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1. Member List of the Survey Team

2. Survey Schedule

Itinerary of Basic Design Survey Team
(July 21, 2001 ~ August 17, 2001)

No.	Date	Day	Officials	Chief Eng./Building Planner	Education Planner	Building/Facility Planner	Equipment Planner	Construction · Procurement Planner/Cost Estimator	Coordinator
				Osamu HAMANO					
1	Jul 21	Sat			Narita	Singapore	Dawin		
2	Jul 22	Sun			Darwin	Dili	Site Survey with curriculum survey team		
3	Jul 23	Mon			Courtesy call to Liaison office of Japanese Government in East Timor, Meeting at JICA Office, Meeting with Experts on Curriculum Development				
4	Jul 24	Tue			Courtesy call to Department of Social Affairs, Meeting with DSA, UNTAET, Meeting with Engineering Faculty of the East Timor National University,				
5	Jul 25	Wed			Survey of East Timor National University, Hearing from Dean of Faculty of Agriculture and ILO Project				
6	Jul 26	Thu			Discussion with UNDP and UNOPS	Discussion of Minutes of Meeting (draft)			
7	Jul 27	Fri			Hearing from AusAID	Discussion of Minute of Discussion (draft)			NRT DWN
8	Jul 28	Sat			Survey of Baucau Don Bosco Vocational Training School				Arrive Dili, Site Survey
9	Jul 29	Sun			Data filling /Internal Meeting				
10	Jul 30	Mon			Signing of Minutes of Meeting. Survey at Becora Home Science School, Comoro Don Bosco Vocational School	Site survey at Hera Campus			
11	Jul 31	Tue	DIL DWN		Report to liaison office of Japanese Government. Site survey at Hera Campus				
12	Aug 1	Wed	DWN SIN		Site survey at Hera Campus				
13	Aug 2	Thu	SIN NRT		Site survey at Hera Campus. Hearing from Faculty of Engineering				
14	Aug 3	Fri			Site survey at Hera Campus. Hearing from AusAid, USAID, Education, Youth and Culture				
15	Aug 4	Sat			Survey of building material supply and cost. Internal meeting.			DIL DWN	
16	Aug 5	Sun			Internal Meeting /Filing of collected data				DWN NRT
17	Aug 6	Mon			Survey of UNTAET Infrastructure, Land and Property. Data filing of questionnaire				
18	Aug 7	Tue			Survey of UNICEF, Portugal Mission, Land and Property and Faculty of Education.				
19	Aug 8	Wed			Survey of SENAI Project, Portugal Project, CISPE and UNICEF				
20	Aug 9	Thu			Survey of World Bank, UNDP, UNTAET Infrastructure and Company Registration Office.				
21	Aug 10	Fri			Survey of renovated Faculty of Education and TIBAR Dumping site. Interim report to JICA Office. Preparation of Facility Plan.				
22	Aug 11	Sat		DIL DPS JKT	Equipment Survey at Don Bosco, Becora Vocational Training School. Building material and equipment market survey.				
23	Aug 12	Sun		JKT NRT	Data filling and preparation of Basic Design Survey Report.				
24	Aug 13	Mon			Building materials and equipment market survey.				
25	Aug 14	Tue			Wrap up meeting with DCU, UNDP, UNOPS and JICA. Report to UNTAET SRSG and Liaison Office of Japanese Government.				
26	Aug 15	Wed			Data filling and preparation of Basic Design Survey Report.				
27	Aug 16	Thu			Report to JICA Office. DIL DPS JKT				
28	Aug 17	Fri			JKT NRT				

Summary of Basic Design Report(Draft)
 (September 27, 2001 ~ October 6, 2001)

No.	Date	Day	Officials	Chief Eng./Building Planner Osamu HAMANO	Equipment Planner Takashi NAKAJIMA
1	Sep.27	Thu.	NRT DPS		
2	Sep.28	Fri.	DPS DLI, Courtesy call to Liaison office of Japanese Government in East Timor and Ministry of Education. Meeting with JICA staffs		
3	Sep.29	Sat.	Explanation of Draft Report to Faculty of Engineering. Site survey at Hera Campus		
4	Sep.30	sun.	Data filing and internal meeting.		
5	Oct.1	Mon.	Confirmation of Equipment at Faculty of Engineering. Meeting with DCU, UNDP, UNOPS and JICA.		
6	Oct.2	Tue.	Discussion of Minutes of Discussion (draft). Confirmation of equipment with Faculty of Engineering. .Hearing from Generator Plant at Dili.		
7	Oct.3	Wed.	Arrangement to record actual voltage drop down at Hera Area. Signing of Minutes of discussion,		
8	Oct.4	Thu.	Report to Liaison Office of Japanese Government. DLI DPS JKT		
9	Oct.5	Fri.	Report to EOJ and JICA in Indonesia	JKT NRT	
10	Oct.6	Sat.	JKT NRT		

3. List of Party Concerned in the Recipient Country

3. List of concerned party in East Timor – Basic Design Survey

1. UNTAET

UNTAET

Mr. Suzuki Shin-ichi	Special Advisor to the SRSG for Development and Humanitarian Affairs
Ms. Shoko Arakaki	Special Assistant to SA

Donor Coordination Unit (DCU)

Mr. Eusebio C. Jeronimo	Director
Ms. Catherine Walker	International Director
Ms. Makiko Watanabe	Program Officer

Department of Social Affairs

Fr. Filomeno Jacob	Cabinet Member
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Department of Social Affairs , Education, Youth & Culture

Mr. Rezene H. Tesfamichael	Education Specialist, Div. of Education
Mr. Marcial Salvatierra	Education Officer

Department of Social Affairs, Social Services

Mr. Jose Asa	Director
Mr. Jim Richardson	Employment Services
Carlito Rosario Cabral	Employment Services

Department of Social Affairs, Internal Administration, CISPE

Mr. Sam Harbor	Chief, Human Resource Management Office
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Department of Infrastructure

Mr. Firomeno De Andrade	Head of Power
Mr. Tom Magill	Contract Engineer
Mr. Graham Jackson	Head of Sewage

Department of Information Technology, Post and Telecommunications (ITPT)

Mr. Pedro A. Braga	Director
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2. ETTA

Land and Property

Mr. Pedro de Sousa Xavier	Manager, Land Claims, Registration, Government Land and Cadastal Survey, Land and Property
Mr. Nuncio Mestre	Dili District Headquarter. Land and Property
Mr. Jose Sobral	Dili District Headquarter. Land and Property
Mr. Luis Gomez Orodea	Dili District Headquarter. Land and Property

Ms. Melanie O'Rourke Harding Assistant Manager

Revenue Services

Mr. Thomas Story Commissioner
Mr. Virgilio Pena da Costa Tax Manager
Mr. Taiwa Research and Census Unit

National Planning Development Agency

Mr. Livingstone Sindaygaya Monitoring Officer

3. International Organization

UNDP

Mr. Joao O Camara Program Assistant
Mr. Greg Mealing Infrastructure Coordinator
Mr. Louis Vaz Rodorigues Infrastructure Engineer

UNOPS

Ms. Risa Ito Associate Portfolio Manager

The World Bank

Mr. Filomeno A. Da Cruz Project Officer

ILO

Mr. Gagan Rajbhandari ILO Liaison Officer
Ms. Sumalee Arayakkosol Program Officer Bangkok Area Office and the East Asia Multidisciplinary Advisory Team, Bangkok

UNICEF

Mr. Maurice Robson Education Department

4. East Timor National University

East Timor National University

Mr. Armindo Maia Rector
Mr. Francisco Miguel Martins, M. Hum Vice Rector
Mr. Renato M. da Cruz Vice Rector (General Affair)

Faculty of Engineering

Mr. Inacio F. Moreira Dean
Mr. Victor Da Costa Vice Dean(School Affair)
Mr. Leonel Da SG Madeira Vice Dean(Administration)
Mr. Duarte Da Costa S. Chief of Mechanical Dep.
Mr. Benjamin Hopffer U. Leonel Chief of Civil Dep.
Mr. Gastao F. de Sausa Chief of Electrical Dep.
Mr. Keiji Kusaka Advisor

Mr. Masayoshi Koyama

Advisor

4. Japanese

Representative Office of Japan

Mr. Kazumasa Shibuta

Deputy Head

JICA East Timor Office

Mr. Katsuo Shoji

Resident Representative

Ms. Tomoko Ueda

Assistant resident Representative

Embassy of Japan in Indonesia

Mr. Hiroshi Matsuura

First Secretary

Mr. Kazuhiro Hasegawa

"

JICA Indonesia Office

Mr. Michio Kanda

Resident Representative

Mr. Tsutomu YTanaka

Staff

Yachiyo Engineering Co. Ltd.

