	Skull model with brain	1	A
39	Spinal model	1	A
40	Torso	1	A
41	Junior Torso (male & female)	1	A
42	Muscular model (male)	1	A
43	Lung model with larynx	1	A
44	Heart model	2	A
45	Pelvis model (female)	1	A
46	Pelvis model (male)	1	A
47	Eye model	1	A
48	Ear model	1	A
49	Auscultation trainer	5	A
50	Blood pressure measuring trainer	5	A
51	Patient care manikin	5	A
52	I.V. injection training arm model	5	A
53	I.V. injection simulator	5	A
54	I.M. injection simulator	5	A
55	I.M. injection training model	5	A
56	Catheterization simulator (female)	5	A
57	Catheterization model & simulator (male)	5	A

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Annex -4 EQUIPMENT LIST

No.	Name of Equipment	Q'ty	Priority
58	Skin sutures training kit	5	A
59	Sutures practice arm	5	A
60	Maternal & neonatal birthing simulator	5	A
61	Episiotomy suturing simulator	5	A
62	Nurse training baby model (new born baby)	5	A
63	Gravid pelvis model (for examination training)	5	A
64	Wearable breast self examination model	5	A
65	Condom training model (male)	5	A
66	Testicle self examination model	5	A
67	Microscope (with teaching-scope)	2	A
68	Microscope	16	A
69	Hot air sterilizer	2	A
70	Incubator	2	A
71	Spectrophotometer	2	A
72	Distillation unit	2	A
73	Centrifuge	2	A
74	Magnetic stirrer	2	A
75	Shaker	2	A
76	Touch mixer	6	A
77	Hand tally counter	6	A
78	Slide glass warmer	2	A
79	Hematocrit centrifuge	2	A
80	Refrigerator	2	A
81	Analytical balance	6	A
82	Electrical balance	6	A
83	Mortar	6	A
84	Hemacytometer	6	A
85	Micro centrifuge	2	A
86	pH meter	6	A
87	Water bath	2	A
88	Hydrometer set	6	A
89	Anaerobic jar	2	A
90	Timer watch	6	A
91	Staining jar	6	A
92	Safety cabinet	2	A
93	Autoclave	2	A
94	Glassware set	6	A
95	Central Laboratory Table	6	A
96	Reagent	1	C
97	Phantom head workstation	15	A
98	Air compressor	2	A
99	Dental chair unit with instrument set	1	A
100	Suction system	1	A
101	Dental X-ray unit	1	C
102	X-Ray developer	1	C
103	X-Ray apron	1	C
104	LED curing light	15	A
105	Amalgam mixer	1	C
106	Instruments for impression mixing	1	C
107	Bench-top autoclave	1	A
108	Mobile instrument cabinet	1	A
109	Surgery cabinet	1	A
110	Plaster vibrator	1	C
111	Ultrasonic scaler	1	C
112	Restorative kit	15	A
113	X-ray machine fixed type	1	C
114	Tomography	1	C

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Annex -4 EQUIPMENT LIST

No.	Name of Equipment	Q'ty	Priority
115	Examination table	1	C
116	Automatic developing machine	1	C
117	Markers of laterality	1	C
118	Vernier caliper for body	2	C
119	Lead screen	1	C
120	Lead apron	8	C
121	Lead goggles	8	C
122	Protector for thyroid	8	C
123	Protector for gonad	8	C
124	Cassette	1	C
125	Base for cassette	1	C
126	Goniometer	2	C
127	Support for lead apron	8	C
128	Emergency kit	1	C
129	Goniometer	30	C
130	Spirometer	30	C
131	Ergometer	3	C
132	Inclined plane	4	C
133	Dumbbell	3	C
134	Multi-purpose exercise machine	2	C
135	Quadriceps exercise machine	2	C
136	Rehabilitation steps	2	C
137	Parallel bars	2	C
138	Shoulder wheel	2	C
139	Hydrocollator pad	3	C
140	Cold pad	4	C
141	Wall bars	2	C
142	Balance boards	3	C
143	Instrument for push ups	4	C
144	Medicine ball	3	C
145	Balance ball	3	C
146	Treadmill	2	C
147	Wheelchair	4	C
148	Walker	3	C
149	Walking stick	4	C
150	Crutch	5	C
151	Exercise mattress	10	C
152	Stretcher	2	C
153	Cage with pulleys and various materials	1	C
154	Mirrors	2	C
155	Electrostimulator	3	C
156	Ultrasonic therapy instrument	3	C
157	Infrared therapy instrument	4	C
158	Shortwave therapy instrument	2	C
159	Ultraviolet therapy instrument	3	C
160	Microwave therapy instrument	2	C
161	Interferential current therapy instrument	3	C
162	Faradic current therapy instrument	3	C
163	Transcutaneous electrical nerve stimulator	3	C
164	Trabert current therapy instrument	2	C
165	Lumbar traction apparatus	2	C
166	Cervical traction apparatus	2	C
167	Large size vat for imersion bath	1	C
168	Hydro massage vat	3	C
169	Hydro ultrasonic instrument	3	C

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Annex -4 EQUIPMENT LIST

No.	Name of Equipment	Q'ty	Priority
170	Paraffin bath	3	C
171	Pool	1	C
172	Copy machine	1	A
173	Duplicating printer	1	A
174	Bus	3	A
175	Desktop PC	41	A
176	Laptop PC	18	A
177	Switching hub	3	A
178	Color printer	1	A
179	Monochrome printer	1	A
180	Video projector	18	A
181	Screen	18	A
182	Sound equipment	1	B
183	Video projector	1	B
184	Screen	1	B
185	Kitchen equipment	1	A

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JAPAN'S GRANT AID

The Government of Japan (hereinafter referred to as "the GOJ") is implementing the organizational reforms to improve the quality of ODA operations, and as a part of this realignment, a new JICA law was entered into effect on October 1, 2008. Based on this law and the decision of the GOJ, JICA has become the executing agency of the Grant Aid for General Projects, for Fisheries and for Cultural Cooperation, etc.

The Grant Aid is non-reimbursable fund provided to a recipient country to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials as such.

1. Grant Aid Procedures

The Japanese Grant Aid is supplied through following procedures :

- Preparatory Survey
 - The Survey conducted by JICA
- Appraisal & Approval
 - Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet
- Authority for Determining Implementation
 - The Notes exchanged between the GOJ and a recipient country
- Grant Agreement (hereinafter referred to as "the G/A")
 - Agreement concluded between JICA and a recipient country
- Implementation
 - Implementation of the Project on the basis of the G/A

2. Preparatory Survey

(1) Contents of the Survey

The aim of the preparatory Survey is to provide a basic document necessary for the appraisal of the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the recipient country necessary for the implementation of the Project.

- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of a outline design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant Aid project. The Outline Design of the Project is confirmed based on the guidelines of the Japan's Grant Aid scheme.

JICA requests the Government of the recipient country to take whatever measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization of the recipient country which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA reviews the Report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the appropriateness of the Project.

3. Japan's Grant Aid Scheme

(1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes(hereinafter referred to as "the E/N") will be signed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles to implement the Project, such as payment conditions,

responsibilities of the Government of the recipient country, and procurement conditions.

(2) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the recipient country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals".

(4) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by JICA. This "Verification" is deemed necessary to fulfill accountability to Japanese taxpayers.

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as Annex.

(6) "Proper Use"

The Government of the recipient country is required to maintain and use properly and effectively the facilities constructed and the equipment purchased under the Grant Aid, to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Grant Aid.

(7) "Export and Re-export"

The products purchased under the Grant Aid should not be exported or re-exported from the recipient country.

(8) Banking Arrangements (B/A)

- a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). JICA will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.
- b) The payments will be made when payment requests are presented by the Bank to JICA under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions paid to the Bank.

(10) Social and Environmental Considerations

A recipient country must carefully consider social and environmental impacts by the Project and must comply with the environmental regulations of the recipient country and JICA socio-environmental guidelines.



Annex-6: Major Undertakings to be taken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To acquire the land use permit (DUAT) regarding proposed construction site and demolish existing buildings, underground structures, pipes and wires, trees and roots, and remove the aerial power line running across the site.		●
2	To construct the following facilities		
	1) The building	●	
	2) The gates, fences around the site and outside stormwater gutter		●
	3) The parking lot	●	
	4) The road within the site	●	
	5) The access road from the main road to the gate		●
3	To provide facilities for distribution of electricity, water supply and drainage and other incidental facilities necessary for the implementation of the Project outside the site		
	1) Power supply		
	a. To contract with EDM and install main power line to the designated point within the site		●
	b. To install cable from the designated point and power distribution system within the site	●	
	2) Water Supply (in case of city water)		
	a. To contract with AdM and install city water pipe to the meter within the site		●
	b. To install pipe from the meter and water supply system within the site	●	
	3) Drainage		
	a. To install pipe or gutter between the soak pit and river for the overflow treated water		●
	b. To install the drainage system within the site	●	
	4) Communication (telephone and internet) system		
	a. To contract with providers and install communication line to the designated receive (MDF and internet router)		●
	b. To install the communication system within the buildings or between the buildings	●	
	c. To install networking equipment and establish the network system		●
	5) Furniture and Equipment		
	a. To provide furniture, equipment, stationary, fabrics not to be covered on this Project		●
	b. To provide furniture equipment to be provided on this Project	●	

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4	To ensure prompt unloading and customs clearance of the products at ports of disembarkation in the recipient country and to assist internal transportation of the products		
	1) Marine (Air) transportation of the Products from Japan to the recipient country	●	
	2) Implementation of tax exemption and prompt custom clearance of the Products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	●	
5	To exempt internal taxes and other fiscal levies to be imposed in the recipient country for the purchase of the products and the services		●
6	To accord entry permits, resident permits and working visas to Japanese nationals and/or nationals of third countries who work exclusively for the Project		●
7	To ensure that the building and the equipment are maintained and used properly and effectively for the implementation of the Project		●
8	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project		●
9	To bear the following commissions paid to the Japanese bank for banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●

(B/A : Banking Arrangement, A/P : Authorization to pay)

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4-2 テクニカルノート (現地調査 I)

Projecto para o Instituto de Ciências de Saúde de Nacala – Estudo Preparatório

NOTA TÉCNICA

Após reuniões, o Ministério da Saúde da República de Moçambique-MISAU junto à Missão do Estudo Preparatório do Projecto para o Instituto de Ciências de Saúde de Nacala (doravante referido como "Missão" e "Projecto" respectivamente), chegou às seguintes concordâncias. Confirmando que:

- O DUAT para o terreno do Projecto, inicialmente suposto à apresentação até 25 de agosto de 2014, será entregue à Missão até final do mês de setembro de 2014.
- O prazo para obtenção da licença ambiental (EIA) para o Projecto será até final de janeiro de 2015, em vez de final de janeiro de 2014, data marcada na Minuta de Discussões (doravante referido como "MD") firmada em 14 de agosto de 2014.
- A instituição de abastecimento de água indicada no "ANNEX6" do MD será o FIPAG (Fundo de Investimento e Património de Abastecimento de Água) em vez de AdM (Águas de Moçambique).
- O MISAU irá, até final de janeiro de 2015, informar em escrito à Missão, o método de tratamento final dos resíduos incinerados no Hospital Distrital de Nacala-Porto.
- O MISAU irá, até antes do início das obras do Projecto, limpar e nivelar o terreno, retirando e providenciando tratamento final das cinzas de incineração e outros resíduos sólidos encontrados no local.
- O MISAU irá concluir, até antes do início das obras, os encargos do lado Moçambicano, nomeadamente:
 - Limpeza do terreno
 - Remoção das estruturas junto com as suas fundações,
 - Remoção dos postes e linhas de electricidades,
 - Corte de árvores e remoção de raízes, e
 - Remoção e tratamento final de resíduos.
 - Preparação da via de acesso e entrada ao terreno para as viaturas da obra. A Missão vai indicar o local para abertura da entrada.
- O MISAU irá concluir os encargos assinados no Artigo7-7 (iii) da MD, sendo elas as obras de conexão de água, electricidade e comunicação, até 3 (três) meses antes da

conclusão das obras, em vez de abril de 2016. A Missão deverá definir atepadamente a carga eléctrica necessária para o Instituto.

- Conexão de serviços de electricidade:

- O encargo de conexão de energia eléctrica do lado Moçambicano será até o transformador instalado pelo lado Japonês.

- Conexão de serviços de abastecimento de água:

- O encargo de conexão de água do lado Moçambicano será até a tubulação dentro do terreno, instalando o contador de água.

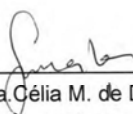
- O MISAU irá concluir as seguintes obras de encargo Moçambicano assinados no MD até 1 (um) mês antes da conclusão das obras, em vez de abril de 2016:

- Conexão de serviços de comunicação

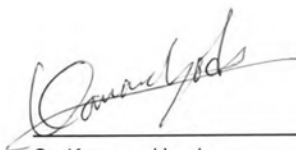
- Conexão de sistemas de comunicações de internet, Gov-net e e-SISTAFE até o hub, incluindo a instalação de servidor e UPS. O hub será instalado pelo lado Japonês.

- O plano de instalações de facilidades será estudado baseado nas questões anotadas no ANEXO 1.
- O plano de colocação será estudado baseado no ANEXO 2.
- A Missão irá entregar ao MISAU, no início de outubro de 2014, o desenho geral de arquitetura e utilidades do Projecto. O MISAU irá retribuir, dentro de um período de 2 (duas) semanas após o contacto da Missão, com observações e indicações sobre este documento.

Maputo, 1 de setembro de 2014



Dra. Célia M. de Deus Gonçalves
Directora Nacional
Direcção de Planificação e Cooperação
Ministério da Saúde



Sr. Kaname Hyodo
Líder da Equipa de Consultoria
Matsuda Consultants International Co., Ltd.



ANEXO 1

Questões técnicas relevantes do Projecto:

- Assegurar a largura, igual ou superior a 2400mm entre centros de colunas, em corredores de espaços comuns com exceção de espaços domiciliare.
- Assegurar a largura, igual ou superior a 2200mm entre centros de colunas, em corredores comuns de espaços domiciliare.
- Desenhar, assegurando o espaço arejado em princípio de ventilação natural. A ventilação forçada será planeada somente em salas com funções necessárias.
- Desenhar a colocação dos edifícios, tomando em consideração futuras ampliações.
- Os laboratórios multi-diciplinares serão desenhados ao nível de biossegurança 2 (BSL2), contudo a cabine de segurança será instalada somente em 1 laboratório, sendo ele o local de aulas de prática do curso de laboratório.
- As casas para professores serão construídas com acesso directo ao exterior. A construção do muro de vedação e entradas será da responsabilidade Moçambicana.
- O circuito eléctrico de emergência, fonte de energia em caso de cortes da linha comum, será instalado em salas e equipamentos necessários.
- O sistema de iluminação incluirá, em modo adequado, a iluminação noturna em pontos estratégicos para prevenir invasões de estranhos.
- O plano de sistema de comunicação será baseado no VoIP por internet.
- As sanitas em casas de banho para docentes serão de porcelana enquanto para alunos serão de inox (SUS 304). Todas as sanitas serão acompanhadas por chuveiros muçulmanos.
- A climatização será colocada em salas necessárias. As salas de aula e dormitórios terão o sistema eléctrico preparado para futura colocação de ar condicionado.
- Para aliviar pesos de manutenção do ICS, serão construídas salas individuais climatizadas para conservação de congelados e frescos com equipamento frigorífico e geleira, evitando a construção de câmaras pré-fabricadas para frigoríficos e refrigeração.
- Como sistema de combate à incêndio, será instalado um sistema de alarme com placa de localização pontual do local e não será instalado detectores térmicos ou de fumaça.

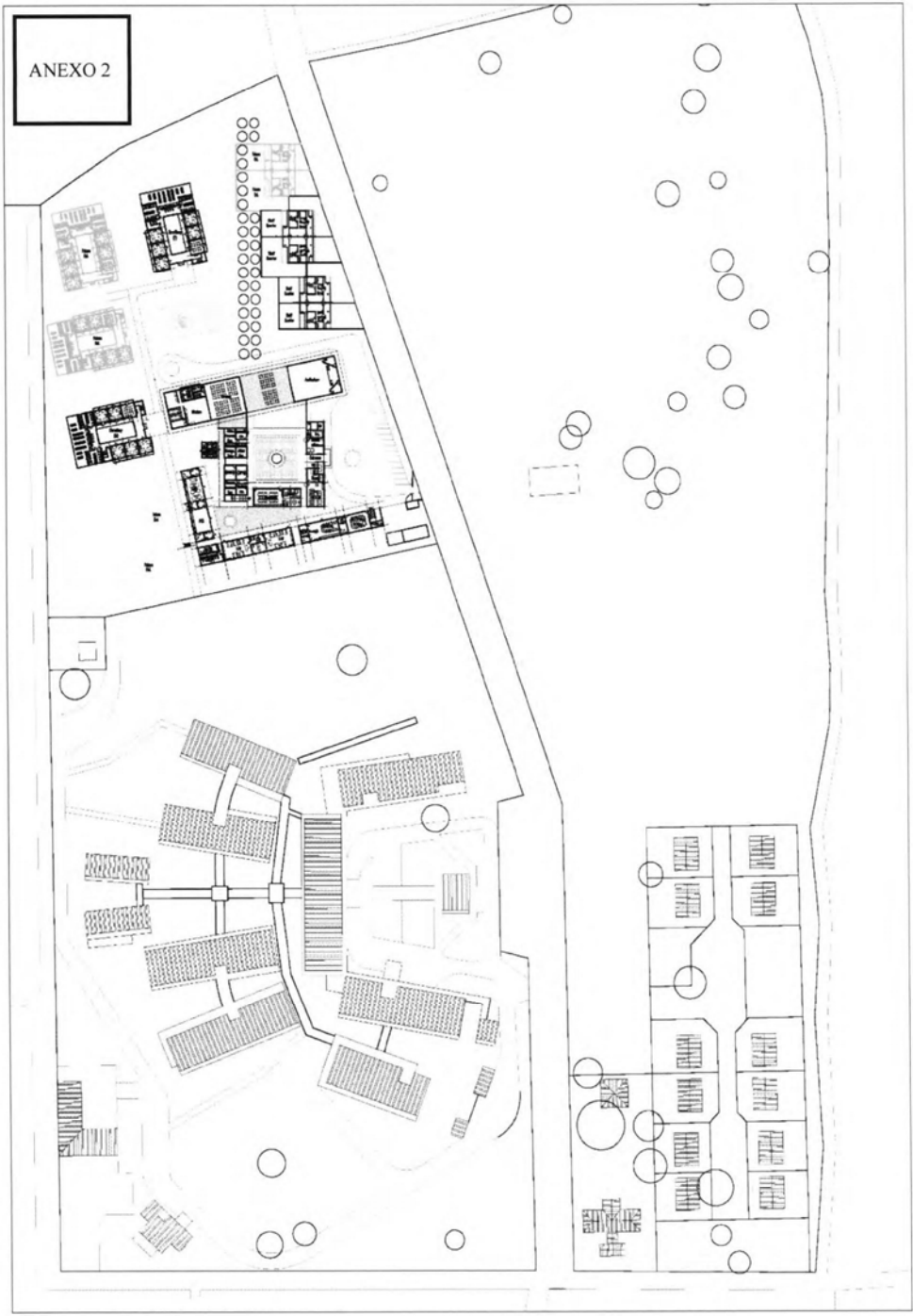
A1-1

- O para-raio será instalado na parte superior do tanque elevado de água, sendo este o ponto de maior altitude do Projecto.
- Como instalações de combate à incêndio, além de extintores, serão colocadas mangueiras de incêndio baseado no raio de 30m de proteção. A água para o combate será assegurada pelo tanque elevado à força de gravidade, visando o uso em casos de cortes de energia.

