ANNEX-2

HUMAN RESPURCE DEVELOPMENT PLAN

DEMOCRATIC REPUBLIC OF TIMOR-LESTE

ADN

EXPERT FOR STRENGTHENING INSTITUTIONAL CAPACITY OF NATIONAL DEVELOPMENT AGENCY

HUMAN RESOURCE DEVELOPMENT PLAN

OCTOBER 2013

JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)

DAINICHI CONSULTANT INC.
TOKYO WATERWORKS INTERNATIONAL CO.LTD
GEOPLAN CO.,LTD
NEWJEC INC.

EXPERT FOR STRENGTHENING INSTITUTIONAL CAPACITY OF
NATIONAL DEVELOPMENT AGENCY (ADN)
IN DEMOCRATIC REPUBLIC OF TIMOR-LESTE

HUMAN RESOURCE DEVELOPMENT PLAN

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1. Background

The low quality of infrastructure in Timor-Leste is one of the most serious social issues that Timor-Leste faces. As part of this, effective quality control of infrastructure is a nationwide issue that remains to be addressed.

The National Development Agency (ADN) is responsible for quality control of infrastructure especially through design verification and construction inspection. However, ADN is a young organization whose institutional framework is still in the process of stabilization. In addition, ADN's staff is almost fully composed of junior engineers and most of them do not have sufficient experiences or knowledge that is required to fulfill their mission.

The Japanese Technical Assistance Project, "Strengthening Institutional Capacity of the National Development Agency of the Democratic Republic of Timor-Leste" was carried out in 2012 (Phase I) and 2013 (Phase II) under these conditions. The Japanese International Cooperation Agency (JICA) proposed to develop a capacity building strategy through the creation of a manual and the "ADN Manual" was made by a JICA-ADN team in 2012. During Phase II it was planned that the capacity of ADN's staff would be strengthened through the use of the ADN Manual and the provision of classroom based lessons and one the job trainings (OTJ) to ADN engineers.

As it is still necessary to continue to develop human resources capability beyond the end of Phase 2 of the JICA-ADN Project, this Human Resource Development Plan has been developed taking into account the results of the activities of the JICA-ADN team. The plan consists of two parts; part one explains the scheme of the general plan and part two describes the specific sections of the plan, namely, Bridge, Power and Water Supply.

2. General Plan

2.1 Outline of the Plan

a. Goal

A more effective human resource development management system is in place and quality is assured through ADN's supervision of projects.

b. Objective

A human resource development system as required for management will be established and human resources will be developed through better coordination with International Advisors.

c. Targeted Staff

All ADN engineers

d. Time Frame

Two years from 2013 to 2015.

2.2 Methodology

Generally, personnel's skills are expected to improve through continued practical work activities, and their development will be assisted by the personnel management and training system.

(1) Personnel management system

a. Recruitment

b. Job rotation

c. Management System for voluntary capacity development.

(2) Training system

a. Off-the-job training (Off JT)

b. On-the-job training (OJT)

c. Self-development support

Practical work activities, self-help efforts, and classroom lesson are factors that will contribute to human resource development in governmental organizations and private companies. However the ADN or Government of Timor-Leste have specific characteristics that makes them difficult:

- ADN engineer's knowledge at recruitment is insufficient.
- ADN is mostly composed of junior engineers.

It is expected that human resource development will be accelerated against above difficulties.

Existing level of ADN engineers is divided into 1) Team Leader level, 2) assistant engineer level

and 3) new recruit level.

Considering these particular situations, this human resource development plan of new recruit level mainly focuses on Classroom Lessons. New recruit level should start from the start line as illustrated in Fig.2-1.

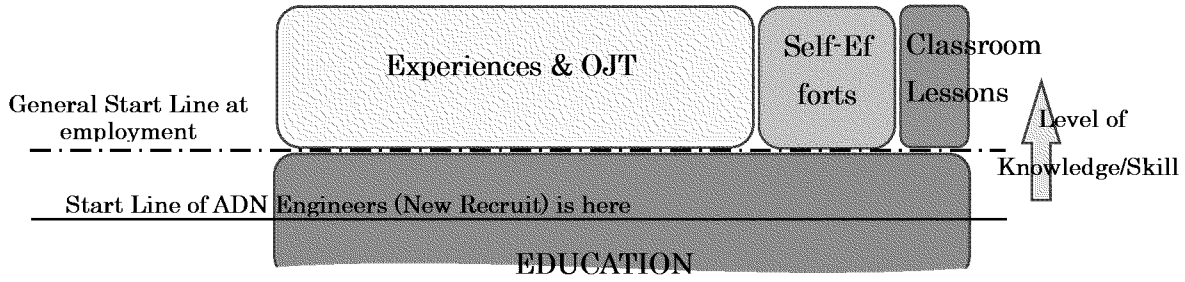

Fig.2-1: Means and level of contribution to of human resource development

2.3 Program

2.3.1 Targeted Engineering Levels

The level of ADN engineers on general plan is defined in Table 2-1.

Table 2-1 Definition of Level of ADN engineers

Level I	New recruit level.
Level II	Assistant engineer level (can handle ADN work with Team Leader's support)
Level III	Team Leader level,(can handle ADN work)

ADN's engineers are required to attain the following abilities:

a. To check the design documents and identify any errors in the design, and
b. To check the construction works, any mistakes and to instruct the contractor rework to remedy such works correctly.

To supervise project adequately, ADN's engineers need to acquire the specific knowledge to be obtained through practical work activities. But, as it takes time to accumulate experience, it is difficult for ADN's engineers to obtain such knowledge within a short period of time. Therefore, it is proposed that;

- First step (Level-I): Fundamental knowledge on civil engineering shall be acquired through classroom lessons,
- Second step (Level-II): The practical knowledge to be applied depending on the

various situations in the different project sites shall be acquired through practical work and OJT, and

- Third step (Level-III): A special program shall be necessary. Refer to **2.3.5.**

2.3.2 Off-the-job training for Level-I

The attainment to Level-I, which is the general start line or a little bit above it, shall be made through classroom lessons. The Level-I Training Course, which may be set on Saturdays, should be prepared in order that as many engineers as possible can attend the classes. E-learning systems should also be constructed and made available for engineers based in the Districts. Whenever possible, simultaneous TV-classes will be the option to favor.

(1) Classroom lessons

The preparation of the classroom lessons shall follow the procedures below:

1. Determination of Curriculum and Syllabus
2. Preparation of texts
3. Preparation of training materials (Power Point Slides)
4. Recruitment of Instructor (International Adviser)

It is expected that the preparation of the training mentioned above is carried out by a team headed by an international adviser(s).

(2) E-learning (Electronic learning)

The contents of the e-learning system should be the same with classroom lesson and the function of evaluation such as "test and record of the test result" will be necessary. The e-learning system should be constructed by IT engineers.

2.3.3 Practical Work Activities & On-the-job training for Level-II

The attainment of Level-II, which is the ability to identify most of the engineering issues to be addressed in a project cycle and to solve them, shall be done through practical work activities and OJT.

(1) Practical work activities

Acquisition of knowledge/skills through practical work activities are deeply related to time, job rotation and the number of jobs undertaken.

(2) OJT

Practical technical transfer of design verification and supervision, monitoring and inspection of construction works shall be done through OJT. OJT activities should be carried out with a leader, senior engineer or international adviser, who is able to give instruction and advice to junior

engineers.

2.3.4 Small group activities/Self-development for Level-II

Additional measures such as "QC group activities" may be necessary to expedite the human resource development.

(1) QC circle activities

A QC Circle is a small group of frontline employees who meet regularly to try to improve the quality of their work. QC Circle activities are at the core of Total Quality Management (TQM). QC Circles normally take a problem-based approach to improve the quality of their work. They identify problems in their workplace, usually related to product quality and referred to as 'themes', and together they set about to find solutions for these problems. They use quality control concepts and techniques, and try to be creative in seeking solutions.

The QC Circle leaders will be the driving force behind the activities. The selected individuals will be able to show leadership to get members to cooperate during meetings, gather ideas, and create an atmosphere where everyone will feel free to express their opinions.

(2) Voluntary study circle

Voluntary study circles consist of members of a small group meeting regularly to pursue a common theme of study. It may take the form of reading a book and discussing it chapter by chapter. Even when the cost is not subsi-dized, it is necessary to provide at least meeting facilities.

2.3.5 Special program for Level-III

If the ADN needs section/sector expert(s), they would be in charge of developing the following activities. The ADN must prepare a special program beginning with the recruitment of Level-III or these expert(s).

- National Development Planning
- Planning of city or district master plans
- Attending international conferences such as the MDGs conferences
- Introduction of advanced technologies to their sectors

The ADN will have to recruit several postgraduate students and prepare courses of study or training abroad for them.

2.3.6 Others

(1). Guidance for newly recruited engineers

Guidance should be provided for newly recruited engineers to ensure their full understanding of the outline of ADN jobs. The ADN Manual which describes the whole work area of ADN will be very useful for this purpose.

(2) Handbook by Sector

The JICA-ADN team produced "Technical Checklists" as a part of the ADN Manual. In the near future the contents of these checklists will be enriched by international advisers and ADN staff. Ultimately, it would be better to complete a second, "Technical Handbook" by ADN staff, which would be very useful for their work and for self-study.

2.4 Time Schedule

The time schedule of the plan is shown in Table 2-2 below.

Table 2-2 Time Schedule

Year	2013	2014				2015		
Activities	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
Annual training plan								
Classroom lessons								
E-learning								
OJT								
Small group activities								
Guidance for new personnel								
Sectoral handbook								

: Preparation

: Implementation, : Intermittent implementation

3. Plan of each sector

Regarding Human Resource Development Plan of ADN, Chapter 2 explains common belief. There are a lot of different conditions among ADN Sector Team, so Chapter 3 focus on Plan of Each Sector, considering existing assignment, personal distribution and time frame of two years.

3.1 Plan for the Road/Bridge Sector

3.1.1 Engineering Field knowledge necessary for ADN Bridge Engineers

Most of the work for the ADN bridge engineers working in the Infrastructure Fund Project (FI Project) consists of the verification of tender documents and inspection for payment. Bridge projects in other budget categories such as PDID are technically similar to FI Project or less difficult.

ADN is the organization in charge of evaluating before a contract is signed as to whether a project is feasible and reasonable, and also ADN must judge whether the payment amount requested by a contractor is reasonable. In other words, ADN is generally not an implementing agency. As a result, the range of engineering fields necessary for the engineers is thus limited. The bridge engineers are not required to plan a project, nor make a detailed design or to supervise and manage bridge works directly on site.

Required knowledge and technology for the engineers to accomplish their responsibilities of verification of tender documents and inspection of payment requests are;

[Verification of Tender Documents]

1) Knowledge regarding which documents are required for the verification,
2) Knowledge regarding the conditions of contract, especially payment conditions such as delay damages, provisional sum, advance payment, percentage of retention, minimum amount of interim payment and so on,
3) General but broad knowledge regarding bridge technology including planning, detailed design, construction, design standards and quality control on technical specifications to evaluate the project shown in the drawings, and
4) Knowledge on BOQ, constitution of BOQ, unit price.

[Inspection for Payment Request]

1) Knowledge regarding which documents are required for the inspection,
2) Knowledge of payment conditions such as contract amounts, advance payments, performance bond, retention, delay damage and so on,

3) Knowledge and technology on BOQ. The engineer has to know how the BOQ document is composed, and how to calculate and verify the percentage of completed work claimed by a contractor at certain times,
4) Knowledge on time schedule. The engineer has to check how the construction work has progressed according to the schedule,
5) Knowledge and technology on quality control. The engineer has to verify if the works done so far conform to the quality specifications. Thus he has to be familiar with the quality control on technical specifications.
6) Knowledge on how to measure and calculate quantities. Some items are calculated by length, linear meter and others by area or volume. The engineers must know how to use these measuring units and how to measure and calculate quantities in order to verify the quantities on which the payment amount requested is based.

Regarding special improvement points identified by JICA-ADN Team, required knowledge and technology for the engineers to accomplish their responsibilities on Bridge, Road & Flood Control sector are;

1) Knowledge of durability assessment of Bridge, Road & Flood Control
2) Knowledge of countermeasure of Bridge, Road & Flood Control against natural disaster
3) Knowledge of safety control of construction and traffic
4) Knowledge of maintenance & operation of Bridge, Road & Flood Control

3.1.2 Targeted Engineers to be Developed and Objectives

There are two kinds of engineers targeted for human resource development. (1) One are the junior engineers, who have just graduated from school, and were recruited and dispatched to district offices; hereinafter they are referred to as **"Junior Engineers"**. (2) The other are engineers equivalent to sub-team leaders, who have worked for several years in the industry or at ADN and who aspire to be senior bridge engineers; hereinafter they are referred to as **"Would-be senior Engineers"**. Table 3-1 shows Relationship between Level of Road/Bridge Sector and Level of General Plan.