Mr. Toru Fujii

Energy Development Section

4. Minutes of Discussions (Basic Design Study)

Minutes of Discussions
on
the Basic Design Study on
the Project for Urgent Rehabilitation of
the Faculty of Engineering of East Timor National University
in East Timor

In response to a request from United Nations Transitional Administration in East Timor / East Timor Transitional Administration (hereinafter referred to as "UNTAET/ETTA"), the Government of Japan has decided to conduct a Basic Design Study on the Project for Urgent Rehabilitation of the Faculty of Engineering of East Timor National University in East Timor (hereinafter referred to as "the Project"), and entrusted the study to Japan International Cooperation Agency (JICA).

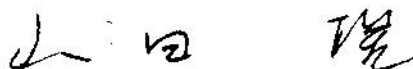
JICA sent to East Timor the Basic Design Study Team (hereinafter referred to as "the Team"), which is headed by Mr. Osamu Yamada, Technical Advisor, JICA, with a field survey period between the 22nd of July and the 16th of August, 2001.

The Team held a series of discussions on the Project with the officials concerned with the Department of Social Affairs (DSA) of UNTAET/ETTA and the Faculty of Engineering of East Timor National University (UNTIL). The discussions were followed up with a field survey of the study area.

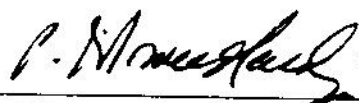
In the course of discussions and field survey, both parties confirmed the main items described on the attached sheets.

The Team will proceed to further work and prepare the Basic Design Study Report.

Dili, 30th July, 2001



Mr. Osamu Yamada
Leader,
Basic Design Study Team,
Japan International Cooperation Agency



Fr. Filomeno Jacob
Cabinet Member for Social Affairs,
United Nations Transitional Administration
in East Timor / East Timor Transitional
Administration (UNTAET/ETTA)



for Dr. Armindo Maia
Acting Rector,
East Timor National University (UNTIL)

ATTACHMENT

1. Objective of the Project

The objective of the Project is to contribute to human resource development of middle level engineers/managers in East Timor through rehabilitation/rebuilding of the Faculty of Engineering of UNTIL and provision of equipment.

2. Project Site

The Project site is located in Hera area, the site of the former Dili Polytechnic, in Dili.

3. Responsible and Implementing Organization

3-1. The responsible organization for the Project is the Division of Education, Culture, Youth and Sports of DSA of UNTAET/ETTA.

3-2. The implementing organization of the Project is the Faculty of Engineering of UNTIL.

4. Items requested by DSA and the Faculty of Engineering of UNTIL

After discussions with the Team, the items described below are finally requested by DSA and the Faculty of Engineering of UNTIL.

JICA will assess the appropriateness of the request. The Team explained that not every component of the requested facilities and equipment would be finally included in the Project.

4-1. The Project supports D3 courses of the Faculty of Engineering in the following departments, in which each department consists of 2 classes of 25 students each year;

- (1) Electrical Engineering,
- (2) Mechanical Engineering, and
- (3) Civil Engineering.

4-2. The rehabilitation/rebuilding of the following former Dili Polytechnic facilities for the above 3 departments;

- (1) Administration wing,
- (2) Workshops wing,
- (3) Teaching/Lecturing wing,
- (4) Toilets,
- (5) Canteen,
- (6) Infrastructure facilities such as water, electricity, sewage system,
- (7) Other facilities according to the urgent necessity.

4-3. The procurement of educational equipment for the above 3 departments, including furniture such as desks, chairs, cabinets.

5. Items requested by the Team

To facilitate the smooth conduct of the study, DSA and the Faculty of Engineering of UNTIL are requested to take the following necessary measures;

- (1) to provide the Team with available data and information necessary for the smooth execution of the study ;
- (2) to prepare the answer for the questionnaire presented by the Team ;
- (3) to secure the permission to photograph for the Team for proper execution of the study, if necessary ;
- (4) to take any necessary measures to secure the safety of the members of the Team ;
- (5) to make arrangements to allow the Team to bring back to Japan any necessary data, maps and photographs related to the study ;
- (6) to assign full time counterparts to the Team during their stay in East Timor, to play

the following roles as the coordinator to the Team ;

- to make the appointments for meetings with the relevant authorities and organizations, if necessary
- to attend the site survey and any other visits with the Team , if necessary
- to assist and advise the Team for their collection of data and information as much as possible

(7) to bear claims, if any arises, against the members of the Team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Team.

6. Procedure of implementation stage

6-1. Both sides confirmed that after the submission of the Draft Report by JICA, the project management service in the implementation stage would be provided by UNDP/UNOPS based on the Management Service Agreement.

6-2. DSA and the Faculty of Engineering of UNTIL will take the necessary measures described in Annex-1, for the smooth implementation of the Project.

7. Schedule of the Study

7-1. The Consultant Team will proceed to further studies in East Timor until the 16th of August 2001.

7-2. Based on the result of the field survey and analysis, JICA will prepare the Draft Report in English and send it to DSA approximately by the end of September 2001. JICA will also dispatch a team in order to explain the outline of the Draft Basic Design approximately around early October 2001.

7-3. In the event of the Draft Report being acceptable in principle by DSA and the Faculty of Engineering of UNTIL, JICA will complete the Final Report and forward it to DSA approximately by the middle of November 2001.

8. Other Relevant Items

8-1. Both sides confirmed that the Faculty of Engineering will be responsible for removing the unusable equipment in the 3 workshops (Electrical, Mechanical, and Civil) as many as possible and putting them into the workshops of maintenance/automobile and that the removing work of the heavy equipment that cannot be done by the Faculty of Engineering should be included in the scope of the Project.

8-2. DSA and the Faculty of Engineering expressed that there is no plan to conserve any one of the damaged buildings of the former Polytechnic as a historic object. DSA and the Faculty of Engineering also expressed that the demolishing work of the damaged and structurally unstable buildings of the former Polytechnic should be included in the scope of the Project, if it's necessary for the rehabilitation work or for safety of the campus. The Team explained that all the damaged buildings should be examined and prioritized, and the demolishing work should be conducted according to its necessity.

8-3. DSA has assured the land ownership of Hera campus for the use of the Faculty of Engineering.

8-4. The Team explained that the selection of equipment necessary for the 3 departments should be examined based on the curriculum (Annex-2) developed by the Faculty of Engineering in cooperation with the experts dispatched by JICA.



- 8-5. Both sides confirmed that the rehabilitation work is preferable to be completed before October 2002 when the new academic year begins.
- 8-6. DSA and the Faculty of Engineering expressed that they would assure the necessary budget and the necessary number of teaching/administrative staff to operate and maintain the Faculty of Engineering, including the means of transportation between Dili center and Hera campus.
- 8-7. The Faculty of Engineering expressed that the teachers' houses and the students' dormitories are also necessary and preferable to be rehabilitated in the Project. The Team explained that the rehabilitation of each building should be prioritized and conducted according to necessity and urgency.