A1-2

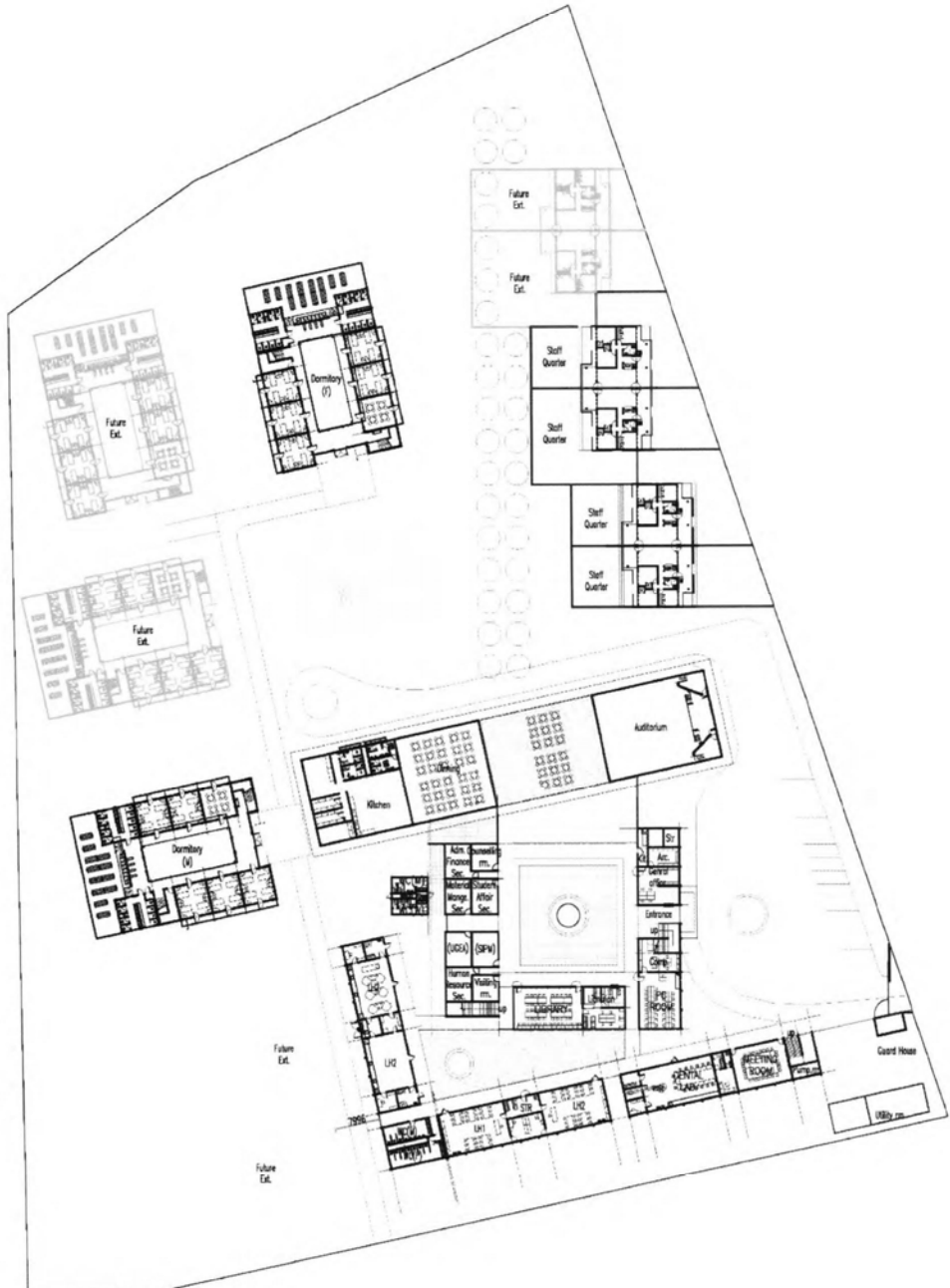
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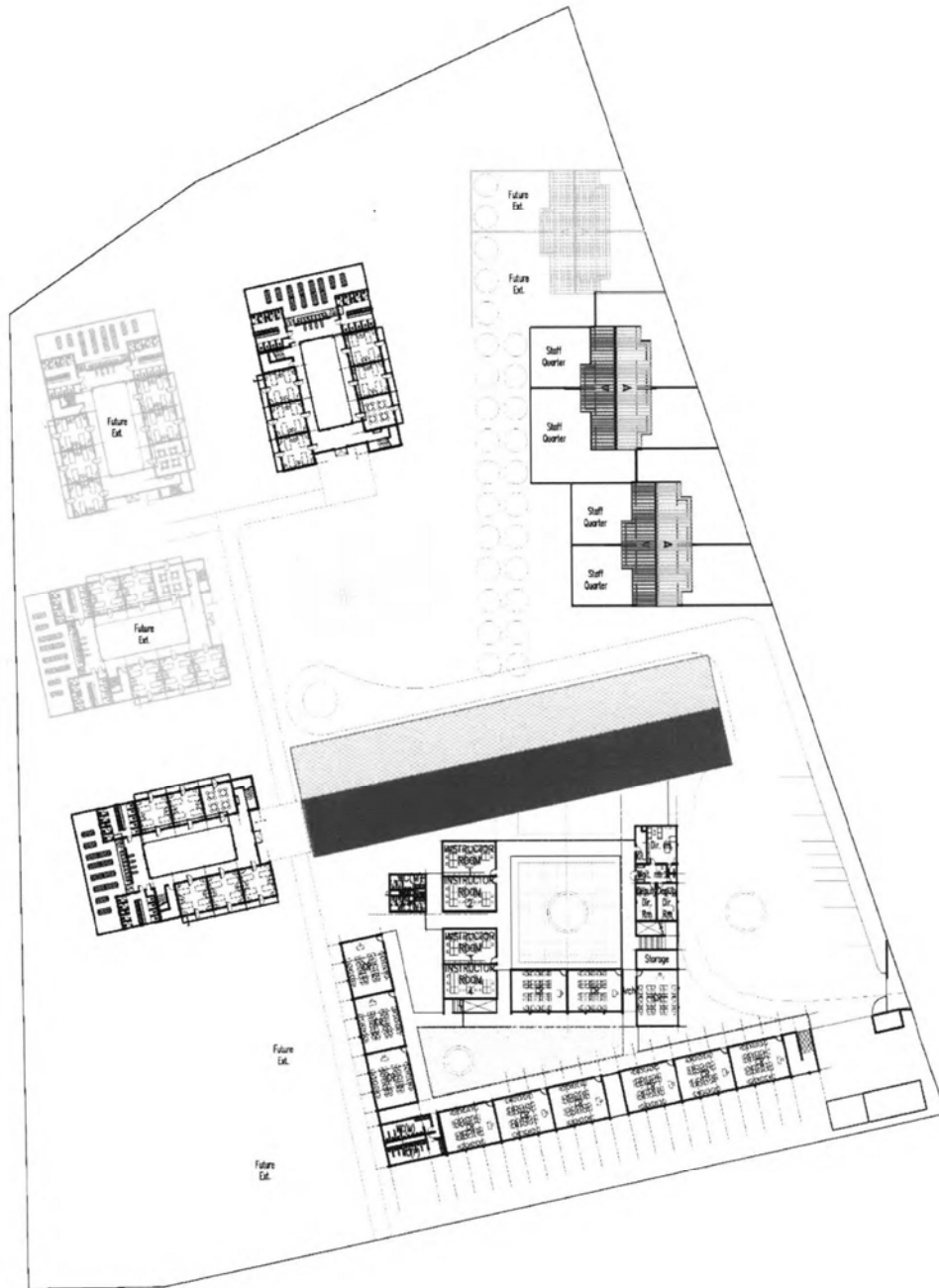
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NOTE:
 - Facility components of Category A and B, which were prioritised in the Minutes of Discussion agreed on 14th August 2014, are fully included in this draft layout plan.

6

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NOTE:
 - Facility components of Category A and B, which were prioritized in the Minutes of Discussion agreed on 14th August 2014, are fully included in this draft layout plan.

①

②

テクニカルノート

保健省と調査団は協議を通じ、以下のように合意した。

- 2014年8月25日までに提出予定であったDUATの取得に関し、調査団への提出を2014年9月末日までとすることを確認した。
- 2014年8月14日付Minutes of Discussion（以下、「MD」）に記載される環境影響評価(EIA)の計画承認取得期日が2014年1月末となっているが、2015年1月末までであることを確認した。
- MDのANNEX6に記載される給水事業者はAdM (Água de Moçambique)でなく、FIPAG(Fundo de Investimento e Património de Abastecimento de Água)であることを確認した。
- 保健省が今後ナカラポルト郡病院で焼却処理される廃棄物の最終処分方法を決定し、2015年1月末までに、調査団に決定内容を書面で通知することを確認した。
- 保健省が本計画サイトの整地を本計画着工前までに実施するとともに、投棄されている焼却灰及び廃棄物を撤去し、最終処分することを確認した。
- 保健省が以下のモザンビーク国側負担工事について本計画工事の着工時までに完了することを確認した。
 - サイトクリアランス
 - 既存構築物及び基礎の撤去、
 - 電力引き込み柱及び架空電線の撤去、
 - 伐採、抜根
 - 廃棄物残渣の撤去と最終処分
 - 工事用搬入路及び搬入口の整備。また調査団はアクセス道路及び搬入路を指示する。
- 保健省が以下のモザンビーク国側負担工事について、MDのArticle7-7 (iii)で、2016年4月までに完了を合意しているが、本計画工事の竣工 三(3)ヶ月前までに完了することを確認した。また調査団は事前に本計画施設に必要な電力供給量を提供する。
 - 電力の引き込みと接続
 - 計画サイト内に日本側で設置するトランスへの受電まで
 - 水道の引き込みと接続
 - 敷地内への給水管の引き込みとメーター設置まで
- 保健省が以下のモザンビーク国側負担工事について、MDでは、2016年4月で合意されているが、本計画工事の竣工 一(1)ヶ月前までに完了することを確認した。

- 通信線の引き込みと接続

- Internet、Gov-net、e-SISTAFE の各通信線引き込み、サーバーとUPS の設置、及びサーバーと本計画で設置するスイッチングハブの接続まで
- 施設計画については、別添 1 に示す事項を基本に計画検討することを確認した。
- 施設配置については、別添 2 を基本に検討することを確認した。
- 施設計画の建築及び設備の一般図に関しては、2014 年 10 月初旬に調査団から保健省に連絡し、調査団からの連絡より 二(2)週間以内に指摘・検討事項を、保健省から調査団に連絡することを確認した。

2014 年 9 月 1 日、マプト

保健省計画協力局

局長

Dra.Célia M. de Deus Gonçalves

(株) マツダコンサルタンツ

業務主任

兵藤要

別添 1

施設計画、配慮すべき事項

- 居住施設を除く供用部の廊下幅を柱芯寸法で 2,400 mm以上確保する。
- 居住施設の供用部の廊下幅を柱芯寸法で 2,200 mm以上確保する。
- 風通しを確保し、自然換気を基本とし涼しい室内空間を計画する。機械換気は、施設機能上不可欠である諸室にのみ計画する。
- 将来の施設拡張を考慮した施設配置を検討する。
- 多目的実験室は、BSL2 レベル相当で計画とするが、安全キャビネットに関しては、臨床検査演習を行う 1 室のみに設置する。
- 教員住居は、メインエントランスを介さずアクセス可能な施設配置を計画する。塀と入口はモザンビーク側負担工事として建設する。
- 非常用電源設備は、機能上必要となる諸室、機器への停電時の電力供給を考慮し設置する。
- 照明設備は、適切な形に部外者の侵入を予防する戦略的な位置に夜間照明を計画する。
- 通信設備は、インターネット回線を利用した VoIP を基本に計画する。
- 衛生器具は、教員用は陶器製、生徒用はステンレス(SUS 304) 製を基本に計画する。またすべてのトイレブースにハンドシャワーを設置する。
- 空調設備は、機能上必要となる諸室への設置を計画する。また将来空調設備の設置が想定される教室及び寮室に電源を確保する。
- 冷凍・冷蔵設備は、維持管理の負担を軽減するため、プレファブ型冷凍室、冷蔵室は設置せず、冷蔵及び冷凍用個々に部屋を設け、壁付空調機を設置した上で、冷凍庫及び冷蔵庫を設置する。
- 防火設備は、煙・熱感知器は設置しないが、アラーム及び警報盤から構成される火災報知機を設置する。
- 避雷設備は、本計画施設内で一番高くなる高架水槽上部に突針を設置する。
- 消火設備は、消火器の設置の他、警戒半径 30m を基準に消火用のホースリールを設置する。また停電時の利用も想定し、消火用水は、高架水槽内に確保し重力給水を基本とする。

以上

4-3 現地調査Ⅱ（概略設計概要説明）

**MINUTES OF DISCUSSIONS
ON PREPARATORY SURVEY
ON THE PROJECT FOR CONSTRUCTION OF A HEALTH SCIENCE INSTITUTE
IN NACALA
IN THE REPUBLIC OF MOZAMBIQUE
(EXPLANATION ON DRAFT REPORT)**

Japan International Cooperation Agency (hereinafter referred to as “JICA”) dispatched a Preparatory Survey (Outline Design) Team on the Project for Construction of a Health Science Institute in Nacala (hereinafter referred to as “the Project”) to the Republic of Mozambique (hereinafter referred to as “Mozambique”) from August 4th to September 4th, 2014. Through discussions, field surveys, and technical examination of the survey results in Japan, JICA prepared a draft report of the study.

In order to explain and to consult the government of Mozambique on the contents of the draft report, JICA dispatched Mozambique a Draft Report Explanation Team (hereinafter referred to as “the Team”), which is headed by Mr. Katsuyoshi SUDO, Representative of JICA Mozambique Office, from June 29 to July 3, 2015.

In the course of discussions, both parties confirmed the main items described on the attached.

Maputo, July 3, 2015



Mr. Katsuyoshi SUDO
Leader
Preparatory Survey Team
Japan International Cooperation Agency
Japan



Dr. João Carlos MAVIMBE
Deputy National Director
Directorate of Planning and Cooperation
Ministry of Health
Government of Mozambique

ATTACHMENT

1. Components of the Draft Report

The Government of Mozambique agreed and accepted in principle the components of the draft report explained by the Team. Specific comments presented from the Mozambican side and the answers provided by the Team are shown in Annex-1. The both sides agreed to proceed with the design presented by the Team with modifications proposed in the answers in Annex-1 and the modifications will be reflected on the detailed design.

2. Japan's Grant Aid Scheme

The Mozambican side understood the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Mozambique as explained by the Team and as described in Annex-5 and Annex-6 of the Minutes of Discussions signed by both sides on August 14, 2014.

3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and deliver it to the Government of Mozambique, not later than the end of November, 2015. The tentative schedule of the Project is described in Annex-2.

4. Confidentiality of the Project Design

Both sides confirmed that all information related to the Project including cost estimation of the Project described in Annex-3, detailed specification of the facilities, the equipment and other technical information shall not be released to any outside party before the signing of all the Contract(s) for the Project. The Mozambican side understood that the estimated cost is subject to change.

5. Other Relevant Issues

- 5.1. The Mozambican side agreed to secure and allocate the necessary staff and budget as described in Annex-4 and Annex-5, in accordance with Organization Chart described in Annex-8 and the plan and schedule of staff allocation to be submitted from the Mozambican side by the end of August 2015, to operate and maintain the constructed institute and procured equipment under the Project properly and sustainably.
- 5.2. The Mozambican side will timely take the necessary undertakings described in Annex-6 including, but not limited to, demolition work of existing structures, removal of trees, electric poles and realign electric supply cables affecting the proposed facilities, finalization of treatment for incinerated ash and medical wastes, instalment of water supply, power and communication lines to the site, minor modification of boundary wall, and arrangements of working permits for Japanese consultants and contractors. With respect to removal of incinerated ash and medical waste, the Mozambican side will prepare a document specifying methods of treatment and removal for these wastes by the end of August 2015 to confirm appropriateness of the removal operation by both sides.
- 5.3. Both sides confirmed that National Directorate of Planning and Cooperation (hereinafter referred to as "DPC") shall take the primary responsibility for implementation of the Project as the implementing agency. The head of the department, Department of Project (hereinafter

referred to as “DP”) will act as a project coordinator and will assign a focal point to follow up on the daily activities of the Project. DPC-DP will, in cooperation with relevant Directorates or Departments, lead and coordinate administrative procedures, including those related to the undertakings mentioned in the point 5.2 and described in Annex-6.

- 5.4. Both sides confirmed that the equipment to be procured under the Project is as listed in Annex-7.
- 5.5. The Mozambican side agreed to take necessary measures concerning environmental and social considerations (Environmental Impact Assessment) in accordance with relevant regulations of the Government of Mozambique and convey the relating information to JICA Mozambique Office by the end of August 2015.
- 5.6. Both sides confirmed that the Mozambican side, after completion of the Project, will take necessary measures for ensuring the safety of the water supply to the new Institute including the budget allocation related to these measures.
- 5.7. Both sides agreed to aim at commencement of training courses in the constructed facilities in July of 2018 due to the current construction schedule shown in Annex-2.
- 5.8. The Mozambican side agreed to arrange on-time data collection for measurement of the project indicators, namely, (1) the total number of annual graduates in the constructed institute, (2) the actual number of training courses for middle-level health personnel held in the constructed institute and (3) the actual hours allocated to clinical exercises and any practical training in the constructed institute.
- 5.9. The Portuguese version of the Minutes of Discussion was elaborated for the sake of promoting mutual understanding. However, the English version is the principal document to be referred, in case any misunderstanding arises.

