

**JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)**

No.
-----

**MINISTRY OF INFRASTRUCTURE**

**DEMOCRATIC REPUBLIC OF TIMOR - LESTE**

**THE CAPACITY DEVELOPMENT BY TRAINING  
AND PREPARATION OF GUIDELINES AND MANUALS  
FOR ROADS  
IN  
DEMOCRATIC REPUBLIC OF TIMOR – LESTE  
PROJECT COMPLETION REPORT  
(MAIN REPORT)**

**MARCH 2008**

**JAPAN ENGINEERING CONSULTANTS CO., LTD.**

<b>SD</b>
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<b>08-23</b>

**THE PROJECT FOR CAPACITY DEVELOPMENT BY TRAINING  
AND PREPARATION OF GUIDELINES AND MANUALS FOR ROADS  
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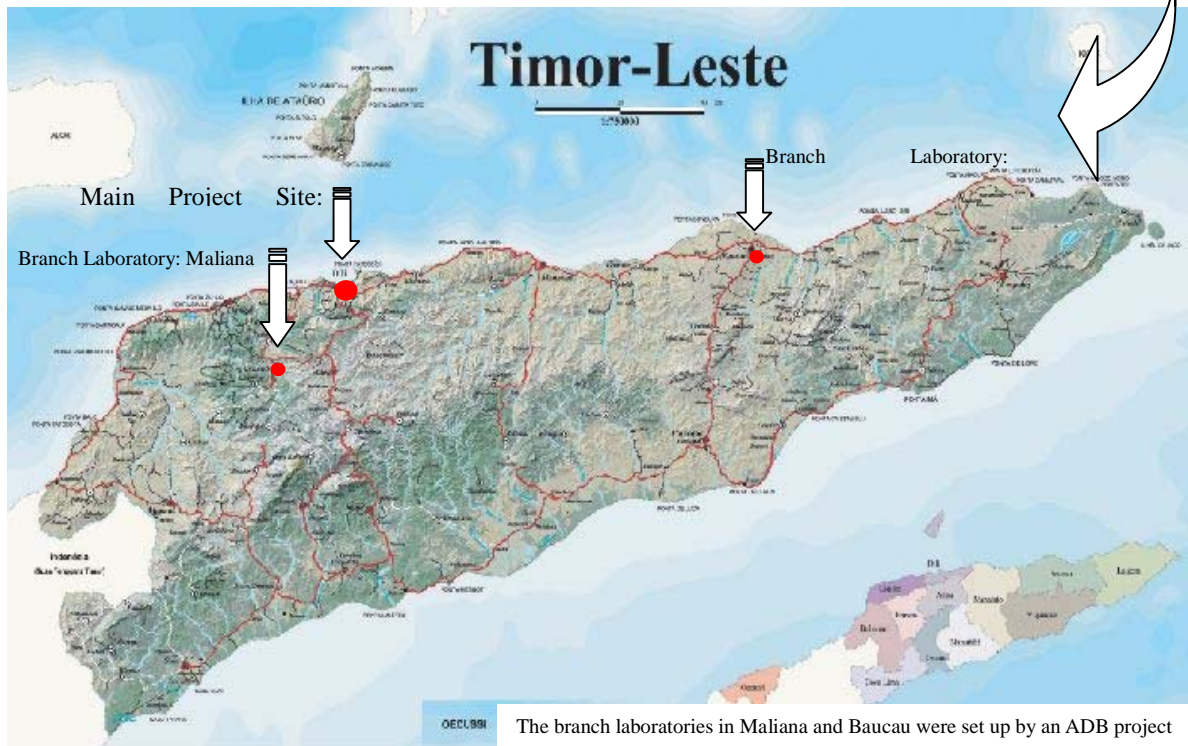
**jica** Japan International Cooperation Agency

Prepared by



**JAPAN ENGINEERING CONSULTANTS CO., LTD.  
JAPAN**

# Project Sites



The branch laboratories in Maliana and Baucau were set up by an ADB project

## Basic Data for Timor-Leste

1. Area: 14,900 km<sup>2</sup> (similar to Nagano Prefecture in Japan)
2. Population: approximately 925,000 (2005)
3. Capital: Dili (population: 150,000)
4. Ethnic groups: predominantly Malayo-Polynesian; some Malay and Chinese
5. Languages: Tetum, Portuguese and English
6. Religions: Christians – 99.1% (predominantly Catholic); Muslim – 0.79%
7. Currency: US dollar; local centaro coins are used alongside US cent coins
8. GDP: US\$ 336 million (2003); US\$ 339 million (2004 estimate)
9. GDP per capita: US\$ 412.6 (2003); US\$ 354.7 (2004)
10. Economic growth rate: -6.7% (2002); -6.2% (2003); 1.8% (2004 estimate)
11. Price inflation rate: 9.5% (2002); 4.2% (2003); 1.8% (2004 estimate)
12. Main industries: agriculture and fisheries (rice, maize, cassava and sweet potatoes, etc; the cultivation of coffee as an export crop is encouraged)
13. Oil and natural gas: (found at the Timor Gap)
14. Topography and climate: Mainly mountains formed by strong orogenic movements in the Tertiary Era of the Cenozoic but no active volcanoes; Mt. Tatamailau (2,963 m) belongs to the savannah zone with a dry season from May to October and a rainy season from December to March.  
Temperature: maximum of 31°C; minimum of 28°C  
Relative humidity: maximum of 70%; minimum of 53% (Dili)

## ABBREVIATION

### International Organizations

ADB	Asian Development Bank
JICA	Japan International Cooperation Agency
UNISSET	United Nations Mission of Support in East Timor
WB	World Bank

### Others

As	Asphalt Concrete Pavement
AADT	Annual Average Day Traffic
AASHTO	American Association of State Highway and Transport Officials
ASTM	American Society for Testing and Materials
CBRM	Capacity Building for Road Maintenance Project
C/P	Counterpart
DRBFC	Division of Roads, Bridges and Flood Control
DRD	Division of Research and Development
GDP	Gross Domestic Product
INAP	National Institute of Public Administration, Ministry of State Administration and Territorial Management, Timor-Leste
JCC	Joint Coordination Committee
JV	Joint Venture
NDPEAC	National Directorate for Planning Assistance Coordination, Timor-Leste
PDM	Project Design Matrix
RDCRB	Research and Development Center for Roads and Bridges
SNI	Standar Nasional Indonesia
TFET	Trust Fund for East Timor

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and  
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in Timor-Leste**

**PROJECT COMPLETION REPORT**

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**Exchange Rate**

US Dollar (US\$)1= Japanese Yen (¥) 109.98

Indonesian Rupia (IDR)1= Japanese Yen (¥)0.01172

As of December, 2007

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## CHAPTER 1 INTRODUCTION

### 1.1 OUTLINES OF THE PROJECT

#### 1.1.1 Background of the Project

The rehabilitation of the infrastructure which was destroyed by civil unrest in September, 1999 has been started in Timor-Leste with the assistance of the world community. While the development and maintenance of the infrastructure which will comprise the basis for medium and long-term socioeconomic development is necessary, there is a serious shortage of human resources to fill middle and senior administrative positions of the government which were formerly worked by Indonesian nationals. Further development of the planning capacity by the Timor-Leste people is required in the field of government policies, socio economic development, law, human resources development and individual projects.

The UN Mission of Support for Timor-Leste (UNMISSET) has provided support to improve the situation, mainly consisting of the dispatch of advisors for 100 positions in the field of infrastructure being considered a priority sector along with the judiciary and finance. Since the completion of the UNMISSET, international advisors have been assigned to the ministers and the main senior official, but the scale of the need demands medium to long-term capacity development (C/D). The following problems are identified.

#### **[Problems related to Policy]**

- ✓ There is no clearly established process starting from policy planning to implementation and evaluation.
- ✓ The quality of construction work has not been controlled due to the absence of legal systems and technical standards of the construction being appropriate for Timor-Leste.

#### **[Problems related to Human Resources Development]**

- ✓ Practical and well-organized training programs have not been conducted, due to the absence of a comprehensive and strategic development plan of human resources.

While the Government of Japan has been assisting capacity building through the formulation of urgent development plans based on the relevant studies and training in Japan, further assistance is required to establish the independent management of the country by the Timor-Leste people for the medium and long-term utilizing the Trust Fund for Timor-Leste (TFET) project, etc. In order to solve the problems listed above, the Government of

Timor-Leste has made a request for the present technical cooperation project, including (i) the preparation of technical standards which are appropriate for Timor-Leste and the establishment of materials testing system for quality control and (ii) the establishment of a viable organization for the DRD, both of which are priorities for the MOI (former MPW), the counterpart organization for the Project.

### 1.1.2 Project Purpose

The goal and project purpose agreed between the Preliminary Study Team and the Government of Timor-Leste are described below;

Table 1-1 Project Purpose agreed with Timor-Leste side

Goal	Improved road construction and maintenance in Timor-Leste
Project Purpose	Improvement of the road construction and maintenance capacity of the DRD and the DRBFC through the training and the preparation of manuals and guidelines.
Outputs	<ul style="list-style-type: none"> <li>■ Improved technical levels of DRD and DRBFC staff members in regard to material testing, pavement design and slope protection</li> <li>■ Preparation of manuals and guidelines <ul style="list-style-type: none"> <li>• Material (soil, concrete and asphalt) testing guidelines and Manuals</li> <li>• Pavement design manual</li> <li>• Slope protection guideline</li> </ul> </li> </ul>

### [Definition of Terms]

Standards : Standards based on the statutory law of the country

Guideline : Commanding the status of supplementary reference materials compiling the technical levels and methods in given technical field

Manual : Commanding the status of internal rules of competent ministry/agency as it complies the application methods of the standards

### 1.1.3 Project Activity to be implemented

The technical cooperation project for the Project for Capacity Development by Training, and Preparation of Guidelines and Manuals (hereinafter referred to as “the Project”) is designed to implement the following activities;

- (1) Support for human resources development at the MOI’s DRD which is responsible for various standards and material testing related to infrastructure and at the DRBFC which

is responsible for construction and maintenance.

- (2) Preparation of technical guidelines and manuals for material (soil, concrete and asphalt) testing with capacity development and slope protection and pavement design.
- (3) Strengthening of the collaboration system with road construction and maintenance through the provision of technical support on the DRBFC, which is responsible for construction, by the DRD which is responsible for standards and material testing based on the fulfilment of above two objectives

Assistance for establishment of the system under which the construction and maintenance of high quality roads is controlled and sustainable in Timor-Leste.

#### 1.1.4 Organization Involved in the Project in Timor-Leste

##### (1) Ministry Involved

The Ministry of Infrastructure is involved on the execution of the Project.

The Ministry of Infrastructure (MOI) which is the former Ministry of Public Works (MPW) has been restructured, effecting from August.2007. The former MPW was integrated with the organizations having of administration responsibilities for information, transport, postal, electricity and water environment.

The total numbers of employee of the MOI is 1,738 consisting 942 of permanent and 796 of temporary, and total number of employee for the Public Works is 350 as of November, 2007.