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Annex-1 Necessary measures undertakings by each side in the stage of implementation

No	Items	To be covered by Grant Aid	To be covered by Recipient side	
1	To secure land		●	
2	To clear, level and reclaim the site when needed		●	
3	To construct gates and fences in and around the site		●	
4	To construct the parking lot	●		
5	To construct roads			
	1) Within the site	●		
	2) Outside the site		●	
6	To construct the building	●		
7	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities			
	1) Electricity			
		a. The distributing line to the site		●
		b. The drop wiring and internal wiring within the site	●	
		c. The main circuit breaker and transformer	●	
	2) Water Supply			
		a. The city water distribution main to the site		●
		b. The supply system within the site (receiving and/or elevated tanks)	●	
	3) Drainage			
		a. The city drainage main (for storm, sewer and others) to the site		●
		b. The drainage system (for toilet sewer, ordinary waste, storm drainage and others) within the site	●	
	4) Gas Supply			
		a. The city gas main to the site		●
		b. The gas supply system within the site	●	
	5) Telephone System			
		a. The telephone trunk line to the main distribution frame / panel (MDF) of the building		●
		b. The MDF and the extension after the frame / panel	●	
6) Furniture and Equipment				
	a. General furniture		●	
	b. Project equipment	●		
8	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country			
		1) Marine(Air) transportation of the products to the recipient country	●	
		2) Tax exemption and customs clearance of the products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	●		
9	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●	
10	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and the services		●	
11	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant		●	
12	To bear all the expenses, other than those to be borne by the Grant, necessary for construction of the facilities as well as for transportation and installation of the equipment		●	

Annex-2 Curriculum developed by the Engineering Faculty
 Faculty of Engineering
 National University of East Timor(UNTIL)

General Subject(GS)


Subject	Group	Credit	Credit						
			Sem. 1	Sem. 2	Sem. 3	Sem. 4	Sem. 5	Sem. 6	
Portuguese I	GS	2	2						
English I	GS	2	2						
Human Rights	GS	2	2						
Mathematics I(Basic Math)	GS	3	3						
Chemistry	GS	2	2						
Computer I	GS	1	1						
Portuguese II	GS	2		2					
English II	GS	2		2					
Ethics & Moral	GS	2		2					
Mathematics II(Calc. I)	GS	3		3					
Physics	GS	2		2					
Physics Lab.	GS	1		1					
Portuguese III	GS	2			2				
English III	GS	2			2				
Mathematics III(Calc. II)	GS	3			3				
Statistics	GS	1			1				
Portuguese IV	GS	2				2			
English IV	GS	2				2			
Subtotal		36	12	12	8	4	0	0	

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Subject	Group	Credit	Credit					
			Sem.1	Sem.2	Sem.3	Sem.4	Sem.5	Sem.6
Electrical Materials	BSS	1	1					
Electric Circuit I	BSS	2	2					
Electric Measurement I	BSS	2	2					
Technical Drawing	BSS	2	2					
Electromagnetics I	BSS	2		2				
Electric Circuit II	BSS	1		1				
Electric Measurement II	BSS	1		1				
Electronic Devices I	BSS	2		2				
C Language & Assembly	BSS	2		2				
Electromagnetics II	BSS	2			2			
Electric Circuit III	BSS	1			1			
Electronic Devices II	BSS	2			2			
Mathematics IV	BSS	3				3		
Electronic Circuit I	BSS	2				2		
Digital Electronics I	BSS	2				2		
Electronic Circuits II	BSS	2					2	
Digital Electronics II	BSS	2					2	
Basic Installation	SS	2	2					
Advanced C Language	SS	2			2			
Electrical Machine	SS	1			1			
Electric Power System	SS	1			1			
Numerical Analysis	SS	2				2		
Electrical Machine II	SS	2				2		
Control System I	SS	1				1		
Communication System I	SS	1				1		
Microprocessor & Interface	SS	2					2	
Power Electronics I	SS	2					2	
Distribution & Transmission	SS	1					1	
Control System II	SS	1					1	
Microprocessor & Interface II	SS	3						3
Power Electronics II	SS	2						2
Introduction to High Voltage Tech.	SS	1						1
Communication System II	SS	2						2
Practice I	PS	1		1				
Practice II	PS	1		1				
Practice III	PS	1			1			
Practice IV	PS	1			1			
Practice V	PS	1				1		
Practice VI	PS	1				1		
Practice VII	PS	1					1	
Practice VIII	PS	1					1	
Practice IX	PS	1						1
Electrical Workshop I	PS	2					2	
Electrical Workshop II	PS	1						1
PKL(Project Work)	PS	3						3
Subtotal		72	9	10	11	15	14	13

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Subject	Group	Credit	Credit						
			Sem. 1	Sem. 2	Sem. 3	Sem. 4	Sem. 5	Sem. 6	
Engineering/Technical Drawing I	BSS	2	2						
Engineering/Technical Drawing II	BSS	2		2					
Engineering Mathematics	BSS	2			2				
Computer Programming	BSS	1		1					
Material Technology	SS	2	2						
Basic Electrical	SS	2		2					
Static Structure I	SS	2		2					
Machine Introduction I	SS	2		2					
Engineering Dynamics	SS	2			2				
Machine Conversion Energy	SS	2			2				
Machine Element I	SS	2			2				
Material Strength	SS	2			2				
Thermodynamics	SS	2					2		
Fluid Mechanics	SS	2					2		
Machine Element II	SS	2					2		
Static Structure II	SS	2					2		
Automotive Engine System	SS	2					2		
Heat Transfer	SS	2						2	
Measurement Engineering	SS	2						2	
Choice Subject I *	SS	2						2	
Management Production	SS	2							2
Maintenance and Services	SS	2							2
Choice Subject II *	SS	2							2
Thesis	SS	2							2
Practice Workshop I	PS	4	4						
Practice Workshop II	PS	4		4					
Practice Workshop III	PS	4			4				
Practice Workshop IV	PS	4				4			
Practice Workshop V	PS	4					4		
Practice Workshop VI	PS	4						4	
CAD/CAM system	PS	1							4
									1
Subtotal		72	8	13	14	12	12		13

Subject	Group	Credit	Credit						
			Sem.1	Sem.2	Sem.3	Sem.4	Sem.5	Sem.6	
Engineering/Technical Drawing I	BSS	2	2						
Statics	BSS	2	2						
Strength of Material	BSS	2		2					
Fluid Mechanics	BSS	2			2				
Building Construction	SS	2		2					
Surveying	SS	2		2					
Material Technology I	SS	1		1					
Material Technology II	SS	1			1				
Structural Analysis I	SS	2			2				
Road Construction I	SS	2			2				
Soil Mechanics I	SS	2			2				
Timber Structures	SS	2			2				
Structural Analysis II	SS	2				2			
Road Construction II	SS	2				2			
Soil Mechanics II	SS	2				2			
Hydrology	SS	2				2			
Steel Structures I	SS	2				2			
Reinforced Concrete Structures I	SS	2				2			
Foundation Engineering	SS	2				2			
Steel Structures II	SS	2					2		
Reinforced Concrete Structures II	SS	2					2		
Seismic Engineering	SS	1					1		
Hydraulics	SS	2					2		
Water Supply	SS	1					1		
Urban Drainage	SS	1					1		
Irrigation & Hydro Infrastructure	SS	2					2		
Construction Techniques &	SS	1					1		
Bridge Structures	SS	1					1		
Traffics Engineering	SS	2					2		
Environmental Effect Analyses	SS	1							1
Construction Project Management	SS	2							2
Engineering Economy	SS	2							2
Hygiene & safety work	SS	1							1
Research Method	SS	1							1
Project Work	SS	3							3
Building Material Testing(Lab)	PS	2		2					
Surveying(Practices)	PS	2			2				
Soil Testing(Lab)	PS	2					2		
Pavement Material Testing(Lab.)	PS	2					2		
Workshop	PS	2							2
CAD	PS	1							1
Subtotal		72	4	9	13	14	19		13

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5. Minutes of Discussions (Explanation on Draft Report)

Minutes of Discussions
on
the Basic Design Study on
the Project for Urgent Rehabilitation of
the Faculty of Engineering of East Timor National University
in East Timor
(EXPLANATION ON DRAFT REPORT)

In July 2001, the Japan International Cooperation Agency (JICA) dispatched a Basic Design Study Team on the Project for Urgent Rehabilitation of the Faculty of Engineering of East Timor National University (hereinafter referred to as "the Project") to East Timor, and through discussions, site surveys, and technical examination of the results in Japan, JICA prepared the draft report of the study.