Annex-1	Comments and Answers on the Proposed Design
Annex-2	Tentative Schedule of the Project
Annex-3	Cost Estimation of the Project
Annex-4	Staff and Budget Allocation for the New Institute
Annex-5	Annual Cost for Utility and Maintenance
Annex-6	Scope of Works and Costs of the Mozambican Side
Annex-7	List of Equipment
Annex-8	Organization Chart of the New Institute
Annex-9	Proposed Layout Plan

Annex-1 Comments and Answers on the Proposed Design

1. COMMENTS ON THE PROPOSED BUILDING DESIGN from MoH

No.	Block	Comments by MoH	Answers from the Team
1	A	Room no. 17 "Working room" shall be changed to "Storage" to securely keep equipment.	Accepted.
2	B	A sign of "ICS Nacala" shall be indicated at the prominent place.	Accepted.
3	D	Openings (windows and doors) of Refectory and Auditorium shall be vertically long profiles from horizontally long ones to improve accessibility to outside for users.	Accepted. The number of windows attached to doors will be reduced to prevent cost increase.
4	D	The number of toilets booth should be increased to the sufficient numbers for audience at the Auditorium.	Accepted.
5	F	Dormitory (only block F) shall be rotated to 90 degrees to prevent sunlight to the bedrooms in the morning and evening.	Accepted. However, the possibility of switching facility use of block E from male dormitory to female one shall be considered, since block E might be better than Block F to secure privacy after modification is done.
6	E	One more toilet booth shall be installed, whereas one urinal is cancelled in the toilets on the both floors (GF and 1F) in the male dormitory.	Accepted.
7	All	Reinforced concrete slab shall be made to weaken heat radiation of the sun.	Rejected to prevent cost increase. However, thermal insulation sheets beneath the roof sheets and ceiling are installed to weaken heat radiation of the sun.
8	All	Joint between Truss and Pillar shall be clearly indicated in the detail design phase.	Accepted.

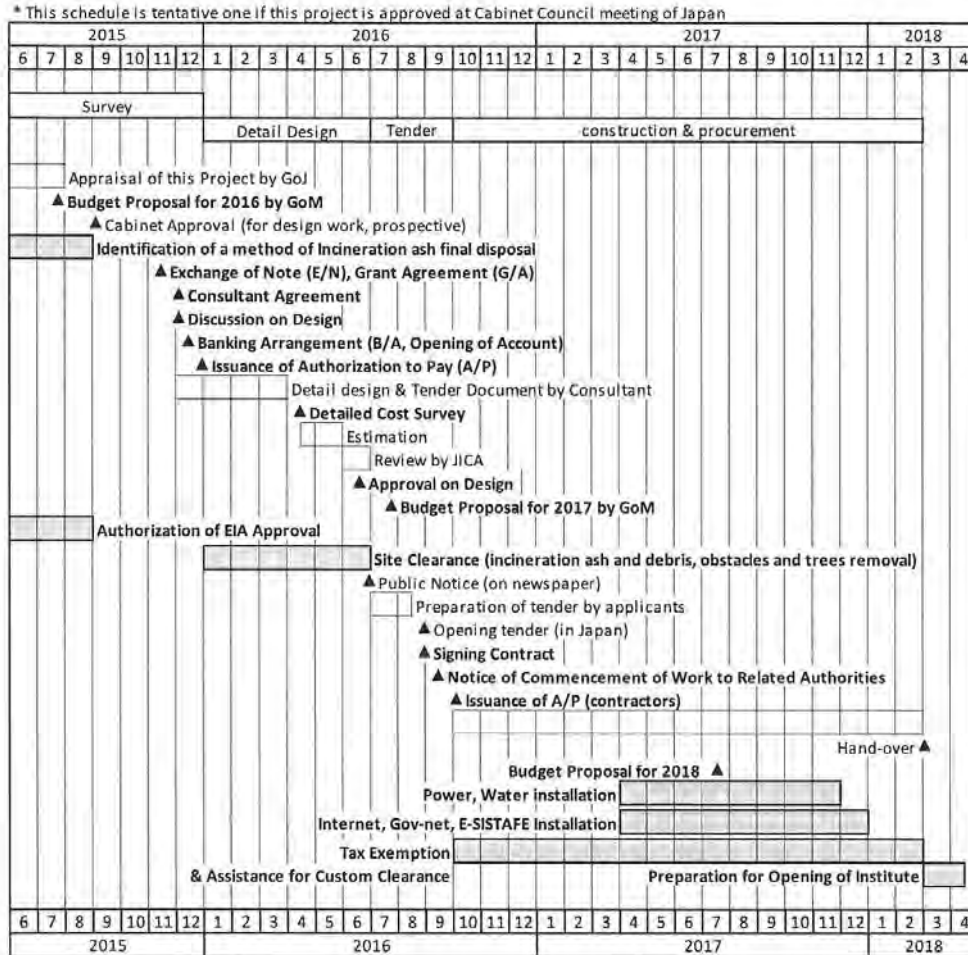
2. COMMENTS ON THE PROPOSED EQUIPMENT DESIGN from MoH

No.	Code No.	Comments by MoH	Answers from the Team
1	N/A	N/A	N/A

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A-1

Annex-2 Tentative Schedule of the Project



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Annex-3

Annex-3 Cost Estimation of the Project

		Amount (million JPY)		Remark
		FY2015	FY2016	
Construction Cost			1,490.2	
	Direct construction Cost		1,177.7	
	General temporary work		65.5	
	On-site expense		127.0	
	Overhead		120.0	
Equipment Cost			129.9	
	Equipment cost		114.2	
	Management and Installation cost, Instruction by manufacturer		12.0	
	Overhead		3.7	
Consultant cost		177.1		
	Detailed Design, Tender and Supervision	177.1		
TOTAL		177.1	1,620.1	

3)

A-3

Annex-4 Staff and Budget Allocation for the New Institute

Category	Proposed Number of Staff	Remark
Director	3	
Director	1	
Deputy Director (Pedagogical)	1	
Deputy Director (Administrative)	1	
Pedagogical	48	
Full-time teaching staff	48	To allocate sufficient number of staffs to ICS Nacala, both new recruitment by training new teaching staffs and transfer of existing teaching staffs from other institutes will be carried out.
Administrative	20	
Library Dept.	4	
Human Resource Dept.	4	
Finance & Account Dept.	4	
UGEA	4	
Student Affairs Dept	4	
Service	29	
Driver	4	
Nutrition and cooking staff	8	
Supporting staff	8	
maintenance staff (Landscape)	2	
Security staff	3	
Laboratory keeper	2	
Matron	2	
Total	100	

Classifications	Nos of staff	Salary category	Basic salary	Ratio of allowance	Monthly Salary	Annual salary[b]	Total Amount
	[a]		[b]	[c]=[b]*x%	[d]=[b+c]	[e]=[d]*12	[a]*[e]
Management division							
Director	1	Médico de saúde pública consultor, A	36,359	60%	58,174	698,093	698,093
Deputy Director	2	Tecnico superior de saúde N1, A	25,448	60%	40,716	488,597	977,194
Pedagogical division							
Senior teaching staff	12	Tecnico superior de saúde N2, A	21,407	60%	34,251	411,014	4,932,173
Teaching staff	36	Tecnico especializado de saúde, A	11,834	60%	18,934	227,203	8,179,315
Administrative division							
Senior staff	8	Tecnico superior N2, A	16,557	40%	23,180	278,162	2,225,294
Staff	12	Tec. Profissional (Adm. Pública)	10,050	40%	14,070	168,840	2,026,080
Service division							
Senior staff	7	Tecnico	8,549	20%	10,258	123,098	861,689
Staff	22	Agente técnicos	4,661	20%	5,593	67,120	1,476,629
	100						21,376,467

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A-4

Annex-5 Annual Cost for Utility and Maintenance

Classifications	Amount (Thousand Mt.)
Personnel expense (Full-time staff)	*23,420
Personnel expense (Part-time staff)	*3,657
Utility Cost	2,063
Communication Cost	385
Facilities and equipment maintenance cost	2,258
	31,783

* personnel expense is figured out by following equation

A x B

Where

A: the budget of 19 courses which are expected to be executed in the 3rd year of ICS Nacala operation

B: Proportion of Personnel expense to the total annual budget in a case of ICS Nampula

Note: The amount indicated above is adapted to identify the annual cost
because of bigger amount compared to the amount calculated in the ANNEX 4,

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A-5

Annex-6 Scope of Works and Costs of the Mozambican Side

Items	Implementation division(s)	Envisaged period or dead line	Amount (Thousand Mt.)
Detail design and tender			
[1] Signee for Consultant Agreement for detailed design, tender, and supervising work	PS	Promptly after G/A conclusion	—
[2] Banking Arrangement (B/A) (=opening of bank account)	DPC/DP	November 2015	—
[3] Issuance of Authorization to Pay (A/P) concerning [1]	DPC/DP	Within 2 weeks after conclusion of consultant agreement	2
[4] Bank charge for payment	Government of Mozambique	Every time of payment application	52
[5] Application for budget for FY 2016 of the Government of Mozambique	DPC	August 2015	—
[6] Approval of drawings, registration of the Project within MoH, registration of the Project to MoF concerning tax exemption, and application to Nacala municipal council.	DPC/DI	Until June 2016	—
[7] Attendance at tender held in Japan, approval of tender evaluation and signing on contract	DPC	September 2016	—
[8] Demolishment and removal of all existing structures on the site.	DPC/DPS Nampula	by June 2016	506
[9] Removal of Electric poles and realign electric supply cables existing in the site	DPC/DPS Nampula		39
[10] Removal of trees and their roots affecting proposed facilities	DPC/DPS Nampula		18
[11] Removal and proper disposal of incineration ash and medical waste left with the Site.	DPC/DPS Nampula		—
During construction and procurement			
[12] Issuance of A/P for the contracts of construction and equipment	DPC/DP	Within 2 weeks after conclusion of contract Documents. October 2016	2
[13] Bank charge for payment	Government of Mozambique	Every time of payment application	473
[14] Application of commencement of work to Nacala municipal council	DPC/DI	Promptly after concluding contracts, October 2016	—
[15] Assistance of entry visa and residence visa for Japanese and third countries people who work for the Project	DPC/DCI		—
[16] Application for budget for FY 2017 of the Government of Mozambique	DPC	August 2016	—

	Items	Implementation division(s)	Envisaged period or dead line	Amount
				(Thousand Mt.)
	[17] Custom clearance and tax exemption for the products to imported for the Project	DPC/DAF	Every time application submitted from the contractors	3,348
	[18] Tax exemption for the products and services to be purchased locally	DPC/DAF		36,525
	[19] Installation of power supply line to the transformer installed by the Project, and contract with the service provider	DPC/ DPS Nampula	3 months prior to completion of works, November 2017	1,300
	[20] Installation of water supply pipe and a water meter, and contract with the service provider	DPC/ DPS Nampula		100
	[21] Application for budget for FY 2018 of the Government of Mozambique	DPC	August 2017	—
	[22] Installation of communication cables of Internet, Gov-net and e-SISTAFE, and a server, and connection of these cables and device to a switching hub installed by the Project	DPC/DI/ DPS Nampula	2 months prior to completion of works, December 2017	300
	[23] Minor repair of the existing boundary wall and installation of gates for staff quarters and stormed water drainage along the access road	DPC	by completion of works, February 2018	306
After handover				
	[24] Preparation of furniture, stationaries and fabrics which are not included within the Project	DPC	soon after handover	1,241

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A-7

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Annex-7 List of Equipment

No.	Name of Equipment	Qty	Details													Course									
			Class room	Lab Humanities	Lab Multidisciplinary	Dental	PC room	Kitchen	Hall	Library	Storage	Garage	Enfermagem	ESMI	Medicina	Medicina Preventiva	Laboratorio	Farmacía	Odontostomatología	Radiología	Fisioterapia	General Equipment			
1	Stethoscope clinical	210		30							180														
2	Stethoscope pinard	90		30							60														
3	Sphygmomanometer	210		30							180														
4	Clinical Thermometer	30		30																					
5	Otoscope	5		5																					
6	Reflex Hammer	5		5																					
7	Magnifying Glass	5		5																					
8	Ophthalmoscope	5		5																					
9	Spatula	30		30																					
10	Laryngoscope	5		5																					
11	Flashlight	30		30																					
12	Spirometer	5		5																					
13	Instrument set	5		5																					
14	Crank bed	10		10																					
15	Sterilizer (autoclave)	2		2																					
16	Sterilizer (hot air type)	1		1																					
17	Aspirator (manual type)	5		5																					
18	Aspirator (electrical type)	5		5																					
19	Resuscitation-bag set	5		5																					
20	Examination lamp	5		5																					
21	Screen	10		10																					
22	Instrument table	5		5																					
23	Scale (for infant)	5		5																					
24	Scale (for adult)	5		5																					
25	Scale (for new-borne baby)	5		5																					
26	Height scale (for adult)	5		5																					
27	Height scale (for new-borne baby)	5		5																					
28	Human skeleton model	2		2																					
29	Skull model with brain	1		1																					
30	Spinal model	1		1																					
31	Torso	1		1																					
32	Junior Torso (male & female)	1		1																					
33	Muscular model (male)	1		1																					
34	Lung model with larynx	1		1																					
35	Heart model	2		2																					
36	Pelvis model (female)	1		1																					
37	Pelvis model (male)	1		1																					
38	Eye model	1		1																					
39	Ear model	1		1																					
40	Auscultation trainer	5		5																					
41	Blood pressure measuring trainer	5		5																					
42	Patient care manikin	5		5																					
43	I.V. injection training arm model	5		5																					
44	I.V. injection simulator	5		5																					
45	I.M. injection simulator	5		5																					
46	I.M. injection training model	5		5																					
47	Catheterization simulator (female)	5		5																					
48	Catheterization model & simulator (male)	5		5																					
49	Skin sutures training kit	5		5																					
50	Sutures practice arm	5		5																					
51	Maternal & neonatal birthing simulator	5		5																					
52	Episiotomy suturing simulator	5		5																					
53	Nurse training baby model (new born baby)	5		5																					
54	Gravid pelvis model (for examination training)	5		5																					
55	Wearable breast self examination model	5		5																					
56	Condom training model (male)	5		5																					
57	Testicle self examination model	5		5																					
58	Microscope (with teachingscope)	2		2																					
59	Microscope	16		16																					
60	Hot air sterilizer	1		1																					
61	Incubator	2		2																					
62	Spectrophotometer	2		2																					
63	Distillation unit	1		1																					
64	Centrifuge	2		2																					
65	Magnetic stirrer	2		2																					
66	Shaker	2		2																					
67	Touch mixer	6		6																					
68	Hand tally counter	6		6																					
69	Slide glass warmer	2		2																					
70	Hematocrit centrifuge	2		2																					

3

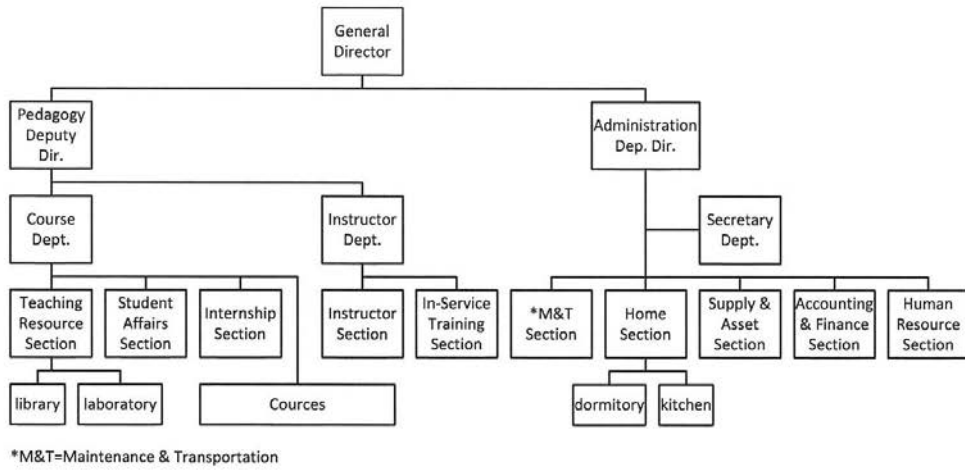
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No.	Name of Equipment	Qty	Details													Course									
			Class room	Lab Humanístico	Lab Multidisciplinar	Dental	PC room	Kitchen	Hall	Library	Storage	Garage	Enfermergcm	ESMI	Medicina	Medicina Preventiva	Laboratorio	Farmacia	Odonotomstomatologi	Radiología	Fisioterapia	General Equipment			
71	Refrigerator	1			1																				
72	Analytical balance	6			6																				
73	Electrical balance	6			6																				
74	Mortar	6			6																				
75	Hemacytometer	6			6																				
76	Micro centrifuge	2			2																				
77	pH meter	6			6																				
78	Water bath	2			2																				
79	Hydrometer set	6			6																				
80	Anaerobic jar	2			2																				
81	Timer watch	6			6																				
82	Staining jar	6			6																				
83	Safety cabinet	1			1																				
84	Autoclave	1			1																				
85	Glassware set	6			6																				
86	Phantom head workstation	15				15																			
87	Air compressor	1				1																			
88	Dental chair unit with instrument set	1				1																			
89	LED curing light	15				15																			
90	Bench-top autoclave	1				1																			
91	Mobile instrument cabinet	1				1																			
92	Restorative kit	15				15																			
93	Copy machine	1									1														
94	Duplicating printer	1									1														
95	Bus	3										3													
96	Desktop PC	40					30			10															
97	Laptop PC	18	12	2	2	1	1																		
98	Switching hub	3					2			1															
99	Color printer	1					1																		
100	Monochrome printer	1								1															
101	Video projector	18	12	2	2	1	1																		
102	Screen	18	12	2	2	1	1																		
103	Sound equipment	1								1															
104	Video projector	1								1															
105	Screen	1								1															
106	Kitchen equipment	1						1																	