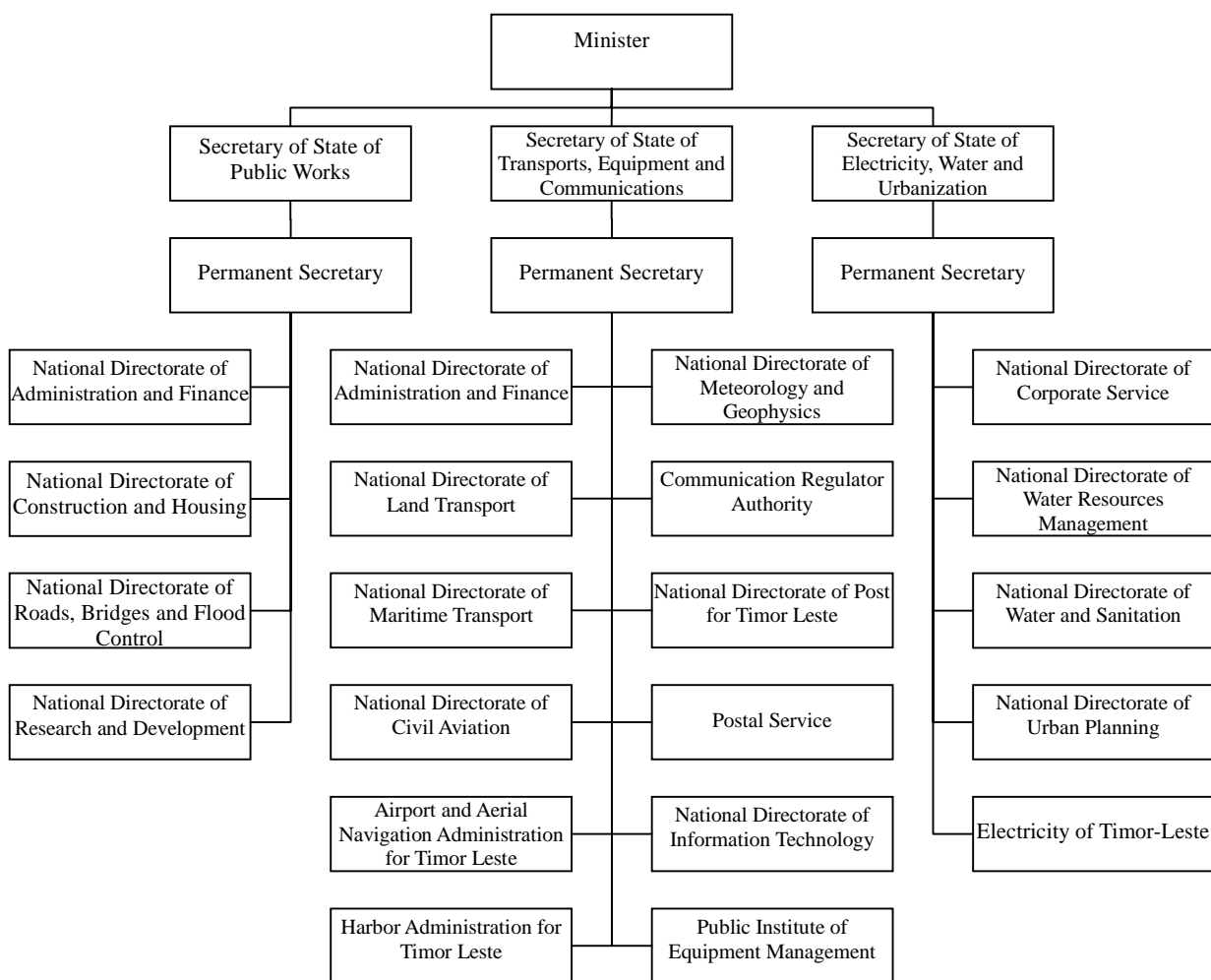


Figure 1-1 Organization Chart of Ministry of Infrastructure

(2) Counterpart (C/P) Organizations

There are some organizations concerned as counterpart of the Project, those are;

- Division of Research and Development (DRD), Bureau of the MOI
- Division of Roads, Bridges and Flood Control (DRBFC), Bureau of the MOI
- Five local office under jurisdiction of the DRBFC

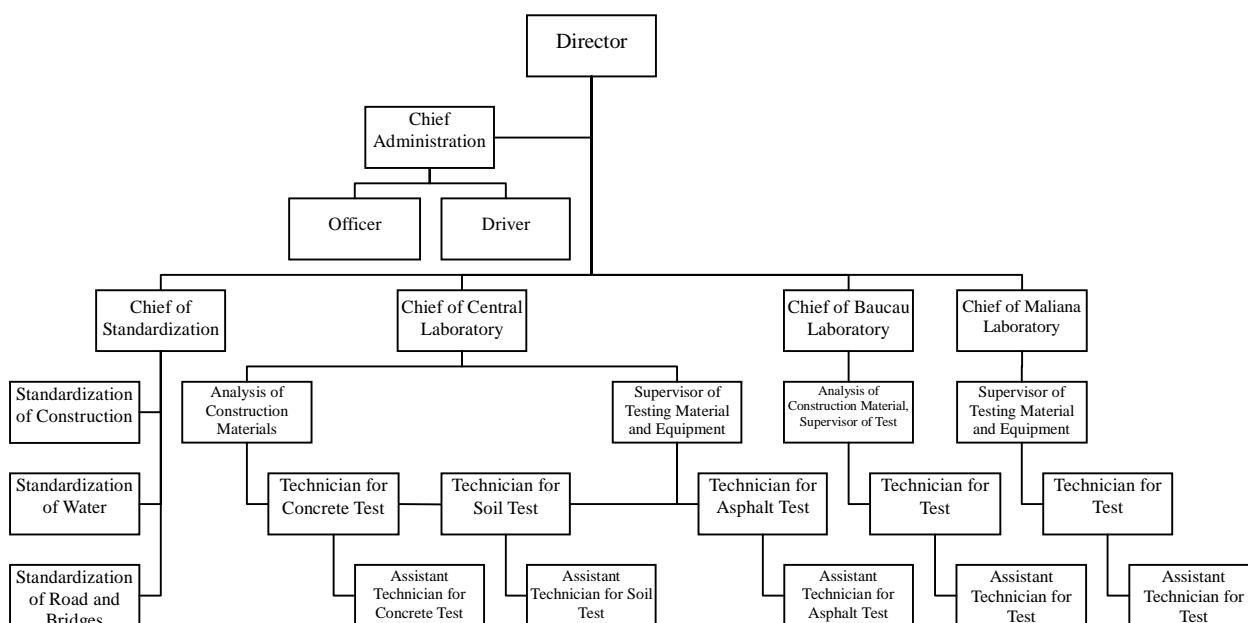


Figure 1-2 Organization Chart of Division of Research and Development (DRD)

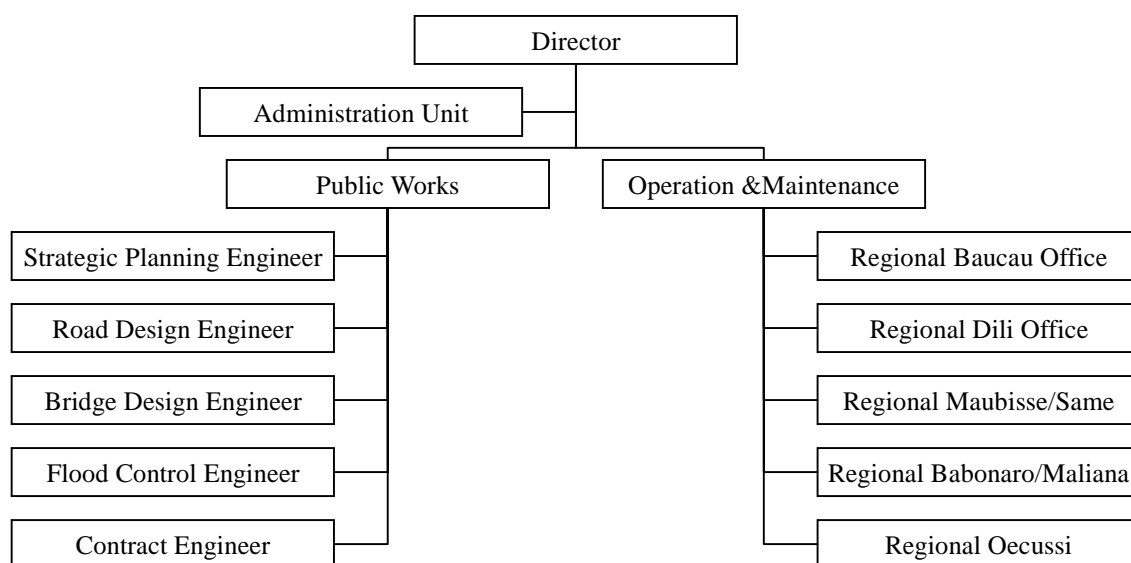


Figure 1-3 Organization Chart of Division of Roads, Bridges and Flood Control (DRBFC)

Total employee of the DRD is 41 consisting of 1 for director, 6 for chiefs, 10 for officers and 8 for assistants and 16 for others, of which 17 for permanent and 24 for temporary as of November, 2007.

Total employee of the DRBFC is 131 consisting of 1 for director, 17 for chiefs, 24 for officers and 32 for assistants and 57 for others, of which 91 for permanent and 40 for temporary as of November, 2007.

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(3) Beneficiaries

Direct Beneficiaries : Staff members of the MOI, particularly those of the C/P organizations

Indirect Beneficiaries : People of Timor-Leste (approx. 925,000 as of 2005)

## 1.2 OVERALL SCHEDULE OF THE PROJECT

### 1.2.1 Overall Schedule of the Entire Project

The work to be conducted under the Project can be classified into the following categories;

- Work Category 1: Preparatory Work in Japan and Explanation to and Discussions with the Counterpart Organizations
- Work Category 2: Preparation of the Manuals and Guidelines (Including Local Sub-Contracting)
- Work Category 3: Implementation of OJT and Workshops
- Work Category 4: Joint Coordination Meeting and Seminar
- Work Category 5: Planning and Implementation of the Training in Indonesia (Including Local Sub-Contracting)
- Work Category 6: Assistance for the Active Use of the Manuals and Guidelines

The flow of these work categories and the general flow of the Project Implementation are shown in Figure 1-4.

Table 1-2 PDM (0) for the Project shows the general activities to “build the road construction and maintenance capacity of DRD and DRBCF staff through training and the preparation of manuals and guidelines” and the indicators for evaluation of the level of achievement following the implementation flow.

The PDM (0) remains unchanged from that of the Inception Report approved by the JCC held on 3<sup>rd</sup> March 2006. The Project would be evaluated by the PDM (0), accordingly.



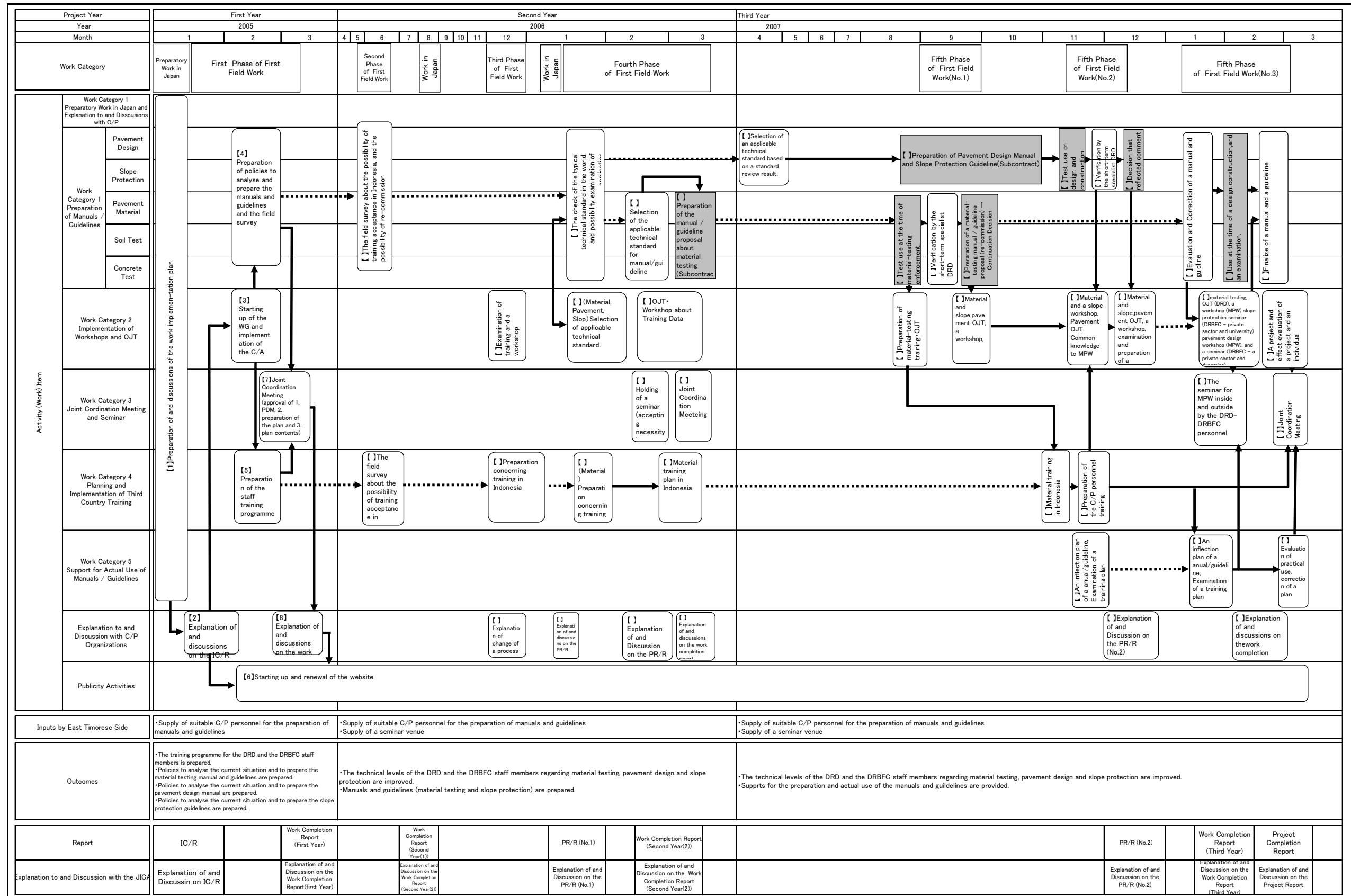


Figure 1-4 Project Implementation Schedule

**PDM for the Project for Capacity Development by Training, and Preparations of Guidelines and Manuals for Roads (PDM 0)**