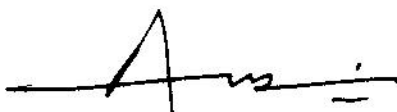
In order to explain and to consult the Ministry of Education, Culture and Youth of UNTAET/ETTA (MECY) and the Faculty of Engineering of East Timor National University (UNTIL) on the components of the draft report, JICA sent to East Timor the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Mr. Osamu Yamada, Technical Advisor, JICA, from 28th September to 4th October, 2001.

As a result of discussions, both sides have confirmed the main items described on the attached sheet.

Dili, 3rd October, 2001



Mr. Osamu Yamada
Leader,
Draft Report Explanation Team,
Japan International Cooperation Agency



Drs. Armindo Maia, M. Phil
Minister for Education, Culture and Youth
United Nations Transitional Administration
in East Timor / East Timor Transitional
Administration (UNTAET/ETTA)



Dr. Benjamim Corte Real
Ad interim Rector,
East Timor National University (UNTIL)

ATTACHMENT

1. Components of the Draft Final Report

MECY and UNTIL agreed and accepted in principle the components of the draft report explained by the Team.

However, MECY and UNTIL requested the Team to reconsider the provision of a generator since the situation of electric power supply in Dili is recently getting worse, which may directly affect the power supply to Hera campus and the operation of the Faculty of Engineering. Therefore, the Team expressed that it would consider the possibility of facilitating a backup generator(s) necessary for the minimum operation of workshops and computer lab even in the unexpected power-cut and notify the result to MECY through JICA Dili Office as soon as possible.

2. Responsible and Implementing Organization

- 2-1. The responsible organization for the Project has been changed to the office of Director General, Ministry of Education, Culture and Youth (MECY) UNTAET/ETTA from the former Division of Education, Culture, Youth and Sports of the Department of Social Affairs of UNTAET/ETTA.
- 2-2. The implementing organization of the Project is the Faculty of Engineering of UNTIL as it has been.

3. Implementation

Both sides confirmed that after the submission of the Draft Report by JICA, the project management service in the implementation stage would be provided by UNDP/UNOPS based on the Management Service Agreement.

4. Schedule of the Study

JICA will complete the Final Report and forward it to MECY approximately by the end of November 2001.

5. Other Relevant Issues

- 5-1. Both sides confirmed that MECY and UNTIL would allocate the sufficient budget and the sufficient number of teaching staff in order to operate and maintain the Faculty of Engineering.
- 5-2. MECY expressed that it would allocate the sufficient number of staff to be in charge of higher education and submit a new organization chart to the Team through JICA Dili Office as soon as it is finalized.
- 5-3. Both sides confirmed that the Faculty of Engineering would be responsible for removing the unusable, light equipment in the 3 workshops (Electrical, Mechanical, and Civil) as described in the draft report and putting them into the workshops of maintenance/automobile before March 2002.
- 5-4. Both sides confirmed that the Faculty of Engineering would be responsible for removing the collapsed trees in Hera campus that may become obstacles for the rehabilitation works before March 2002.
- 5-5. Both sides confirmed that the Faculty of Engineering would be responsible for

assuring the means of commutation and its expense between Dili and Hera after the reopening of Hera campus.

5-6. The Team explained that the requested amount of grant from MECY through UNDP may not be fully approved by the Japanese government.

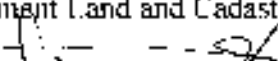
5-7. Both sides confirmed that the Draft Report should be carefully handled until the tender procedure finalizes.

G

Ami
12.19

6. Certificate of Land Ownership

**UNTAET****United Nations Transitional Administration in East Timor**

Statement made by: Pedro de Sousa Xavier, Manager, Land Claims, Registration,
Government Land and Cadastral Survey, Land and Property Unit
ETTA. 