Table 3-1. Relationship between Level of Road/Bridge Sector and Level of General Plan

Level of Road/Bridge Sector	Level of General Plan
Junior Engineers	Level I
Would-be Senior Engineers	Level II or Level III
Senior Engineers	Level III

"The Junior Engineers" seldom have knowledge and experience on bridge, even though they are graduated from a faculty of civil engineering. Japanese civil engineers are classified into specialized areas depending on the specialization that they choose during their university studies. By contrast, as mentioned by an Indonesian adviser, Timorese as well as Indonesian civil engineers get their specialization after graduation through experience gained in the industry with time.

"Would-be Senior Engineers" may have some experience in the bridge sector but usually they have not exclusively worked in this field, but also in other fields such as irrigation or water supply. Thus even the Would-be senior Engineers do not have sufficient knowledge and technological skills to be considered as bridge specialists. They still need to ask advice from Indonesian advisers when they have to make an important judgment.

(1) The purpose of the human resource development plan for the Junior Engineers is to give them very basic and general knowledge on bridges as a part of the general scope of work in order to raise the level and/or accuracy of the on-site inspection of bridges and of the relevant documents. Finally after one or two years of capacity development the junior engineer will be able to work as a "Generalist" in a district, with the ability to inspect a bridge not only on site but through the examination of documents also as a part of his scope of work.

(2) The purpose of the human resource development plan for Would-be Senior Engineers is to give them deeper knowledge on bridges through which they can inspect a bridge and also verify tender documents themselves. Even after getting a deeper knowledge on bridges, they will need at least 5 years experiences by working exclusively on bridges. Finally they will be expected to become bridge specialists, able to give advice and instructions to junior engineers.

3.1.3 Methods of Human Resource Development

Two human resource development methods are introduced to Junior Engineers and Would-be Senior Engineers; lectures and OJT.

(1) Verification of Tender Documents

Tender documents are verified mainly at the Head Office by Senior Engineers and Would-be Senior Engineer. Would-be Senior Engineers have to know about the tender document itself, especially contract conditions and also technical matters such as verification of drawings and BOQ. Junior Engineers do not need to gain this knowledge for the time being as it is too difficult for them to verify documents. Instead they must focus on the inspection of bridges at

district level. So only Would-be Senior Engineers will benefit from the trainings mentioned below;

[Lectures to Would-be Senior Engineers]

Knowledge on verification of contract, unit price analysis and drawings

[OJT to Would-be Senior Engineers]

Technology on verification of contract, unit price analysis and drawings

(2) Inspection for Payment

Junior Engineers, stationed at the district level, work on bridge inspection with the help of Senior Engineers and international advisers. They will gain the necessary knowledge through lectures, and practical technical skills through actual inspections.

Would-be Senior Engineers will have to replace Senior Engineers in the near future, so they have to gain full knowledge and technical skills required for effective inspections.

[Lectures to Junior Engineers]

As Junior Engineers work on bridges consists of inspection for payments, they need lectures by international advisers on subjects such as;

1) Knowledge on the required documents for inspection for payment
   Refer to the "ADN Manual" and materials for Classroom Lessons prepared by JICA-ADN Team
2) Knowledge on payment conditions
   Refer to "ADN Manual" and materials for Classroom Lessons prepared by JICA-ADN Team
3) Knowledge and technology on BOQ
   Refer to the materials for Classroom Lessons prepared by JICA-ADN Team
4) Knowledge on time schedule
5) Knowledge on quality control
   Refer to the materials for classroom lessons prepared by JICA-ADN Team
   Even after taking lectures on quality control, it is still hard for the junior engineer to actually understand the quality control system or each clause of the specifications. They need experience in actual situations related to specified quality specifications and instruction from senior engineers.
6) Knowledge on how to measure and calculate the quantities
   Refer to materials for classroom lessons prepared by JICA-ADN Team

[OJT to Junior Engineers]

1) Quality control techniques

Capability on quality control consists of understanding technical specifications and judging

the actually achieved results. To fully understand the specifications and judge the results is a long term process. Junior Engineers need to learn this material step by step under the instruction of Senior Engineers and advisers.

2) Quantity measurement techniques

Junior Engineers will practice what they study through the lectures, that is, measure and calculate the work completed so far under instruction from the Senior Engineers or advisers.

[Lectures to Would-be senior Engineers]

1) With regards to 4), and 6), Would-be Senior Engineers usually have considerable knowledge about these subjects in principle, thus no lecture is necessary.

2) Knowledge on quality control

Most specifications are written in English with many technical terms. Some would-be Senior Engineers have a good understanding of English, but the majority are weak in reading English. This is one reason why engineers are reluctant to looking into specifications.

Lectures will teach would be senior engineers how to use and how to find out proper clauses of the specifications for specific quality control activities.

[OJT to Would-be Senior Engineers]

1) Quality control techniques

International advisers will teach Would be Senior Engineers how to make a comparison between the specified quality level and the actually achieved quality as well as on how to make an on the job quality evaluation.

3.2 Plan of Power Sector

3.2.1 Engineering Field necessary for Power Engineers in ADN

Power Sector Development Projects in Timor-Leste are divided roughly into two categories, the 'Construction Supervision Services of the Nationwide Electrical Power Grid and Power Plants and its Facilities' project and the 'Installation Middle Voltage and Low Voltage line, House Connection and Home Installation (Hereinafter, it is referred to as The Power Distribution Line Extension)" project.

The former consists of the construction of two diesel power stations, the construction of high voltage (150kV) transmission lines (700km in full length), and the construction of nine distribution substations. The construction has been mostly completed as of September, 2013. Meanwhile, the latter project is still in the middle of development.

Required knowledge and techniques for the engineers to accomplish their responsibilities in the Power sector are;

1) Knowledge of the verification of inventory/ master plan of implementation project list
2) Knowledge of the verification of project development pronouncing the infrastructure plan
3) Knowledge of the verification on the selection of contractors and award of contract
4) Knowledge of the verification of contracts (payment condition, control of costs and quality)
5) Knowledge on the Inspection of Power Stations (Mainly Diesel Power Station)
6) Knowledge of the Inspection of Power Substation
7) Knowledge of the Inspection on Transmission and Distribution System
8) Knowledge of the Inspection on Renewable Energy (Photovoltaic Power)
9) Knowledge required of others on electrical engineers

Regarding special improvement points found by JICA-ADN Team, required knowledge and technology for the engineers to accomplish their responsibilities on Power sector are;

1) All the domains, which are generation, transmission, transformation, and distribution.
2) The establishment of a continuous education system which can acquire the knowledge of each domain and can understand the relevance between each domain is recommended.
3) Effective use of Classroom Materials
4) Training in PLN (electric power company of Indonesia) University

3.2.2 Targeted Engineers to be Developed and Objectives

One definition of the level of engineers is shown in the IEA Technical Report, Structure of

Operation and Maintenance Training Programmes (May 2000). The level of competence has been classified into five categories applicable to a shift charge-engineer, the control room technician and the plant operator of the hydro power plant.

Table 3-2 shows Level of Competence.

Table 3-2 Level of Competence on Power (Defined in IEA Technical Report)

LEVEL	CONPETENCE
5	Can perform the task/competence with better than acceptable speed and quality and with initiative and adaptability. Can lead others in performing the task.
4	Can perform the task/competence with better than acceptable speed and quality and with initiative and adaptability to special problems and situations.
3	Can perform the task/competence without assistance and supervision with better than acceptable speed and quality of work.
2	Can perform this task/competence without assistance and supervision.
1	Can perform the task/competence satisfactorily, but requires periodic supervision and some assistance.

Table 3-3 shows Relationship between Level of Power Sector and Level of General Plan.

Table 3-3. Relationship between Level of Power Sector and Level of General Plan

Level of Power Sector	Level of General Plan
Level 5	Level III
Level 4	Level II or Level III
Level 3	Level II
Level 2	Level II
Level 1	Level I

3.2.3 Methods of Human Resource Development

Training is divided into two sections, one of which is theory and the other, practice.

Regarding theory, it is necessary to use the classroom lessons materials effectively.

Table3-4 shows the classroom syllabus

Table3-4 Syllabus of Classroom on Power

No	Contents
1	Introduction
2	Power Station (Diesel)
3	Substation
4	Transmission and Distribution System
5	Power System Study
6	Power Flow Analysis
7	Power System Stability
8	An Example of Power System Analysis (Using PSS/E)

9	How to Use the Result of Power System Analysis
10	Renewable Energy (Photovoltaic Power)

It is also useful to use the course of PLN University. Table 3-5 shows course of PLN University.

Table 3-5 Course of PLN University

Level	subject of educational training
Basic	Operation of LV line and LV connection service
Bas/spe	Operation of MV Line
Bas/spe	Operation of distribution substation
Bas/spe	Operation of culbicle 20KV
Basic	Instalation and sealing APP (measuring and limiting tools)
Bas/spe	Wiring and APP (measuring and limiting tools) LV testing
Bas/spe	Testing of CT- PT distribution
Bas/spe	Wiring and testing APP – MV
Bas/spe	Electronic meter reading and AMR
Basic	Inspection of distribution network
Basic	LV line maintenance
Basic	MV line maintenance
Bas/spe	Maintenance of distribution transformer
Bas/spe	Maintenance of culbicle 20KV
Bas/spe	Connecting and terminating ground cable 20KV
Spe/sys	Construction plan of medium voltage distribution network
Sys/opt	Distribution plan management
Sys/opt	Operation management and distribution maintenance
Bas/spe	Controling of power consumption
Bas/spe	Introducing automatic meter reading

Junior engineers in Electrical Team will categorized into level, from Level 1 to Level 3, as shown in Table 3-2 & Table 3-3. Table 3-6 shows a case model for the development of competence.

Table 3-6 Model Case for Development of Competence

LEVEL	Position	NO. of Syllabus	OJT	PLN University
1	-	1~4	accompany with inspection	arbitrarily
2~3	-	5~9	Inspection with level 4	
4	Sub Leader	-	Experiences are acquired	
5	Leader	-		

3.3 Plan of Water Supply Sector

3.3.1 Engineering Field necessary for Water Supply Engineers in ADN

Required knowledge/skills in water supply section are as follows:

1. Knowledge for verification of design documents
   - Basic knowledge on rural water supply systems
   - Basic knowledge on the design of rural water supply system
   - Practical knowledge on the outlining and design of rural water supply system
   - Basic knowledge on basic hydraulics of pipelines
   - Practical knowledge on hydraulics calculation of simple pipelines using EPANET or PIPECAL
   - Knowledge on profile of pipeline and air release valve
   - Practical knowledge on drawing profile using Google Earth
2. Knowledge for inspection of construction works
   - Basic knowledge on inspection procedures
   - Basic knowledge on the inspection of water source facilities
   - Basic knowledge on the inspection of concrete storage tanks
   - Basic knowledge on the inspection of transmission and distribution pipelines
   - Basic knowledge on the inspection of public taps

Regarding special improvement points identified by JICA-ADN Team, required knowledge and technology for the engineers to accomplish their responsibilities on Water Supply sector are;

1) Knowledge of adoption of good sample drawings for design
2) Knowledge of information from Google earth and preparation of pipeline profile.
3) Knowledge of air valves and sand valves on pipeline
4) Knowledge of countermeasure of leakage from tank and pipeline

3.3.2 Targeted Engineers

The proportion of time that ADN spends on water supply projects is not large. Therefore, it will require a significant timeframe for water engineers to gain OJT experience. Also, ADN does not have a specialized section to deal with water supply. As a result the creation of a mechanism to increase the capacity of ADN engineers in the area of water supply is difficult. Due to the short period of time spent by the ADN engineers investigating water supply issues it may be inefficient itself to retain in the ADN personnel a water supply specialist. Thus it might be better

to carry out periodical training to all ADN engineers by international adviser(s).

Table 3-7 shows Relationship between Level of Water Supply Sector and Level of General Plan.

Table 3-7. Relationship between Level of Water Supply Sector and Level of General Plan

Level of Water Suplly Sector	Level of General Plan
Level III	Level III
Level II	Level II
Level I	Level I

3.3.3 Method of Human Resource Development

Table 3-8 shows Level I Plan on Water Supply.

Table 3-8 Level I Plan on Water Supply

Name	General Program of Water Supply
Objects	To acquire basic knowledge on rural water supply
Methodology	Classroom Lecture and e-Learning
Preparation	1. Curriculum and Syllabus 2. Preparation of Text (refer to WB's Manual of Rural Water Supply) 3. Preparation of Training materials (Power Point Slides) 4. Instructor (International Adviser) Preparation of training mentioned above shall be carried out by an International Adviser lead team.

Table 3-9 shows the Level II Plan on Water Supply.

Table 3-9 Plan for Level-II on Water Supply

Name	Senior Engineer Program of Water Supply
Objects	To acquire practical and specific knowledge on rural water supply so that he/she can identify technical problems on water supply projects and solve them.
Methodology	Experiences, OJT, and QC circle activity
QC Circle Activity	A QC Circle is a small group of frontline employees who meet regularly to try to improve the quality of their work. QC Circle activities are at the core of Total Quality Management (TQM). QC Circles normally take a problem-based approach in order to improve the quality of their work. They identify problems in their workplace, usually related to product quality and referred to as 'themes', and together they set about finding a solution. They use quality control concepts and techniques, and try to be creative in seeking solutions. The QC Circle leaders will be the driving force behind the activities. Select people, who can show leadership, get members to cooperate in meetings, can gather ideas, and can create an atmosphere where everyone will feel free to express their opinion.