Period: Jan., 2006 – Mar., 2008

Target Group: DRD and DRBFC Staff concern to Material (Asphalt, Concrete, Soil) testing, Pavement design and Slope Protection

Date of Preparation: 6<sup>th</sup> March., 2006

Table 1-2 Project Design Matrix (PDM 0)

Overall Goal	Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<p>• Improve road construction and maintenance capacity in Timor – Leste</p>	<p>• Improvement of the road construction and maintenance capacity of the DRD and DRBFC through training and the preparation of manual/guideline</p>	<ul style="list-style-type: none"> <li>By applying the prepared manuals/guidelines properly, road construction, maintenance and quality control are systematically conducted, and contribute to quality/quantity improvement of roads.</li> <li>The knowledge and experience got through trainings and seminars are transferred to other road engineers to develop technology and skills of MOI</li> </ul>	<ul style="list-style-type: none"> <li>The publication of the Government.</li> <li>The records of the MOI</li> </ul>	<ul style="list-style-type: none"> <li>The Policy of the MOI remains unchanged regarding application of technical standard.</li> </ul>
<p>• Improvement of the road construction and maintenance capacity of the DRD and DRBFC through training and the preparation of manual/guideline</p>	<p>• Effort will be made to prepare technical standards for material testing, pavement design and slope protection based on the manuals and guidelines prepared by the Project</p> <ul style="list-style-type: none"> <li>Staff members if the DRD and DRBFC will precisely perform their work through the actual use of the manual and guideline</li> <li>Transfer of technology to external personnel through seminar, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Effort will be made to prepare technical standards for material testing, pavement design and slope protection based on the manuals and guidelines prepared by the Project</li> <li>Staff members if the DRD and DRBFC will precisely perform their work through the actual use of the manual and guideline</li> <li>Transfer of technology to external personnel through seminar, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Project Completion Report</li> <li>Seminar Report (Questionnaire survey with participants)</li> </ul>	<ul style="list-style-type: none"> <li>The required budget and human resources of the DRD and DRBFC are maintained.</li> </ul>
<p>1. Preparation of manuals and guidelines (material testing manual and guideline; pavement design manual; slope protection guideline)</p> <p>2. Improved technical level of the DRD's and DRBFC's staff members in regard to material testing, pavement design and slope protection</p>	<p>1. Preparation of material testing manual and guideline, pavement design manual slope protection guideline</p> <p>2. Training of the DRD's and DRBFC's staff members</p> <p>2.1 More than 80% of the DRD Staff member mark more than 70 points of the paper test* by the end of the Project conducted by the expert. (Material manual/Guideline)</p> <p>2.2 More than 80% of the DRBFC Staff member mark more than 70 points of the paper test* by the end of the Project conducted by the expert. (Asphalt pavement design manual / Slope protection guideline)</p>	<p>1. Preparation of material testing manual and guideline, pavement design manual slope protection guideline</p> <p>2. Training of the DRD's and DRBFC's staff members</p> <p>2.1 More than 80% of the DRD Staff member mark more than 70 points of the paper test* by the end of the Project conducted by the expert. (Material manual/Guideline)</p> <p>2.2 More than 80% of the DRBFC Staff member mark more than 70 points of the paper test* by the end of the Project conducted by the expert. (Asphalt pavement design manual / Slope protection guideline)</p>	<p>1 Manuals and Guidelines</p> <p>2. Project Completion Report</p> <p>3. Capacity Assessment (Paper test)</p>	<ul style="list-style-type: none"> <li>The prepared manuals and guidelines are adopt as standard of Timor-Leste..</li> </ul>
<p><b>1. Preparation of Manuals/Guidelines</b></p> <p><b>1-1 Material Testing Manual/Guideline</b></p> <p>(1) Selection of technical standards which are applicable to Timor – Leste</p> <p>(2) Preparation of the material testing manual/guideline based on existing technical standards for material testing</p> <p>(3) Preparation of a use support plan</p> <p>(4) Setting up of standard testing fees</p> <p><b>1-2 Pavement Design Manual</b></p> <p>(1) Selection of technical standards which are applicable to Timor – Leste</p> <p>(2) Preparation of draft pavement design manual based on the existing technical standards for pavement design</p> <p>(3) Publicity of the contents of the prepared pavement design manual through workshops and seminars</p> <p>(4) Preparation of a use support plan</p> <p><b>1-3 Slope Protection Guidelines</b></p> <p>(1) Selection of slope protection works which are applicable to Timor – Leste by field investigation.</p> <p>(2) Selection of technical standards which are applicable to Timor – Leste.</p> <p>(3) Preparation of the draft slope protection guidelines based on the existing technical standards for slope protection</p> <p>(4) Field re-investigation based on the guidelines</p> <p>(5) Publicity of the contents of the prepared slope protection guidelines through workshops and seminars</p> <p>(6) Preparation of a use support plan</p> <p><b>2. Training of the DRD's and DRBFC's staff members</b></p> <p>(1) Judgement on the necessity for training and checking of the capacity of staff members</p> <p>(2) Training at the DRD and DRBFC Overseas training</p>	<p><b>Inputs</b></p> <p><b>Japanese Side</b></p> <p>Experts: short-term expert x 4</p> <p>1) Leader / Road (Pavement Design)/Material Testing (Pavement Test)</p> <p>2) Road (Slope Protection)</p> <p>3) Material Testing (Soil Test)</p> <p>4) Concrete Testing</p> <p><b>Timor Leste Side</b></p> <p>(1) Human resources: C/P personnel DRBFC Engineers, DRD Engineers</p> <p>(2) Funding: personnel cost for the C/P personnel and material testing cost required for project implementation</p> <p>(3) Land, buildings and facilities, etc.: training and seminar venues, etc.</p>	<p><b>Inputs</b></p> <p><b>Japanese Side</b></p> <p>Experts: short-term expert x 4</p> <p>1) Leader / Road (Pavement Design)/Material Testing (Pavement Test)</p> <p>2) Road (Slope Protection)</p> <p>3) Material Testing (Soil Test)</p> <p>4) Concrete Testing</p> <p><b>Timor Leste Side</b></p> <p>(1) Human resources: C/P personnel DRBFC Engineers, DRD Engineers</p> <p>(2) Funding: personnel cost for the C/P personnel and material testing cost required for project implementation</p> <p>(3) Land, buildings and facilities, etc.: training and seminar venues, etc.</p>	<p>1 Leader / Road (Pavement Design)/Material Testing (Pavement Test)</p> <p>2) Road (Slope Protection)</p> <p>3) Material Testing (Soil Test)</p> <p>4) Concrete Testing</p>	<ul style="list-style-type: none"> <li>The trained C/P personnel continue to work at these divisions.</li> </ul> <p>Pre-conditions</p> <ul style="list-style-type: none"> <li>There is no involvement by other donors in the organizations and sectors to be assisted by the Japanese side. If there is, it is at an adjustable level.</li> </ul>

## CHAPTER 2 RESULTS OF THE PROJECT

### 2.1 ACHIEVEMENTS LEVEL

#### 2.1.1 Achievement Level to the Project Purpose

As the Project Purpose was set to be the improvement of road construction and maintenance capacity of the DRD and the DRBFC through the preparation of guidelines/manuals, the guidelines and manuals prepared in the Project almost covers the requirements and demands of the C/P's activities. It could be evaluated that the Project has successfully achieved the targeted level

However, the requirements and the demands might be changed by the future development and expansion of the construction industry in Timor-Leste, the C/P, by own effort, has to develop their skill obtained by the Project as well as the contents of the guidelines and the manuals so as to meet the trend and new requirements.

#### 2.1.2 Achievement Level to the Project Outputs

The achievement level to the expected project outputs can be summarized as generally successful; the details are as follows;

- (1) [Output 1]:Preparation of manuals and guidelines (material testing manual and guideline, pavement design manual and slope protection guideline)

Through the discussion with JICA Experts and the Training in Indonesia, the C/P has selected items and contents which are essential for the Manuals and Guidelines in the Timor-Leste. As the result of that, the C/P has succeeded to prepare the Manuals and Guidelines and start to utilize them for road works.

The outlines of the output 1 are as follows;

Table 2-1 Outlines of Output 1

No.	Name	Outlines	Main Language used
1	Pavement Design Manual	Manual for pavement design based on the AASHTO methodology. It also covers rehabilitation and bituminous material design	English

No.	Name	Outlines	Main Language used
2	Slope Protection Guideline	Guideline for slope protection based upon several existing documents but mainly European's one. It covers design and survey methodology, the standard survey form is annexed.	English
3	Soil Material Testing Guideline and Manual	Soil material testing manual and guideline for selected testing items in terms of road works, based upon the SNI	Indonesian
4	Concrete Material Testing Guideline and Manual	Concrete material testing manual and guideline for selected testing items in terms of road works, based upon the SNI	Indonesian
5	Asphalt Material Testing Guideline and Manual	Asphalt material testing manual and guideline for selected testing items, based upon the SNI	Indonesian

The detailed contents of each manual are shown in Chapter 7.

The language used in each manual and guideline was selected by the following considerations;

■ Material Testing Guidelines and Manuals

Main user of the Material Testing Guidelines/Manuals is considered to be technicians who carry out testing physically at laboratory; the Indonesian language shall be used as texts of the Manuals in order them to understand easily since technicians are using existing standards and manuals written in Indonesian language in their daily work.

■ Pavement Design Manual and Slope Protection Guideline

Main user of the Pavement Manual and Slope Guideline is considered to be engineers who

are given English education. Besides, considering existing MOI's capability of both financial and engineering level, large scale pavement and slope protection work is difficult to be carried out by themselves alone. In case of conducting such works it is necessary to have support from foreign financier and engineer. Accordingly, English is selected as text on the Manual and the Guideline so as both foreign and Timor engineers to understand the contents of the Pavement Manual and the Slope Protection Guidelines.

- (2) [Output 2]: Improved technical level of the DRD's and the DRBFC's staff members in regard to material testing, pavement design and slope protection

On the final capacity assessment conducted by JICA Experts, 80% of the C/P obtained more than 70 score, which means that C/P's technical skill has been reached at acceptable level on the execution of the material testis as well as the pavement and slope protection designs. The following table shows the results of the final capacity assessment.

Table 2-2 Results of Final Capacity Assessment

Subjects	Soil Material Testing	Concrete Material Testing	Asphalt Material Testing	Pavement Design	Slope Protection
Nos. of Trainees (C/P)	6	6	8	2	2
Average Score	69.0	73.8	73.1	75.0	75.0
% of Trainees with more than 70 score	83.3	83.3	87.5	100.0	100.0

Following Table 2-3 shows summary of the achievement on both the Project goal and purpose, and the table corresponds to the items on the PDM (0).