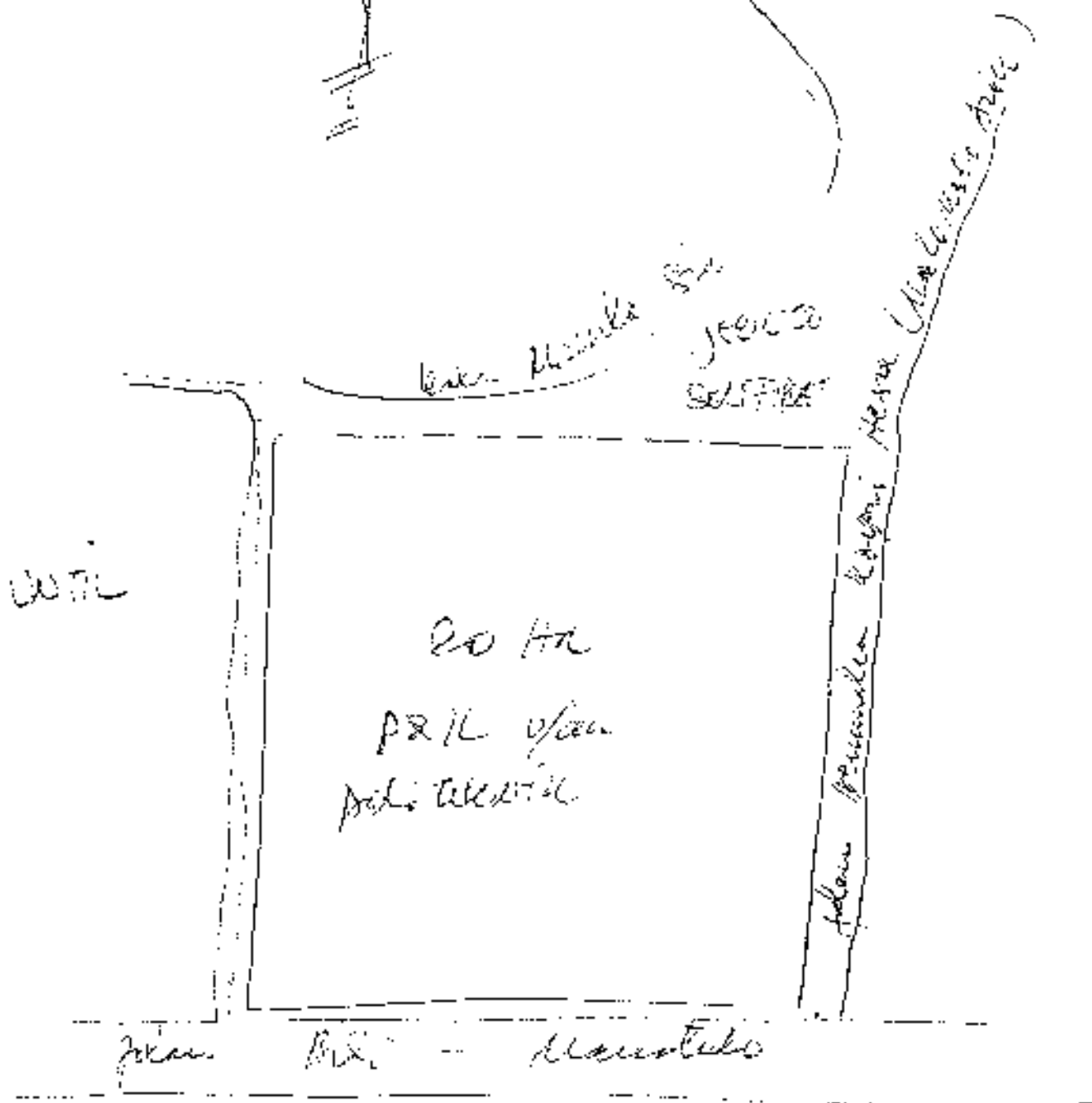
Date: 8 August, 2001

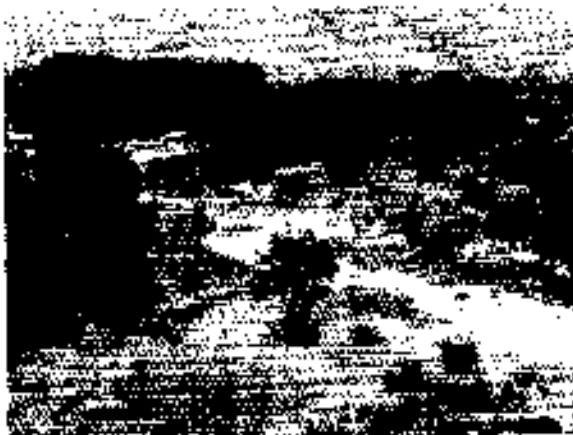
Re: **Proposed Faculty of Engineering, National University of East
Timor**

We refer to the former Polytechnic, located in Hera, East Timor, as depicted on the attached map marked "Annexure A" and as depicted in the attached photographs and site map marked "Annexure B" and "Annexure C" respectively.

The Polytechnic was formerly administered by the Indonesian State, and in the opinion of the Land and Property Unit is considered "government land".

In accordance with Section 7 of Regulation 1999/1 the property now falls under UNTAET's administration.





Boundary Fence Between Faculty of Agri. and Eng.



Maintenance Workshop



Mechanical Workshop



Mechanical, Civil and Electric Workshop



Lecture Building, Assembly Hall



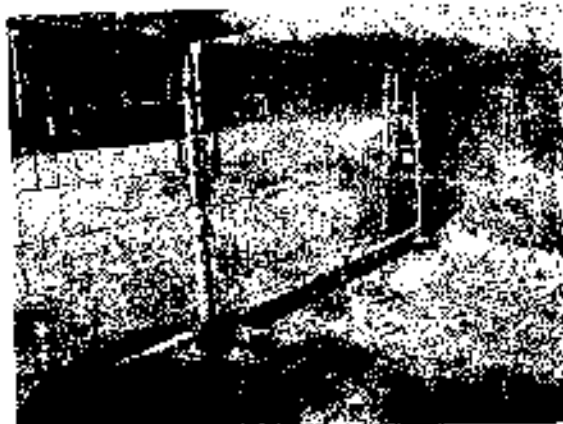
Assembly Hall, Laboratory Building and Main Road

Faculty of Engineering National University of East Timor

Guard House and Buildings along Main Road



Guard House (1)



Main Gate



Guard House (2)



Administration building from Main Road

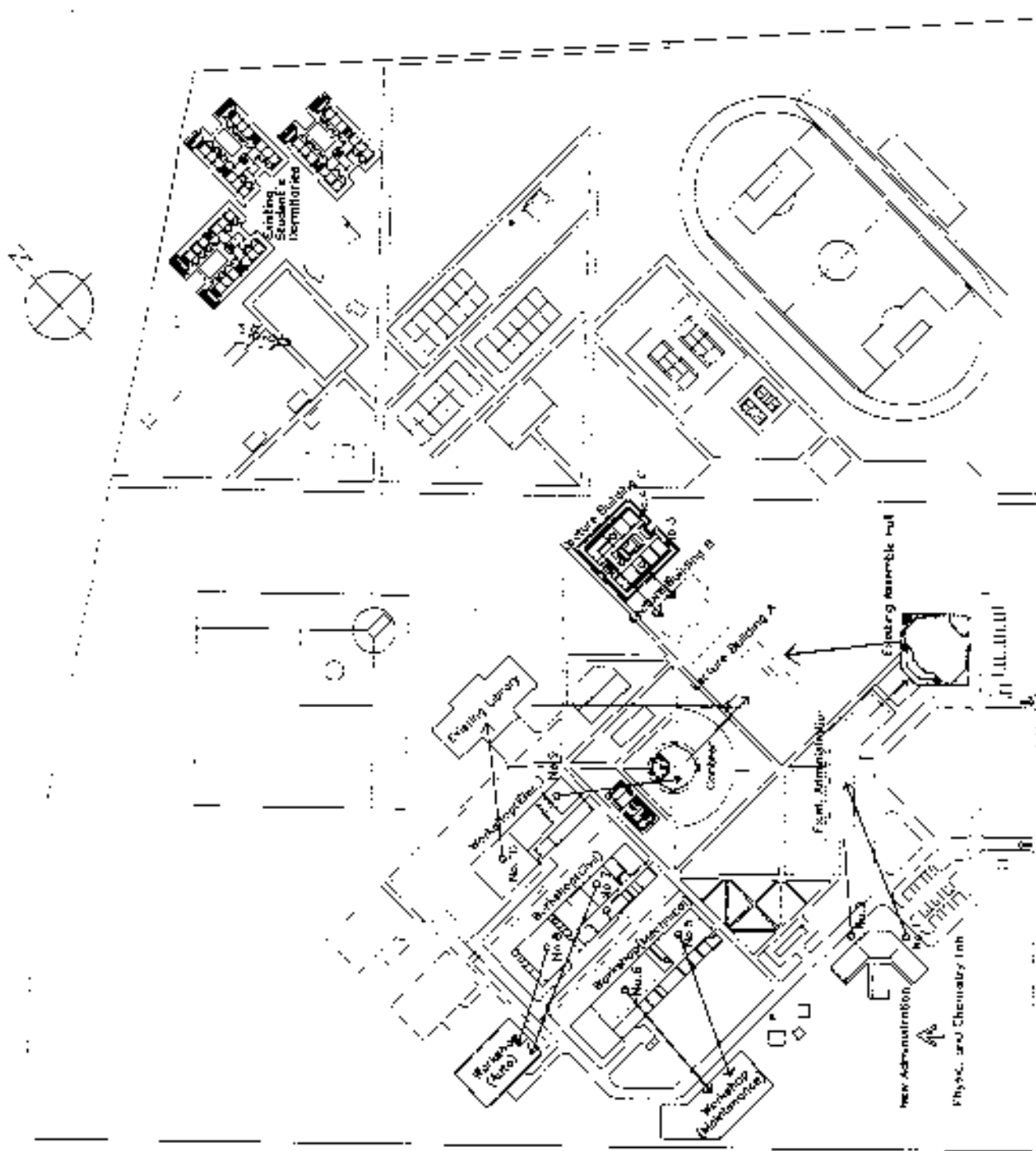


Assembly Hall from Main Road



Laboratory Building from Guard House (2)

ANNEXURE C



○ Scaffolding No. 1 - 11
 → Movement of the scaffolding as
 S I T E P L A N 5 (27/10)

7. Photographs of Hera Campus and related facilities

East Timor National University, Hera Campus

Existing Administration Building and Assembly Hall



Left side building: Administration Building, which will be demolished.

Right side building: Assembly Hall, which can be renovated.



Panorama view of the Administration Building: Fire damage is so severe. Roof structure was completely broken by fire.