9

A-9

Annex-8 Organization Chart of the New Institute



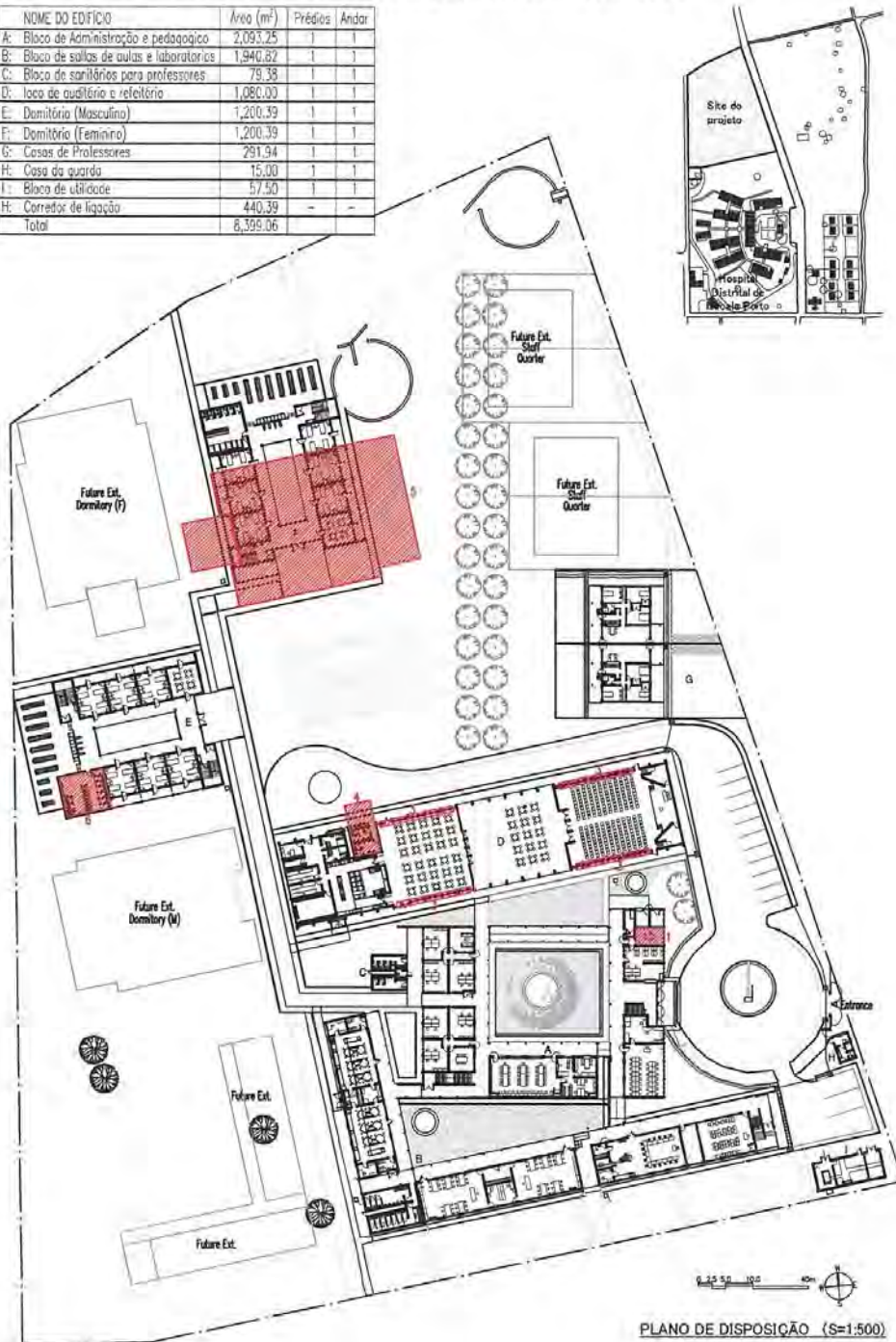
9)

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Annex-9 Proposed Layout Plan

Modifications described in Annex 1 are the areas filled with shades in the drawing below and the indicated numbers are respectively corresponding to listed items of Annex 1

NOME DO EDIFÍCIO	Área (m ²)	Prédios	Andar
A: Bloco de Administração e pedagógico	2,093.25	1	1
B: Bloco de salas de aulas e laboratórios	1,940.62	1	1
C: Bloco de sanitários para professores	79.38	1	1
D: local de auditório e refeitório	1,080.00	1	1
E: Dormitório (Masculino)	1,200.39	1	1
F: Dormitório (Feminino)	1,200.39	1	1
G: Casas de Professores	291.94	1	1
H: Casa da guarda	75.00	1	1
I: Bloco de utilidade	57.50	1	1
H: Corredor de ligação	440.39	-	-
Total	8,399.06		



PLANO DE DISPOSIÇÃO (S=1:500)

A-II

5. 参考資料

番号	資料名	発行年	発行機関
1	Plano Estratégico do Sector da Saúde PESS 2014-2019	September 2013	MISAU
2	Plano Estratégico do Sector da Saúde PESS 2013-2017	March 2013	MISAU
3	Plano Estratégico do Sector da Saúde PESS 2007-2012	n.d.	MISAU
4	Plano Nacional de Desenvolvimento dos Recursos Humanos da Saúde (PNDRHS) 2008-2015	n.d.	DRH, MISAU
5	National Plan for Health Human Resources Development (NPHHRD) 2008-2015	n.d.	DRH, MISAU
6	Plano Nacional de Formação 2011-2015 por Instituição de Formação	Dec. 2011	DRH, MISAU
7	Plano Acelerado de Formação 2013 – 2015	July 2012	DRH, MISAU
8	Estratégia da Formação Contínua em Saúde	December 2011	DNRH, MISAU
9	Regulamento da Formação Contínua em Saúde	October 2012	DRH, MISAU
10	CURRÍCULO PARA A FORMAÇÃO		DRH,
10-1	CURRÍCULO PARA A FORMAÇÃO DE TÉCNICOS DE LABORATÓRIO	March 2009	Departamento de Formação, MISAU
10-2	CURSO DE ENFERMAGEM GERAL	December 2010	
10-3	CURSO DE ENFERMAGEM DE SAÚDE MATERNO INFANTIL – NÍVEL MÉDIO	December 2010	
10-4	CURSO DE MEDICINA PREVENTIVA – NÍVEL MÉDIO-INICIAL	2005	
10-5	CURSO DE TMSM (Técnico de Medicina Preventiva e Saneamento do Meio)	n.d.	
10-6	CURSO DE TÉCNICOS DE MEDICINA	May 2010	
10-7	CURSO DE TÉCNICOS DE MANUTENÇÃO – NÍVEL MÉDIO	2010	
10-8	CURSO DE FARMACIA DO NIVEL MEDIO	2007	
10-9	CURSO DE TECNICOS DE NUTRIÇÃO	2009	
10-10	CURSO DE TECNICOS DE ODONTOESTOMATOLOGIA NIVEL MEDIO INICIAL	2005	
10-11	CURSO TÉCNICOS DE ODONTOESTOMATOLOGIA NÍVEL-MÉDIO PROMOÇÃO	n.d.	
10-12	CURSO MÉDIO-PROMOÇÃO DE FORMAÇÃO DE TÉCNICOS DE LABORATÓRIO	2009	
11	Relação de Material e Equipamento Didático para os Cursos de Enfermagem Geral, de Enfermagem de Saúde Materno Infantil e Agentes de Medicina Geral	February 2011	DRH, Departamento de Formação, MISAU
12	Regulamento de Continuação de Estudos	November 2011	DRH, MISAU
13	Regulamento para Mudança de Carreira no Sector Saúde	November 2011	DRH, MISAU
14	Regulamento de Organização e Funções das Instituições de Formação	December 2009	
15	Relatorio Anual 2011	May 2012	DRH, MISAU
16	Relatorio Anual 2012	2013	
17	Relatorio Anual 2013	April 2014	

番号	資料名	発行年	発行機関
18	Estatísticas de Recursos Humanos para Saúde no Serviço Nacional de Saúde nos últimos 09 anos (2005-2013)	n.d.	DRH, MISAU
19	Relatório de balanço de 9 anos da Direcção de Recursos Humanos (2005-2013)	May 2013	DRH, MISAU
20	RELATÓRIO ANUAL DE ACTIVIDADES DO ANO 2013 - Instituições de Formação da Saúde	n.d.	DPF/DPS de Nampula, MISAU
21	Estatísticas de 36 anos de Formação nas Instituições de Formação do Ministério da Saúde 1975 - 2010	November 2011	DRH, MISAU
22	3º Anuário Estatístico sobre Recursos Humanos para a Saúde em Moçambique - 2012	2013	DRH, MISAU
23	2º Anuário Estatístico sobre Recursos Humanos para a Saúde em Moçambique - 2011	2012	DRH, MISAU
24	1º Anuário Estatístico sobre Recursos Humanos para a Saúde em Moçambique - 2010	2011	DRH, MISAU
25	Relatório de Execução Orçamental e Financeira 2010	2011	DAF, MISAU
26	Relatório de Execução Orçamental e Financeira 2011	2012	
27	Relatório de Execução Orçamental e Financeira 2012	2013	
28	Relatório de Execução Orçamental e Financeira 2013	2014	
29	RELATÓRIO DA REVISÃO DO SECTOR DE SAÚDE	September 2012	DNPC, MISAU
30	Avaliação Conjunta Anual do Desempenho do Sector de Saúde - 2011	April 2012	MISAU
31	Custos da Formação Inicial- Ferramenta de Cálculo dos Custos dos Cursos	April 2012	DRH(DF), MISAU
32	AGENDA 2025	Nov. 2003	Comité de Conselheiros
33	PROGRAMA QUINQUENAL DO GOVERNO PARA 2010-2014	April 2010	MPD (Min. Planificação/Desenvolvimento)
34	POVERTY REDUCTION ACTION PLAN (PARP) 2011-2014	May 2011	The Council of Ministers
35	PLANO ECONÓMICO E SOCIAL PARA 2014	December 2013	MPD
36	PROGRAMA INTEGRADO DE INVESTIMENTOS 2014-2017	September 2013	MPD
37	CENÁRIO FISCAL DE MÉDIO PRAZO 2014-2016	June 2013	MPD & Ministério das Finanças
38	RELATÓRIO DE EXECUÇÃO DO ORÇAMENTO DO ESTADO ANO 2013	2014	Ministério das Finanças
39	PROPOSTA DE ORÇAMENTO DO ESTADO PARA 2014	December 2013	Ministério das Finanças
40	Statistical Yearbook 2012	2013	Instituto Nacional de Estatística
41	Estatísticas Distritais (Estatísticas do Distrito de Nacala - Porto) 2013	2012	Instituto Nacional de Estatística

番号	機材名	数量	優先度	数量内訳									算定根拠 G=グループ CL=クラス	対象コース												
				一般教室	実技演習室	生物化学演習室	歯科用演習室	PC室	食堂・厨房	講堂	図書室	倉庫		車庫	看護師	助産師	医療技師	検査技師	薬剤師	歯科技師	放射線技師	理学療法士	一般機材			
128	救急キット	1	C																					○		
129	ゴニオメーター	30	C																						○	
130	スパイロメーター	30	C																						○	
131	エルゴメーター	3	C																						○	
132	傾斜板	4	C																						○	
133	ダンベル	3	C																						○	
134	多目的訓練装置	2	C																						○	
135	大腿筋訓練装置	2	C																						○	
136	昇降階段	2	C																						○	
137	平行棒	2	C																						○	
138	肩訓練用車輪	2	C																						○	
139	温パッド	3	C																						○	
140	冷パッド	4	C																						○	
141	肋木	2	C																						○	
142	バランスボード	3	C																						○	
143	腕立て補助具	4	C																						○	
144	訓練ボール	3	C																						○	
145	バランスボール	3	C																						○	
146	トレッドミル	2	C																						○	
147	車椅子	4	C																						○	
148	歩行器	3	C																						○	
149	ステッキ	4	C																						○	
150	松葉杖	5	C																						○	
151	運動用マットレス	10	C																						○	
152	ストレッチャー	2	C																						○	
153	複合訓練用装置	1	C																						○	
154	鏡	2	C																						○	
155	電気刺激装置	3	C																						○	
156	超音波治療器	3	C																						○	
157	赤外線治療器	4	C																						○	
158	短波治療器	2	C																						○	
159	紫外線治療器	3	C																						○	
160	マイクロ波治療器	2	C																						○	
161	干渉波治療器	3	C																						○	
162	誘導電気式刺激器	3	C																						○	
163	経皮的末梢神経電気刺激器	3	C																						○	
164	電気治療器	2	C																						○	
165	腰部牽引器	2	C																						○	
166	頸部牽引器	2	C																						○	
167	浴槽用バット	1	C																						○	
168	水流マッサージ用バット	3	C																						○	
169	超音波治療装置	3	C																						○	
170	バラフィン治療器	3	C																						○	
171	プール	1	C																						○	
172	コピー機	1	A							1				1台/室											○	
173	印刷機	1	A							1				1台/室											○	
174	バス	3	A										3	運行計画による											○	
175	デスクトップ型パソコン	40	A						30		10			PC室30台 +図書室10台											○	
176	ノート型パソコン	18	A	12	2	2	1	1						教室数 +実習室数											○	
177	スイッチングハブ	3	A					2			1			PC室2台 +図書室1台											○	
178	カラープリンター	1	A					1						PC室用											○	
179	モノクロプリンター	1	A								1			図書室用											○	
180	プロジェクター	18	A	12	2	2	1	1						教室数 +実習室数											○	
181	スクリーン	18	A	12	2	2	1	1						教室数 +実習室数											○	
182	音響機器	1	B							1				講堂用											○	
183	プロジェクター	1	B							1				講堂用											○	
184	スクリーン	1	B							1				講堂用											○	
185	厨房機材セット	1	A							1				1式/室											○	

選定基準

- ① ICS の標準設備・機能と整合する機材
- ② 実施コース毎のカリキュラム・演習内容と整合する機材
- ③ ICS ナカラの施設運営・活動内容と整合する機材
- ④ 既存 ICS で活用実績が有り、必要性が認められる機材

削除基準

- I 使用頻度が低いと見込まれるなど、費用対効果の低い機材
- II 他の機材で代用が可能である等、要請内容が重複する機材
- III 入札による調達上、支障が生ずる機材(銘柄指定が必要かつ妥当な理由がない等)
- IV 優先順位が低く、予算上の制約等により協力対象事業に含めることが難しい機材
- V 病院で実習を行う等、機材整備の妥当性が認められない機材
- VI 消耗品等、先方側で整備すべき機材

6-2 機材リスト

室名	機材番号	機材名	数量	室名	機材番号	機材名	数量
実技 演習室	1	聴診器	210	生物化学 演習室	58	双眼顕微鏡(ティーチングスコープ付)	2
	2	聴診器(胎児用)	90		59	双眼顕微鏡	16
	3	非観血式血圧計	210		60	滅菌器(乾熱式)	1
	4	体温計	30		61	培養器	2
	5	耳鏡	5		62	分光光度計	2
	6	打鍵器	5		63	蒸留装置	1
	7	拡大鏡	5		64	遠心分離器	2
	8	検眼鏡	5		65	磁気攪拌器	2
	9	スパーテル	30		66	振盪器	2
	10	喉頭鏡	5		67	タッチミキサー	6
	11	ペンライト	30		68	計数器	6
	12	スパイロメーター	5		69	スライドグラス乾燥器	2
	13	鋼製小物	5		70	ヘマトクリット遠心器	2
	14	クランクベッド	10		71	冷蔵庫	1
	15	滅菌器(オートクレーブ)	2		72	分析用天秤	6
	16	滅菌器(乾熱式)	1		73	電子天秤	6
	17	吸引器(マニュアル式)	5		74	乳鉢	6
	18	吸引機(電動)	5		75	血球計算盤	6
	19	アンビュバッグセット	5		76	微量遠心分離器	2
	20	診察灯	5		77	pH計	6
	21	衝立	10		78	恒温水槽	2
	22	回診車	5		79	比重計	6
	23	体重計(幼児用懸架式)	5		80	嫌気ジャー	2
	24	体重計(床置き式)	5		81	ストップウォッチ	6
	25	体重計(新生児用)	5		82	染色容器	6
	26	身長計(大人用)	5		83	安全キャビネット	1
	27	身長計(新生児用)	5		84	蒸気滅菌器	1
	28	骨格模型	2		85	ガラス器具セット	6
	29	脳模型	1		86	ファントムヘッドユニット	15
	30	脊柱模型	1	87	エアコンプレッサー	1	
	31	人体模型	1	88	歯科治療ユニット	1	
	32	人体模型(小児)	1	89	光重合照射器	15	
	33	筋肉模型	1	90	卓上型滅菌器	1	
	34	喉頭・肺模型	1	91	器具運搬台	1	
	35	心臓模型	2	92	修復器具セット	15	
	36	骨盤模型(女性)	1	93	コピー機	1	
	37	骨盤模型(男性)	1	94	印刷機	1	
	38	目模型	1	95	バス	3	
	39	耳模型	1	96	デスクトップ型パソコン	40	
	40	聴診実習用模型	5	97	ノート型パソコン	18	
	41	血圧測定訓練模型	5	98	スイッチングハブ	3	
	42	患者介護訓練用模型	5	99	カラープリンター	1	
	43	静脈注射訓練用腕模型	5	100	モノクロプリンター	1	
	44	静脈注射シミュレーター	5	101	プロジェクター	18	
	45	筋肉注射シミュレーター	5	102	スクリーン	18	
	46	筋肉注射訓練用模型	5	103	音響機器	1	
	47	導尿シミュレーター(女性)	5	104	プロジェクター	1	
	48	導尿シミュレーター(男性)	5	105	スクリーン	1	
	49	皮膚縫合キット	5	厨房	106	厨房機材セット	1
	50	縫合練習腕模型	5				
	51	出産シミュレーター(高機能型)	5				
	52	会陰縫合シミュレーター	5				
	53	看護訓練用新生児模型	5				
	54	妊娠骨盤模型	5				
	55	触診訓練用乳部模型(自診訓練用)	5				
	56	コンドーム装着訓練模型(男性)	5				
	57	診察訓練用睾丸模型	5				

6-3 土地使用許可書 (DUAT)



CONSELHO MUNICIPAL DE NACALA
DEPARTAMENTO DOS SERVIÇOS TÉCNICOS E CADASTRO
SERVIÇOS DE ADMINISTRAÇÃO, TOPOGRAFIA E ARQUIVO

EXMO SENHOR (A)
DIRECÇÃO PROVINCIAL DE SAÚDE
Nacala

N/Refª 354/DSTC/2014

Data:26.08.2014

Assunto: **COMUNICAÇÃO DO DESPACHO**

Através desta comunicamos à V. Excia o despacho do Conselho Municipal do dia 26 de Agosto de 2014, recaído no vosso requerimento datado de 25 de Agosto de 2014, no qual V. Excia solicita a autorização e emissão de uma licença provisória de uso e aproveitamento de uma parcela, talhão s/n, quarteirão s/n, sita no bairro Mathapue, para construção de um Instituto de Ciência e Saúde de Nacala, cujo teor se segue:

“AUTORIZO”

Assinatura ilegível e data.