Table 3-10 shows Level III Plan on Water Supply.

Table 3-10 Level III Plan on Water Supply

Name	Expert program of Water Supply
Objects	To acquire total water supply knowledge as followings: • Water Supply Policy (National Plan, Tariff, Sustainable water supply) • Water supply and Hygiene • MDG • Urban Water supply System • Advanced Technology and Appropriate Technology • Planning of Master Plan
Methodology	Special training (Master course, e-Learning of special program, Study or Training Abroad)

A reference handbook should be prepared to use as needed. Concerning the Handbook, it is recommended that the Rural Water Supply Manuals published by WB Manila Office, which should be edited in accordance with the actual situation of this country and in the spoken language of Timor-Leste.

ANNEX-3

HANDOUT OF PRESENTER

(WORKSHOP ON QUALITY CONTROL

THROUGH ADN MANUAL)

AGÉNCIA DE DESENVOLVIMENTO NAÇIONAL
REPÚBLICA DEMOCRÁTICA DE TIMOR-LESTE

Workshop on Quality Control through ADN Work

Handout of Presenter

20th September 2013

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ACTIVITIES OF JICA-ADN TEAM

Presented
by
Mr. Hideo MATSUSHIMA
JICA-ADN TEAM

1

Project Title / Overall Goal / Purpose of JICA-ADN Team

PROJECT TITLE	JAPANESE TECHNICAL ASSISTANCE ON STRENGTHENING INSTITUTIONAL CAPACITY OF NATIONAL DEVELOPMENT AGENCY (ADN)
OVERALL GOAL	More effective management of Infrastructure Development is carried out and quality is assured through ADN
PROJECT PURPOSE	Human resource of ADN is developed on fundamental knowledge & experience of evaluation, monitoring and inspection of infrastructure project as following fields. 1) Road/Bridge/Flood Control (Use of Infrastructure Fund on ADN Manual) 2) Power (Use of National Electrification Program: PEN on ADN Manual) 3) Water (Use of PDD I & II on ADN Manual)

2

Project Activities of JICA-ADN Team (Phase-1)

- JICA provided JICA-ADN Team (Phase-1) for **OJT** of project monitoring/ inspections for infrastructure and **development of ADN manual**. JICA-ADN Team (Phase-1) dispatched from Jun 2012 to Nov 2012.

Mr. Hideo MATSUSHIMA (Road & Bridges #1)
Mr. Jiro KOYAMA (Road & Bridges #2)
Mr. Shimpei TOMITA (Power)
Mr. Hiroyasu YODA (Water)
Mr. Hiroki Oe (ITC) (Assistant)
Mr. Osamu KUNITA (Port & Aviation)

3

Project Activities of JICA-ADN Team (Phase-2)

- JICA provides JICA-ADN Team (Phase-2) for **wide use of ADN Manual** and **basic skill training** for project inspection, review and monitoring. JICA-ADN Team (Phase-2) dispatched from Apr 2013 to Sep 2013.


Road & Bridges expert #1 Mr. Hideo MATSUSHIMA


Road & Bridges expert #2 Mr. Jiro KOYAMA


Water expert #1 Mr. Hideo HIGUCHI


Water expert #1 (Assistant) Mr. Takeo SAKAMOTO


Water expert #2 Mr. Hiroyasu YODA


Power expert Mr. Koichi UCHIDA

4

Outputs resulted from JICA-ADN Team

[1] **The Revised ADN Manual** ---pp6-10

JICA-ADN Team/ADN engineers revised ADN Manual.

[2] **Core technologies** on evaluation, monitoring and inspection of infrastructure projects. ---pp11-14

ADN engineers acquire the core technologies by use of ADN Manual.

[3] **Fundamental knowledge** on evaluation, monitoring and inspection of infrastructure projects. ---pp15-19

ADN engineers acquire the fundamental knowledge by class room lessons.

[4] **Coordination** with relevant Ministries/Agencies---pp20-22

[5] Suggestion on Human resource development plan ---p23

[6] Finding & Achievements ---pp24-38

[7] Workshop --- p39

5

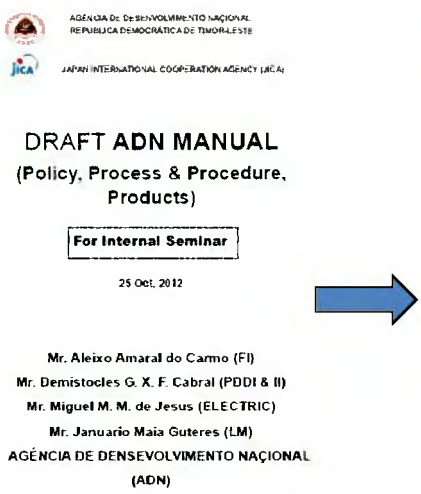
[1] **The Revised ADN Manual**

- ADN engineers revised the Checklists/Forms resulting from actual use.
- JICA-ADN Team and ADN engineers revised the Checklists/Forms according to the discussion results.

(Achievement)

- **Revised ADN Manual**

6

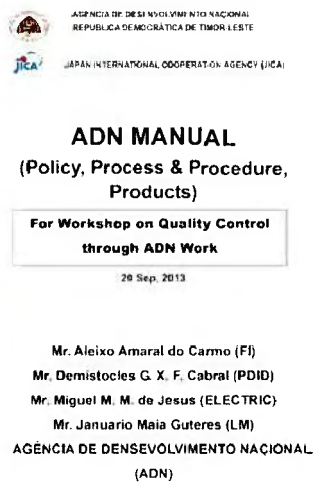

AGÊNCIA DE DESENVOLVIMENTO NAÇIONAL
REPUBLICA DEMOCRÁTICA DE TIMOR-LESTE
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

DRAFT **ADN MANUAL**
(Policy, Process & Procedure, Products)

For Internal Seminar

25 Oct. 2012

Mr. Aleixo Amaral do Carmo (FI)
Mr. Demistocles G. X. F. Cabral (PDDI & II)
Mr. Miguel M. M. de Jesus (ELECTRIC)
Mr. Januario Maia Guteres (LM)
AGÊNCIA DE DENSEVOLVIMENTO NAÇIONAL
(ADN)


AGÊNCIA DE DESENVOLVIMENTO NACIONAL
REPUBLICA DEMOCRÁTICA DE TIMOR LESTE
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

ADN MANUAL
(Policy, Process & Procedure, Products)

For Workshop on Quality Control through ADN Work

26 Sep. 2013

Mr. Aleixo Amaral do Carmo (FI)
Mr. Demistocles G. X. F. Cabral (PDID)
Mr. Miguel M. M. de Jesus (ELECTRIC)
Mr. Januario Maia Guteres (LM)
AGÊNCIA DE DENSEVOLVIMENTO NAÇIONAL
(ADN)

Draft ADN Manual (Phase-1)

Revised ADN Manual (Phase-2)

7

Brief Summary of Revised ADN Manual

(Scope)

- ADN Manual aims at ADN to carry out properly and efficiently its duties which are specified in the Decree-Law. The manual also aims at LMs and other organizations concerned to play properly their roles and responsibilities during provision of the capital development project.
- The manual focuses specifically on the following processes since they are most busily handled at present.
- -Verification of Tender Documents
- -Inspection for Payment Request

8

(Category of Projects/Funds)

- The manual is separately formulated based on the category of projects in consideration of different procedure and in favor of the users.
- The manual deals with **Infrastructure Fund** Project, **Line Ministries** Fund Project, **PDID** Fund Project, and National Electrification Program (**PEN**).
- The manual does not deal with **Emergency**, **Additional**, **SEFOPE**, **MDG**, and **Special Project** under ADN.

9

(Range of Application of Each Sector)

- Regarding Sectors, the manual includes technical checklist for **Road & Bridge on Infrastructure Fund**, **Water Supply on PDID**, and **Electric Power on PEN**. The technical checklist will be able to use for other category partially.
- Please note the explanation of page 5 on ADN Manual, when application on other category.

10

[2] **Core technologies** on evaluation, monitoring and inspection of infrastructure projects.

- Regarding Inspection, JICA-ADN Team supported how to use ADN Manual at District Office and at site.
- Regarding Verification, JICA-ADN Team supported how to use ADN Manual at Head Office and at site.

(Achievement)

- **ADN engineers acquire the Core technologies by use of ADN Manual. As a result, the work flow is visual and uniform, and procedure is more efficient than before. The system is improved.**

11

Inspection at Los palos

Inspection at Betano

Verification at Suai

Inspection at Los palos

Inspection at Betano

Mobile Team at Ainaro

12

Inspection at Viqueque

Inspection at Lahane,Dili

Inspection at Lahane,Dili

Verification at Loes River

Inspection at Lahane,Dili

Inspection at Lahane,Dili

13

Explanation after Inspection at Oecussi

Explanation after Inspection at Oecussi

Verification at Tasi ToluDry Port, Dili

Inspection at Comoro Bridge

Verification at Maubisse

Verification Bidau River, Dili

14

[3] **Fundamental knowledge** on evaluation, monitoring and inspection of infrastructure projects.

JICA-ADN Team had a lot of Lectures in classroom on Saturday at ADN head office.

(Achievement)

ADN engineers acquire the Fundamental knowledge by class room lessons. As a result, the quality of verification and inspection is improved.

15

Class Room Lesson on Road/Flood Control

Class Room Lesson on Power

Class Room Lesson on Power

Class Room Lesson on Bridge

Class Room Lesson on Water Supply

Class Room Lesson on Water Supply

16

Class Room Lesson by JICA-ADN Team

(1) Bridge

No.	Contents	Date	Entry
1	Flow of Bridge Work & Site Investigation	5/11	19
2	Bridge Plan (Superstructure)	5/18	10
3	Bridge Plan (Substructure, Foundation and Accessories)	6/1	3
4	Detail Design & How to Read Bridge Drawings	6/8	4
5	Construction method & Tender Documents (Bidding Documents)	6/29	25
6	Review of above No.1 & No.2	7/6	17
7	Review of above No.3 & No.4	7/13	14
8	Use of ADN Manual	7/27	14
9	Specification	8/3	2

(2) Road

No.	Contents	Date	Entry
1	Pavement	5/11	19
2	Road Width & Landslide, Slope Stability Analysis	5/18	10
3	Design Speed, Plan & Profile	6/1	3
4	Soil Condition, Design of Retaining Wall, Box Culvert, Landslide	6/8	4
5	Construction of Road, Payment	6/29	25
6	Review of above No.1 & No.2	7/6	17
7	Review of above No.3 & No.4	7/13	14
8	Comment on Comoro Bridge, and so on	7/27	14
9	Comment on Pavement materials in Oecussi, Cold Mix and so on	8/3	2

17

(3) Flood Control

No.	Contents	Date	Entry
1	Countermeasure of Flood Control	5/11	19
2	Topographic Data, Hydrologic Data, Design Discharge	5/18	10
3	Channel Characteristic, Revetment, Foot Protection	6/1	3
4	Construction of Dike, Revetment	6/8	4
5	Construction of Spur Dike, Weir	6/29	25
6	Review of above No.1 & No.2	7/6	17
7	Review of above No.3 & No.4	7/13	14
8	Comment on Loes River, and so on	7/27	14
9	Comment on Tono River, and so on	8/3	2

(4) Electric Power

No.	Contents	Date	Entry
1	Introduction, Power Engineering, Transmission & Distribution	5/25	7
2	Power Station (Mainly Diesel Power Station)	6/29	7

18

(5) Water Supply

No.	Contents	Date	Entry
1	How to Use EPANET with Practice (1/6)	4/29	3
2	How to Use EPANET with Practice (2/6)	4/30	10
3	How to Use EPANET with Practice (3/6)	5/3	6
4	How to Use EPANET with Practice (4/6)	5/6	5
5	How to Use EPANET with Practice (5/6)	5/8	12
6	How to Use EPANET with Practice (6/6)	5/9	6
7	Design of Rural Water Supply System (Case Study) (1/5)	5/13	7
8	Design of Rural Water Supply System (Case Study) (2/5)	5/14	8
9	Design of Rural Water Supply System (Case Study) (3/5)	5/16	5
10	Design of Rural Water Supply System (Case Study) (4/5)	5/23	5
11	Design of Rural Water Supply System (Case Study) (5/5)	5/28	4
12	How to Use EPANET & How to Use PIPECAL (1/1)	5/25	16
13	Design of Rural Water Supply System (Introduction. Water Demand)	6/1	3
14	Design of Rural Water Supply System (Water Source)	6/8	4
15	Outline of Rural Water Supply System	7/6	17
16	Diagnosis of Rural Water Supply System	7/13	14
17	Design of Rural Water Supply System (Trasmission and Distribution)	7/27	14
18	One point lesson on air release valve	8/3	2

19

[4] **Coordination** with relevant Ministries/Agencies

- JICA-ADN Team explained the ADN Manual to relevant Ministries/Agencies stressing use of the forms, and checklists.
- JICA-ADN Team confirmed “Schedules of the Work” specified in the ADN Manual with relevant Ministries/Agencies.
- JICA-ADN Team discussed with relevant Ministries/Agencies how to facilitate verification and inspection of the procedures.