Administration Building: view from sub-gate. Entrance Hall of the Administration Building



Ground Floor : Fire damage was so severe because there were so many documents to be burnt . Building structure damaged by fire. There were some explosions on the floor slab by fire .



View from the Entrance Hall to the roof: Roof is completely burnt by fire.



Second floor : The Roof is completely burnt by fire.

East Timor National University, Hera Campus

Physical and Chemistry Laboratory Building: It will be rehabilitated as Administration and Lecture building. It does not have so much fire damage.



Front View



Side View



Rear Side View



Roof: Several roof tiles are missing.



Roof: Several roof tiles are missing.



Broken glasses by shooting.



Poach : No damage by fire.



Entrance Aluminum Sash : All glasses are broken.



Entrance Eaves : Reinforced bars are exposed.



Entrance Hall : Handrail of the staircase is removed. No lighting fixtures of the ceiling.



Laboratory : There are some fire damage.



Laboratory : There are some fire damage.



Laboratory : Door panels are missing and aluminum door frame is broken.



Laboratory : No door panels and aluminum door frame is broken.



Storage : Ceiling was burnt.



Laboratory : Floor and desk tiles are peeled off.



Laboratory : There are fire damage on Floor cabinet.



Corridor at the ground floor : Graffiti on the wall.



Stair case : Hand rail is missing. Ceiling panel was damaged.



Laboratory : Water leakage on the ceiling.



Laboratory annex room : Door panels are removed



Laboratory : Water leakage on the ceiling.



Corridor 2nd floor : Leakage on the ceiling and cracks on the wall.



Storage : Ceiling was burnt down. Some roof tiles are removed.

East Timor National University, Hera Campus

Mechanical Workshop, which will be renovated as Electrical and Mechanical Workshop.



Exterior View : Fire damage on the roof.



Exterior View : Fire damage on the roof.



Exterior View : Aluminum sash and glasses are broken.



Exterior View : Damaged roof.



Workshop : Water leakage on the ceiling.
Lighting fixtures were removed.



Workshop : Water leakage on the ceiling.
Lighting fixtures were removed.



Workshop : Ceiling is damaged.



Workshop : Ceiling was burnt down.



Lower part of Workshop : Roof and ceiling were burnt down.



Lower part of Workshop : Roof was burnt down. Concrete surface color changed to pink.



Lower part of Workshop : Fire damaged ceiling.



Entrance shutter : It was broken.

East Timor National University, Hera Campus

Civil Workshop, which will be renovated as Civil Workshop.



Exterior View : Roof was damaged by fire.



Exterior View: Roof was damaged by fire.



Exterior View : Aluminum sashes were broken.



Exterior View : Damage of the roof.



Workshop Interior View : Existing equipment



Workshop Interior View: Damaged ceiling.



Workshop Interior View : Lower part of roof was burnt .



Workshop Interior View : Damaged wall and roof .



Lower part of Workshop : Fire damage of the ceiling and roof .



Lower part of Workshop : Fire damage of the roof .



Lower part of workshop : Fire damage of Ceiling and roof .



Corridor : Fire damage of the ceiling and roof .

East Timor National University, Hera Campus

Electrical Workshop, which can be renovated.



Exterior View: Damaged roof by fire.



Exterior View : Damaged roof by fire.



Exterior View : Damaged roof and shutter .



Workshop Interior View : Broken ceiling and lighting fixture.



Workshop Interior View : Ceiling and roof were damaged by fire.



Workshop Interior View : Water leakage on the ceiling.



Lower part of Workshop : Roof was broken by fire.



Workshop Interior View : Ceiling and roof were broken by fire.



Lower part of Workshop: Damaged Roof by fire.



Lower part of Workshop : Damaged roof by fire.



Lower part of Workshop : Broken ceiling and water leakage on the ceiling.

East Timor National University, Hera Campus
Canteen which will be renovated.



Exterior View : Peeling off the paint



Exterior View : peeled off plywood below eaves.



Interior View : Ruins of fire at the kitchen and ceiling



Interior View : Marks of water leakage and fire damage



Kitchen : Fire damage



Kitchen : Fire damage

East Timor National University, Hera Campus

Lecture Building A, which needs to be demolished.



Exterior View



Ground floor Corridor : Ceiling was broken by fire.



Lecture Room : Water leakage on the ceiling and cracks on the wall.



Lecture Room : Water leakage on the ceiling, and wall cracks on the wall.



Lecture Room : Wooden door panel is missing.



Lecture Room on the 2nd Floor : Ceiling and roof broken by fire.



Drawing Room on 2nd floor: Roof was burnt down.



Drawing Room on 2nd floor: Roof was burnt down.



Panorama view of Lecture building A,B and C.

East Timor National University, Hera Campus

Lecture Building B, which needs to be demolished.



Lecture Building A • B • C , panorama view



Lecture Building B : broken roof by fire



Ground floor Corridor : Ceiling was broken by fire.



Ground floor Corridor : Roof and Ceiling is broken by fire.



Lecture Room 1-2 : Water leakage on the ceiling, Broken Sash (All rooms of the ground floor are in the same condition, except Room 1-4)



Lecture Room 1-2 : No door



Lecture Room 1-4 : All Finishing coat damaged
Sash burnt and bent



Lecture Room 1-4 : Discoloration of the mortar



Lecture Room 1-4 : Aluminum sash broken



1st floor classroom : Fallen steel truss



1st floor classroom Fallen steel truss

East Timor National University, Hera Campus

Lecture Building C, which needs to be demolished.



Lecture Building B · C , Panorama view : Both roof is burnt.



Lecture Building C



Exterior View : declined outside wall



Ground floor Corridor : Roof and Ceiling was broken by fire



Classroom 1-3: Ceiling and floor tiles are removed



Classroom 1-3 : Ceiling, floor tiles and ALM sash are removed.



Classroom 1-2 : No door frame.



1st floor classroom : Fallen steel truss



1st floor Corridor : Roof and Ceiling is broken by fire

East Timor National University, Hera Campus
Library, which needs to be demolished.



Exterior view : From the lecture building side Front view: Roof on the right side burnt



1st floor : Interior view 1



1st floor : Interior view 2



2nd floor: Interior view, minor damage because here was few combustible material.



2nd floor : Interior view

East Timor National University, Hera Campus
Staff quarters, which needs to be demolished.



2-story house: It was totally burnt.



1 story house: It was broken intentionally



2-story house: burnt eaves



Mortar finish was peeled off.



2-story house 2nd floor
Rooms were heavily burnt.



Road is covered by bushes.

East Timor National University, Hera Campus

Dormitory Building A



Exterior View 1



Exterior View 2



Exterior View 3



View from the corridor towards



Interior View



Toilet and shower booth

East Timor National University, Hera Campus

Dormitory Building B,C



Building B, exterior view



Building B Bed Room: Interior view



Building B 2nd Floor corridor



Building B Bed Room : Fire dama



Building C Exterior View



Building C Bed Room :Fire damage
Only this room got fire.

East Timor National University, Hera Campus

Infrastructure: Electricity



Power intake by aerial electric cable.



Electrical room : No door



High tension Panel Board was broken intentionally.



High tension panel board room : cable pit



Transformer room : No door



Transformer : 400kVA



Generator room : destroyed by fire



Generator room : burnt switchboard and generator



Transformer on electric pole



Switchboard in residential zone : broken intentionally.