Sendo assim, **V. Excia deverá pagar o valor de 103.411,99mts (Cento e três mil, quatrocentos e onze meticais e noventa e nove centavos) de taxa de autorização .**

Sem mais assunto as nossas cordiais saudações.

O Director

Samuel Vasco Domingos
(Téc. Prof. de Construção Civil)

São Obrigações do titular de licença

- 1- Requerer a licença de construção até ao 26 de Agosto de 2015.
- 2- Realizar obras de combate á erosão recomendadas pelo Conselho Municipal (somente para ocupantes das zonas urbanas 1a e 1b);
- 3- Manter os marcos de demarcação cadastral e outros que sirvam de ponto de referência dentro da área concedida;
- 4- Esta licença caduca em 26 de Agosto de 2015, e o seu cancelamento não carece de outras formalidades adicionais.

Tomei conhecimento.

O Concessionário,



Nacala, aos 26 de Agosto de 2014



República de Moçambique
Conselho Municipal de Nacala
Departamento dos Serviços Técnicos e Cadastro

LICENÇA PROVISÓRIA DE USO E APROVEITAMENTO Nº 323/2014

Por deliberação de 26 de Agosto de 2014, do Conselho Municipal outorgo. **DIRECÇÃO PROVINCIAL DE SAÚDE** a Licença Provisória de Uso e Aproveitamento de Terra nº **323/2014**, válida pelo prazo de 12 meses e de acordo com as seguintes especificações:

Tipo e finalidade: **CONSTRUÇÃO DE INSTITUTO DE CIÊNCIAS E SAÚDE DE NACALA**
Categoria: **B**

Talhão (ões) no (s): **S/N**

Quarteirão (ões) no (s) Zona: **S/N**

Bairro ou Zona: **MATHAPUE**

O (s) Concessionário (s) do (s) talhão (s) assume (m) as obrigações constantes no verso da presente licença de que vou comigo assinar.

Taxa de autorização
25852,999m²x4.00mts

=**103. 411,99mts**

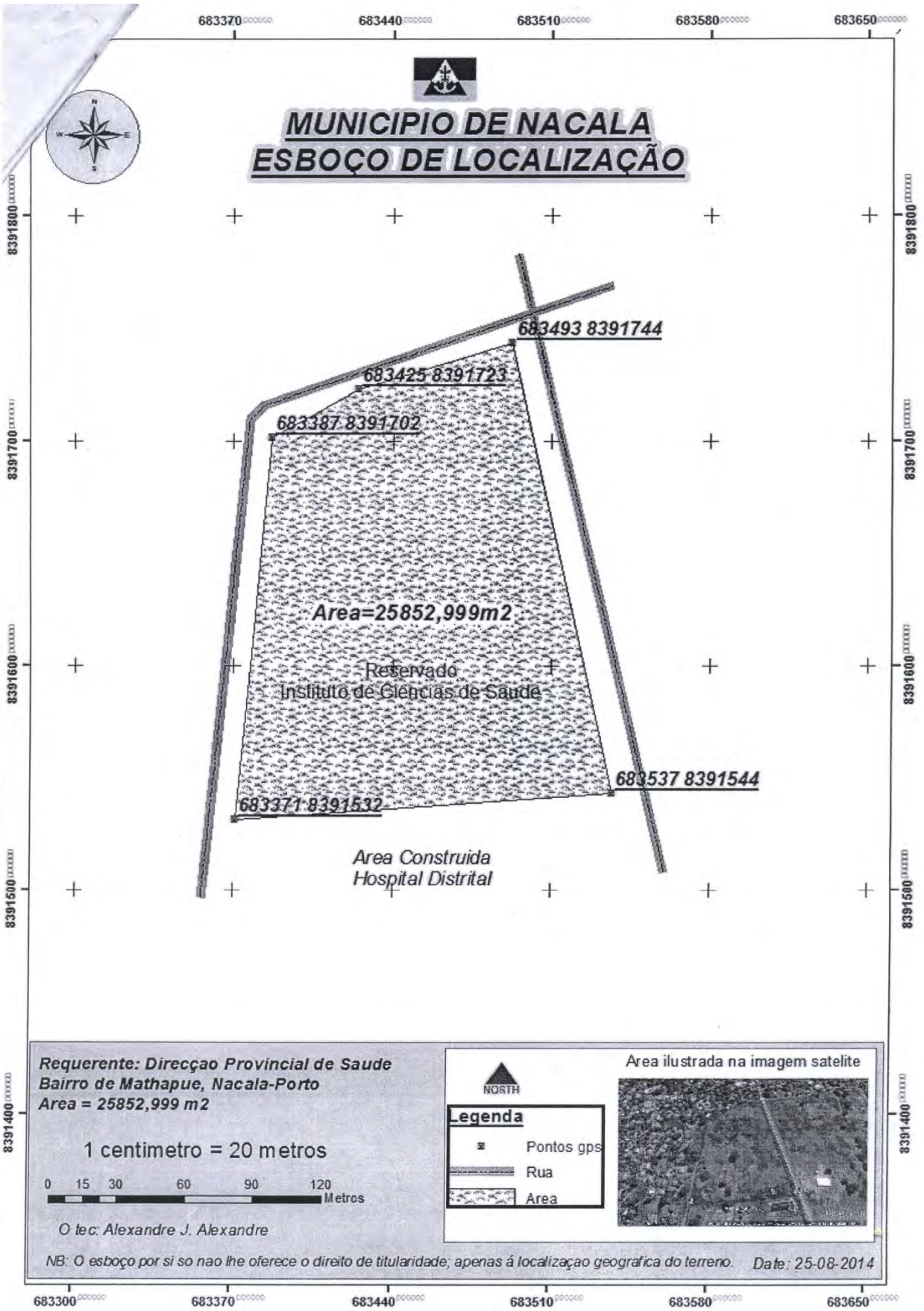
Taxa anual
25852,999m² x 1.20mts

= **31.023,60mts**

Nacala aos 26 de Agosto de 2014

O Presidente

Rui Chong Saw





ナカラ市役所 技術・登録サービス部
管理・地図・公文書サービス

州保健局殿

ナカラ、2014年8月26日

文書番号：354/DSTC/2014

件名：決裁通知

ナカラ保健人材養成校を建設する目的で、御州局が再申請した土地（住所：Mathapue 地区ブロック耕地番号無し）の2014年8月25日付け仮利用活用許可に対し、市役所は2014年8月26日付けで決済を下した旨を以下の通り本文書で通知する：

“承認”

署名と日付は判読不明

よって、許可料として、御局は 103,411.99MT を支払わなければならない。

(署名)

サムエル・ヴァスコ・ドミンゴス

(土木工事専門技師)

ナカラ市役所 技術・登録サービス部

仮利用活用許可証 (DUAT) No.323/2014

2014年8月26日付けの市役所決定により、以下条件に基づき、**州保健局**に12カ月間有効の仮土地利用活用許可No.323/2014を与える。

種類及び目的：ナカラ保健人材養成校の建設

カテゴリー：B

耕地番号：無し

ブロック番号：無し

地区または域名：MATHAPUE

土地を委託される者は、本許可証裏面に記載された責任を継続的に追う事となる。

許可料

25,852.999m² × 4.00MT

=103,411.99MT

年間費用

25,852.999m² × 1.20MT

=31,023.60MT

ナカラ、2014年8月26日

(署名)

市長

ルイ・チョング・ソウ

許可保持者の責任

- 1- 2015年8月25日までに建設許可申請を提出すること。
- 2- 市議会が推奨する土地浸食対策をとる事（都市部1aまたは1b地域の場合のみ）。
- 3- 許可された土地に境界標識または、その他の土地認識参考ポイントを維持すること。
- 4- 本許可は、特別な手続きなく2015年8月25日に失効する。

承知した。

委託者

(署名)

マヌエル・エドゥアルド

ナカラ、2014年8月26日

ナカラ市

位置図

(地図)

申請者：州保健局

Nacala-Porto、Mathapue 地区

面積：25,852.999m²

縮尺：1cm=20m

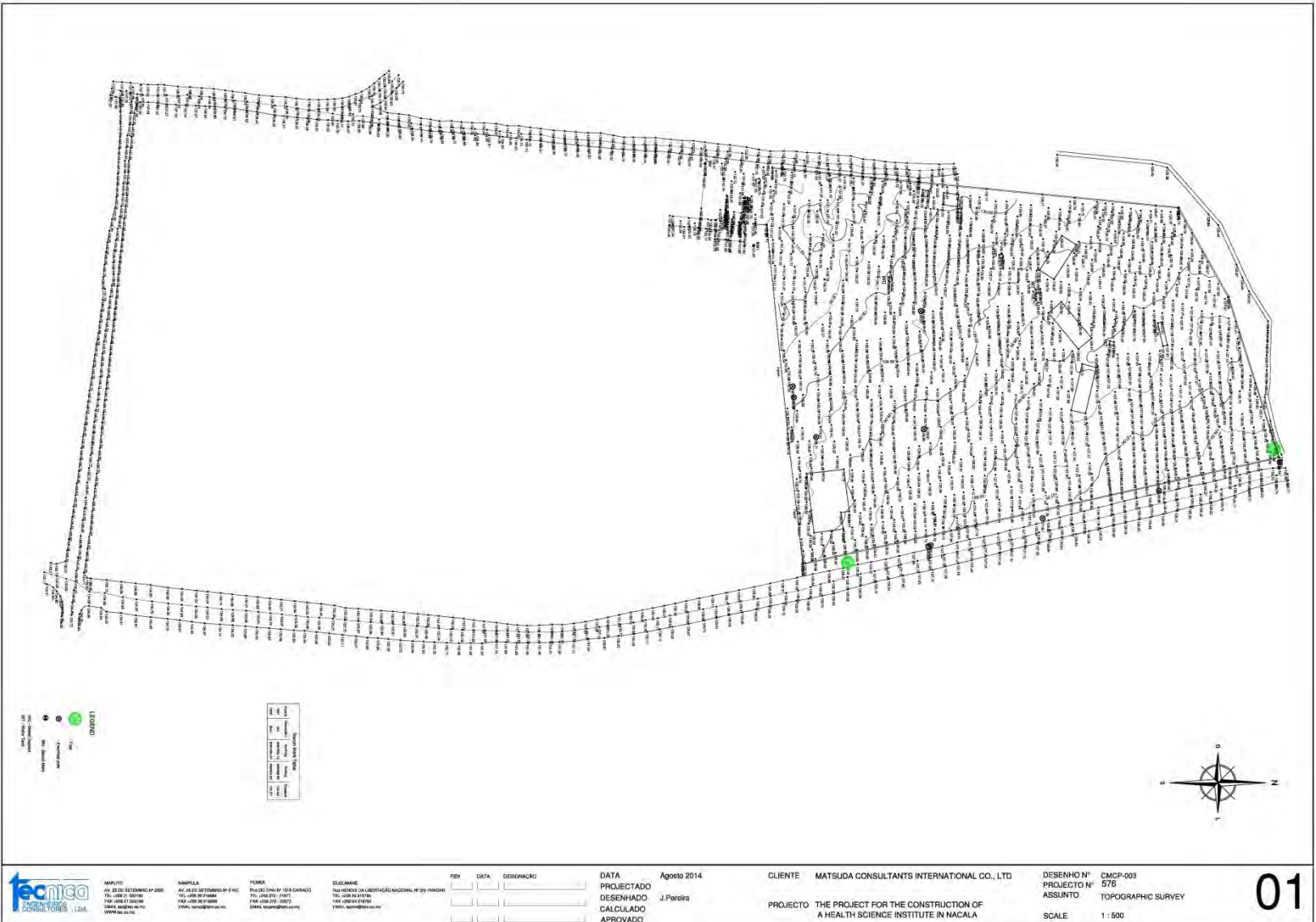
担当技師：アレシャンドレ・J

備考：本スケッチは土地の地理情報を示したものであり、許可証ではない。

(翻訳文なし)

以上

6-4 敷地測量結果 (現地再委託)



01

DESENHO Nº CMCP-003
 PROJECTO Nº 576
 ASSUNTO TOPOGRAPHIC SURVEY
 SCALE 1 : 500

CLIENTE MATSUDA CONSULTANTS INTERNATIONAL CO., LTD
 PROJECTO THE PROJECT FOR THE CONSTRUCTION OF
 A HEALTH SCIENCE INSTITUTE IN NACALA

DATA Agosto 2014
 DESENHADO J. Pereira
 CALCULADO
 APROVADO

REV	DATA	DESIGNAÇÃO

	MAPA 270	NAMPULA	FORMA	QUEBRANNE
	AV. 25 DE SETEMBRO Nº 200	AV. 25 DE SETEMBRO Nº 176	PAV. SAC. C/AV. Nº 1218 GARAOZI	TRAF. RESERVA DA LIBERTIÇÃO NACIONAL, Nº 1218 PARSOBA
	TEL. +351 21 507140	TEL. +351 21 507140	TEL. +351 21 514777	TEL. +351 21 514777
	FAX +351 21 507140	FAX +351 21 507140	FAX +351 21 514777	FAX +351 21 514777
WWW.TECNICA.PT	WWW.TECNICA.PT	WWW.TECNICA.PT	WWW.TECNICA.PT	



MINISTÉRIO DAS OBRAS PÚBLICAS E HABITAÇÃO

Laboratório de Engenharia de Moçambique

DEPARTAMENTO DE GEOTECNIA

RELATÓRIO Nº 32.361

GEOTECHNICAL SURVEY CARRIED OUT
ON A PARCEL LAND SITED IN MATHAPUÉ
AREA IN NACALA CITY, NAMPULA
PROVINCE

Work requested by Matsuda
Consultants International co.
Ltd

Outubro de 2014



REPÚBLICA DE MOÇAMBIQUE
MINISTÉRIO DAS OBRAS PÚBLICAS E HABITAÇÃO
LABORATÓRIO DE ENGENHARIA DE MOÇAMBIQUE
Telefone 475268/70/71 – Fax: 475266 – Telegramas LEM – MAPUTO
DEPARTAMENTO DE GEOTECNIA

Register No 32.361

REPORT

**SUBJECT: GEOTECHNICAL SURVEY CARRIED OUT ON A PARCEL
LAND SITED IN MATHAPUÉ AREA IN NACALA CITY,
NAMPULA PROVINCE**

1. Introduction

Matsuda Consultants International Co. Ltd asked by E-mail, dated July 2014, for investigation to carry out on a parcel land located in Mathapué site in Nacala city. On this report we present the works carried out.

2. Field and laboratory tests

It was carried out five boring holes with a percussion drilling equipment to a depth of fifteen meters, follow by standard penetration test every 1.5 meters, and sampling for disturbed samples and two permeability field tests.

On the annex I there is a map with the boring holes (BH) and permeability field tests location.

On samples it was carried out the following laboratory tests:

- Sieve analysis
- Atterberg limits
- Moisture content

3. Tests results

On the annex II you can find the soil description with depth, the values of N_{60} , and the soil classification by the Unified Soil Classification System.

On the annex III, you can find the percolation test results and on the annex IV you can find the laboratory tests results: sieve analysis, Atterberg Limits.

The ground water table was detected at 15 meters depth.

4. SOIL BEARING CAPACITY

4.1. Foundation Bearing Capacity

The following conditions are assumed to evaluate the ultimate bearing capacity:

- shallow foundation with square pad footing
- safety factor SF=3
- B variable in (m)
- Depth of foundation Df=1,0 m
- Soil friction angle $\phi = 30^\circ$ (assumed)
- Cohesion $c=0$
- $\gamma_s=17 \text{ KN/m}^3$ (assumed)

The ultimate bearing capacity equation for shallow foundations is as follows:

$$q_{\text{ult}} = c \times N_c \times s_c \times d_c + q \times (N_q - 1) \times s_q \times d_q + 0,5 \times B \times \gamma \times N_\gamma \times s_\gamma \times d_\gamma$$

Where:

N_c , N_q , N_γ are the bearing capacity factors adjusted by Brinch Hansen:

$$N_q = e^{\tan \phi} \times tg^2 \left(45 + \frac{\phi}{2} \right)$$

$$N_c = (N_q - 1) \cot \phi$$

$$N_\gamma = 1,5(N_q - 1) \tan \phi$$

For $\phi=30^\circ$:

$$N_c=30,14$$

$$N_q=18,40$$

$$N_\gamma=15,07$$

s_c , d_c , s_q , d_q , s_γ , d_γ are shape and depth factors which were ignored in this case, giving a more conservative ultimate load:

$$s_c = s_q = s_\gamma = 1$$

$$d_c = d_q = d_\gamma = 1$$

According to Brinch Hansen, we can expect the following net bearing capacity for Df=1 m and SF=3

B (m)	q_{net} (KPa)	$q_{\text{all(net)}}$ (KPa)
1,0	434	145
1,5	494	165
2,0	552	184
2,5	608	205

It is advisable to link the different pads with foundation beams, to reduce differential settlements.

4.2 Soil Treatment

According to the results of soil exploration (Standard Penetration Test), it is recommended to previously improve the soil foundations as follows:

- It is essential to improve the mechanical characteristics of the soil under the foundation in order to obtain the conditions for general shear failure.
- Improvement includes compaction of soil in a thickness of 1 meter below the foundation, with appropriate manual tamping and moisture content.
- Excavate the soils up to 2 m and replace it with same soils up to 1 meter in layers with thickness $\leq 150\text{mm}$, with $w=w_{\text{opt}} \pm 0,5\%$ e $CR \geq 95\%$ of maximum density obtained in laboratory with Proctor Standard energy. For that, it may be used the mechanical compactor hand operated (tamping);

In these conditions, shallow structural foundations in square pads may be foreseen.

5. Technical specifications

LNEC, E-218 1968-Prospecção geotécnica de terrenos

LNEC, E-196 1966-Análise granulométrica

LNEC, NP-143 1969-Determinação dos limites de consistência

E-19, Earth Manual-United States Bureau of Reclamation (USBR) – Permeability field test.