20

MPW DRBFC JICA expert

DNSA

ADN

MPW DRBFC Director

DNSA

ADN

21

Recommendation & Achievement

(Issues)

Request of Verification and inspection come to ADN from LM suddenly. LM also receive them from Contractor suddenly. It is hard to make efficient and effective schedule.

(Recommendation)

LM instructs Contractor to submit Monthly & Weekly Schedule of Verification and Inspection, so that LM and ADN will share schedule at same time.

(Achievement)

Relationship between ADN and relevant LM is smoother than phase 1.

22

[5] Suggestion on Human resource development plan

- New organization was discussed at Dare Retreat on July 2013.

The sub-team leaders and junior engineers developed through the lessons & OJT, but still they need help of the advisers to make serious decision. Based on activities of this project, JICA-ADN Team submitted Human Resource Development Plan of ADN.

(Achievement)

Human Resource Development Plan

23

[6] Finding & Achievement

through evaluation, monitoring and inspection of infrastructure projects

24

1. Road/Bridge/Flood Control (Infrastructure Fund Projects)

1) Findings of FI projects on Road/ Bridge/ Flood Control

- Team Leader, Sub Team Leader, Staffs and Indonesia Advisor carry out the verification of tender documents and inspection for payment request.
- Increase of verification of feasibility study and/or preliminary phase.
- Donor and/or MPW have complaints of 1) uncertainty of process of ADN, 2) unclear template of submit form, and 3) closed procedure system of ADN.

25

2) Achievements on Road/Bridge/Flood Control

(a) Upgrading human resource of FI projects on Road/Bridge/Flood Control

- Sub-team leader is leveled up to Team Leader class and young engineers is Sub-team leader class, with use of ADN Manual and material of class room lessons of English version and Tetum version , and with OJT by Indonesia/ JICA-ADN Team.

26

(b) Wide Use of Revised ADN Manual

- ADN engineers know it is necessary to use 1) the form & checklist, 2) the technical checklist using class room lesson's material.

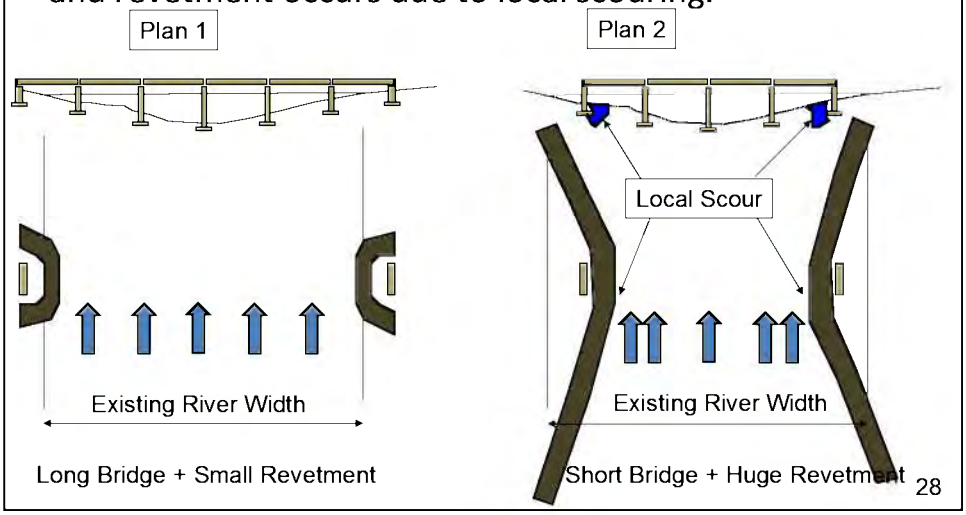
(c) Showings by JICA-ADN Team

- They were saved in ADN share folder, which are 1) materials of class room lesson, 2) short reports on site training, 3) material of MPW guidelines, 4) Revised ADN Manual.

27

Finding No.1 of FI project

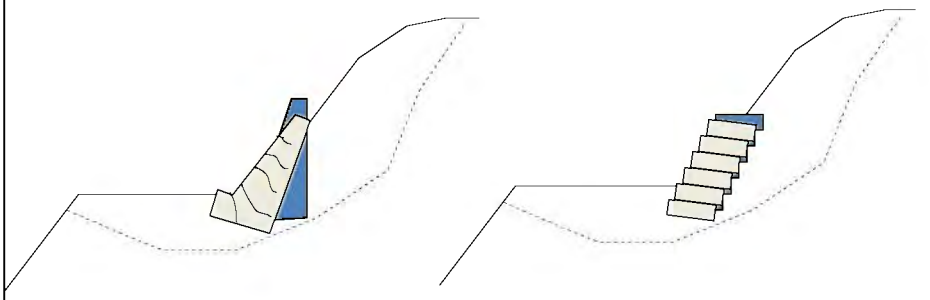
- Comparative study is necessary. The damage of abutment and revetment occurs due to local scouring.



28

Finding No.2 of FI project

- It is necessary to specify the area of Landslide. It is required to make safety & flexible stability structure like gabion.



Concrete Retaining Wall

Gabion Retaining Wall

29

2. Power (National Electrification Program: PEN)

1) Findings of PEN projects on Electric

- Team Leader and electric team carry out the verification of tender documents and inspection for payment request based on PEN Decree-Law No.40/2012.
- There are no district engineers on power, so that electric team covers all of Timor-Leste
- PEN Decree-Law requires evaluation of the plan/ design/ construction/ tender of distribution system by ADN engineers. Regarding power, there is no Indonesia Advisor in ADN.

30

2) Achievements on Power

(a) Upgrading human resource of PEN projects on Electric

- Sub-team leader is leveled up to Team Leader class and young engineers is Sub-team leader class, with use of ADN Manual, material of class room lessons of English version and Tetum version, and with OJT by JICA-ADN Team of Electric.

31

(b) Wide Use of Revised ADN Manual

- ADN engineers know it is necessary to use 1) the form & checklist, 2) the technical checklist together with class room lesson's material.

(c) Showings by JICA-ADN Team

- They were saved in ADN share folder, which are 1) materials of class room lesson, 2) short reports on site training, 3) material of EDTL guidelines, 4) Revised ADN Manual.

32

3. Water (PDID)

- **1) Findings of PDID projects on Water**
- There are lots of projects of PDID in ADN, which sectors are building, road, ditch, river development, irrigation, water supply. There are a few numbers of projects on water supply.
- ADN checklist is not efficient under the present situation such as the design drawings are far different from the site.
- ADN's inspectors must judge the facilities from the viewpoints of the function, not complying the design drawings at the inspection of some rural water supply projects.

33

- Mobile Team started to train contractors and consultants of each district for PDID projects.
- Contractors (design & construction) of PDID projects would have little technical knowledge/ experience, so that it is necessary for ADN engineers not only to verify the projects but also to coach the contractors on the plan, design, tender document and construction.
- Regarding water supply, there is no Indonesia Advisor in ADN.
- One of the main problems in rural water supply projects is lack of technical knowledge/ experience on pipeline hydraulics/calculation and pipeline profile.

34

2) Achievements on Water

(a) Upgrading of human resource of PDID projects on Water

Some of young engineers acquired fundamental knowledge through class room lessons, and OJT at inspection site by JICA-ADN Team of Water Supply

35

(b) Wide Use of Revised ADN Manual

- Fundamental technical knowledge is required to use ADN Manual (technical checklist). Therefore technical notes were attached with existing checklist.
- As a result, ADN engineers can use technical checklist more effictively.

(c) Showings by JICA-ADN Team

- They were saved in ADN share folder, which are 1) materials of class room lesson, 2) short reports on site training, 3) Revised ADN Manual, and 4) technical references such as EPANET software with the user manual and World Bank's Rural Water Supply Manual.

36

4. ICT work in ADN (Outside the scope of JICA-ADN Team)

- Donor and/or MPW have complaints of 1) uncertainty of process of ADN, 2) unclear template of submit form, and 3) closed procedure system of ADN.
- ICT Advisor starts the bellow countermeasures of information system in ADN.
- **(a) Project Monitoring System**
- ICT Team prepares the project monitoring system, which can monitor the progress of each project, sorting in sequence from oldest.

37

- **(b) Down load of Template, ADN Manual** on website of http://adn.gov.tl
- ICT Team will prepare the template and ADN Manual data on website.
- **(c) Project Mapping System**
- ICT Team will prepare project mapping system.
- The above information system is to cooperate between ADN and Line Ministries.

38

[7] Workshop

- Each presenter explain **Issues** During ADN performance verification for tender documents and conduct inspection at project. They also make a suggestion about them.
- Each presenter explain process & procedure of ADN work.
- Each presenter explain sample of bad quality control work/ good quality control work.
- Please listen them and **use ADN Manual for systematic way** of process & procedure of infrastructure projects.

39

END

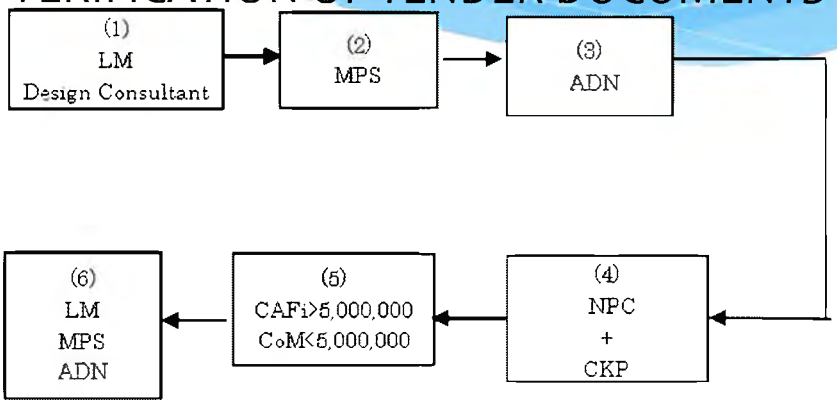
- Thank you very much for your cooperation with JICA-ADN Team.

40

Quality Control
and
Use of ADN Manual
on Infrastructure Fund Projects

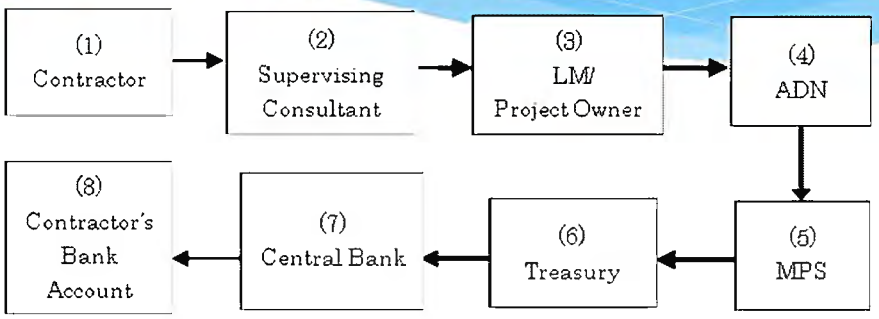
By Aleixo Amaral do Carmo

FLOW CHART
IN
VERIFICATION OF TENDER DOCUMENTS



Contact to Administration Unit of ADN for inquiry on progress of Tender Document

FLOW CHART
IN
INSPECTION FOR PAYMENT



Contact to Administration Unit of ADN for inquiry on progress of Inspection for Payment

3

CHECKLIST OF VERIFICATION DOCUMENT
FOR DESIGN AND BOQ
(ROAD, BRIDGE, PORT & IRRIGATION)

Checklist A

DEMOCRATIC REPUBLIC OF TIMOR LESTE
CABINET OF PRIME MINISTER
NATIONAL DEVOLOPMENT AGENCY

Checklist of Verification Document for Designs and BOQ

Name of Project :
Owner of the Project :
Number of Contract :
Date of Receipt :

1. The Letter of Inclusion ☐
2. Design should be completed and obtained the signature by LM's Engineers ☐
3. BOQ and Estimation Cost should be gotten the signature by Public Works ☐
4. Unit Price Analysis ☐
5. Soft copy of documents which mentioned above ☐
6. Technical Specification ☐
7. It should also have the Structure and Hydrologic Calculation Analysis, and Topography data ☐

Note: This checklist is used to confirm that all the required documents are submitted for Verification Document of Infrastructure Fund project of Road, Bridge, Port, Irrigation