Table 2-3 Project Achievements

Project Achievements

Narrative Summary	Objective Verifiable Indicator	Achievement	Impeding (-) or Facilitating (+) Factors	Important Assumptions	Current State of the Important Assumptions	Factors that affect the Important Assumptions
<p><b>Overall Goal</b></p> <ul style="list-style-type: none"> <li>Improve road construction and maintenance capacity in Timor-Leste</li> </ul>	<p>1 By applying the prepared manuals / guidelines properly, road construction, maintenance and quality control are systematically conducted and contribute to quality improvement of roads.</p> <p>2 The knowledge and experience got through trainings and seminars are transferred to other road engineers to develop technology and skills of MOI</p>	<p>The DRD started to use prepared guidelines and manuals for their works.</p> <p>The DRD and DRBFC members who are as the C/P of the Project started use skills and technologies obtained through the Project activity on their works..</p>	<p>(-) Preparation of guidelines/manuals were delayed due to schedule change of the Project caused by security crisis</p> <p>(-) Seminar and Training at third country were conducted on limited time due to schedule change of the Project.</p>	<p>The Policy of the MOI remains unchanged regarding application of technical standard.</p>	<ul style="list-style-type: none"> <li>The Policy remains unchanged.</li> <li>The development of road standards stated in the National Development Plan is not well progressed.</li> </ul>	<p>The administration system of the government is not well-developed due to unstable political condition.</p>
<p><b>Project Purpose</b></p> <ul style="list-style-type: none"> <li>Improvement of the road construction and maintenance capacity of the DRD and DRBFC through training and preparation of manual/guideline</li> </ul>	<p>1 Effort will be made to prepare technical standards for material testing, pavement design and slope protection based on the manuals and guidelines prepared by the Project</p> <p>2 Staff members of the DRD and DRBFC will precisely perform their work through the actual use of the manual and guideline</p> <p>3 Transfer of technology to external personnel through seminar, etc..</p>	<p>C/P has succeeded to prepare the Guidelines/Manuals in collaboration with JICA Experts and the Guidelines are used as if they are authorized standards</p> <p>C/P started to use the Guidelines in daily works</p> <p>Technical seminar was conducted with more than 60 participants, however some participants commented that it required more detail explanation on their contents</p>	<p>(-) Seminar was conducted at limited time due to schedule change of the Project</p>	<p>The required budget and resources of the DRD and DRBFC are maintained.</p>	<p>The budget to the road sector is increased, however the budget is not used effectively and results remaining of it at each financial year.</p>	<p>No proper annual plan is established.</p>
<p><b>Outputs</b></p> <p>1 Preparation of manuals and guidelines (material testing manual and guideline; pavement design manual; slope protection guideline)</p> <p>2 Improved technical level of the DRD's and DRBFC's staff members in regard to material testing, pavement design and slope protection</p>	<p>1 Preparation of material testing manual and guideline, pavement design manual and slope protection guideline</p> <p>Training of the DRD's and DRBFC's staff members</p> <p>(1) More than 80% of the DRD Staff member mark more than 70 points of the paper test* by the end of the Project conducted by the expert. (Material manual/Guideline)</p> <p>(2) More than 80% of the DRBFC Staff member mark more than 70 points of the paper test* by the end of the Project conducted by the expert. (Asphalt pavement design manual / Slope protection guideline)</p>	<ul style="list-style-type: none"> <li>Soil Material Testing Guideline/Manual (Indonesian)</li> <li>Concrete Material Testing Guideline/Manual (Indonesian)</li> <li>Asphalt Material Testing Guideline/Manual (Indonesian)</li> <li>Slope Protection Guideline (English)</li> <li>Pavement Design Manual (English)</li> </ul> <p>Soil Material : Average Score: 69.0 point (83.3% of C/P obtained more than 70 point)</p> <p>Concrete Material : Average Score: 73.8 point (83.3% of C/P obtained more than 70 point)</p> <p>Asphalt Material Average Score: 73.1 point (87.5% of C/P obtained more than 70 point)</p> <p>Pavement Design : Average Score: 75.0 point (100% of C/P obtained more than 70 point)</p> <p>Slope Protection : Average Score: 75.0 point (100% of C/P obtained more than 70 point)</p>	<p>(+) Some program of the training was conducted with cooperation of Indonesian spoken engineer</p> <p>(+) Training in Indonesia was effective because of no difficulty of communication</p>	<p>The manuals and guidelines adopted as standard of Timor-Leste.</p>	<p>The process of authorization to the guidelines and manuals is not clarified.</p> <p>The government decided to review all regulation and laws and outstanding.</p>	

## 2.1.3 Implementation Results for scheduled Activities

In order to accomplish the Project outputs, many activities have been planned and carried out; the following Table 2-4 explains the comparison between the scheduled activity and actual result.

Table 2-4 Results of Activity

Work Category	Work No.	Scheduled Activity	Actual Result
1	1-1	Collection and analysis of existing reference	<ul style="list-style-type: none"> <li>JICA Experts Team (hereinafter referred to as “the Team”) collected existing reference regarding general condition in Timor-Leste from JICA TL Office, JICA Long Term Adviser in TL and web site.</li> </ul>
	1-2	Examination of basic policies of the project implementation	<ul style="list-style-type: none"> <li>The Team made discussions with JICA HQ, TL office, Long Term Adviser and C/P regarding the project implementation policy.</li> <li>Result of the discussions was reflected to IC/R.</li> </ul>
	1-3	Preparation of the ICR	<ul style="list-style-type: none"> <li>IC/R was made reflecting result of discussions with relevant authorities as well as policy and methodology of the Project mentioned in the bidding proposal.</li> </ul>
	1-4	Explanation and discussion on the ICR	<ul style="list-style-type: none"> <li>IC/R was explained and approved at 1<sup>st</sup> JCC.</li> </ul>
	1-5	Discussion on the PR/R	<ul style="list-style-type: none"> <li>The schedule of other reports as well as their contents was also explained and approved at 1<sup>st</sup> JCC.</li> </ul>
	1-6	Discussion on the Work Completion Report	
	1-7	Collection of reference material relating to the C/A (Capacity Assessment)	<ul style="list-style-type: none"> <li>The Team collected text books and drills for 1st and 2nd class civil construction supervisor in Japan.</li> </ul>
	1-8	Starting up of the WG (Working Group)	<ul style="list-style-type: none"> <li>WG is set up as the result of discussion with C/P, the detail of grouping is shown in 4.2.</li> </ul>
2	2-1	Site Investigation for manuals and guidelines	<ul style="list-style-type: none"> <li>The Team, the C/P and JICA Long Term Adviser jointly conducted site investigation a couple of time, the destination were A09, A02, A11 and A12.</li> <li>In addition to above, the Team, the sub consultant and the C/P jointly conducted extra investigations on A01 and A06.</li> </ul>
	2-2	Establishment of policies of manuals and guidelines	<ul style="list-style-type: none"> <li>The policy of “Practical and Useful” was established as the result of discussion with the C/P and current situation of the TL.</li> <li>The language to be used was selected reflecting discussion with the C/P as well as prediction of main users</li> <li>Pavement design catalog would be introduced as the attachment of the manual in comply with established policy “Practical and Useful”</li> </ul>
	2-3	Collection and analysis of existing manuals and guidelines	<ul style="list-style-type: none"> <li>AASHTO manuals was purchased and provide to the C/P</li> <li>Indonesian standards was studied by the Team</li> <li>So called ADB red book was studied by the Team</li> <li>Other standards including Japanese was studied by the C/P and the Team</li> </ul>

Work Category	Work No.	Scheduled Activity	Actual Result
	2-4	Selection of applicable standards for manuals and guidelines	<ul style="list-style-type: none"> <li>As for material testing and slope protection, ASTM and Indonesian standards are selected with some modification as the result of the discussions.</li> <li>As for pavement design manuals, the AASHTO was selected considering of world trend</li> </ul>
	2-5	Determination of contents for manuals and guidelines	<ul style="list-style-type: none"> <li>The contents to each manual are determined as the result of the discussion with C/P and necessity with consideration of existing engineering level.</li> </ul>
	2-6	Preparation for subletting of sub consultants	<ul style="list-style-type: none"> <li>Several Indonesian consulting firms were checked by interviews and past experiences.</li> <li>Comments from JICA Long Term Adviser in Jakarta were considered for the selection of sub consultant.</li> </ul>
	2-7	Contracting with sub consultants on subletting works	<ul style="list-style-type: none"> <li>RDCRB was appointed to the work of preparation of material testing concern in consideration of link for the Training in Indonesia; and evaluation results including price competition, two contracts were signed for it on 18<sup>th</sup> January 2007 and 4<sup>th</sup> October 2007, respectively.</li> <li>PT. VIRAMA KARIYA (V.K) was appointed to the work of preparation of the Pavement Design Manual and Slope Protection Guideline as the result of evaluation results including price competition.</li> </ul>
	2-8	Drafting of manuals and guidelines	<ul style="list-style-type: none"> <li>Progress report on the Material Testing Manuals was made at end of March 2007.</li> <li>1<sup>st</sup> draft of the Pavement Design Manual and the Slope Protection Guideline were submitted on 6<sup>th</sup> December 2007</li> <li>Completion Certificates were issued on 8<sup>th</sup> January 2008 to both RDCRB and V.K. after checking results.</li> </ul>
	2-9	Finalization of manuals and guidelines	<ul style="list-style-type: none"> <li>Finalizations of manuals were carried out from mid of January to beginning of February by the Team and C/P at Dili.</li> </ul>
	2-10	Evaluation of manuals and guidelines	<ul style="list-style-type: none"> <li>Evaluations of the manuals were carried out through the discussion with the C/P and the Questionnaire distributed at Seminar.</li> <li>According to the answers against the Questionnaire, most of answers was “understandable”</li> </ul>
3	3-1	Implementation of initial C/A	<ul style="list-style-type: none"> <li>Initial C/A was conducted at beginning of February 2006. <ol style="list-style-type: none"> <li>Soil was on 6<sup>th</sup> and 13<sup>th</sup> Feb</li> <li>Concrete was on 14th Feb</li> <li>Asphalt was on 14th Feb</li> <li>Slope Protection on 16th Feb</li> <li>Pavement on 16th Feb</li> </ol> </li> </ul>
	3-2	DRD's equipments inventory survey	<ul style="list-style-type: none"> <li>Since there was no inventory for DRD's equipment, survey for kinds of equipment as well as their conditions were conducted by the Team at beginning of February 2006.</li> <li>Data for equipment inventory was saved on Excel and hand it over to the C/P</li> </ul>