Secondary cable was cut off in residential zone

East Timor National University, Hera Campus

Infrastructure



Deep well



Well : Depth of 72m,



Reservoir: broken and mud settling



Lifting pump(2,950rpm) : broken



Control board of the lifting pump : broken



Tower of the elevated water tank

Similar Facilities

East Timor National University, Main building



Main building, Panorama



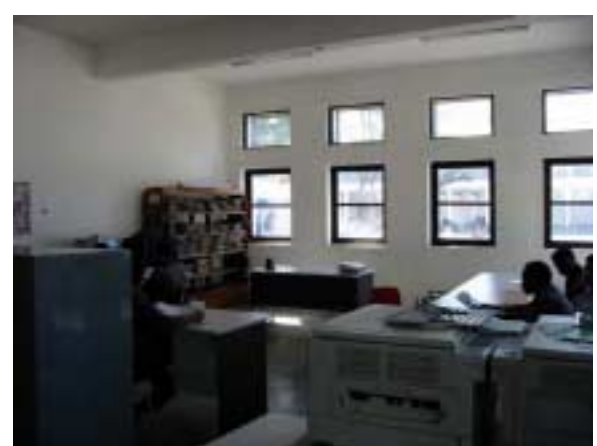
Entrance of the Main building



President's room



Vice President's room



Administration Office

East Timor National University, Main building



Administration Office



Classroom : (capacity 50 students)



Classroom



Classroom



Computer room : 20 PC (students) + 1 (professor)



Computer room, air conditioned

East Timor National University, Main building



Professor room : capacity 30 persons



Library : capacity 18 persons



Library : 3,850 books



New library under repair work : 100 seats and 34,000 books (expected)



New library : Internet room



Mini bus donated by an Australian company : 18 persons

Similar Facilities

East Timor National University, Faculty of Education



Front View



Outside View



Patio



Dean's room : 36 m², air-conditioned



Dean's room



Room for professors



Lecture Room for 60 students, air-conditioned



Lecture Room for 60 students, air-conditioned



Lecture Room for 32 students



Lecture Room for 32 students



Library Stack room for 35,000 books (Portuguese)



Library Reading room with 84 seats

8. Other relevant Data

References

Survey: Urgent Rehabilitation of the Faculty of Engineering of East Timor National University

No.	Title	Type	Original or Copy	Organization	Date
1	Employment Patterns and Skill Requirements in East Timor and their Implications for TVET	Report	Copy	AustAID + CAPET	2001.6
2	The Australian Aid Program in East Timor	Report	Copy	Australian Agency for International Development	2001.6
3	IMF DONOR'S MEETING ON EAST TIMOR	Report	Copy	IMF	2001.6
4	Voice of The Teachers	Report	Copy	UNICEF East-Timor	2001.6
5	Background Paper for donor's meeting on East Timor	Report	Copy	UNTAET and The World Bank	2001.6
6	East Timor Update, June/May 2001	Report	Copy	UNTAET	2001.5.6
7	EDUCATION IN EAST TIMOR	Report	Copy	National Planning and Development Agency	2001.5
8	East Timor Human Resources Survey Final Report	Report	Original	East Timor Development Agency	2001.5
9	AIDE-MEMOIRE PART A: NATIONAL EDUCATION BUDGET FOR FY 2001/2	Report	Copy	EAST TIMOR JOINT-DONOR EDUCATION SECTOR MISSION	2001.4
10	CAPACITY DEVELOPMENT FOR GOVERNANCE AND PUBLIC SECTOR MANAGEMENT	Report	Copy	National Planning and Development Agency Office of the Deputy Transitional Administrator	2001.3
11	TRAINING NEEDS ANALYSIS	Report	Copy	UNDP	2001.3
12	PROGRAMME SUPPORT DOCUMENT(PSD)	Report	Copy	UNDP	2001.1
13	On the Establishment of the Universidad Nacional de Timor Lorosae (Draft Regulation)	Book	Copy	UNTAET	2001
14	The Common Country Assessment (CCA) for East Timor Building Blocks for a Nation	Report	Copy	UN Country Team	2000.11
15	East Timor Establishing the Foundations of Sound Macroeconomic Management	Report	Copy	IMF	2000
16	The East Timor Combined Sources Budget	Report	Copy	Central Fiscal Authority ETTA	2001

8. References

9. Other Relevant Data

9-1 Water Quality Testing Result

Request For Water Quality Testing

last

Date: Sept 01

Requesting Organization : <u>PMU</u>	
Description of the organization :	
Contact person :	Telephone :
On behalf of organization, I agree to pay the cost of test requested below :	
Signature :	
Date and time sample was taken : <u>4 Sep 2001 / 19:30</u>	Date and time sample was received :
Sample location specification : <u>DISTRICT DIU (HEKA) POLYTERMAK I</u>	
Water source: <input type="checkbox"/> River	<input type="checkbox"/> Mountain Stream
<input type="checkbox"/> Spring	<input checked="" type="checkbox"/> Well
<input type="checkbox"/> Others	
Sampled by :	Received in laboratory by :
Approved to test by : <u>MIGUEL Quintao WSS Laboratory</u>	
Signature :	

Cost (AUS)	Parameter	Unit	Request test	Result	East Timor Guideline	Testing method
3.74	pH value	-		<u>7.7</u>	6.5-8.5	Comparator
1.64	Electrical conductivity	(μ S/cm)		<u>539</u>	NS	Conductivity meter
1.64	Total dissolved solids	(Mg/L)		<u>261</u>	1000	Conductivity meter
1.64	Salinity	(‰)		<u>0.3</u>	NS	Conductivity meter
1.64	Temperature	(°C)		<u>23</u>	NS	Conductivity meter
1.73	Turbidity	NTU		<u>1.0</u>	5 (NTU)	Turbidity meter
4.67	NH ₃ -N	mg/L		<u>6.4</u>	NS	Spectrophotometer
4.72	NO ₂ -N	mg/L		<u>0.1</u>	50 (as NO ₃)	Spectrophotometer
3.47	NO ₃ -N	mg/L		<u>0.001</u>	3 (as NO ₂)	Spectrophotometer
3.24	Iron (Fe)	mg/L		<u>0.02</u>	0.3	Spectrophotometer
3.84	Manganese (Mn)	mg/L		<u>ND</u>	0.3	Spectrophotometer
3.64	Fluoride	mg/L		<u>ND</u>	1.5	Spectrophotometer
3.74	Free chlorine	mg/L		<u>NT</u>	5	Comparator
4.88	Total hardness	mg/L		<u>148</u>	200 (CaCO ₃)	Titration
4.88	Total alkalinity	mg/L		<u>228</u>	NS	Titration
	Total coliform			<u>NT</u>	-	Paper slip test
	General bacteria			<u>NT</u>	-	Paper slip test
32.54	Total coliform	CFU/100mL		<u>NT</u>	0	Membrane filtration
32.54	E.Coli	CFU/100mL		<u>NT</u>	0	Membrane filtration
Total cost		Remark				
		Inspected by : <u>Miguel Quintao</u>				

Legend:

1. NS: not set; ND: not detectable; NT: not tested; NR: no result
2. For paper slip test, the result is quantified by number of colonies grew on the paper slip: "0": 0- "2": 3-10; "+" : 10-20; "++": 20-30; "+++": more than 30
3. CFU : Colony Formed Unit TNC : too Numerouse Count.