Maputo, September 11, 2014

Technical

Gonçalves Amadeu Semente
(Eng. Técnico Civil)

Visa:

The Department Head

Doutor Luís Sozinho Abel
The General Director

Dr. Henrique Vasco Filimone
(Research Assistant)

Annexes

Annex I Plant location of boreholes and percolation points

Annex II Boreholes log's

Annex III Percolation test results

Annex IV laboratory test results

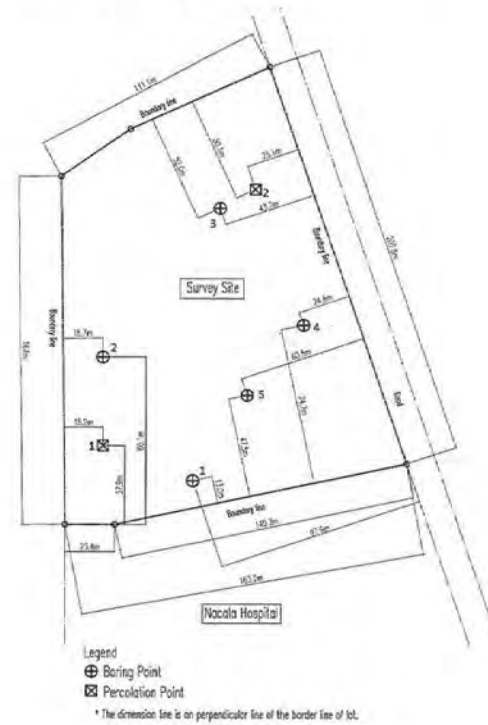
Annex V Photo report

ANNEX I

LABORATÓRIO DE ENGENHARIA DE MOÇAMBIQUE

DEPARTAMENTO DE GEOTECNIA

Plant location of boreholes and percolation points



ANNEX II

LABORATÓRIO DE ENGENHARIA DE MOÇAMBIQUE
DEPARTAMENTO DE GEOTECNIA

Project: Construction of Health Science Institute in Nacala Coordinator:
 Site: Nacala Porto S 14°52'34.4"
 Client: Malsoda Consultores Internacional co. Ltd E 040°42'09.5"
 Date: August, 2014
 Borehole No. 1

Depth (m)	Sample n°	Log	Geological description	Unified Classification	SPT (N)
0.50			Fine to medium dark sand		
0.50					
1.50			Fine to medium brown sand		9
1.50					
2.50					
3.00	* 4150-X				6
3.50					
4.50			Reddish silty sand	SM	13
4.50					
5.50					
6.00	* 4152-X				15
6.50					
7.50					19
7.50					
8.50					
9.00	* 4154-X		Low plasticity reddish sandy clay	CL	20
9.00					
10.00					
10.50					12
10.50					
11.50					
12.00	* 4156-X				17
12.50					
13.50					
14.50			Yellowish sandy silty clay	CL-ML	34
14.50					
15.00					23
15.00					
15.50					
16.00					
16.50					

LABORATÓRIO DE ENGENHARIA DE MOÇAMBIQUE
DEPARTAMENTO DE GEOTECNIA

Project: Construction of Health Science Institute in Nacala Coordinates:
Site: Nacala Porto S 14°32'33.3"
Client: Matuda Consultants International co. Ltd E 049°42'17.6"
Date: August, 2014
Borehole No. 2

Depth (m)	Sample n°	Log.	Geological description	Unified Classification	SPT (N)
0.00			Fine to medium dark sand (top soil)		
0.50					
1.00					
1.50			Fine to medium brownish sand		24
2.00					
2.50					
3.00	*4160-X				6
3.50					
4.00			Brownish silty sand	SM	22
4.50					
5.00					
5.50					
6.00	*4162-X				22
6.50					
7.00					
7.50					27
8.00					
8.50			Reddish clayey sand	SC	15
9.00	*4164-X				
9.50					
10.00					10
10.50					
11.00					
11.50					
12.00	*4168-X				12
12.50					
13.00					
13.50			Yellowish clayey sand	SC	16
14.00					
14.50					
15.00					19
15.50					
16.00					
16.50					

LABORATÓRIO DE ENGENHARIA DE MOÇAMBIQUE
DEPARTAMENTO DE GEOTECNIA

Project: Construction of Health Science Institute in Nacala Coordinates:
Site: Nacala Porto S 14°32'30.1"
Client: Matuda Consultants International co. Ltd E 049°42'09.8"
Date: August, 2014
Borehole No. 3

Depth (m)	Sample n°	Log.	Geological description	Unified Classification	SPT (N)
0.00			Fine to medium dark sand (topsoil)		
0.50					
1.00			Fine to medium brownish sand		
1.50					17
2.00					
2.50					
3.00	*4172-X				19
3.50					
4.00					
4.50					10
5.00					
5.50					
6.00	*4174-X				19
6.50					
7.00					
7.50			Reddish clayey sand	SC	11
8.00					
8.50					
9.00	*4176-X				15
9.50					
10.00					
10.50					12
11.00					
11.50					
12.00					15
12.50	*4178-X				
13.00					
13.50					
14.00			Yellowish clayey sand		
14.50					
15.00					17
15.50					
16.00					
16.50					

LABORATÓRIO DE ENGENHARIA DE MOÇAMBIQUE
DEPARTAMENTO DE GEOTECNIA

Project: Construction of Health Science Institute in Nacala
Site: Nacala Porto
Client: Mabusca Consultoria Internacional co. Ltd
Date: August, 2014
Borehole No. 4

Coordinates:
S 14°32'32.0"
E 049°42'10.9"

Depth (m)	Sample n°	Log.	Geological description	Unit Classification	SPT (N)
0.00			Fine to medium dark sand (big spots)		
0.50			Fine to medium brownish sand		
1.00					
1.50	* 4181-X				4
2.00					
2.50			Reddish silty sand	SM	5
3.00					
3.50					
4.00					
4.50	* 4183-X				18
5.00			Clayey sand reddish	SC	
5.50					
6.00					11
6.50					
7.00			Reddish clayey sand with gray silt	SC	8
7.50	* 4186-X				
8.00					
8.50					
9.00					18
9.50					
10.00			Reddish clayey sand	SC	10
10.50	* 4187-X				
11.00					
11.50					
12.00					15
12.50			Fine to medium yellowish sand with white spots		
13.00					
13.50					
14.00			Fine to medium brown sand with white spots		
14.50					
15.00					16
15.50					
16.00					
16.50					

LABORATÓRIO DE ENGENHARIA DE MOÇAMBIQUE
DEPARTAMENTO DE GEOTECNIA

Project: Construction of Health Science Institute in Nacala
Site: Nacala Porto
Client: Mabusca Consultoria Internacional co. Ltd
Date: August, 2014
Borehole No. 5

Coordinates:
S 14°32'33.2"
E 049°42'10.0"

Depth (m)	Sample n°	Log.	Geological description	Unit Classification	SPT (N)
0.00			Landfill		
0.50					
1.00			Fine to medium dark brown sand		
1.50	* 4191-X				16
2.00					
2.50			Dark brown clayey sand	SC	21
3.00					
3.50					
4.00					
4.50					21
5.00					
5.50	* 4194-X				20
6.00					
6.50					
7.00					
7.50	* 4195-X				8
8.00			Low plasticity reddish red clay	CL	
8.50					
9.00					10
9.50					
10.00					
10.50	* 4197-X				23
11.00					
11.50					
12.00					24
12.50					
13.00					
13.50			Fine to medium yellowish sand		15
14.00					
14.50					
15.00					17
15.50					
16.00					
16.50					

ANNEX III

LABORATÓRIO DE ENGENHARIA DE MOÇAMBIQUE

DEPARTAMENTO DE GEOTECNIA

Project: Construction of Health Science Institute in Nacala Porto

Client: Matsuda Consultants International co, Ltd

Date: August 25, 2014

"In situ Permeability Test"

Borehole no. 1

h(cm)=90

r=5,2

Accumulated time (minutes)	Volume (cm ³)	Flow Q=V/1800s (cm ³ /s)	Permeability K(cm/s)
30	9.260	5,14	$2,58 \times 10^{-4}$
60	10.800	6,00	$3,01 \times 10^{-4}$
90	12.570	6,98	$3,50 \times 10^{-4}$
120	22.870	12,71	$6,37 \times 10^{-4}$
150	25.500	14,17	$7,10 \times 10^{-4}$
180	28.500	15,83	$7,94 \times 10^{-4}$
210	27.570	15,32	$7,68 \times 10^{-4}$
240	28.590	15,88	$7,96 \times 10^{-4}$
270	28.600	15,89	$7,97 \times 10^{-4}$

Average = $6,01 \times 10^{-4}$

$$k = \frac{\sinh^{-1}\left(\frac{Q}{r}\right) - 1}{h^2} \times \frac{Q}{2\pi}$$

K(average) = $6,01 \times 10^{-4}$ cm/s

Fine to medium sand with silty

h=water column

r=hole radius

LABORATÓRIO DE ENGENHARIA DE MOÇAMBIQUE
DEPARTAMENTO DE GEOTECNIA

Project: Construction of Health Science Institute in Nacala Porto
Client: Matsuda Consultants International co. Ltd
Date: August 26, 2014
"In situ Permeability Test"
Borehole no. 2

h(cm)=90

r=5,2

Accumulated time (minutes)	Volume (cm ³)	Flow Q=V/1800s (cm ³ /s)	Permeability K(cm/s)
30	14.960	8,31	4,17 × 10 ⁻⁴
60	19.660	10,92	5,48 × 10 ⁻⁴
90	18.650	10,36	5,19 × 10 ⁻⁴
120	20.770	11,54	5,78 × 10 ⁻⁴
150	20.500	11,39	5,71 × 10 ⁻⁴
180	20.630	11,46	5,75 × 10 ⁻⁴
210	19.420	10,79	5,41 × 10 ⁻⁴
240	25.480	14,16	7,10 × 10 ⁻⁴
270	24.290	13,49	6,76 × 10 ⁻⁴

Average = 5,70 × 10⁻⁴

$$k = \frac{\sinh^{-1}\left(\frac{h}{r}\right) - 1}{h^2} \times \frac{Q}{2\pi}$$

K(average) = 5,70 × 10⁻⁴ cm/s

Fine to medium sand with silty

h=water column

r=hole radius

Solos

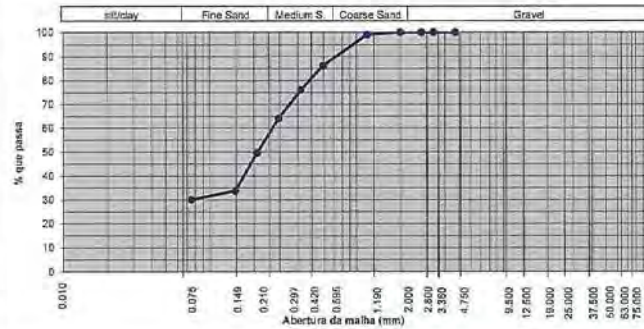
ANÁLISE GRANULOMÉTRICA POR PENEIRAÇÃO HÚMIDA

MESH	ASTM	(mm)	RETAINED W(g)	% RETAINED	% TOTAL STRAINED
3"	75.000				
2" 1/2	63.000				
2"	50.790				
1" 1/2	37.500				
1"	25.000				
3/4"	19.000				
1/2"	12.500				
3/8"	9.500				
4	4.750				100.0
6	3.360		0.00	0.00	100.0
7	2.800		0.00	0.00	100.0
10	2.000		0.00	0.00	100.0
16	1.190		1.97	0.99	99.0
30	0.596		25.72	12.86	86.2
40	0.420		20.18	10.09	76.1
50	0.297		24.02	12.01	64.1
70	0.210		28.99	14.50	49.6
100	0.149		31.62	15.76	33.8
200	0.075		7.25	3.63	30.2

SAMPLE		
REP* OF LEM:	4150-X	
REP* OF CLIENT	BH 1	
CLIENT	Matsuda C.I. Co. Ltd	
SITE	Nacala porto	
WORK/DESTINY		
DATE OF TEST	03-09-2014 a 05-09-2014	
DEPTH (m)	3	
Granulometric analysis of coarse fraction		
Total weight of sample (g)		
Weight of coarse fraction (g)		
Total percentage of coarse		
Granulometric analysis of fine fraction		
Total weight of sample (g)	200.00	
Weight of washed material and dry	139.75	
Weight of fine material washed (g)	60.25	

LIMITES	LL	LP	IP
	(%)	(%)	(%)
	14	12	2

GRANULOMÉTRIC CURVE



Executou: Estrócio Nhavene
Verificou: Gonçalves Amadeu Semente

Solos

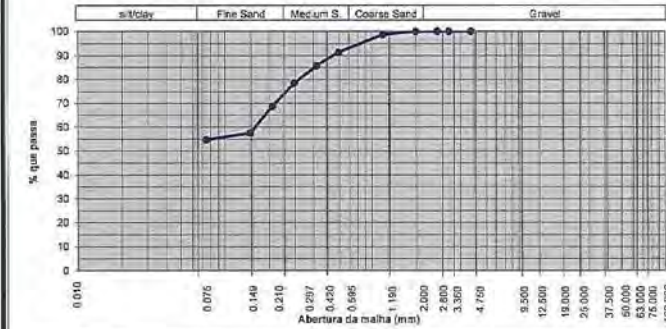
ANÁLISE GRANULOMÉTRICA POR PENEIRAÇÃO HÚMIDA

MESH	ASTM	(mm)	RETAINED W(g)	% RETAINED	% TOTAL STRAINED
3"	75.000				
2" 1/2	63.000				
2"	50.790				
1" 1/2	37.500				
1"	25.000				
3/4"	19.000				
1/2"	12.500				
3/8"	9.500				
4	4.750				100.0
6	3.360		0.00	0.00	100.0
7	2.800		0.00	0.00	100.0
10	2.000		0.07	0.04	100.0
16	1.190		2.75	1.38	98.6
30	0.596		14.38	7.19	91.4
40	0.420		11.48	5.74	85.7
50	0.297		14.60	7.30	76.4
70	0.210		19.56	9.78	68.6
100	0.149		22.22	11.11	57.5
200	0.075		5.62	2.81	54.7

SAMPLE		
REP* OF LEM:	4152-X	
REP* OF CLIENT	BH 1	
CLIENT	Matsuda C.I. Co. Ltd	
SITE	Nacala porto	
WORK/DESTINY		
DATE OF TEST	03-09-2014 a 05-09-2014	
DEPTH (m)	6	
Granulometric analysis of coarse fraction		
Total weight of sample (g)		
Weight of coarse fraction (g)		
Total percentage of coarse		
Granulometric analysis of fine fraction		
Total weight of sample (g)	200.00	
Weight of washed material and dry	90.83	
Weight of fine material washed (g)	109.17	

LIMITES	LL	LP	IP
	(%)	(%)	(%)
	21	15	6

GRANULOMÉTRIC CURVE



Executou: Estrócio Nhavene
Verificou: Gonçalves Amadeu Semente

LABORATÓRIO DE ENGENHARIA DE MOÇAMBIQUE

DEPARTAMENTO DE GEOTECNIA

Solos

ANÁLISE GRANULOMÉTRICA POR PENEIRAÇÃO HÚMIDA

MESH				SAMPLE				
ASTM	(mm)	RETAINED W(g)	% RETAINED	% TOTAL STRAINED	REP* OF LEM	4154-X		
3"	75.000				REP* OF CLIENT	BH 1		
2" 1/2	63.000				CLIENT	Matsuda C.I. Co. Ltd		
2"	50.790				SITE	Nacala porto		
1" 1/2	37.500				WORK/DESTINY			
1"	25.000				DATE OF TEST	03-09-2014 a 05-09-2014		
3/4"	19.000				DEPTH (m)	8		
1/2"	12.500				Granulometric analysis of coarse fraction			
3/8"	9.500				Total weight of sample (g)			
4	4.750			100.0	Weight of coarse fraction (g)			
6	3.360	0.00	0.00	100.0	Total percentage of coarse			
7	2.800	0.00	0.00	100.0	Granulometric analysis of fine fraction			
10	2.000	0.25	0.13	99.9	Total weight of sample (g)	200.00		
15	1.190	3.33	1.67	98.2	Weight of washed material and dry	98.52		
30	0.596	14.31	7.16	91.1	Weight of fine material washed (g)	101.48		
40	0.420	12.01	6.01	85.1	LIMITES			
50	0.297	17.71	8.86	76.2	LL (%)	LP (%)	IP (%)	
70	0.210	21.94	10.97	65.2	26	17	9	
100	0.149	22.70	11.35	53.9				
200	0.075	6.14	3.07	50.8				

GRANULOMÉTRIC 4CURVE



Executou

Estrácio Nhavene

Verificou

Gonçalves Amadeu Semente

LABORATÓRIO DE ENGENHARIA DE MOÇAMBIQUE

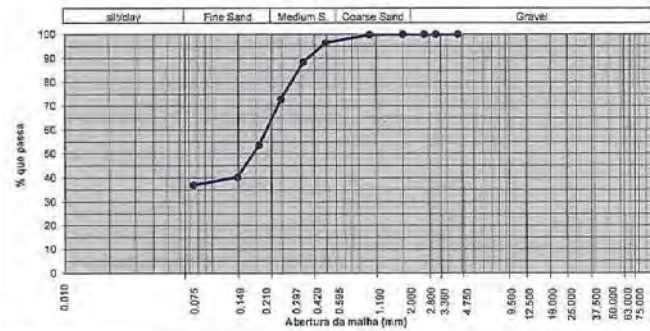
DEPARTAMENTO DE GEOTECNIA

Solos

ANÁLISE GRANULOMÉTRICA POR PENEIRAÇÃO HÚMIDA

MESH				SAMPLE				
ASTM	(mm)	RETAINED W(g)	% RETAINED	% TOTAL STRAINED	REP* OF LEM	4154-X		
3"	75.000				REP* OF CLIENT	BH 1		
2" 1/2	63.000				CLIENT	Matsuda C.I. Co. Ltd		
2"	50.790				SITE	Nacala porto		
1" 1/2	37.500				WORK/DESTINY			
1"	25.000				DATE OF TEST	03-09-2014 a 05-09-2014		
3/4"	19.000				DEPTH (m)	12		
1/2"	12.500				Granulometric analysis of coarse fraction			
3/8"	9.500				Total weight of sample (g)			
4	4.750			100.0	Weight of coarse fraction (g)			
6	3.360	0.00	0.00	100.0	Total percentage of coarse			
7	2.800	0.00	0.00	100.0	Granulometric analysis of fine fraction			
10	2.000	0.00	0.00	100.0	Total weight of sample (g)	200.00		
16	1.190	0.36	0.18	99.8	Weight of washed material and dry	126.09		
30	0.596	6.98	3.49	96.3	Weight of fine material washed (g)	73.91		
40	0.420	16.04	8.02	88.3	LIMITES			
50	0.297	31.21	15.61	72.7	LL (%)	LP (%)	IP (%)	
70	0.210	38.23	19.12	53.8	21	15	6	
100	0.149	26.56	13.28	40.3				
200	0.075	6.58	3.29	37.0				