Work Category	Work No.	Scheduled Activity	Actual Result
	3-3	Preparation of training module and programmes	<ul style="list-style-type: none"> <li>• Training programme was once established during 2<sup>nd</sup> phase.</li> </ul>
	3-4	Preparation of training materials	<ul style="list-style-type: none"> <li>• Due to security crisis, the programme was difficult to maintain, so some changes were made</li> </ul>
	3-5	OJT and/or workshop on material testing (soil)	<ul style="list-style-type: none"> <li>• Following trainings on test were conducted at the DRD;               <ol style="list-style-type: none"> <li>1. Sieve Analysis</li> <li>2. Specific Gravity Test</li> <li>3. Liquid Limit Test</li> <li>4. Plastic Limit Test</li> <li>5. Compaction/CBR Test</li> <li>6. Consolidation Test</li> <li>7. Unconfined Compressive Test</li> <li>8. Traxial Compressive Test</li> <li>9. Hydrometre Analysis Test</li> <li>10. Shrinkage Limit Test</li> <li>11. Permeability Test</li> </ol> </li> </ul>
	3-6	OJT and/or workshop on material testing (concrete)	<ul style="list-style-type: none"> <li>• Following trainings on test were conducted at the DRD;               <ol style="list-style-type: none"> <li>1. Preparation of Testing Equipments and Samples</li> <li>2. Concrete Slump Test</li> <li>3. Concrete Compressive Test</li> <li>4. Mortar Compressive Test</li> </ol> </li> <li>• Lecture on the adjustment of compressive test result by mould type</li> <li>• General testing of concrete was lectured, however mixing design was not lectured due that C/P has no background on such.feild.</li> </ul>
	3-7	OJT and/or workshop on material testing (asphalt)	<ul style="list-style-type: none"> <li>• Following trainings on test were conducted at the DRD;               <ol style="list-style-type: none"> <li>1. Preparation of Testing Equipments and Samples</li> <li>2. Marshall Test</li> <li>3. Penetration Test</li> <li>4. Specific Gravity Test</li> <li>5. Softening Point Test</li> <li>6. Ductility Test</li> <li>7. Soybolt Viscosity Test</li> <li>8. Flash &amp; Fire point test</li> <li>9. Bekelman Beam Test</li> </ol>               The mix design was also lectured, however understood member was a few.             </li> </ul>
	3-8	OJT and/or workshop on slope protection	<ul style="list-style-type: none"> <li>• Following subjects as on workshop were exercised and lectured:               <ol style="list-style-type: none"> <li>1. Protection Measure and Site Investigation</li> <li>2. Introduction of Practical Monitoring Methodology for Land Slide (Nukiita)</li> <li>3. Exercise on Nukiita Monitoring in collaboration with CBRM case study</li> <li>4. Evaluation of Existing Slope with Check Sheet</li> </ol>               The C/P themselves continue to do the monitoring even after the workshop.             </li> </ul>

Work Category	Work No.	Scheduled Activity	Actual Result
	3-9	OJT and/or workshop on pavement design	<ul style="list-style-type: none"> <li>• Following subjects as on workshop were exercised and lectured:               <ol style="list-style-type: none"> <li>1. Comparison of Existing Major Pavement Design Standard</li> <li>2. Cross Section</li> <li>3. Pavement Composition</li> <li>4. Specific Characters by Pavement Types</li> <li>5. Design Period</li> <li>6. Treatment for Problem Soil</li> <li>7. Design Methodology</li> <li>8. Pavement Catalog</li> </ol> </li> </ul>
	3-10	Implementation of interim C/A	<ul style="list-style-type: none"> <li>• Interim C/A were conducted on following day for training classes, respectively;               <ol style="list-style-type: none"> <li>1. Concrete 26<sup>th</sup> Sep. and 30 Nov. 2007</li> <li>2. Soil 26<sup>th</sup> Sep. and 30 Nov. 2007</li> <li>3. Asphalt 30<sup>th</sup> Nov 2007</li> </ol> </li> </ul>
	3-11	Implementation of final C/A	<ul style="list-style-type: none"> <li>• Final C/A were conducted on following day for training classes, respectively;               <ol style="list-style-type: none"> <li>1. Concrete 18<sup>th</sup> Feb. 2008</li> <li>2. Soil 25<sup>th</sup> Jan 2008</li> <li>3. Asphalt 1<sup>st</sup> Feb 2008</li> <li>4. Pavement Design 18<sup>th</sup> Feb 2008</li> <li>5. Slope Protection 18<sup>th</sup> Feb 2008</li> </ol> </li> </ul>
	3-12	Evaluation of improved capacity	<ul style="list-style-type: none"> <li>• The Project have succeeded to accomplish targeted level (score) stated PDM (0)</li> <li>• Although accomplishment of the target, maintaining obtained skill need to have routine exercise and effort by the C/P</li> </ul>
	3-13	Evaluation of training programme	<ul style="list-style-type: none"> <li>• The discussion was made between C/P and JICA Experts. According to comment by the C/P on the programme, it was effective on level-up of the C/P's capacity, and however the continuous support on marinating of skills is still required.</li> </ul>
4	4-1	Preparation of PR/R	<ul style="list-style-type: none"> <li>• The PR/R No.1 was submitted on end of March 2007</li> <li>• The PR/R No.2 was submitted on beginning of January 2008</li> </ul>
	4-2	Preparation of Annual Project Completion Report	<ul style="list-style-type: none"> <li>• The AC/P of 1<sup>st</sup> phase was submitted on end of March 2006</li> <li>• The AC/P of Term 1 of 2<sup>nd</sup> phase was submitted on July 2006</li> <li>• The AC/P of Term 2 of 2<sup>nd</sup> phase was submitted on</li> </ul>
	4-3	Preparation of Project Completion Report	<ul style="list-style-type: none"> <li>• The PC/R will be submitted on middle of March 2008</li> </ul>
	4-4	Implementation of JCC	<ul style="list-style-type: none"> <li>• 1<sup>st</sup> JCC was held on 3<sup>rd</sup> Mar 2006</li> <li>• 2<sup>nd</sup> JCC was held on 6<sup>th</sup> Mar 2007</li> <li>• 3<sup>rd</sup> JCC was held on 14<sup>th</sup> Dec 2007</li> <li>• Final JCC is scheduled on 25<sup>th</sup> Feb 2008</li> </ul>
	4-5	Preparation of documents for the Seminar	<ul style="list-style-type: none"> <li>• Documents were prepared by the C/P with consultation and assistance of the Team</li> </ul>
	4-6	Implementation of the Seminar	<ul style="list-style-type: none"> <li>• The Seminar is schedule on 27<sup>th</sup> Feb 2008</li> </ul>

Work Category	Work No.	Scheduled Activity	Actual Result
	4-7	Evaluation of the Seminar	<ul style="list-style-type: none"> <li>Discussion with the C/P will be held on 3-6th Mar 2008</li> </ul>
5	5-1	Planning of the Training of Indonesia	<ul style="list-style-type: none"> <li>Contents of the training were examined and selected at 1<sup>st</sup> phase and 1<sup>st</sup> Term and 2<sup>nd</sup> phase.</li> <li>The suggestions for the training from Long Term Adviser in Jakarta were received on Jun 2006 and Oct 2007.</li> </ul>
	5-2	Preparation for Subletting of Training Institution	<ul style="list-style-type: none"> <li>The discussion for the training was continued from Jun 2006 to Oct 2007 between the C/P and the RDCRB and the Team.</li> <li>The RDCRB visited at DRR so as to discuss with candidates of trainees at Feb. 2007</li> </ul>
	5-3	Contracting with Training Institution for the Training	<ul style="list-style-type: none"> <li>The Contract was signed on 4<sup>th</sup> Oct.2007.</li> </ul>
	5-4	Implementation of the Training	<ul style="list-style-type: none"> <li>The training was conducted with 22 trainees from 3<sup>rd</sup> Nov. to 16<sup>th</sup> Nov 2007</li> </ul>
	5-5	Reporting of result of the training	<ul style="list-style-type: none"> <li>The report of result of the training by the RDCRB was submitted on Nov.2007.</li> </ul>
	5-6	Evaluation of the Training	<ul style="list-style-type: none"> <li>The result of evaluation of the training by both trainee and trainer was made at Nov. 2007</li> </ul>
6	6-1	Introduction of New Standard Tariff on tests at DRD	<ul style="list-style-type: none"> <li>The New Tariff was effective from Aug.2007</li> </ul>
	6-2	Establishment of Manual use plan	<ul style="list-style-type: none"> <li>The discussion was made with the C/P</li> </ul>
	6-3	Discussion for making authorization on the Manuals and Guidelines	<ul style="list-style-type: none"> <li>The discussion with C/P started from time of submission of 1<sup>st</sup> draft; of the Guidelines ,Dec 2007</li> </ul>

#### 2.1.4 Improvements of Utilization Condition of Possessed Equipments

The DRD possesses enough equipment for road construction and design; however the utilization rates were generally low because that the members did not know how to use equipment before the Project. The rates of utilization were concrete of 43%, asphalt of 41% and soil of 30%.

By the OJT of the Project, the numbers of equipment which become available to use is increased and the rate reaches concrete of 79%, asphalt of 83% and soil of 73%. The following tables show the details of equipment's utilization condition with comparison of that at February 2006; at beginning of the Project.

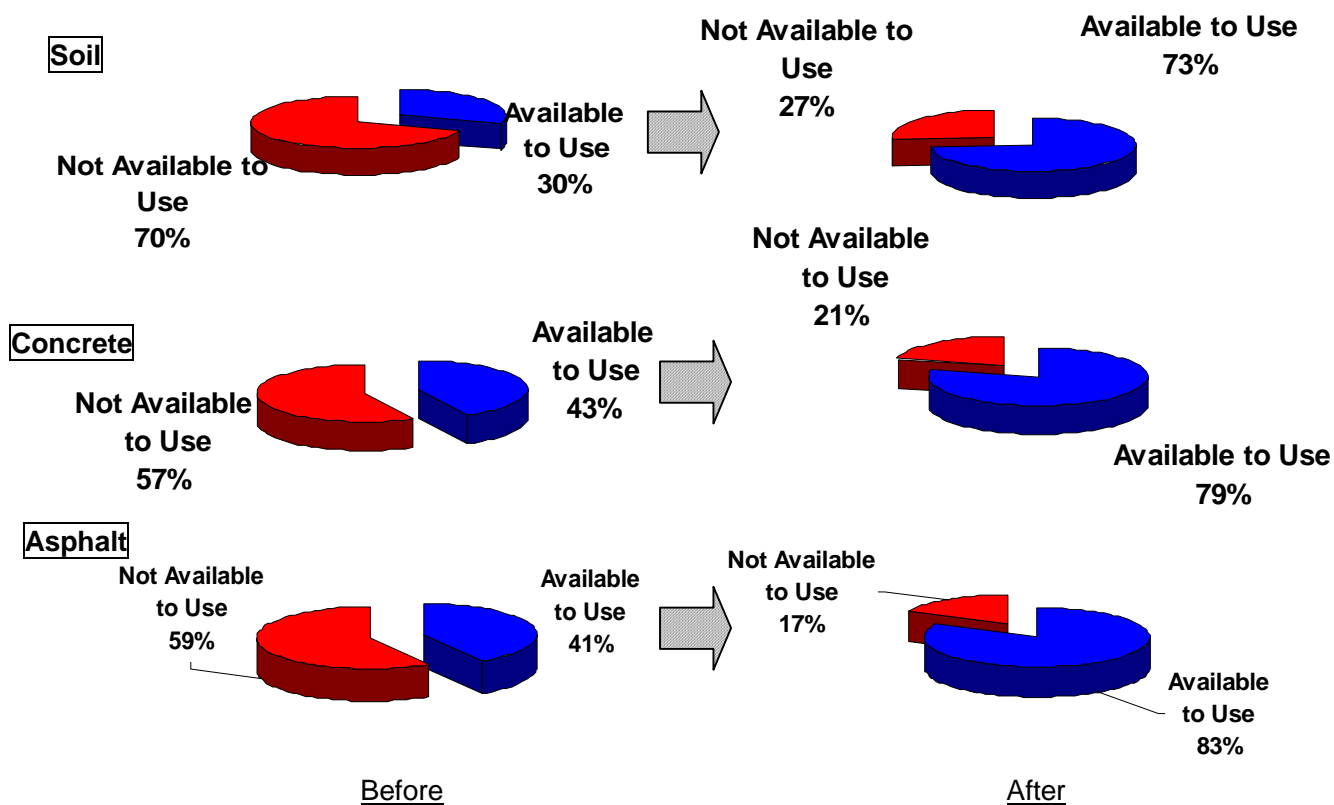


Figure 2-1 Nos. of Equipments available to use

For Concrete;

Table 2-5(1) Test Equipments for Concrete

Name of Material TEST	ASTM	AASHTO	Equipment Name	Condition	Availability of Utilization	
					Feb-06	Feb-08
Compressive Concrete test	C39	T97,T177,T22	Compression Test Machine	Good	A	A
			Laboratory concrete mixer	Good	A	A
			Concrete cube moulds	Good	A	A
Slump test	C143	T119	Vertical cylinder capping set	Good	A	A
Hummer test	C805-02		Concrete test hammer	Good	A	A
Calibration test			Calibration anvil	Good	A	A