Date: Sept 01

Requesting Organization : <u>PMU</u>	
Description of the organization :	
Contact person :	Telephone :
On behalf of organization, I agree to pay the cost of test requested below :	
Signature :	
Date and time sample was taken : <u>4 Sep 2001</u>	Date and time sample was received :
Sample location specification : <u>DISTRICT DILI (HERA X) POLYTEKNIK 1</u>	
Water source: <u>River</u> <u>Mountain Stream</u> <u>Spring</u> <u>Well</u> <u>Others</u>	
Sampled by :	Received in laboratory by :
Approved to test by : <u>MIGUEL Quintao WSS Laboratory</u>	
Signature	

Cost (AUS)	Parameter	Unit	Request test	Result	East Timor Guideline	Testing method
3.74	pH value	-		<u>7.5</u>	6.5-8.5	Comparator
1.64	Electrical conductivity	(μ S/cm)		<u>538</u>	NS	Conductivity meter
1.64	Total dissolved solids	(Mg/L)		<u>261</u>	1000	Conductivity meter
1.64	Salinity	(‰)		<u>0.3</u>	NS	Conductivity meter
1.64	Temperature	(°C)		<u>23.0</u>	NS	Conductivity meter
1.73	Turbidity	NTU		<u>0.8</u>	5 (NTU)	Turbidity meter
4.67	NH ₃ -N	mg/L		<u>4.3</u>	NS	Spectrophotometer
4.72	NO ₃ -N	mg/L		<u>0.2</u>	50 (as NO ₃)	Spectrophotometer
3.47	NO ₂ -N	mg/L		<u>0.001</u>	3 (as NO ₂)	Spectrophotometer
3.24	Iron (Fe)	mg/L		<u>0.02</u>	0.3	Spectrophotometer
3.84	Manganese (Mn)	mg/L		<u>0.1</u>	0.3	Spectrophotometer
3.64	Fluoride	mg/L		<u>0.54</u>	1.5	Spectrophotometer
3.74	Free chlorine	mg/L		<u>NT</u>	5	Comparator
4.88	Total hardness	mg/L		<u>154</u>	200 (CaCO ₃)	Titration
4.88	Total alkalinity	mg/L		<u>284</u>	NS	Titration
	Total coliform			<u>NT</u>	-	Paper slip test
	General bacteria			<u>NT</u>	-	Paper slip test
32.54	Total coliform	CFU/100mL		<u>NT</u>	0	Membrane filtration
32.54	E. Coli	CFU/100mL		<u>NT</u>	0	Membrane filtration
Total cost		Remark				
		Inspected by : <u>Miguel Quintao</u>				

Legend:

1. NS: not set; ND: not detectable; NT: not tested; NR: no result
2. For paper slip test, the result is quantified by number of colonies grew on the paper slip: "0": 0- "±": 3-10; "+" : 10-20; "++" : 20-30; "+++" : more than 30
3. CFU : Colony Formed Unit TNC : too Numerous to Count.

Request For Water Quality Testing

700 minutes -
constant test
Date: Sept 01

Requesting Organization : PMU	
Description of the organization :	
Contact person :	Telephone :
On behalf of organization, I agree to pay the cost of test requested below :	
Signature :	
Date and time sample was taken : 5 Sep 2001 / 0520	Date and time sample was received :
Sample location specification : DISTRICT DILI (HEMAYO) POLYTEKNIK 1	
Water source: <input type="checkbox"/> River <input type="checkbox"/> Mountain Stream <input type="checkbox"/> Spring <input checked="" type="checkbox"/> Well <input type="checkbox"/> Others	
Sampled by :	Received in laboratory by :
Approved to test by : MIGUEL Quintao WSS Laboratory	
Signature :	

Cost (A03)	Parameter	Unit	Request test	Result	East Timor Guideline	Testing method
3.74	pH value	-		8.3	6.5-8.5	Comparator
1.64	Electrical conductivity	(μ S/cm)		581	NS	Conductivity meter
1.64	Total dissolved solids	(Mg/L)		282	1000	Conductivity meter
1.64	Salinity	(‰)		0.3	NS	Conductivity meter
1.64	Temperature	(°C)		28.1	NS	Conductivity meter
1.73	Turbidity	NTU		3.0	5 (NTU)	Turbidity meter
4.67	NO ₃ -N	mg/L		3.2	NS	Spectrophotometer
4.72	NO ₂ -N	mg/L		0.2	50 (as NO ₃)	Spectrophotometer
3.47	NO ₂ -N	mg/L		0.002	3 (as NO ₂)	Spectrophotometer
3.24	Iron (Fe)	mg/L		0.07	0.3	Spectrophotometer
3.84	Manganese (Mn)	mg/L		0.4	0.3	Spectrophotometer
3.64	Fluoride	mg/L		0.01	1.5	Spectrophotometer
3.74	Free chlorine	mg/L		NT	3	Comparator,
4.88	Total hardness	mg/L		209	200 (CaCO ₃)	Titration
4.88	Total alkalinity	mg/L		322	NS	Titration
	Total coliform			NT	-	Paper slip test
	General bacteria			NT	-	Paper slip test
32.54	Total coliform	CFU/100mL		NT	0	Membrane filtration
32.54	E. Coli	CFU/100mL		NT	0	Membrane filtration
Total cost		Remark				
		Inspected by : Mario Saung.				

Legend:

1. NS: not set; ND: not detectable; NT: not tested; NR: no result
2. For paper slip test, the result is quantified by number of colonies grew on the paper slip: "-": 0- "±": 1-10; "+" : 10-20; "+-" : 20-30; "++": more than 30
3. CPU : Colony Formed Unit TNC : too Numerous to Count.

Request For Water Quality Testing

1000 minutes
constant lab

Date: Sept-01

Requesting Organization : <u>PMU</u>	
Description of the organization :	
Contact person :	Telephone :
On behalf of organization, I agree to pay the cost of test requested below :	
Signature :	
Date and time sample was taken : <u>5 Sep 2007 / 1650</u>	Date and time sample was received :
Sample location specification : <u>DISTRICT DILI (HERAL)</u> <u>POLY TERAK - 1</u>	
Water source: <u>River</u> <u>Mountain Stream</u> <u>Spring</u> <u>(Well)</u> <u>Others</u>	
Sampled by :	Received in laboratory by :
Approved to test by : <u>MICHAEL QUINTAO WSS Laboratory</u>	
Signature :	

Cost (USD)	Parameter	Unit	Request test	Result	East Timor Guideline	Testing method
PHYSICAL						
3.74	pH value	-		<u>7.5</u>	6.5-8.5	Comparator
1.64	Electrical conductivity	(μ /cm)		<u>527</u>	NS	Conductivity meter
1.64	Total dissolved solids	(Mg/L)		<u>255</u>	1000	Conductivity meter
1.64	Salinity	(‰)		<u>0.3</u>	NS	Conductivity meter
1.64	Temperature	(°C)		<u>23.3</u>	NS	Conductivity meter
1.73	Turbidity	NTU		<u>0.8</u>	5 (NTU)	Turbidity meter
CHEMICAL						
4.67	NH ₃ -N	mg/L		<u>3.3</u>	NS	Spectrophotometer
4.72	NO ₃ -N	mg/L		<u>0.3</u>	50 (as NO ₃)	Spectrophotometer
3.47	NO ₂ -N	mg/L		<u>0.002</u>	3 (as NO ₂)	Spectrophotometer
3.24	Iron (Fe)	mg/L		<u>0.02</u>	0.3	Spectrophotometer
3.84	Manganese (Mn)	mg/L		<u>0.1</u>	0.3	Spectrophotometer
3.64	Fluoride	mg/L		<u>0.17</u>	1.5	Spectrophotometer
3.74	Free chlorine	mg/L		<u>NT</u>	5	Comparator,
4.88	Total hardness	mg/L		<u>160</u>	200 (CaCO ₃)	Titration
4.88	Total alkalinity	mg/L		<u>296</u>	NS	Titration
BIOLOGICAL						
	Total coliform			<u>NT</u>	-	Paper slip test
	General bacteria			<u>NT</u>	-	Paper slip test
32.54	Total coliforms	CFU/100mL		<u>NT</u>	0	Membrane filtration
32.54	E.Coli	CFU/100mL		<u>NT</u>	0	Membrane filtration
Total cost : Remark						
Inspected by : <u>Monis Seang.</u>						

Legend:

1. NS: not set; ND: not detectable; NT: not tested; NR: no result
2. For paper slip test, the result is quantified by number of colonies grew on the paper slip: "0"; "±": 3-10; "1-2": 10-20; "1-3": 20-30; "4-5": more than 30
3. CFU : Colony Formed Unit TNC : too Numerously Count.