GRANULOMÉTRIC 4CURVE



Executou

Estrácio Nhavene

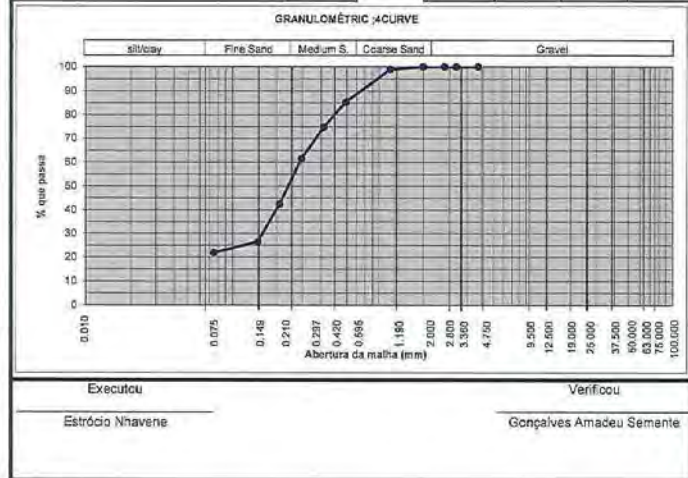
Verificou

Gonçalves Amadeu Semente

Solos
ANÁLISE GRANULOMÉTRICA POR PENEIRAÇÃO HÚMIDA

MESH	ASTM	(mm)	RETAINED W(g)	% RETAINED	% TOTAL STRAINED
3"	75.000				
2" 1/2	63.000				
2"	50.790				
1" 1/2	37.500				
1"	25.000				
3/4"	19.000				
1/2"	12.500				
3/8"	9.500				
4	4.750				100.0
6	3.360	0.00	0.00	0.00	100.0
7	2.800	0.00	0.00	0.00	100.0
10	2.000	0.00	0.00	0.00	100.0
16	1.190	2.27	1.14	88.9	
30	0.596	27.09	13.55	85.3	
40	0.420	21.26	10.53	74.7	
50	0.297	26.37	13.19	61.5	
70	0.210	37.91	18.96	42.6	
100	0.149	31.96	15.98	26.6	
200	0.075	8.97	4.49	22.1	

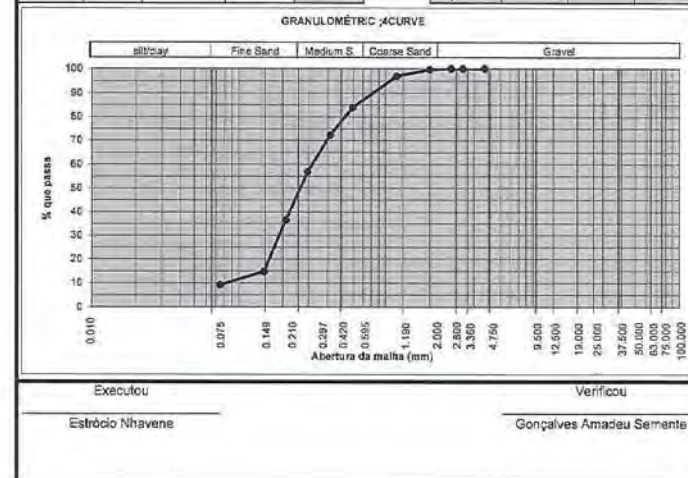
SAMPLE					
REP* OF LEM:	4160-X				
REP* OF CLIENT	BH 2				
CLIENT	Matsuda C.I. Co. Ltd				
SITE	Nacala porto				
WORK/DESTINY					
DATE OF TEST	03-08-2014 a 05-09-2014				
DEPTH (m)	3				
Granulometric analysis of coarse fraction					
Total weight of sample (g)					
Weight of coarse fraction (g)					
Total percentage of coarse					
Granulometric analysis of fine fraction					
Total weight of sample (g)	200.00				
Weight of washed material and dry	155.90				
Weight of fine material washed (g)	44.10				
LIMITES					
LL (%)	14	LP (%)	12	IP (%)	2



Solos
ANÁLISE GRANULOMÉTRICA POR PENEIRAÇÃO HÚMIDA

MESH	ASTM	(mm)	RETAINED W(g)	% RETAINED	% TOTAL STRAINED
3"	75.000				
2" 1/2	63.000				
2"	50.790				
1" 1/2	37.500				
1"	25.000				
3/4"	19.000				
1/2"	12.500				
3/8"	9.500				
4	4.750				100.0
6	3.360	0.00	0.00	0.00	100.0
7	2.800	0.00	0.00	0.00	100.0
10	2.000	0.79	0.40	99.6	
16	1.190	5.51	2.76	96.9	
30	0.596	26.30	13.15	83.7	
40	0.420	22.99	11.50	72.2	
50	0.297	30.57	15.29	55.9	
70	0.210	40.83	20.42	38.5	
100	0.149	43.28	21.64	14.9	
200	0.075	11.15	5.58	9.3	

SAMPLE					
REP* OF LEM:	4162-X				
REP* OF CLIENT	BH 2				
CLIENT	Matsuda C.I. Co. Ltd				
SITE	Nacala porto				
WORK/DESTINY					
DATE OF TEST	03-08-2014 a 05-09-2014				
DEPTH (m)	8				
Granulometric analysis of coarse fraction					
Total weight of sample (g)					
Weight of coarse fraction (g)					
Total percentage of coarse					
Granulometric analysis of fine fraction					
Total weight of sample (g)	200.00				
Weight of washed material and dry	181.52				
Weight of fine material washed (g)	18.48				
LIMITES					
LL (%)	27	LP (%)	17	IP (%)	16



Solos
ANÁLISE GRANULOMÉTRICA POR PENEIRAÇÃO HÚMIDA

MESH	RETAINED Wt(g)	% RETAINED	% TOTAL STRAINED
3"	75.000		
2" 1/2	63.000		
2"	50.790		
1 1/2"	37.500		
1"	25.000		
3/4"	19.000		
1/2"	12.500		
3/8"	9.500		
4	4.750		100.0
6	3.360	0.00	0.00
7	2.800	0.31	0.16
10	2.000	0.92	0.46
16	1.190	1.75	0.88
30	0.596	6.38	3.19
40	0.420	6.02	3.01
50	0.297	13.65	6.93
70	0.210	53.30	26.65
100	0.149	28.53	14.27
200	0.075	7.62	3.81

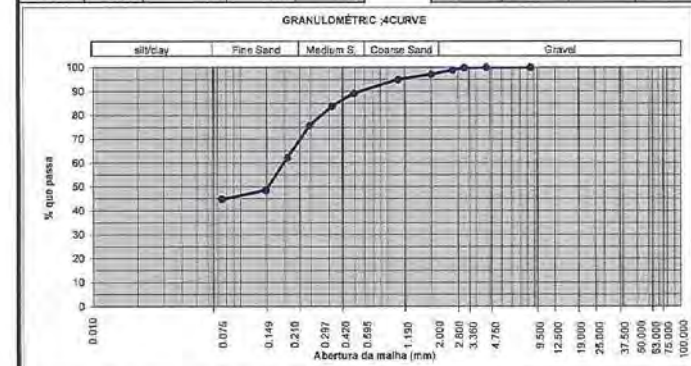
SAMPLE			
REF* OF LEM:	4168-X		
REF* OF CLIENT	BH 2		
CLIENT	Matsuda C.I. Co. Ltd		
SITE	Nacale porto		
WORKDESTINY			
DATE OF TEST	03-09-2014 a 05-09-2014		
DEPTH (m)	12		
Granulometric analysis of coarse fraction			
Total weight of sample (g)			
Weight of coarse fraction (g)			
Total percentage of coarse			
Granulometric analysis of fine fraction			
Total weight of sample (g)	200.00		
Weight of washed material and dry	118.78		
Weight of fine material washed (g)	81.22		
LIMITES			
	LL (%)	LP (%)	IP (%)
	23	13	1



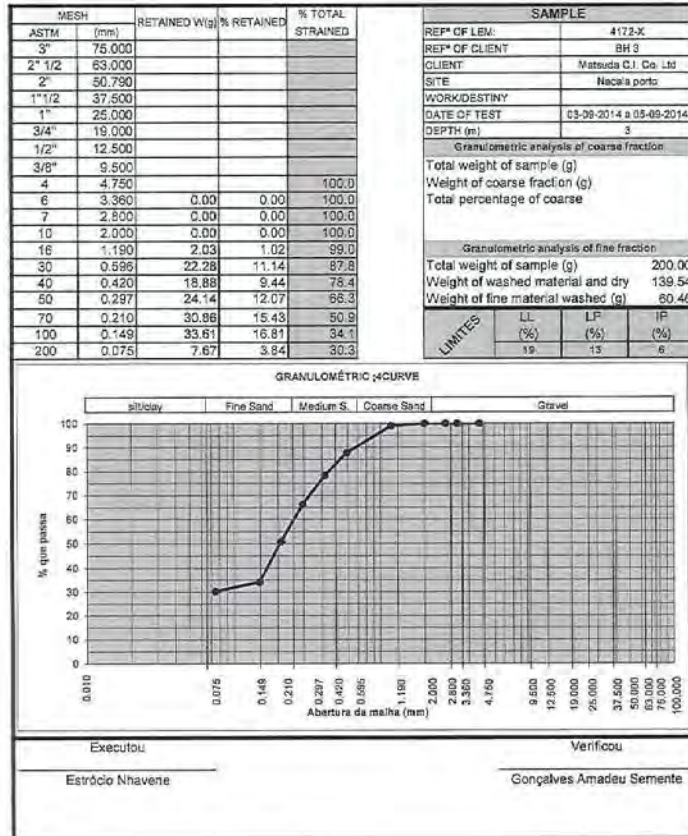
Solos
ANÁLISE GRANULOMÉTRICA POR PENEIRAÇÃO HÚMIDA

MESH	RETAINED Wt(g)	% RETAINED	% TOTAL STRAINED
3"	75.000		
2" 1/2	63.000		
2"	50.790		
1 1/2"	37.500		
1"	25.000		
3/4"	19.000		
1/2"	12.500		
3/8"	9.500		100
4	4.750	0.00	0.0
6	3.360	0.37	0.19
7	2.800	1.93	0.97
10	2.000	3.59	1.80
16	1.190	4.28	2.14
30	0.596	11.54	5.77
40	0.420	10.97	5.49
50	0.297	16.29	8.15
70	0.210	26.74	13.37
100	0.149	27.27	13.64
200	0.075	7.45	3.73

SAMPLE			
REF* OF LEM:	4178-X		
REF* OF CLIENT	BH 3		
CLIENT	Matsuda C.I. Co. Ltd		
SITE	Nacale porto		
WORKDESTINY			
DATE OF TEST	03-09-2014 a 05-09-2014		
DEPTH (m)	12		
Granulometric analysis of coarse fraction			
Total weight of sample (g)			
Weight of coarse fraction (g)			
Total percentage of coarse			
Granulometric analysis of fine fraction			
Total weight of sample (g)	200.00		
Weight of washed material and dry	110.53		
Weight of fine material washed (g)	89.47		
LIMITES			
	LL (%)	LP (%)	IP (%)
	23	14	9

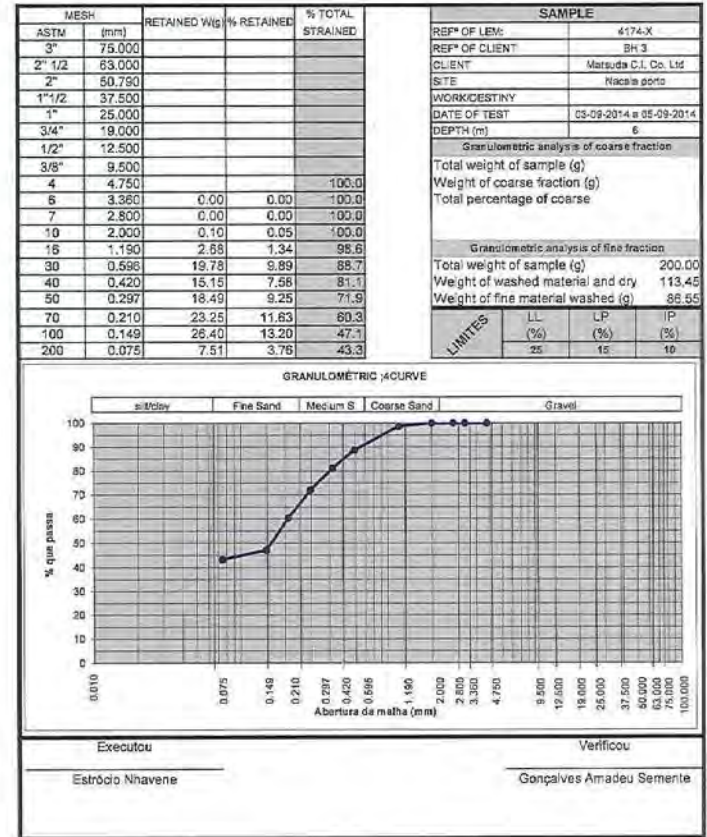


Solos
ANÁLISE GRANULOMÉTRICA POR PENEIRAÇÃO HÚMIDA



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Solos
ANÁLISE GRANULOMÉTRICA POR PENEIRAÇÃO HÚMIDA



LABORATÓRIO DE ENGENHARIA DE MOÇAMBIQUE

DEPARTAMENTO DE GEOTECNIA

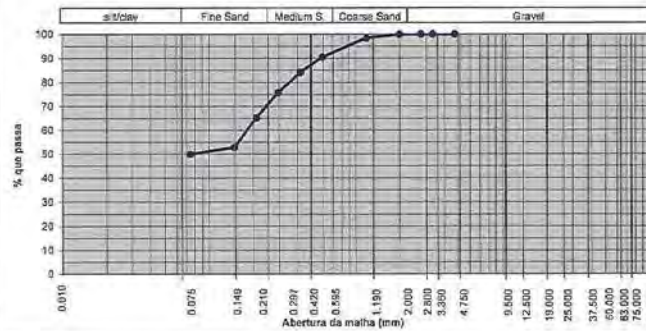
Solos

ANÁLISE GRANULOMÉTRICA POR PENEIRAÇÃO HÚMIDA

MESH	ASTM (mm)	RETAINED W(g)	% RETAINED	% TOTAL STRAINED
3"	75.000			
2" 1/2	63.000			
2"	50.790			
1" 1/2	37.500			
1"	25.000			
3/4"	19.000			
1/2"	12.500			
3/8"	9.500			
4	4.750			100.0
6	3.360	0.00	0.00	100.0
7	2.800	0.00	0.00	100.0
10	2.000	0.24	0.12	99.9
16	1.190	3.06	1.53	98.4
30	0.596	15.61	7.81	90.5
40	0.420	12.87	6.44	84.1
50	0.297	16.78	8.39	75.7
70	0.210	20.94	10.47	65.3
100	0.149	24.76	12.38	52.9
200	0.075	5.64	2.82	50.1

SAMPLE			
REF* OF LEM:	4175-X		
REF* OF CLIENT	BH 3		
CLIENT	Matsuda C.I. Co. Ltd		
SITE	Nacais porto		
WORK/DESTINY			
DATE OF TEST	03-09-2014 a 05-09-2014		
DEPTH (m)	6		
Granulometric analysis of coarse fraction			
Total weight of sample (g)			
Weight of coarse fraction (g)			
Total percentage of coarse			
Granulometric analysis of fine fraction			
Total weight of sample (g)	200.00		
Weight of washed material and dry	99.97		
Weight of fine material washed (g)	100.03		
LIMITES			
LL (%)	LP (%)	IP (%)	
24	15	9	

GRANULOMÉTRIC ACURVE



Executou

Verificou

Estrócio Nhavene

Gonçalves Amadeu Semente

LABORATÓRIO DE ENGENHARIA DE MOÇAMBIQUE

DEPARTAMENTO DE GEOTECNIA

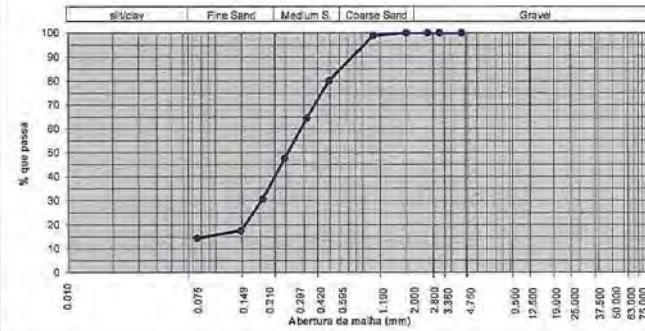
Solos

ANÁLISE GRANULOMÉTRICA POR PENEIRAÇÃO HÚMIDA

MESH	ASTM (mm)	RETAINED W(g)	% RETAINED	% TOTAL STRAINED
3"	75.000			
2" 1/2	63.000			
2"	50.790			
1" 1/2	37.500			
1"	25.000			
3/4"	19.000			
1/2"	12.500			
3/8"	9.500			
4	4.750			100.0
6	3.360	0.00	0.00	100.0
7	2.800	0.00	0.00	100.0
10	2.000	0.11	0.06	99.9
16	1.190	2.11	1.06	98.9
30	0.596	37.28	18.64	80.3
40	0.420	31.46	15.73	64.5
50	0.297	33.85	16.93	47.6
70	0.210	33.79	16.90	30.7
100	0.149	26.13	13.07	17.6
200	0.075	6.41	3.21	14.4

SAMPLE			
REF* OF LEM:	4161-X		
REF* OF CLIENT	BH 4		
CLIENT	Matsuda C.I. Co. Ltd		
SITE	Nacais porto		
WORK/DESTINY			
DATE OF TEST	03-09-2014 a 03-09-2014		
DEPTH (m)	1.5		
Granulometric analysis of coarse fraction			
Total weight of sample (g)			
Weight of coarse fraction (g)			
Total percentage of coarse			
Granulometric analysis of fine fraction			
Total weight of sample (g)	200.00		
Weight of washed material and dry	171.22		
Weight of fine material washed (g)	28.78		
LIMITES			
LL (%)	LP (%)	IP (%)	
14	12	2	