Table 2-5(2) Test Equipments for Concrete Aggregates

Name of Material TEST	ASTM	AASHTO	Equipment Name	Condition	Availability of Utilization	
					Feb-06	Feb-08
Abrasion test	C29/C29 M-97	T97,T177,T22	Loss Angeles abrasion machine	Good	A	A
			Brass sieve	Good	A	A

Sieve test — Coarse aggregate	C127-01	T96	Standard sieve set	Good	A	A
		TM80	Sieve frame brass	Good	A	A
— Fine aggregate	C127-02	M6	Pan and cover	Good	A	A
		M29	Sieve shaker electric	Good	A	A
		(ASTMD1073 )	Bulk density test set	Good	*N/A	A
			Specific gravity and absorption	Good	A	A
			Aggregate crushing value test set	Good	*N/A	*N/A
Sand equivalent test			Sand equivalent test set	Good	*N/A	*N/A
Calibration anvil test			Calibration anvil	Good	*N/A	*N/A
Thickness gauge test			Thickness gauge	Good	*N/A	*N/A
Elongation index test			Elongation index test set	Good	*N/A	*N/A

Table-2-5(3) Test Equipments for Cement

Name of Material TEST	ASTM	AASHTO	Equipment Name	Condition	Availability of Utilization	
					Feb-06	Feb-08
Compressive strength of hydraulic cement test			Compressive strength of hydraulic cement mortar	Good	*N/A	A
Specific gravity of hydraulic cement test			Specific gravity of hydraulic cement test set	Good	*N/A	A
Vicar test			Vicar test apparatus	Good	*N/A	A

A: Available to use, N/A: Not available to use, \*N/A: Not knowing how to use

For Asphalt;

Table 2-6 Test Equipments for Asphalt

Name of Material TEST	ASTM	AASHTO	Equipment Name	Condition	Availability of Utilization	
					Feb-06	Feb-08
Penetration test			Laboratory penetration Test set	Good	*N/A	A
			Penetrometer			
			Penetration Needle			
			Transfers Dish			
Asphalt Ductility Test			Thin Box, 55mm I. d approx	Good	*N/A	A
			Ductility of Bituminous Materials Test Set			
			Ductility Mold			
			Ductility Machine			
			Glycerin			

			Talk			
Softening Point Test			Softening Point Test Set	Good	*N/A	A
			Shouldered Ring Assembly			
			Standard Ball			
			Flash Support			
			Support Assembly			
			Bunsen Burner			
			Asbestos Wire Gauge			
			Beaker Glass 100ml capacity			
			Thermometer			
Loss on Heating Test			Loss on Heating/Thin Film Test	Good	*N/A	A
			Revolving Shelf Oven			
			Thin Box			
			Thermometer			
			Cent 0-gram Balance			
Extraction Test			Centrifuge Extractor Test Set	Good	*N/A	A
			Centrifuge Extractor			
			Filter Paper			
			Trichloroethylene (TCE)			
			Triple Beam Balance			
Marshal Test			Marshal Test Set	Good	*N/A	A
			Compression Machine			
			Compaction Mold			
			Stability Mold			
			Compaction Hammer			
			Compaction Pedestal			
			Compaction Mold Holder			
			Extruder			
			Flow Meter			
			Water Bath			
Proving Ring 6000 lbs capacity						
Benkelman Beam Test			Benkelman Beam	Good	*N/A	A
			Fixed Beam			
			Tire Gauge			
			Surface Thermometer			
			Dial Indicator			
Core Drilling Test	D2113		Core Drilling Test Set	Good	*N/A	A
			Core Drilling Machine			
			Diamond Bit			
			Sample Tong			
			Breaking Strip			
			Spanner			
Specific Gravity Test			Specific Gravity of Semi-Solid Bituminous Materials	Good	*N/A	A
Distillation of Cutback Asphalt Test			Distillation of Cutback Asphalt	Good	*N/A	*N/A

Water Content Test	2216		Water Content in Petroleum Products	Good	*N/A	*N/A
Saybolt Test			Saybolt Viscometer	Good	*N/A	A
Flash and Fire Point Test			Flash and Fire Point by Cleveland Open Cup	Good	*N/A	A
Centrifuge Extractor Test			Centrifuge Extractor Test Set	Good	*N/A	A
Mot Straight Edge Test			Mot Straight Edge	Good	*N/A	A

A: Available to use, N/A: Not available to use, \*N/A: Not knowing how to use

For Soil;

Table 2-7(1) Test Equipments for Soil

Name of Soil Testing	ASTM	AASHTO	Equipment Name	Condition	Availability of Utilization	
					Feb-06	Feb-08
Sieve Analysis	D 422	T 88	Sieve 25mm- 0.075m	Good	A	A
			Mechanical stirrer	Good		
			Sieve shaker	Good		
Hydrometer Analysis	D 422	T 88	Hydrometer	Good	N/A	A
			Test tank	Good		
			Water heater	Good		
			Thermometer	Good		
Liquid Limit/ Plastic Limit	D 4318	T 89	Liquid limit device	Good	A	A
		T 90	Glass plate	Good		
Shrinkage Limit	D 427	T 92	Mercury	Good	*N/A	A
			Glass plate	Good		
			Evaporating dish	Good		
			Shrinkage dish	Good		
Specific Gravity	D 854	T 100	Pycnometer	Good	A	A
			Desiccator	Good		
			Container	Good		
Compaction	D 698	T 99	Mold assembly	Good	A	A
	D 1557	T 180	Manual rammer	Good		
CBR	D 1883	T 193	Electrical loading mach.	Good	A	A
			Mold assembly (6-in)	Good		
			Soaking tank	Good		
			Manual Rammer	Good		
Direct shear	D 3080	T 236	Shear device	M	*N/A	A
			Loading device	M		
			Porous inserts	M		
One-dimensional	D 2435	T 216	Loading device	M	*N/A	A

Consolidation			Consolidometer	M		
			Porous disk	M		
Permeability	D 2434	T 215	Permeameter	M	*N/A	A
Unconfined Compression	D 2166	T 208	Compression device	Good	A	A
			Sample extruder	Good		
			Deformation indicator	Good		
			Molding equipment	Good		
Triaxial Compression	D 2850	T 296	Triaxial compression mach.	+M	*N/A	A
	D 4767	T 297	Triaxial control panel	+M		

Table 2-7(2) In-situ Test Equipments for Soil

Name of In-situ test	ASTM	AASHTO	Equipment name	Condition	Availability of Utilization	
					Feb-06	Feb-08
Field CBR	D 4429	N/A	Mechanical screw jack	Good	*N/A	A
			Proving rings	Good		
			Penetration piston	Good		
Hand auger boring	N/A	N/A	Hand auger	Good	A	A
Sand cone test	D 1559	T 191	Sand cone apparatus	Good	A	A
			Standard sand	Good		
Dynamic cone penetration test	N/A	N/A	Dynamic cone Penetrometer	Good	A	A
Standard Penetration Test				Good	*N/A	A

+M: Maintenance shall be necessary, A: Available to use, N/A: Not available to use,

## 2.2 EVALUATION OF THE PROJECT BY FIVE (5) ASPECTS

### (1) Relevance

- Correspondence with Japan's Support Policy:

GOJ has established the Support Policy to Timor Leste, as follows;

- Development of Social and Economical Infrastructure and Improvement of its Maintenance Capacity

JICA has also established the Support Policy to Timor Leste, as follows;

- Strengthening Maintenance Capacity of Infrastructure



- Correspondence with National Strategy of Timor - Leste:

There are some national strategies for Timor Leste's development.

National Development Plan (NDP) was overall development plan for Timor Leste which included the development vision on year of 2020 and national plan between 2002 and 2007; the NDP identified the capacity development of road maintenance as one of priority subjects.

Sector Investment Program (SIP), which is under preparation, mentions that development of sustainable and reliable road network by routine maintenance would contribute to minimize life cycle cost and improvement of its accessibility.

Moreover, it is recognized that road maintenance has been prioritized so as to attain national development in Timor Leste form the fact that budget to road development and maintenance is being increased.

From both Japan's support policies and Timor's development plans, it is clarified that the Project activities has relevance to development of Timor Leste..

#### (2) Effectiveness

By the preparation of the Guidelines/ Manuals, proper methodology and procedure of the designing and resting were documented and C/P's capacity was also developed through the preparation. As the result, the fundamental and basic condition for road development and maintenance are settled. Therefore, the Project activities are identified to contribute the effectiveness of road development and maintenance in Timor Leste.

#### (3) Efficiency

The Project adopted to employ Indonesian institution and consulting firm for both preparing the manuals and training for the C/P. Comparing to those of by Japanese and at Japan, the costs were extremely reasonable and those were very effective in terms of communication. Trainings were well organized by Japanese experts and implemented by Indonesian institutions. Hence, it is evaluated that the methodology was effective, and this experience can be developed to other field and program.

#### (4) Impact

As mentioned above, the Project utilized supports form Indonesia. This fact would give some positive impacts on establishing new relation-ship with Indonesia for other engineering fields in between two nations.

(5) Sustainability

The Project prepared the Guidelines/Manuals; those would be improved by the C/P through actual use in daily work. In addition, the contents would also be reviewed and added by change of demand as the construction industry is developed. Therefore, the Project results need self development and sustainability.

### **CHAPTER 3 SCHEDULE OF ACTIVITIES DONE**

The following Figure 3-1 shows the schedule of activity done of the Project; the Project activity stretch over January, 2006 to March 2008, and the Figure 3-1 also shows the comparison between actual and initial plan proposed by the IC/R. The detailed explanation of each activity was already made on Chapter 2.



## CHAPTER 4 RESULTS OF INPUT

### 4.1 RESULTS OF INPUT BY JAPANESE SIDE

#### 4.1.1 Input of Japanese Experts

JICA Experts Team consisting of 8 engineers has been assigned in Timor-Leste with 22.6 man-months totally. The team has carried out the activities specified in the TOR and provided supports to the C/P in connection with their activities; the results of input of JICA Experts are shown both in Table 4-1 and Figure 4-1.

Table 4-1 Results of Input of JICA Experts in Timor-Leste

#### (1) 1<sup>st</sup> phase

No.	Expert Name	Title	Assignment Schedule
1	Mr. Mitsuo HARA	Team Leader(1)/Road(Pavement Design / Material Testing)(Asphalt Test)	(1) 31.01.06-14.02.06 (2) 25.02.06-11.03.06
2	Mr. Hisashi MUTO	Road(Slop Protection)	(1) 31.01.06-01.03.06
3	Mr. Takashi HARA	Material Testing(Soil) Expert(1)	(1) 31.01.06-24.02.06
4	Mr. Motoki OGAWA	Concrete Testing Expert(1)	(1) 05.02.06-01.03.06
*5	Mr. Ikumasa KAWASAKI	Project Coordinator (3)	(1) 28.01.06-11.03.06

\*Assignment of No.5 was not included in the TOR; its expense was borne by the JICA Experts Team itself.

#### (2) Tem1 on 2<sup>nd</sup> phase

No.	Expert Name	Title	Assignment Schedule
1	Mr. Mitsuo HARA	Team Leader(1), Project Coordinator(1)	(1) 28.05.06-03.06.06

#### (3) Term2 on 2<sup>nd</sup> phase

No.	Expert Name	Title	Assignment Schedule
1	Mr.Mitsuo HARA	Team Leader(1)/Road(Pavement Design / Material Testing)(Asphalt Test)/ Project Coordinator	(1) 10.12.06-21.12.06 (2) 08.01.07-14.03.07
2	Mr.Hisashi MUTO	Road(Slop Protection)	(1) 30.01.07-27.02.07
3	Mr.Ichiro TANAKA	Material Testing(Soil) Expert(2)	(1) 24.01.07-15.03.07
4	Mr.Noburo YONEDA	Concrete Testing Expert(2)	(1) 13.02.07-15.03.07

## (4) 3rd phase

No.	Expert Name	Title	Assignment Schedule
1	Mr. Hisashi MUTO	Team Leader(2)	(1) 02.12.07-21.12.07 (2) 03.02.08-03.03.08
2	Mr. Tetsuro IZAWA	Pavement Design/ Slope Protection Expert/ Project Coordinator (2)	(1) 08.09.07-08.10.07 (2) 25.11.07-25.12.07 (3) 15.01.08-04.03.08
3	Mr. Takashi HARA	Material Testing (Soil) Expert(1)	(1) 01.09.07-28.09.07 (2) 25.11.07-21.12.07 (3) 20.01.08-04.03.08.
4.	Mr. Motoki OGAWA	Material Testing (Concrete & Asphalt) Expert (1)	(1) 01.09.07- 15.09.07
5	Dr. Tatsumi TOKUNAGA	Material Testing (Concrete & Asphalt) Expert (2)	(1) 25.11.07-15.12.07
6.	Mr. Mitsuo HARA	Material Testing (Concrete & Asphalt) Expert (3)/ Project Coordinator (1)	(1) 31.10.07-18.11.07 (2) *13.01.08-09.03.08

\*One (1) day of JICA Experts Team own expense is included.