4

TENDER DOCUMENT CHECKLIST OF CONSTRUCTION FOR BUILDING & OFFICE FENCING WALLPROJECTS

CHECKLIST A

DEMOCRATIC REPUBLIC OF TIMOR LESTE
CABINET OF PRIME MINISTER
NATIONAL DEVOLOPMENT AGENCY

TENDER DOCUMENT CHECKLIST OF CONSTRUCTION FOR BUILDINGS & OFFICE FENCING WALL PROJECTS

1. The Drawings should be approved by Public Works _____ ☐
2. Bill of Quantity (BoQ) should be approved by Public Works_____ ☐
3. Cost Estimation should be approved by Public Works _____ ☐
4. Technical Specification should be ascertainable by Public Works_____ ☐
5. Submit the Electronic files which saved inside CD _____ ☐
6. If the buildings is more than 2 stairs, it should be attached the feasibility study of Soil or soil investigation results_____ ☐
7. If the buildings is more than 2 stairs, it should be attached the Structure Calculation analysis _____ ☐

Note: This checklist is used to confirm that all the required documents are submitted for Verification Document of Infrastructure Fund project of Building

5

CHECKLIST OF PAYMENT DOCUMENT FOR THE SUPERVISING CONSULTANT

Checklist D

DEMOCRATIC REPUBLIC OF TIMOR LESTE
CABINET OF PRIME MINISTER
NATIONAL DEVOLOPMENT AGENCY

Checklist of Payment Document for the Supervising Consultant

Name of Project :
Owner of Project :
Number of Contract :
Date of Receipt :

1. The Invoice in Original submitted by Consultant..... ☐
2. The Payment Certificate in Original which obtained approval by Minister or Secretary of State..... ☐
3. Submit the completed copy of the Valid Contract with attachment..... ☐
4. Submit the Monthly Report which obtained approval by Project Owner..... ☐
5. Submit No. TIN (Identification of the Taxpayer contributions Number)..... ☐
6. Number of Bank Account..... ☐
7. Submit the valid of the Company Birth Certificate and should be legalized..... ☐
8. Submit the Valid Economic Activity License and should be legalized ..... ☐
9. Submit the Valid of Company Ownership License..... ☐

Note: This checklist is used to confirm that all the required documents are submitted for Payment Document of Infrastructure Fund project of Road, Bridge, Port & Irrigation

6

INFRASTRUCTURE FUND CHECKLIST OF PAYMENT
(Submitted by Contractor)

Checklist D

DEMOCRATIC REPUBLIC OF TIMOR LESTE
CABINET OF PRIME MINISTER
NATIONAL DEVOLOPMENT AGENCY

INFRASTRUCTURE FUND CHECKLIST OF PAYMENT

Name of Project :
Name of Company :
Contract Number :
The Value of Contract : US$
The Value of Invoice/Request : US$

No	Documents to be submitted at the Invoice	Results		Remarks
		Yes	No	
1	The contract is still valid (at least one month before expired date). The contract Value is more than 5 hundreds thousands must be subjected to get Justification Letter from the chamber of Account in the Superior Administrative Curt of Timor Leste.			
2	Submit the valid of the Company Birth Certificate and should be legalized			
3	No TIN (Identification of the Taxpayer contributions Number)			
4	Submit the Valid of Company Ownership License			
5	Submit the Valid Economic Activity License and should be legalized			
6	Submit 1 Original Invoice (5 copies) and obtained approval by the LM 's Techniques			
7	Request of Payment Letter			
8	The Payment Certificate approved by Line Ministries			
9	Bank Account Number of company			
10	Performance Bond should be saved in the bank as guarantee, it is a similar with the Advance Value or based on the Terms of contract			
11	The Invoice should be attached with the Monthly Progress Report			
12	International Company should attach the certificates from International Standard Organization (ISO)			

Note: This checklist is used to confirm that all the required documents are submitted for Payment Document of Infrastructure Fund project of Building, Road, Bridge, Port & Irrigation and others.

7

PROBLEMS AND RECOMMENDATIONS

PROBLEM 1. Sometimes MPW and related LM, Consultant and Contractor do not attend the site inspection.

RECOMMENDATION 1. ADN will inform when the inspection is carried out.

RECOMMENDATION 2. In accordance with ADN Manual, MPW and Related Ministries will prepare for the inspection

8

PROBLEM 3. Consultant who designs a work has sometimes no appropriate background and qualification.

RECOMMENDATION 3. Project owners, relevant ministries or agencies, have to employ good enough consultants to work on the project.

PROBLEM 4. We find out contractor's activities on site that do not follow the specification.

RECOMMENDATION 4. Both parties, project owner and contractor should follow not only specifications but all the contract documents.

9

PROBLEM 5. It is specified in the ADN Manual that ADN has to complete inspection for payment within 10 days after receiving complete set of documents, but sometimes it takes more than 10 days.

RECOMMENDATION 5. ADN staff in charge of the inspection has to complete the document and site inspection, and then send recommendation for the payment to MPS within the specified time. But on the other hand, the project owner has to send all the required documents, specified in the ADN Manual, within the specified time and cooperate with AND on the inspection .

10

PROBLEM 6. Contractors complain to ADN regarding deduction of money.

RECOMMENDATION 6. ADN makes inspection for payment in accordance with the ADN Manual. When quality of the works is less than specified, then remedy against the defectives are issued. When quantities invoiced is more than the quantities actually completed at the time of inspection, the amount the contractor receives may be deducted from the invoiced amount.

11

The Quality of the Construction

Doing Construction

Must be based on designs and technical specification:

- **Type of materials**
- **Quantities**
- **Qualities**
- **Dimensions**
- **Mixtures**
- **Construction Methods**
- **Miscellaneous(Colors, Indoors, outdoors)**

12

Doing Construction

Dimensions must be based on Designs :

- Its Length
- Its Width
- Its Height
- Its Depth
- Its Thickness
- Radius

THE WORKS HAVE BEEN SUCCESSFUL AND CORRECTED, WHEN :

-In accordance with the terminated time of contract

-Corrected quality based on technical specification and other technical methods.

-Corrected quantities is based on technical specification and other technical methods.

-Corrected Dimensions is based on designs, technical specification and other technical methods.

-Based on administrative matters.

13

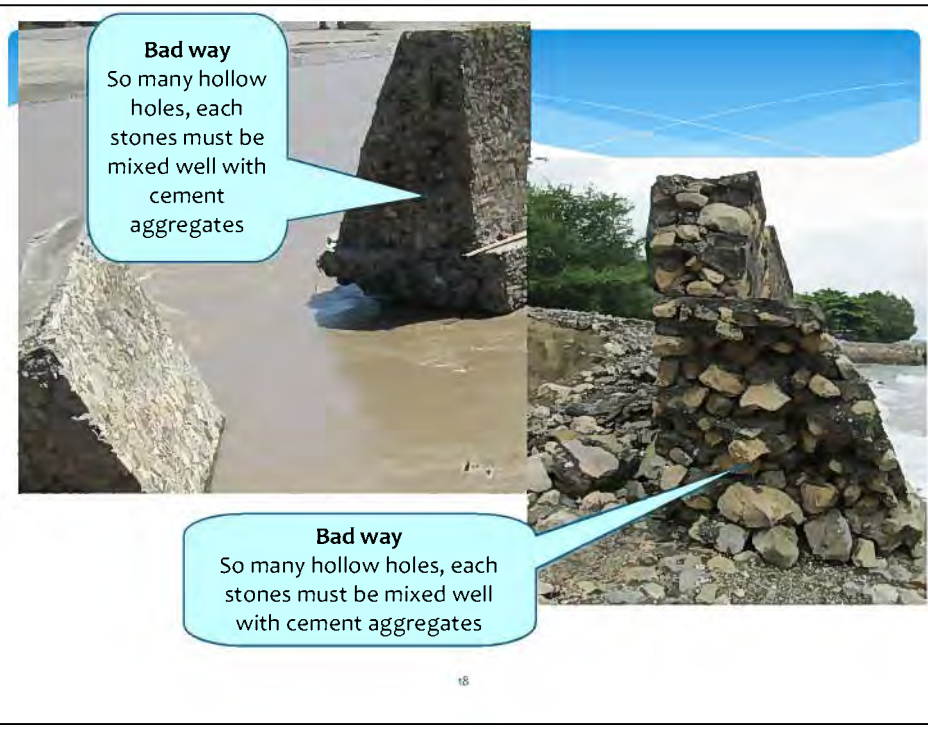
Some Documentations of Construction has been uncorrected/not corrected yet

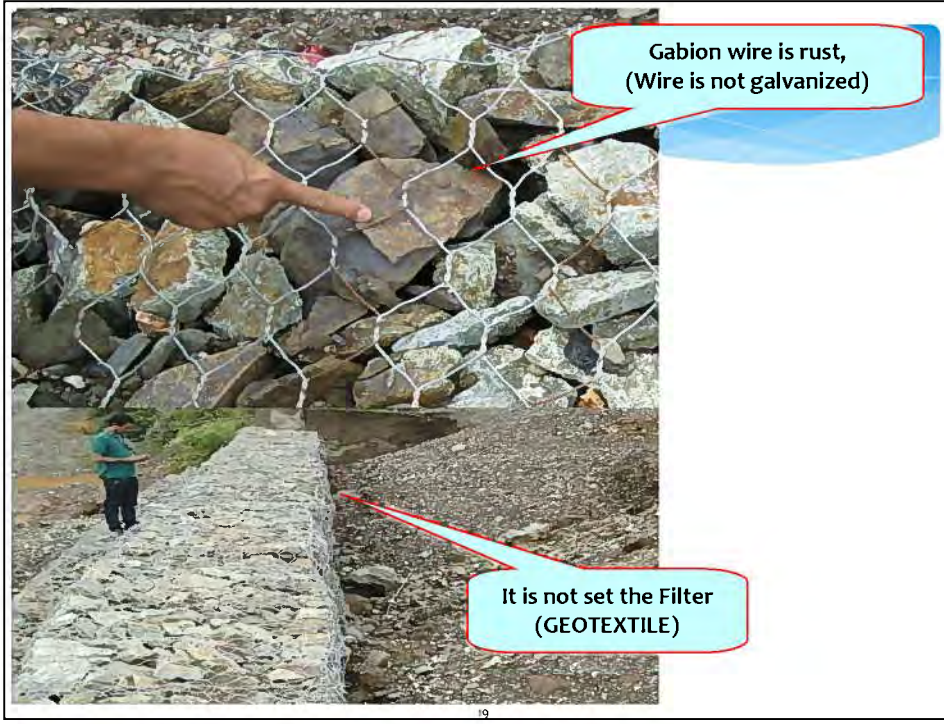
14

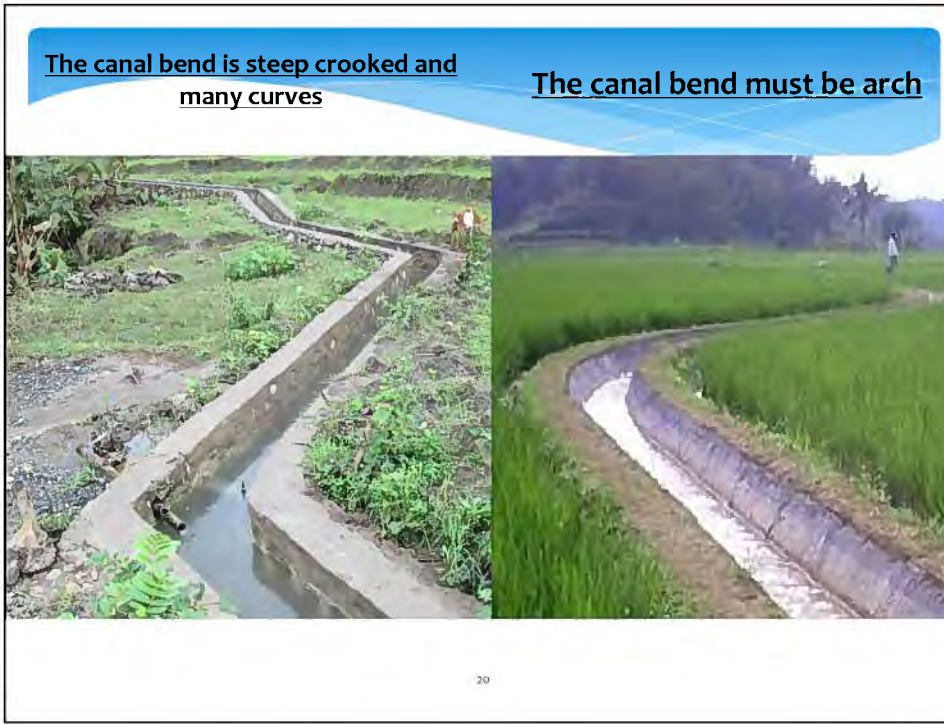

Distances from the others stirrup reinforcement is too big.
End of the reinforcement does not bend
15