GRANULOMÉTRIC ACURVE



Executou

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Estrócio Nhavene

Gonçalves Amadeu Semente

Solos

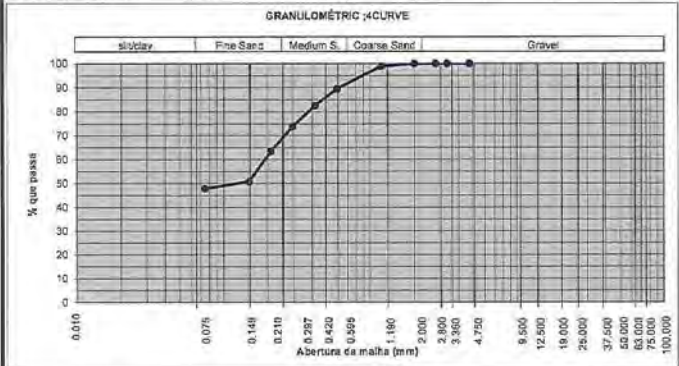
ANÁLISE GRANULOMÉTRICA POR PENEIRAÇÃO HÚMIDA

MESH	ASTM	(mm)	RETAINED W(g)	% RETAINED	% TOTAL STRAINED
3"	75.000				
2" 1/2	63.000				
2"	50.790				
1" 1/2	37.500				
1"	25.000				
3/4"	19.000				
1/2"	12.500				
3/8"	9.500				
4	4.750				100.0
6	3.360	0.00	0.00	0.00	100.0
7	2.800	0.00	0.00	0.00	100.0
10	2.000	0.13	0.07	0.07	99.9
16	1.190	2.10	1.05	0.88	98.9
30	0.596	18.79	9.40	7.51	89.5
40	0.420	14.15	7.03	5.71	81.5
50	0.297	17.31	8.66	6.93	72.1
70	0.210	20.76	10.38	8.31	60.4
100	0.149	25.25	12.63	10.19	49.5
200	0.075	5.73	2.87	2.31	46.4

SAMPLE			
REP* OF LEM	4183-X		
REP* OF CLIENT	BH 4		
CLIENT	Matsuda C.I. Co. Ltd		
SITE	Nacala porto		
WORK/DESTINY			
DATE OF TEST	03-09-2014 a 05-09-2014		
DEPTH (m)	4.5		
Granulometric analysis of coarse fraction			
Total weight of sample (g)	200.00		
Weight of coarse fraction (g)	104.30		
Total percentage of coarse	52.15		

Granulometric analysis of fine fraction			
Total weight of sample (g)	200.00		
Weight of washed material and dry	104.30		
Weight of fine material washed (g)	95.70		

LIMITES	LL	LP	IP
	(%)	(%)	(%)
	14	12	2



Executou: Estrôcio Nhavente
Verificou: Gonçalves Amadeu Semente

Solos

ANÁLISE GRANULOMÉTRICA POR PENEIRAÇÃO HÚMIDA

MESH	ASTM	(mm)	RETAINED W(g)	% RETAINED	% TOTAL STRAINED
3"	75.000				
2" 1/2	63.000				
2"	50.790				
1" 1/2	37.500				
1"	25.000				
3/4"	19.000				
1/2"	12.500				
3/8"	9.500				
4	4.750				100.0
6	3.360	0.00	0.00	0.00	100.0
7	2.800	0.00	0.00	0.00	100.0
10	2.000	0.12	0.06	0.06	99.9
16	1.190	3.19	1.60	1.30	98.3
30	0.596	18.72	9.36	7.53	88.0
40	0.420	15.01	7.51	6.01	81.5
50	0.297	18.75	9.36	7.51	72.1
70	0.210	23.34	11.67	9.36	60.4
100	0.149	21.96	10.96	8.71	49.5
200	0.075	6.16	3.06	2.45	46.4

SAMPLE			
REP* OF LEM	4185-X		
REP* OF CLIENT	BH 4		
CLIENT	Matsuda C.I. Co. Ltd		
SITE	Nacala porto		
WORK/DESTINY			
DATE OF TEST	03-09-2014 a 05-09-2014		
DEPTH (m)	7.5		
Granulometric analysis of coarse fraction			
Total weight of sample (g)	200.00		
Weight of coarse fraction (g)	107.32		
Total percentage of coarse	53.66		

Granulometric analysis of fine fraction			
Total weight of sample (g)	200.00		
Weight of washed material and dry	107.32		
Weight of fine material washed (g)	92.68		

LIMITES	LL	LP	IP
	(%)	(%)	(%)
	27	16	11



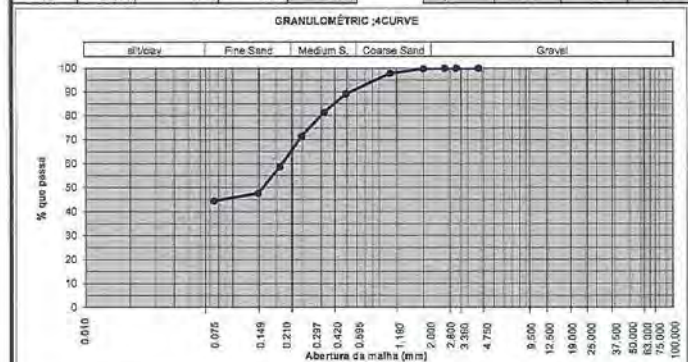
Executou: Estrôcio Nhavente
Verificou: Gonçalves Amadeu Semente

Solos

ANÁLISE GRANULOMÉTRICA POR PENEIRAÇÃO HÚMIDA

MESH	ASTM (mm)	RETAINED W(g)	% RETAINED	% TOTAL STRAINED
3"	75.000			
2" 1/2	63.000			
2"	50.790			
1" 1/2	37.500			
1"	25.000			
3/4"	19.000			
1/2"	12.500			
3/8"	9.500			
4	4.750			100.0
6	3.360	0.00	0.00	100.0
7	2.800	0.00	0.00	100.0
10	2.000	0.55	0.28	99.7
16	1.190	3.63	1.92	97.8
30	0.596	17.21	8.61	89.2
40	0.420	15.60	7.80	81.4
50	0.297	19.86	9.93	71.5
70	0.210	25.70	12.85	58.6
100	0.148	21.98	10.99	47.6
200	0.075	6.43	3.22	44.4

SAMPLE			
REP* OF LEM:	4187-X		
REP* OF CLIENT:	BH 4		
CLIENT:	Matsuda C.I. Co. Ltd		
SITE:	Nacala porto		
WORK/DESTINY:			
DATE OF TEST:	03-09-2014 a 05-09-2014		
DEPTH (m):	10.5		
Granulometric analysis of coarse fraction			
Total weight of sample (g)			
Weight of coarse fraction (g)			
Total percentage of coarse			
Granulometric analysis of fine fraction			
Total weight of sample (g)	200.00		
Weight of washed material and dry	111.25		
Weight of fine material washed (g)	88.75		
LIMITES			
LL (%)	LP (%)	IP (%)	
25	15	10	



Executou: Estrácio Nhavene
 Verificou: Gonçalves Amadeu Semente

Solos

ANÁLISE GRANULOMÉTRICA POR PENEIRAÇÃO HÚMIDA

MESH	ASTM (mm)	RETAINED W(g)	% RETAINED	% TOTAL STRAINED
3"	75.000			
2" 1/2	63.000			
2"	50.790			
1" 1/2	37.500			
1"	25.000			
3/4"	19.000			
1/2"	12.500			
3/8"	9.500			
4	4.750			100.0
6	3.360	0.00	0.00	100.0
7	2.800	0.00	0.00	100.0
10	2.000	0.09	0.05	100.0
16	1.190	2.71	1.36	98.6
30	0.596	32.03	16.02	82.6
40	0.420	23.19	11.50	71.0
50	0.297	20.64	10.32	60.7
70	0.210	18.72	9.36	51.3
100	0.148	15.54	7.77	43.5
200	0.075	3.59	1.80	41.7

SAMPLE			
REP* OF LEM:	4191-X		
REP* OF CLIENT:	BH 5		
CLIENT:	Matsuda C.I. Co. Ltd		
SITE:	Nacala porto		
WORK/DESTINY:			
DATE OF TEST:	03-09-2014 a 05-09-2014		
DEPTH (m):	1.5		
Granulometric analysis of coarse fraction			
Total weight of sample (g)			
Weight of coarse fraction (g)			
Total percentage of coarse			
Granulometric analysis of fine fraction			
Total weight of sample (g)	200.00		
Weight of washed material and dry	116.60		
Weight of fine material washed (g)	83.40		
LIMITES			
LL (%)	LP (%)	IP (%)	
26	11	16	

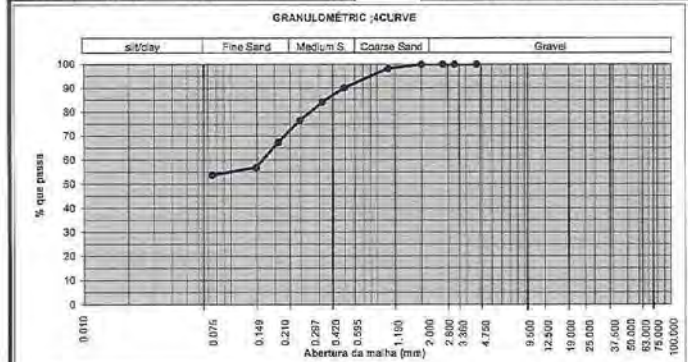


Executou: Estrácio Nhavene
 Verificou: Gonçalves Amadeu Semente

Solos
ANÁLISE GRANULOMÉTRICA POR PENEIRAÇÃO HÚMIDA

MESH	ASTM	(mm)	RETAINED W(g)	% RETAINED	% TOTAL STRAINED
3"		75.000			
2" 1/2		63.000			
2"		50.790			
1" 1/2		37.500			
1"		25.000			
3/4"		19.000			
1/2"		12.500			
3/8"		9.500			
4		4.750			100.0
6		3.360	0.00	0.00	100.0
7		2.800	0.00	0.00	100.0
10		2.000	0.27	0.14	99.9
16		1.190	3.42	1.71	98.2
30		0.596	15.96	7.98	90.2
40		0.420	12.32	6.16	84.0
50		0.297	15.13	7.57	76.5
70		0.210	18.30	9.15	67.3
100		0.149	20.88	10.44	56.9
200		0.075	6.03	3.02	53.8

SAMPLE			
REP* OF LEM:	4194-X		
REP* OF CLIENT	BH 5		
CLIENT	Matsuda C.I. Co. Ltd		
SITE	Nacala porto		
WORK/DESTINY			
DATE OF TEST	03-09-2014 e 05-09-2014		
DEPTH (m)	5		
Granulometric analysis of coarse fraction			
Total weight of sample (g)			
Weight of coarse fraction (g)			
Total percentage of coarse			
Granulometric analysis of fine fraction			
Total weight of sample (g)	200.00		
Weight of washed material and dry	92.40		
Weight of fine material washed (g)	107.60		
LIMITES			
	LL (%)	LP (%)	IP (%)
	31	18	13

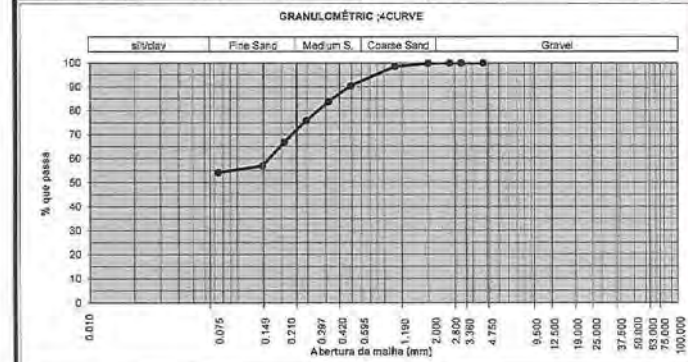


Executou: Estrácio Nhavene
Verificou: Gonçalves Amadeu Semente

Solos
ANÁLISE GRANULOMÉTRICA POR PENEIRAÇÃO HÚMIDA

MESH	ASTM	(mm)	RETAINED W(g)	% RETAINED	% TOTAL STRAINED
3"		75.000			
2" 1/2		63.000			
2"		50.790			
1" 1/2		37.500			
1"		25.000			
3/4"		19.000			
1/2"		12.500			
3/8"		9.500			
4		4.750			100.0
6		3.360	0.00	0.00	100.0
7		2.800	0.00	0.00	100.0
10		2.000	0.41	0.21	99.8
16		1.190	2.71	1.36	98.4
30		0.596	15.96	7.98	90.5
40		0.420	13.48	6.74	83.7
50		0.297	15.86	7.93	75.8
70		0.210	17.79	8.90	66.9
100		0.149	19.97	9.99	56.9
200		0.075	6.45	2.73	54.2

SAMPLE			
REP* OF LEM:	4195-X		
REP* OF CLIENT	BH 5		
CLIENT	Matsuda C.I. Co. Ltd		
SITE	Nacala porto		
WORK/DESTINY			
DATE OF TEST	03-09-2014 e 05-09-2014		
DEPTH (m)	7.5		
Granulometric analysis of coarse fraction			
Total weight of sample (g)			
Weight of coarse fraction (g)			
Total percentage of coarse			
Granulometric analysis of fine fraction			
Total weight of sample (g)	200.00		
Weight of washed material and dry	91.73		
Weight of fine material washed (g)	108.28		
LIMITES			
	LL (%)	LP (%)	IP (%)
	27	16	11



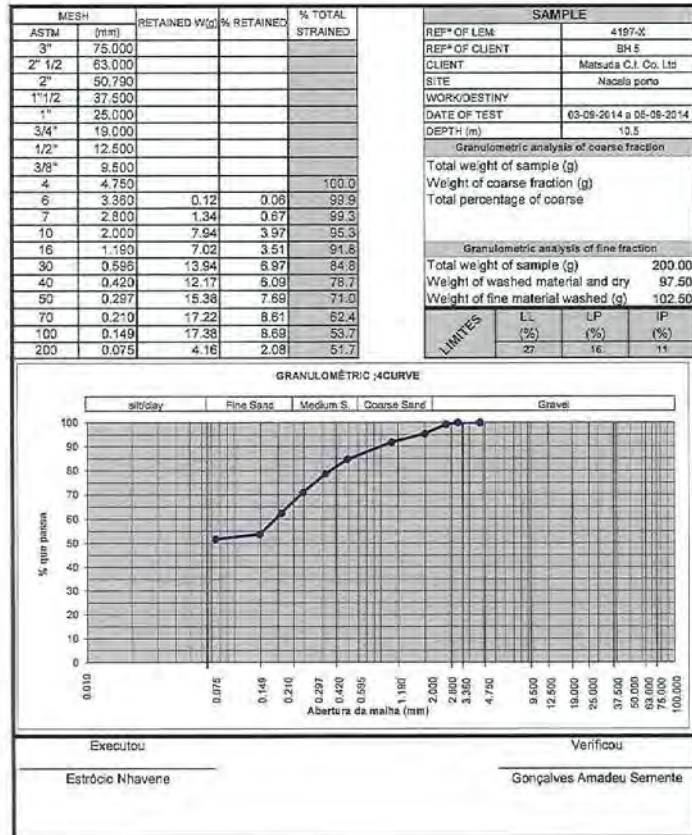
Executou: Estrácio Nhavene
Verificou: Gonçalves Amadeu Semente

LABORATÓRIO DE ENGENHARIA DE MOÇAMBIQUE

DEPARTAMENTO DE GEOTECNIA

Solos

ANÁLISE GRANULOMÉTRICA POR PENEIRAÇÃO HÚMIDA



ANNEX V



Permeability field test



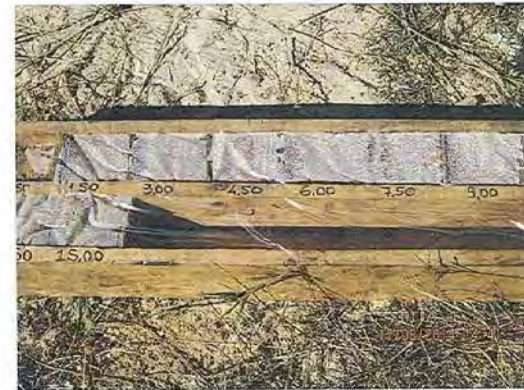
Permeability field test



Sampling



Sampling



6-6 ICS ナカラ実習先リスト

		Distance km	Transport	1 Enfermagem geral	2 SMI	3 Medicina preventiva	4 Laboratório e bioquímica	5 Medicina	6 Farmácia	7 Psiquiatria e Saúde Mental	8 Medicina Física e Reabilitação	9 Nutrição	10 Radiologia	11 Odontostomatologia
ナンブラ州内実習機関														
1	Hospital Distrital de Nacala Porto	0	F	x	x	x	x	x	x	x	x	x	x	
2	Centro de Saúde Urbano	3	B	x	x	x	x	x	x	x				x
3	Centro de Saúde Akumi	2	B	x	x	x	x	x	x					
4	Centro de Saúde Murrupelane	6	B	x	x	x	x	x	x					
5	Centro de Saúde Nacala A Velha	24	B	x	x	x	x	x	x					
6	Hospital Rural de Monapo	60	B	x	x	x	x	x	x		x	x	x	x
7	Hospital Distrital de Monapo (planned to open in 2015)	60	B	x	x	x	x	x	x		x	x	x	x
8	Centro de Saúde de Monapo	60	B	x	x	x	x	x	x					
9	Centro de Saúde de Monapo Vila	60	B	x	x	x	x	x	x					
10	Centro de Saúde de Ilha de Mozambique	80	S	x	x	x	x	x	x					
11	Centro de Saúde de Meconta	140	S	x	x	x	x	x	x					
12	Hospital Central de Nampula	190	S	x	x	x	x	x	x		x	x	x	x
13	Centro de Saúde Mental	190	S	x	x	x	x	x	x	x				
14	Hospital Militar de Nampula	190	S	x	x	x	x	x	x					
15	Centro de Saúde Urbano 25 de Setembro	190	S	x	x	x	x	x	x					x
16	Hospital Geral de Marrere	190	S	x	x	x	x	x	x		x	x	x	x
17	Centro de Saúde 1o de Maio- cidade de Nampula	190	S	x	x	x	x	x	x					
18	Centro de Saúde Muhala Expansão	190	S	x	x	x	x	x	x					
19	Hospital Distrital de Alua	230	S	x	x	x	x	x	x					
20	Hospital Rural de Erati	250	S	x	x	x	x	x	x			x	x	x
21	Hospital Rural de Ribawé	310	S	x	x	x	x	x	x		x	x	x	x
22	Hospital Rural de Angoche	370	S	x	x	x	x	x	x		x	x	x	x
23	Hospital Distrital de Moma	450	S	x	x	x	x	x	x		x	x	x	x
ナンブラ州外実習機関														
1	Hospital Distrital de Cuamba		S	x	x	x	x	x	x	x	x	x	x	x
2	Hospital Provincial de Pemba		S	x	x	x	x	x	x	x	x	x	x	x
3	Hospital Provincial de Lichinga		S	x	x	x	x	x	x	x	x	x	x	x
4	Hospital Provincial de Quelimane		S	x	x	x	x	x	x	x	x	x	x	x
5	Hospital Central da Beira		S	x	x	x	x	x	x	x	x	x	x	x

Remarks: “F”: on foot, “B”: Bus, “S”: Stay