No.	Name of Expert	Title	1 <sup>st</sup> phase		2 <sup>nd</sup> phase												3 <sup>rd</sup> phase												Total Assignment Days	Total Assignment M/M	
			Y2006		Term 1						Term 2						Y2007						Y2008								
			1	2	3	4	5	6	7	8	12	1	2	3	8	9	10	11	12	1	2	3									
1	Mr. Mitsuo HARA	Team Leader (1)/Road (Pavement Design)/Material Material Tetsting (Concrete & Asphalt)(3) Project Coordinator (1)																											90	3.00	
2	Mr. Hisashi MUTO	Team Leader (2) Road (Slope Protection)																												50	1.67
3	Mr. Takashi HARA	Material Tetsting (Soil)(1)																												125	4.17
4	Mr. Motoki OGAWA	Material Tetsting (Concrete) (1) Material Tetsting (Concrete& Asphalt)(1)																												25	0.83
5	Mr. Ichiro TANAKA	Material Tetsting (Soil)(2)																												15	0.50
6	Mr. Nobuo YONEDA	Material Tetsting (Concrete) (2) Pavement Design/Slope Protection																												51	1.70
7	Mr. Tetsuro IZAWA	Project Coordinator (2)																												31	1.03
8	Dr. Tatsumi TOKUNAGA	Material Tetsting (Concrete& Asphalt)(2)																												95	3.17
	Total																													17	0.57
																														20	0.67
																														678	22.60
9	Mr. Ikumasa KAWASAKI	Project Coordinator (3)																												43	1.43

Figure 4-1 Results of Input of JICA Experts in Timor-Leste

## 4.1.2 Provisions of Equipments

The following equipment and document were provided to the DRD in order the C/P to develop their skills, as follows;

Table 4-2 List of Provided Equipments

No.	Name of Equipment	Quantity	Production Year	Price	Condition
1	Book of AASHTO's Material Testing Manual <ul style="list-style-type: none"> <li>• Standard Specification 25<sup>th</sup> edition for Transportation Material</li> <li>• 2005 Provisional Standards</li> <li>• CD ROM standard specification for Transport Material and Methods</li> <li>• Errata Standard Specification for Transport Material</li> </ul>	1 set	2005	1,440 USD	Good
2	SONY Projector CS20	1 nos.	2005	145,000JPY	Missing

Item No.2 which is SONY Projector is missing due to inappropriate arrangement of the DRD during security crisis. Although JICA Experts Team made a strong request of which the DRD must make an effort to find out the Projector, it does not come to be found out upto present.

## 4.1.3 Local Expense

Used local expense in connection with the execution of the Project is summarized as follows;



Table 4-3 Used Local Expense (Unit : Japanese Yen)

Item	Description	1 <sup>st</sup> phase	2 <sup>nd</sup> phase	2 <sup>nd</sup> phase (Term 2)	*3 <sup>rd</sup> phase	Total
General	Personnel Expense	356,553	42,607	655,387	1,150,050	2,204,597
	Documents Creation Expense	0	0	76,696	1,007,250	1,083,946
	Rental Expense	405,068	0	681,445	1,352,274	2,438,787
	Training in Indonesia Expense	0	0	0	5,186,368	5,186,368
Provided Equipment Expense		309,096	0	0	0	309,096
Sublet Expense		0	0	1,814,698	3,698,756	5,513,454
Total		1,070,717	42,607	3,228,226	12,394,698	16,736,248

2<sup>nd</sup> phase was once postponed due to security crisis and re-started as Term 2 after the improvement

\*Amount of 3rd phase is estimated amount.

## 4.2 RESULTS OF INPUT BY TIMOR-LESTE SIDE

### 4.2.1 Organization and Facilities

Any particular organization was not established for the Project. The DRD's laboratory was set to be the main place for the Project activity; the most of JICA Experts were positioned at the laboratory during their assignment periods.

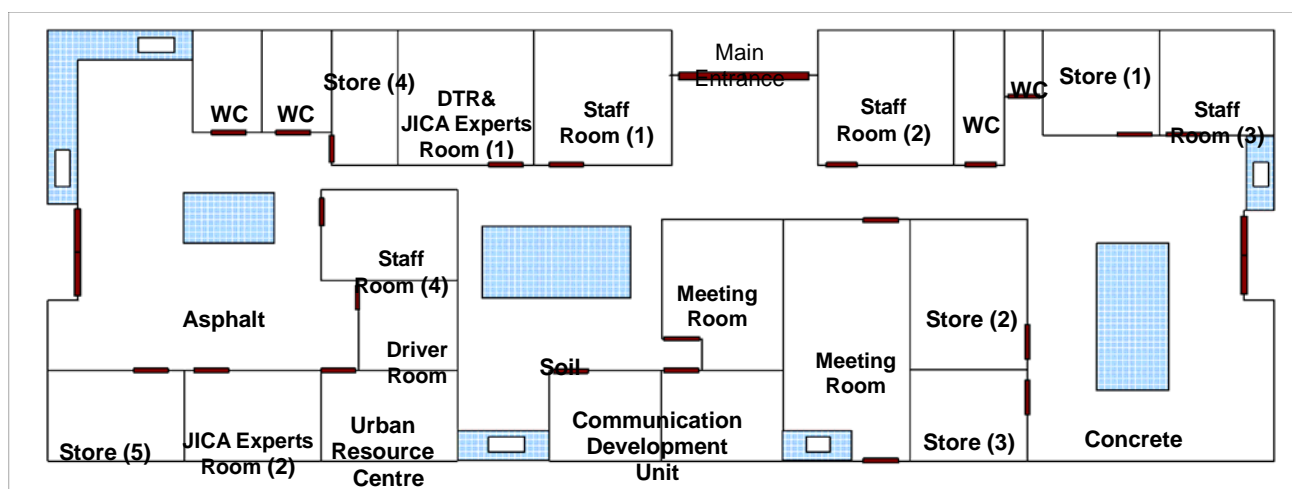


Figure 4-2 Layout of DRD Laboratory in Dili

The DRD laboratory has already possessed necessary test equipments for the road works and designs.

#### 4.2.2 Human Recourses

The Timor-Leste side prepared the following personnel shown in Table 4-4 as the C/P and the trainees for the Project; however some changes in the personnel were happened due to the re-organizing in the Ministry, Table 4-5 shows the C/P and trainee of the 3<sup>rd</sup> phase.

Table 4-4 List of C/P and Trainees at 1<sup>st</sup> phase

No.	Subject	Name	Organization	Position	Remark
1	Head of the Project	Mr. R. MOUSACO.	MPW	Vice Minister	
2	Deputy Head of the Project	Mr. J. PIEDADE	MPW	Permanent Secretary	
3	Project Director	Mr. RGUTERRES	DRBFC	Director	
4	Project Director/Concrete	Mr. S BRITO	DRD	Ag. Director	
5	Pavement Design & Slope Protection	Mr. C. GONCALVES	DRBFC	Chief of Project and Work Division	
6	Slope Protection	Mr. J. AUGUST	DRBFC	Chief of Design Engineer	
7	Pavement Design	Mr. M. MONTRIRO	DRBFC	Chief of Bridge	

No.	Subject	Name	Organization	Position	Remark
				Design Engineer	
8	Asphalt	Mr. H. GUTERRES	DRD	Chief of Laboratory	
9	Asphalt	Mr. J. COSTA	DRD	Technician	
10	Asphalt	Mr. N. FREITAS	DRD	Technician	
11	Asphalt	Mr.F. CUNHA	DRD	Technician	
12	Asphalt	Mr. A. NEVES	DRD	Technician	
13	Asphalt	Mr. M. GODINHO	DRD	Technician	
14	Concrete	Ms.I. ALVES	DRD	Technician	
15	Concrete	Mr. A COSTA	DRD	Technician	
16	Concrete	Mr. O. ROSALES	DRD	Technician	
17	Concrete	Ms. J NEVES	DRD	Technician	
18	Concrete	Mr. G. REIS	DRD	Technician	
19	Concrete	Mr. M. MONTEIRO	DRD	Technician	
20	Concrete	Ms. D SOUSA	DRD	Technician	
21	Soil	Mr. A. COSTA	DRD	Engineer	
22	Soil	Mr. A. MONTEIRO	DRD	Technician	
23	Soil	Mr. F. ALMEIDA	DRD	Technician	
24	Soil	Mr. J. SARMENTO	DRD	Technician	
25	Soil	Mr. C. GUTERRES	DRD	Technician	
26	Soil	Mr. A NEVES	DRD	Technician	

Table 4-5 List of the C/P and Trainees at 3<sup>rd</sup> phase

No.	Subject	Name	Organization	Position	Remark
1	Head of the Project	Mr. D. CAEIRO.	Public Works, MOI	Secretary State	
2	Deputy Head of the Project	Mr. J.PIEDADE	Pubic Works, MOI	Permanent Secretary	
3	Project Director/Concrete	Mr. S BRITO	DRD	Ag. Director	
4	Slope Protection	Mr. J. AUGUST	DRBFC	Chief of Design Engineer	
5	Pavement Design	Mr. M. MONTRIRO	DRBFC	Chief of Bridge Design Engineer	
6	Slope Protection	Mr. A. CRUZ	DRBFC	Supervisor, Dili Regional Office	

No.	Subject	Name	Organization	Position	Remark
7	Slope Protection	Mr. M.TILMAN	DRBFC	Ass. Supervisor, Dili Regional Office	
8	Asphalt	Mr. H. GUTERRES	DRD	Chief of Laboratory	
9	Asphalt	Mr. J. COSTA	DRD	Technician	
10	Asphalt	Mr. N. FREITAS	DRD	Technician	
11	Asphalt	Mr.F. CUNHA	DRD	Technician	
12	Asphalt	Mr. A. NEVES	DRD	Technician	
13	Asphalt	Mr. M. GODINHO	DRD	Technician	
14	Concrete	Ms.I. ALVES	DRD	Engineer	
15	Concrete	Mr. A COSTA	DRD	Technician	
16	Concrete	Mr. O. ROSALES	DRD	Technician	
17	Concrete	Ms. J NEVES	DRD	Technician	
18	Concrete	Mr. G. REIS	DRD	Technician	
19	Concrete	Mr. M. MONTEIRO	DRD	Technician	
20	Concrete	Ms. D SOUSA	DRD	Technician	
21	Soil	Mr. A. COSTA	DRD	Engineer	
22	Soil	Mr. A. MONTEIRO	DRD	Technician	
23	Soil	Mr. F. ALMEIDA	DRD	Technician	
24	Soil	Mr. J. SARMENTO	DRD	Technician	
25	Soil	Mr. C. GUTERRES	DRD	Technician	
26	Soil	Mr. A NEVES	DRD	Technician	

## CHAPTER 5 JOINT COORDINATION COMMITTEE

### 5.1 JCC ON 1<sup>ST</sup> PHASE

The JCC for 1<sup>st</sup> phase was held on 3<sup>rd</sup> March, 2006.