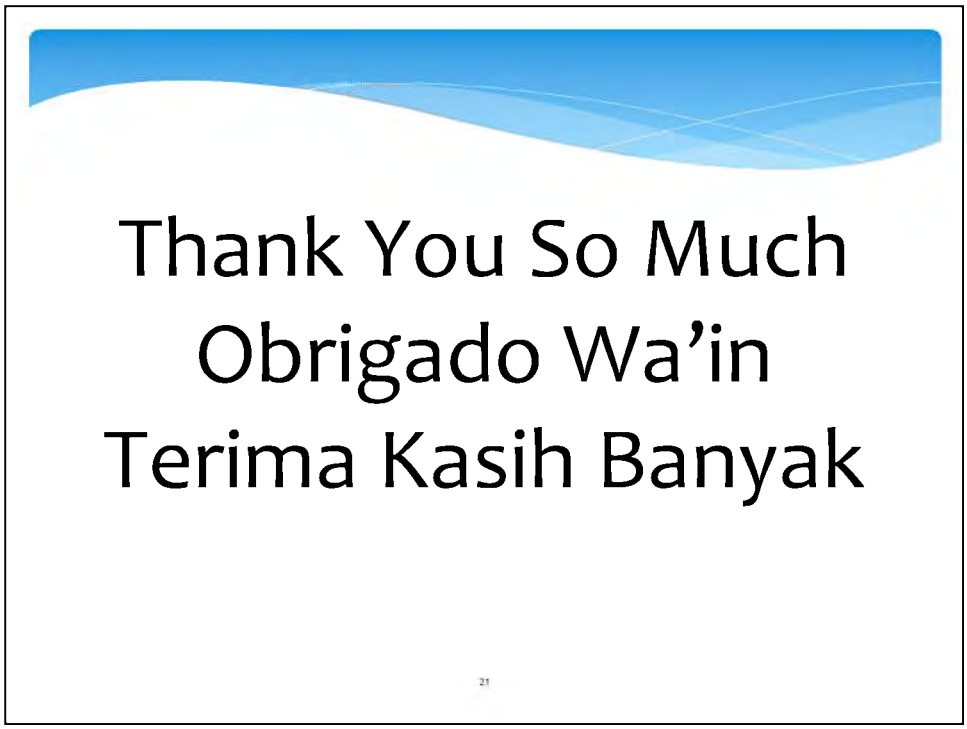

Making the wrong mortar
(excavator instead of a tool for stirring)
CAT
16


Do not used mixed concrete bar stone gravel, stone large diameter and should not be used round mixed
17


Bad way
So many hollow holes, each stones must be mixed well with cement aggregates
Bad way
So many hollow holes, each stones must be mixed well with cement aggregates
18


Gabion wire is rust,
(Wire is not galvanized)
It is not set the Filter
(GEOTEXTILE)
19


The canal bend is steep crooked and many curves
The canal bend must be arch
20


Thank You So Much
Obrigado Wa'in
Terima Kasih Banyak
21

Rapid Assessment of ADN
ADN's Role in the Infrastructure Development Process

Carolyn Peterken
Consultant to AusAID/ADN

Rapid Assessment – Purpose

- Propose a way forward for ADN that will enable it to better meet its current mandate
- Consider the potential transition of ADN to EPIA

ADN's Strengths

- Has already led to significant cost savings for GovTL
- Strong sense of shared values across ADN
- Some strong HR policies, and a commitment to L&D
- Checklists to guide administrative processes
- Strong district presence
- Strong relationship with Office of the PM, and good personal relationship with other government stakeholders
- Positive internal management style

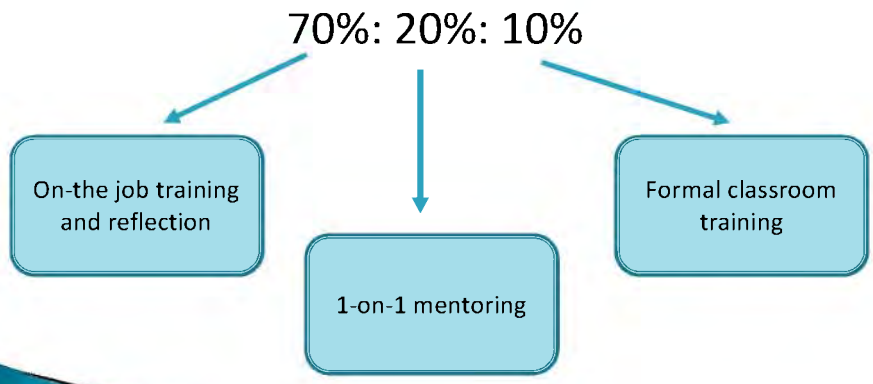
3

Recommendations re. Internal Operations

- Articulate and maintain a ***positive culture*** that supports good relationships with its stakeholders
- Strengthen ***capabilities***, not only technical, but also in communication, negotiation, community engagement, leadership and management...
- Add certain areas of ***professional expertise***, such as legal and contract management
- Establish and communicate ***standard operating procedures*** on the basis of which recommendations are made
- Establish an ***internal structure*** with clearly identified coordinators who take a leadership role with respect to their team
- Maintain good ***internal channels of communication*** and information sharing as the Agency establishes a more formal organisational structure

Framework for Learning and Development at ADN

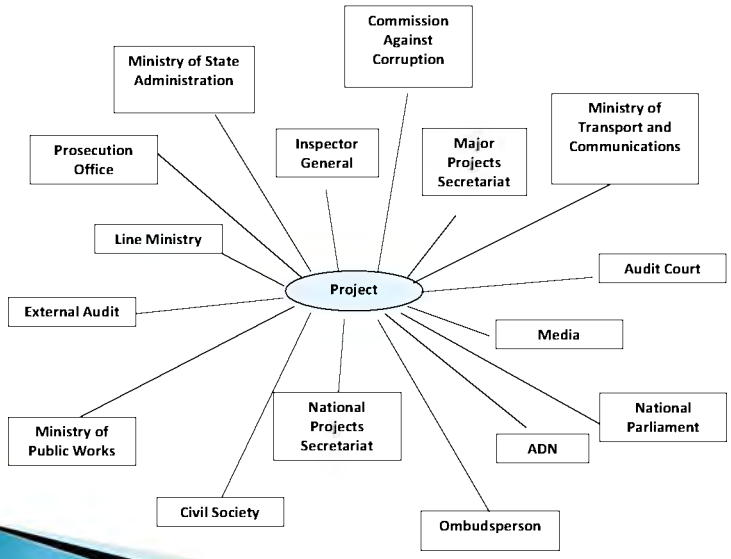
- Annual Agency Learning and Development Plan
- Annual individual Learning and Development plans



Draft Skills Framework for ADN

General skills/knowledge	Core engineering skills/knowledge	Working with stakeholders
All staff need an understanding of the following: •Role, structure and processes of government •Role, structure and processes of ADN •General administration •Portuguese language •English language	***All technical staff*** need a qualification and breadth of knowledge in one of the following: •Civil Engineering •Architecture •Electrical Engineering •IT and communications •Project management	***All technical staff*** need skills in the following: •Communication with stakeholders •Negotiation
Specialised corporate/professional skills	**Specialised engineering skills/knowledge**	**Management and leadership skills**
Some corporate staff need specialised knowledge in one of the following: •Finance/FMIS •Procurement •HR management	***Some technical staff*** need to specialised knowledge in one of the following areas of engineering •Roads •Bridges •Construction/buildings •Geotechnical •Water and sanitation •Irrigation •Electricity transmission and distribution •Renewable energy •Ports	***Some staff*** need to develop skills in the following: •Team management •Leadership •Communicaty engagement
Other professional capabilities		
Some staff need professional qualifications/experience in the following •Economics* •Social planning* •Environment* •Contract management •Legal		

Organisations potentially involved in monitoring/ inspection process



7

Challenges in infrastructure process as identified by ADN

- Different contracts used by Line Ministries
- Incomplete documents and late submissions
- Poor communications between state institutions
- Many projects have no project manger

8

Challenges identified through Rapid Assessment process

- Lack of certainty regarding future intentions for ADN/ EPIA
- Overlap of roles ADN/MPS
  - Evaluation of projects prior to procurement
  - Processing of payments
- Overlapping mandates between ministries (or overlap in their implementation)
- Lack of clarity around project owner and project accountability, and inconsistencies between authority/ accountability
- Inefficient process leading to significant delays in both project approvals and in payments
- Lack of clarity around basis on which ADN makes its decisions/recommendations

9

Recommendations

- Clearly define words commonly used around quality control process ("project owner", "accountability", "monitor", "evaluate", "supervise", "inspect", "quality control", "certify"...)
- Produce a single document that summarises the roles of different players at each step of the infrastructure development process, their roles, authorities and accountabilities, and work through this with the respective stakeholders.
- Establish a program of regular meetings between ADN and key stakeholders at various organisational levels.
- Once finalised, share ADN's standard operating procedures with stakeholders.
- Where possible conduct joint inspections with ADN and other stakeholders.

10


Questions/Comments?
Thank You!

PRESENTATION ADN MANUAL FOR LINE MINISTRY PROJECT

Presented

by

Januario Maia Guterres

ADN was established by Decree-Law No.11/ 2011 as one of the government take initiatives to establish reform and strengthen an organizational structure of the public administration.

ADN is responsible for strict reviewing of capital development projects as follows:

-assessing merit and feasibility of capital development projects;

-supervising, inspecting and certifying capital development projects;

-managing construction projects under PDDII; and

-providing support to MDG program for Sucos.

During ADN performance of verification for tender documents and conduct of inspection at project, many issues were met as follows:

Issues

- Many drawings were submitted without detailed drawings.
- Regarding many designs/drawings, they were uncompleted.
- The design/drawing compared with the condition at site were very differents.
- Due to a lot of BoQ, analyzing the unit price were uncompleted.
- Regarding many Payment of Document, they were uncompleted.
- Payments for the other Company were delayed because the long process to complete the document for the inspection.
- Many payments of the other Company were delayed because an administrative system does not flow.

It is effective and efficient work, that ADN has support from JICA to make ADN Manual. This Manual was helpful for the ADN to perform the job appropriately and to follow Decree-Law efficiently. So that, also this Manual have supported to LM and other relevant Institutes for supporting the responsible papers during procurement and implementation of projects at capital development.

This Manual specially explained about the process and flow chart :

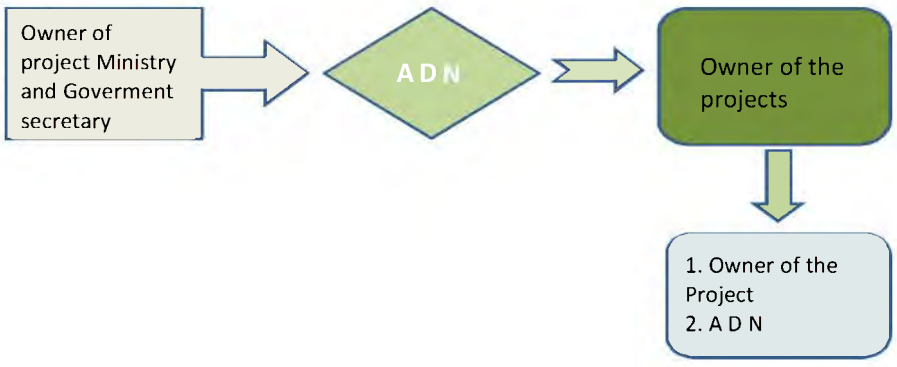
- Verification of Documents for tender.
- Inspection for payment recommendation

The Manual was separate base on Category. One is forms where the fund indicated in the following table and second is to have a considerate and different procedure.

Table 3. Anticipated Category on ADN as of 2014

Class of Project	Infrastructure	Line Ministries	PDID	MDG	SEFOPE	Emergency Fund	National Electrification Programa (PEN)	Additional	Special Projects under ADN
Note				Building house	Decree Law LM	Only in emergency cases	Decree Law No: 40/2012	Only used for projects not foreseen in the budget	Upon instruction and approval by PM
Funding Source	Infrastructure Fund	Line ministries Budget	ADN	ADN	SEFOPE	Emergency Fund Managed by MoF	Infrastructure Fund	Contingency Fund managed by MoF	Funds allocated to ADN
Budget Range	Over US$1,000,000	US$5000,00 to US$1,000,000	(PDDI) Up to 150,000 (PDDII) 150,001 Up to 300,000	No limit	No Limit	US$100,000 to US$150,000	US$ 1,000,000 to US$ 4,500,000	Maximum 2,000,000 (Normal pratice)	Upon to 10,000,000

Project Evaluation before Contract Award



Check List of Tender Document

DEMOCRATIC REPUBLIC OF TIMOR LESTE

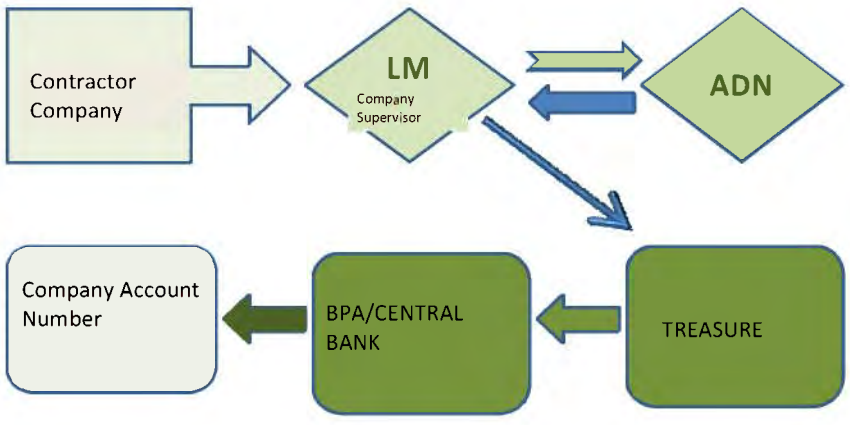
CABINET OF PRIME MINISTER

NATIONAL DEVOLOPMENT AGENCY

TENDER DOCUMENT CHECKLIST OF CONSTRUCTION FOR BUILDINGS & OFFICE FENCING WALL PROJECTS

1. The Drawings should be approved by Public Works _____ ☐
2. Bill of Quantity (BoQ) should be approved by Public Works_____ ☐
3. Cost Estimation should be approved by Public Works _____ ☐
4. Technical Specification should be ascertainable by Public Works_____ ☐
5. Submit the Electronic files which saved inside CD _____ ☐
6. If the buildings is more than 2 stairs, it should be attached the feasibility study of Soil or soil investigation results_____ ☐
7. If the buildings is more than 2 stairs, it should be attached the Structure Calculation analysis _____ ☐

Project Inspection & Recommendation for Payment



Check List of Payment

DEMOCRATIC REPUBLIC OF TIMOR LESTE
CABINET OF PRIME MINISTER
NATIONAL DEVOLOPMENT AGENCY

CHECKLIST OF DOCUMENT FOR THE PAYMENT OF BUILDINGS & FENCING WALL PROJECTS

1. The Original Invoice submitted by Company _____ ☐
2. Submit the Original Payment Certificates which approved by Minister or State Secretary of Line Ministries _____ ☐
3. Submit the Copied document of the valid Contract and completed with its annex_____ ☐
4. Submit the three copies of Phisical Progress Report which approved by the Owner of Project ☐
5. No.TIN (Identification of the Taxpayer contributions Number)_____ ☐
6. Bank Account Number of company_____ ☐
7. Submit the valid of the Company Birth Certificate and should be legalized _____ ☐
8. Submit the Valid Economic Activity License and should be legalized _____ ☐
9. Submit the Valid of Company Ownership License_____ ☐
10. If, the payment for 100% of phisical progress, it should attach the Term of Pre Handover Letter (PHO)_____ ☐
11. If, the Payment of retention, it should attach the Term of Final HandOver Letter for deduction of retention money (FHO) _____ ☐

Letter Head of Line Ministries

Date : _____Month_____Year

Número : Ministry/ Infra Unit/_____(number of Letter)

To : Excellency Mr. Samuel Marçal
Director of ADN
In Dili

Subject : Request of Inspection
Project of Line Ministries Fund (Type of project)
Localization (place of project)

In response to the request of payment which submitted by company_____(name of company). We (LM) inform that will be done the inspection for the project o_____(name of project) with the contract number: RDTL_____, at_____(date of inspection). In this case, we also submitted the Invoice of companies and progress report which attached below in order to ADN could inspect and prepare the inspection report and the recommendation for payment.

Finally, we would express appreciation for your cooperation.

Chief of project

(.....)

Approved by Minister/SOS

(.....)

Attachment:
1. Implementation period (Completion for the project)
2. Summary of Project
2. List of Quantity (BOQ)
3. Drawings
4. Detailed technical specification
5. Measurement
6. Invoice and progress report of company
7. Others, if required

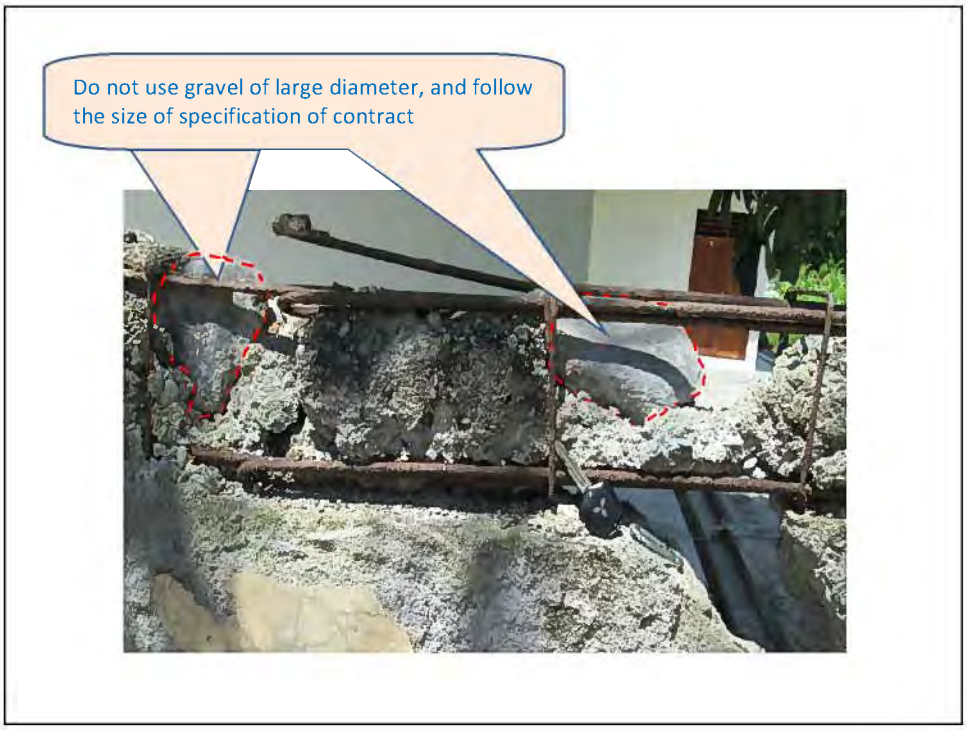
REPUBLICA DEMOCRATICA DE TIMOR LESTE
GABINETE DO PRIMEIRO MINISTRO
AGENCIA DESENVOLVIMENTO NACIONAL

No	Inspection Result and Recommendation for Payment				
A	Name of Project				
B	Ministry/Project Owner			*Line Ministry*	
C	Sources of Funds : (PDD I, PDD II,PDI,H,Emergency,MDG Suco,etc)				
D	Contractor				
E	PO number (Purchase Order)				
F	Project site :	a.District b.Sub district c.Village/Hamlet	: : :		
G	Contract Value				
H	Previous physical progress				
I	Physical progress up to date				
J	Gross payment value up to date (gross)	(9-8)*7			
K	Advance payment which paid ...%	(...%*7)			
L	Deduction for advance payment 10%	(9-8)*11)			
M	Deduction for retention payment	(10%*10)			
N	Value payment after deduction for retention	(10-13)			
O	Value for this payment	(14-12)			
P	Balance after this payment	7-(9*7)			
Q	Observation or others Commands:				
R	Recommendation for payment to MPS MoF/Treasurer MoF/Ministry/other reelevant agency with amount (USD)				
S	Observation		Yes	Comments	No
a	Based on Design ?				
b	Based on BOQ ?				
c	Based on specification ?				
d	Based on Schedule curve S ?				
e	Based on Terms of Contract ?				
T	Inspection date		Date:	Month:	Year:
U	Inspector	Signature:			Date :
	1				
	2	Signature:			Date :
		Signature:			Date :
V	Verified by:	Signature:			Date :
	Miguel Marques Monteiro de Jesus				
W	Q.C.	Signature:			Date :
	Esron ST. Renuk				
X	Approved by:	Signature:			Date :
	Sr. Samuel Marçal				
	Director Geral - ADN.				
Y	Annex :	Site Picture			

REPUBLICA DEMOCRATICA DE TIMOR LESTE
GABINETE DO PRIMEIRO MINISTRO
AGENCIA DESENVOLVIMENTO NACIONAL

Date _____Month, Year
To : Director of Major Project Secretary (MPS)
From : Samuel Marçal *(Stamp and signed by Director of ADN)*
General Director of ADN
Ref : _____ RDTL/ GPM /ADN / III / 20____
Subject : Payment Request
On regarding to the Payment Request No._____(Number of Request) by the company _____(Name of company) on the project for _____(name of project) in _____(district) _____(sub district) _____(Village). ADN's Technical Team which done the inspection for works referred recommends to be able making payment for existed progress. So we would ask to Major Project Secretary (MPS) when executing the payment process has to verify again the previous payment.

Finally, Thank You Very Much for Your collaboration .



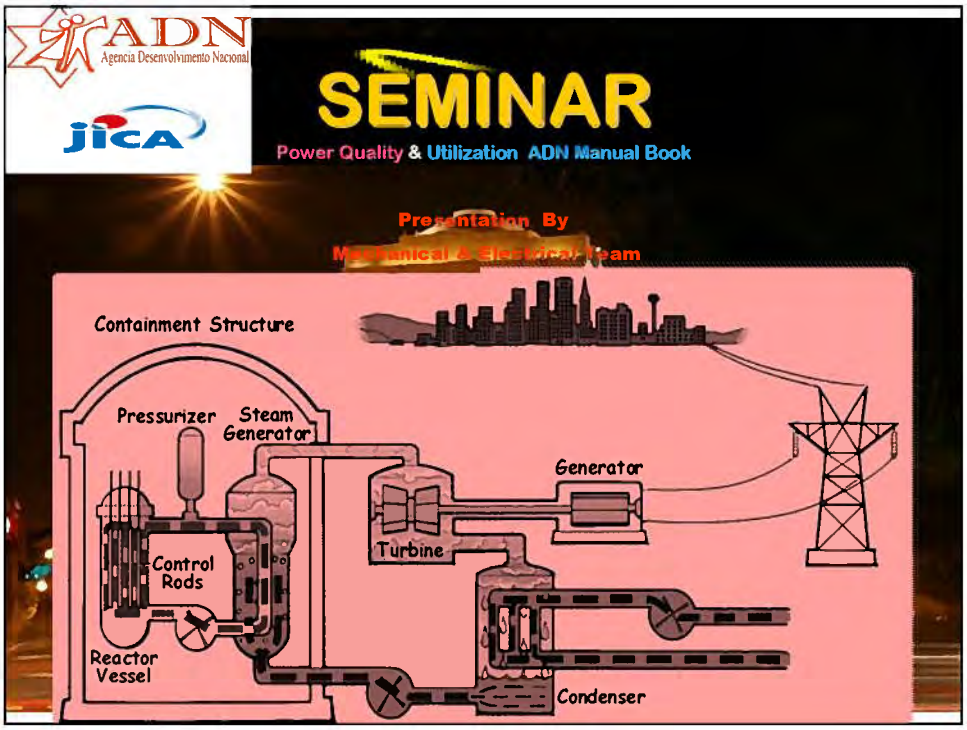
Making the wrong mortar
(excavator instead of a tool for stirring)

Distance from the others stirrup to stirrup of reinforcement is too wide

Re-bar work is not true

End of the reinforcement does not bend

- Thank you very much

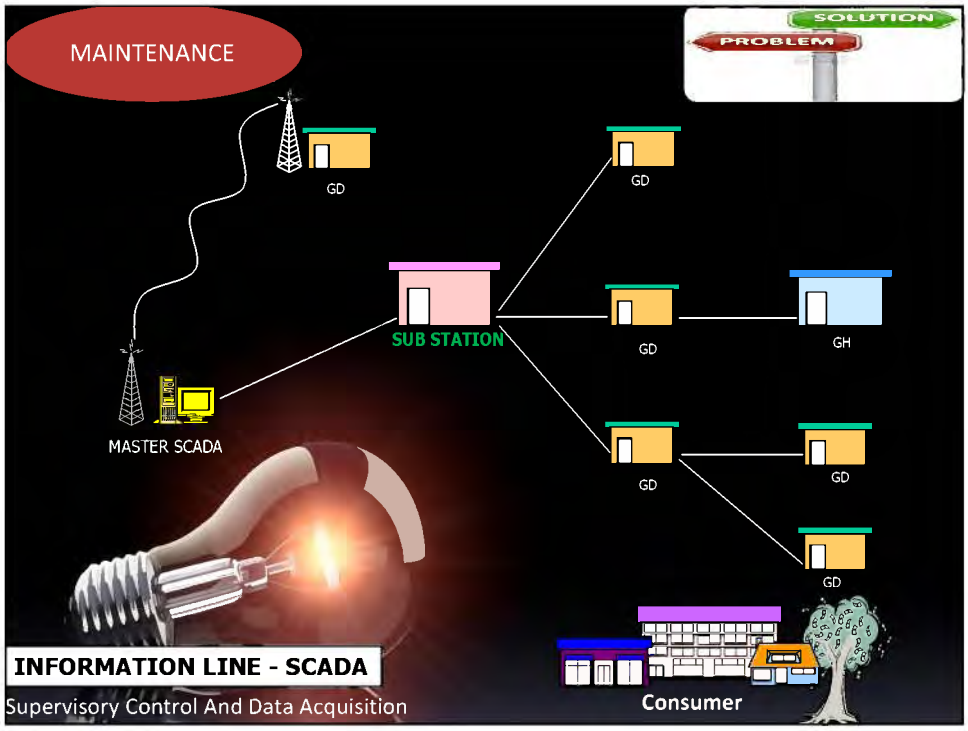

ADN
Agencia Desenvolvimento Nacional
JICA
SEMINAR
Power Quality & Utilization ADN Manual Book
Presentation By
Containment Structure
Pressurizer
Steam Generator
Generator
Turbine
Control Rods
Reactor Vessel
Condenser