(1) Topics

Explanation of the Inception Report

(2) Participants

Table 5-1 Participants in JCC of 1<sup>st</sup> phase

	NAME	ORGANIZATION	POSITION
Timor-Leste Side			
1	Mr. Raul Mousaco	MPW	Vice Minister MPW
2	Mr. Jose Gaspar Piedade	MPW	Permanent Secretary for MPW
3	Mr. Januario da Costa Pereira	Research and Development/MPW	Director
4	Mr. Augusto Barreto S	CDCU/PM	Director
Japan Side			
5	Mr. Tetsuya KAMIJO	JICA TL Office	Resident Representative
6	Mr. Takayuki TOMIHARA	JICA TL Office	Assistant Resident Representative
7	Mr. Jose PERREIRA	JICA TL Office	Program Officer
8	Mr. Mituo HARA	Japan Engineering Consultants Co., Ltd.	Team Leader/Road Engineer(Pavement Design)/Material Testing(Pavement)
9	Mr. Ikumasa KAWASAKI	Japan Engineering Consultants Co., Ltd.	Project Coordinator
10	Mr. Mikio ORIKASA	JICA Long Term Expert	Infrastructure Policy Adviser
11	Mr. Hirofumi UEMURA	JICA Long Term Expert	Road Maintenance Adviser

(3) Conclusion

The IC/R was approved by the JCC.

**5.2 JCC ON 2<sup>ND</sup> PHASE**

The JCC was held on 6<sup>th</sup> March, 2007 for 2<sup>nd</sup> phase.

## (1) Topics

Report of progress of the Project and the explanation of activity plan for 3<sup>rd</sup> phase

## (2) Participants

Table 5-2 Participants in JCC of 2<sup>nd</sup> phase

	NAME	ORGANIZATION	POSITION
Timor-Leste Side			
1	Mr. Raul Mousaco	MPW	Vice Minister MPW
2	Mr. Jose Gaspar Piedade	MPW	Permanent Secretary for MPW
3	Mr. Rui H. Guterres	DRBFC,/MPW	Director
4	Mr. Januario da Costa Pereira	NDAF MPW	Director
5	Mr. Staturino Gomes Brito	DRD, MPW	Director
Japan Side			
6	Mr. Nobuhiro KOYAMA	JICA HQ	Leader
7	Mr. Hirofumi KAMIMURA	JICA HQ	Road Maintenance
8	Mr. Tomoyoshi SUZUKI	JICA HQ	Project Coordinator
9	Mr. Jose PERREIRA	JICA TL Office	Program Officer
10	Mr. Kouji NAITO	Nippon Koei Co. Ltd.	Team Leader for CBRM
11	Mr. Shinsuke KURIHARA	Nippon Koei Co., Ltd.	Road Maintenance Expert for CBRM
12	Mr. Mituo HARA	Japan Engineering Consultants Co., Ltd.	Team Leader/Road Engineer(Pavement Design)/Material Testing(Pavement)
13	Mr. Nobuo YONEDA	Japan Engineering Consultants Co., Ltd.	Concrete Testing Expert
14	Mr. Ichiro TANAKA	OYO International Co., Ltd.	Soil Testing Expert

## (3) Conclusion

The progress of the Project was confirmed and. activity plan for 3<sup>rd</sup> phase was approved.

**5.3 JCC ON 3<sup>RD</sup> PHASE**

The 1<sup>st</sup> Joint Coordination Committee was held on 14<sup>th</sup> December 2007..

## (1) Topics

Report of Progress of the Project and the explanation of activity plan for January and February 2008

## (2) Participants

Table 5-3 Participants in JCC of 3<sup>rd</sup> phase

	NAME	ORGANIZATION	POSITION
Timor-Leste Side			
1	Mr. Domingos Dos Santos CAEIRO	Public Works, MOI	State Secretary
2	Mr. Jose Gaspar PIEDADE	Public Works, MOI	Permanent Secretary
3	Mr. Staturino Gomes BRITO	DRD, MOI	Ag. Director
4	Mr. Hermengildo GUTERRES	DRD, MOI	Chief of Laboratory
5	Ms. Odete Esperanca FREITAS	MOI	Chief of Human Resources
6	Mr. Arlinndo MONTEIRO	NDPEAC	Project Officer
7	Mr. Agostinho LETENCID	INAP	Director
8	Ms. Eriko KAMEYAMA	INAP	Project Formulation Adviser
Japan Side			
9	Mr. Hozumi KATSUTA	JICA HQ	Leader
10	Mr. Tomoyoshi SUZUKI	JICA HQ	Project Coordinator
11	Mr. Tetsutya KAMIJO	JICA TL Office	Representative
12	Ms. Tomomi UCHIKAWA	JICA TL Office	Assistant Representative
13	Mr. Kouji NAITO	Nippon Koei Co. Ltd.	Team Leader for CBRM
14	Mr. Shinsuke KURIHARA	Nippon Koei Co., Ltd.	Road Maintenance Expert for CBRM
15	Mr. Hishashi MUTO	Japan Engineering Consultants Co., Ltd.	Team Leader
16	Mr. Tetsuro IZAWA	Japan Engineering Consultants Co., Ltd.	Pavement Design/Slope Protection Expert
17	Mr. Takashi HARA	OYO International Co., Ltd.	Soil Testing Expert

(3) Conclusion

The progress of activity in 3rd phase was reported in the JCC and confirmed by the committee member.

2<sup>nd</sup> JCC for 3rd phase (Last) is scheduled to be on 25<sup>th</sup> February 2008, and the Project will be concluded in the 2<sup>nd</sup> JCC.



## CHAPTER 6 ACTIVITY ON 1<sup>ST</sup> AND 2<sup>ND</sup> PHASE

### 6.1 SUMMARY OF ACTIVITIES ON 1<sup>ST</sup> PHASE

The Project is divided in 3 phases; the 1st phase was started at January, 2006 and completed at the end of March on same year, and period thus was short with 3 month.

Main works completed in 1<sup>st</sup> phase was identified as follows;

- To assess existing capacity of C/P
- To activate the Working Group for the Project Implementation
- To establish the Project Implementation Plan for 2 and 3 phase
- To carry out the Joint Coordination Committee
- To submit the Completion Report for 1<sup>st</sup> phase

#### (1) Activities

The major activities and results of 1<sup>st</sup> phase by the work category identified on 1.2.1 are summarized as below;

- 1) Work Category 1 (Preparatory Work in Japan and Explanation to and Discussions with the Counterpart Organizations)
  - Preparation of and Discussions on the Work Implementation Plan
  - Explanation of and Discussions on the Inception Report (IC/R)
  - Explanation of and Discussions on schedule of the Progress Report (PR/R)
  - Explanation of and Discussions on schedule of the Project Completion Report
- 2) Work Category 2 (Preparation of the Manuals and Guidelines)
  - Data collection for current applied standards and specifications
  - Interrelation of standards and recommended standards
  - Data collection for climate conditions
  - Site investigation for slope failure on A09, A02, A11 and A12
  - Site investigation for pavement condition on Dili city roads
  - Establishments of policy for each manual and guideline
- 3) Work Category 3 (Implementation of OJT and Workshops)
  - Listing up of DRD's testing equipments with their conditions
  - Capacity assessment and analysis for the Soil Testing to DRD members

- Capacity assessment and analysis for the Concrete Testing to DRD members
- Capacity assessment and analysis for the Asphalt Testing to DRD members
- Capacity assessment and analysis for the Pavement Design to DRD and DRBFC members
- Capacity assessment and analysis for the Slope Protection to DRBFC members
- Establishment of the training plan for the Soil Testing
- Establishment of the training plan for the Concrete Testing
- Establishment of the training plan for the Asphalt Testing

#### 4) Work Category 4 (Joint Coordination Meeting and Seminar)

It was already mentioned on chapter 5

#### 5) Work Category 5 (Planning and Implementation of the Training in Indonesia )

No major activity was made in this phase.

#### 6) Work Category 6 (Assistance for the Active Use of the Manuals and Guidelines)

No major activity was made in this phase.

#### (2) Assigned Expert

Assigned Experts on 1<sup>st</sup> phase are tabulated as below;

Table 6-1 Assigned Experts on 1<sup>st</sup> phase

No.	Expert Name	Title	Assignment Schedule
1	Mr. Mitsuo HARA	Team Leader/Road(Pavement Design / Material Testing)(Asphalt Test)	(1) 31.01.06-14.02.06 (2) 25.02.06-11.03.06
2	Mr. Hisashi MUTO	Road(Slop Protection)	(1) 31.01.06-01.03.06
3	Mr. Takashi HARA	Material Testing(Soil) Expert	(1) 31.01.06-24.02.06
4	Mr. Motoki OGAWA	Concrete Testing Expert/Publicity	(1) 05.02.06-01.03.06
5	Mr. Ikumasa KAWASAKI	Project Coordination	(1) 28.01.06-11.03.06

## 6.2 SUMMARY OF ACTIVITIES ON 2<sup>ND</sup> PHASE

### 6.2.1 General Conditions

#### (1) First Term (April 2006 – August 2006)

Just before starting the 2<sup>nd</sup> phase activities, the crisis had become serious over the country and the JICA project had been postponed until the situation would change better.

Accordingly only minor works have been done in regard to material testing, pavement design and slope protection which was preliminary discussion with Indonesian institutions and consultants who were candidates for agencies to be entrusted.

Following Expert was assigned on this first term as follows;

Table 6-2 Assigned Experts on 1<sup>st</sup> term of 2<sup>nd</sup> phase

No.	Expert Name	Title	Assignment Schedule
1	Mr.Mitsuo HARA	Team Leader, Project Coordination	(1) 28.05.06-03.06.06

### 6.2.2 Second Term (December 2006 – March 2007)

#### (1) General Condition

After the stable situation came back, the project was started again in December 2006. At beginning, the preparatory investigations were carried out such as equipments, both C/P's organization function and human resource condition.

As the result of the investigation, it was confirmed that there was no problem of re-restarting the Project.

#### (2) Activities

The major activities and results of 2<sup>nd</sup> phase by the work category are summarized as below;

- 1) Work Category 1 (Preparatory Work in Japan and Explanation to and Discussions with the Counterpart Organizations)

The work was completed on 1<sup>st</sup> phase.

- 2) Work Category 2 (Preparation of the Manuals and Guidelines)

- Exchanging opinions on the material testing manuals and guidelines between JICA Experts and Research and Development Centre for Roads and Bridges, Agency for Research and Development, Ministry of Public Works, Indonesia (RDCRB ) and DRD in Dili at February 2007
- Preliminary discussion with candidate consulting firms for the drafting manuals and guidelines
- Drafting proposed contents for each manual and guideline

- 3) Work Category 3 (Implementation of OJT and Workshops)

- OJT on the Soil Testing for CBR test and Atterberg Limit test in collaboration

with CBRM

- Slope protection work shop at A01 around KP15
- OJT on the Concrete Testing for the Slump and the Compression

4) Work Category 4 (Joint Coordination Meeting and Seminar)

It was already mentioned in Chapter 5

5) Work Category 5 (Planning and Implementation of the Training in Indonesia )

- Exchanging opinions on the Training in Indonesia between JICA Experts and Research and Development Centre for Roads and Bridges, Agency for Research and Development, Ministry of Public Works, Indonesia (RDCRB ) and DRD
- Preliminary coordination discussions with RDCRB and JICA long term expert in Indonesia

6) Work Category 6 (Assistance for the Active Use of the Manuals and Guidelines)

No major activity was made in this phase.

(3) Assigned Expert

Assigned Experts on Term 2 of 2<sup>nd</sup> phase are tabulated as below;

Table 6-3 Assigned Experts on Term2 of 2<sup>nd</sup> phase

No.	Expert Name	Title	Assignment Schedule
1	Mr.Mitsuo HARA	Team Leader/Road(Pavement Design / Material Testing)(Asphalt Test)/ Work Coordination	(1) 10.12.06-21.12.06 (2) 08.01.07-14.03.07
2	Mr.Hisashi MUTO	Road(Slop Protection)	(1) 30.01.07-27.02.07
3	Mr.Ichiro TANAKA	Material Testing(Soil) Expert	(1) 24.01.07-15.03.07
4	Mr.Noburo YONEDA	Concrete Testing Expert	(1) 13.02.07-15.03.07