Power Quality
Construction
Planning
Material
Orderly
Safety
Reliable
Quality
Efficiency
Control
Maintenance
Operational
SOP

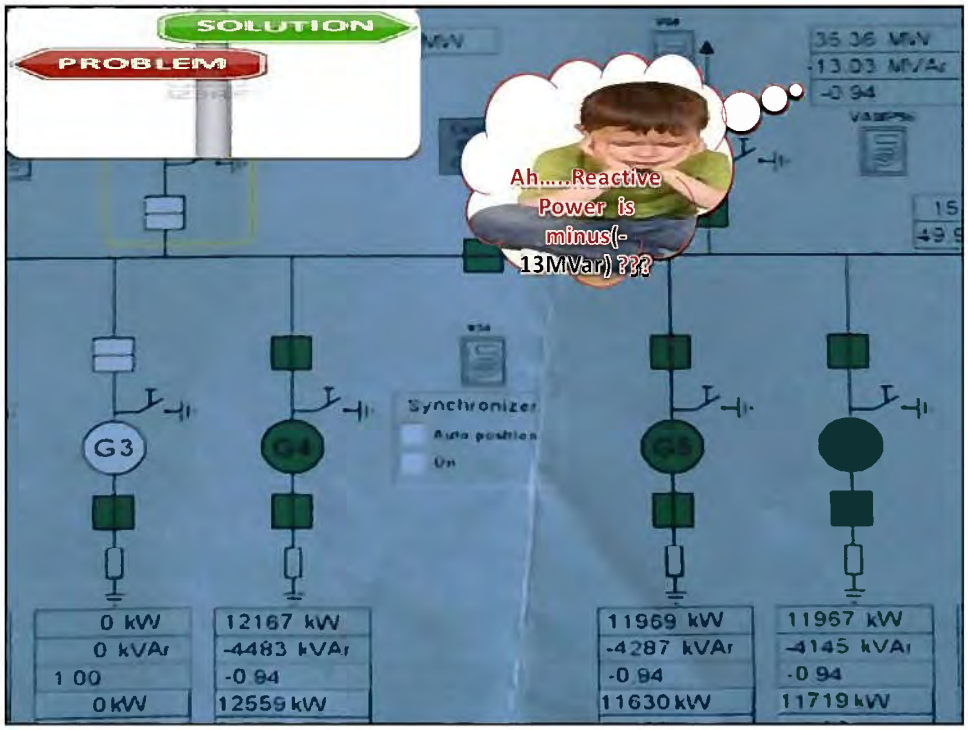

PLANNING
SOLUTION
PROBLEM
Double Line = High Cost
Revoke
Emergency Project
2010-2011
PEN - 2013
Should be
Revoked ...

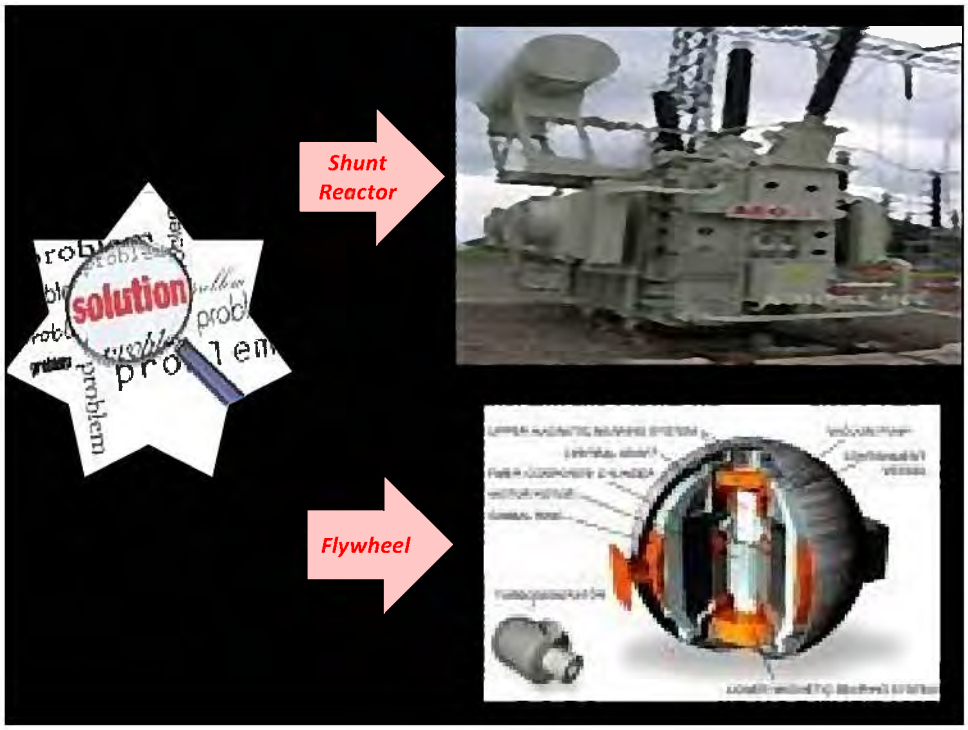

PLANNING
SOLUTION
PROBLEM
Inefficiency = High Cost


MAINTENANCE
SOLUTION
PROBLEM
Maintenance = POWER OFF
Maintenance = POWER ON
Blackout Again....

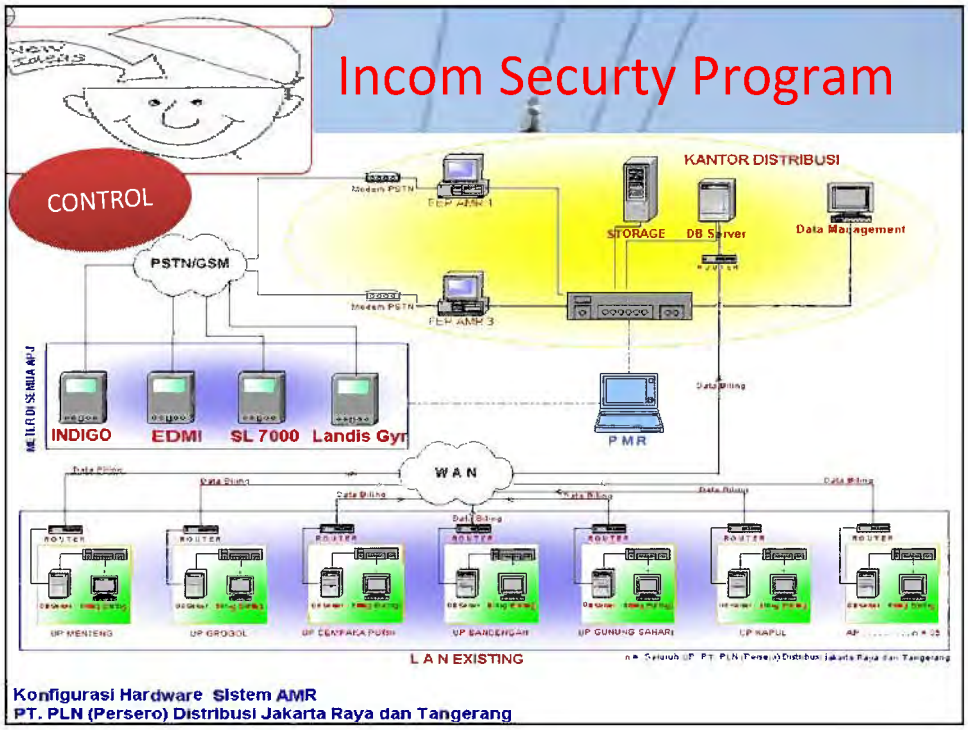

MAINTENANCE
SOLUTION
PROBLEM
GD
GD
SUB STATION
GD
GH
MASTER SCADA
GD
GD
GD
INFORMATION LINE - SCADA
Supervisory Control And Data Acquisition
Consumer

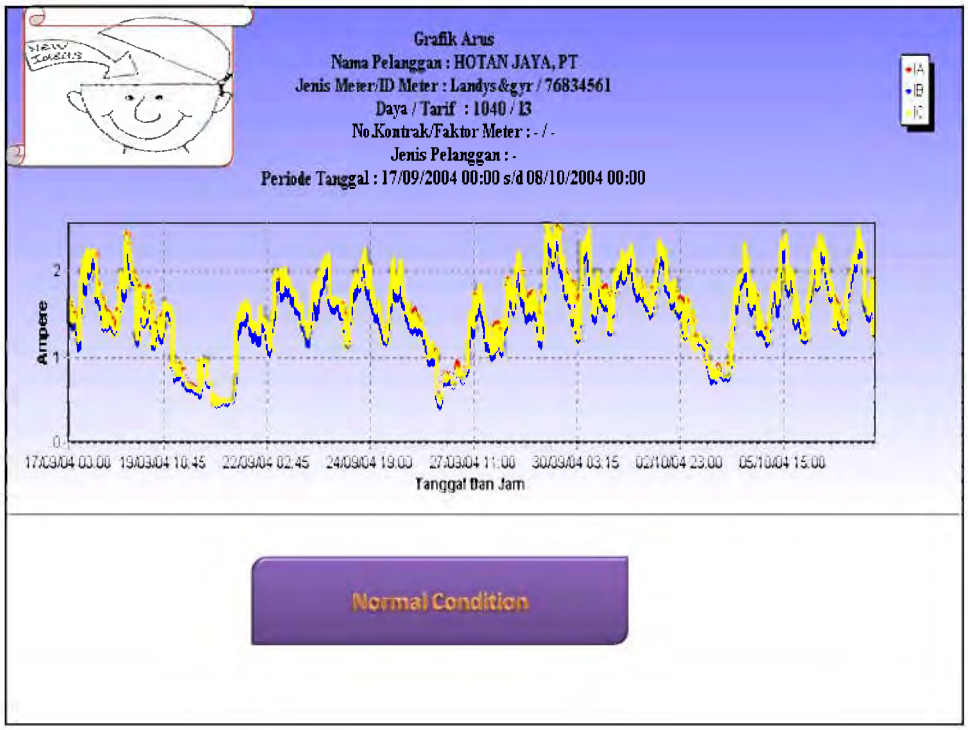

SOP
SOLUTION
PROBLEM
UNSAFE
SAFE

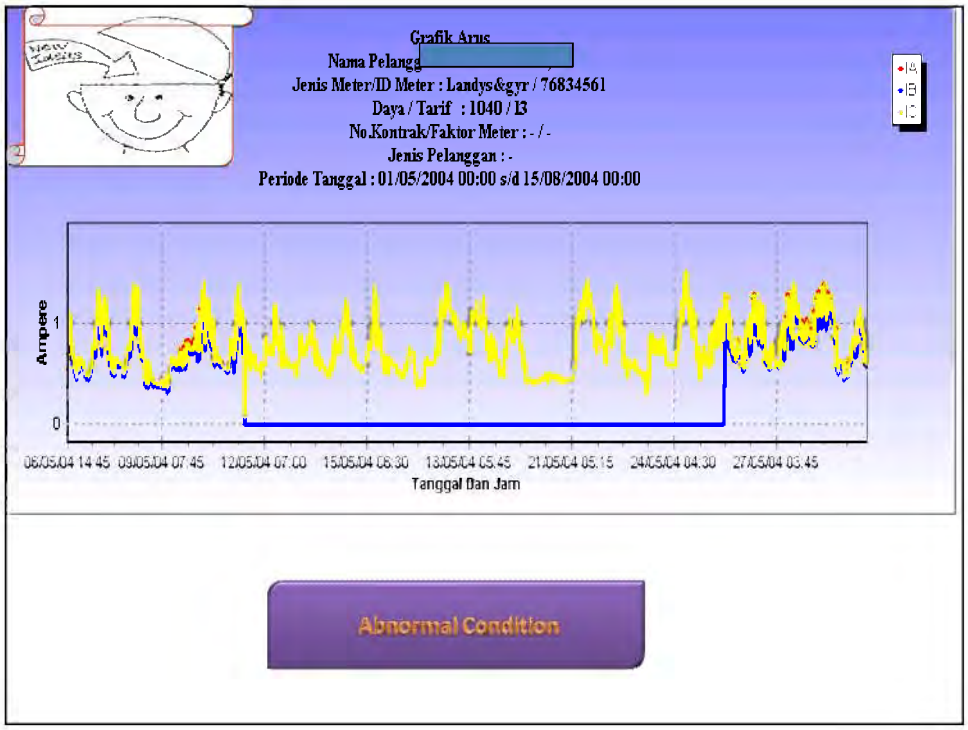

SOLUTION
PROBLEM
Ah.....Reactive Power is minus(-13MVar) ???
G3
Synchronizer
0 kW
0 kVAr
1 00
0 kW
12167 kW
-4483 kVAr
-0 94
12559 kW
11969 kW
-4287 kVAr
-0 94
11630 kW
11967 kW
-4145 kVAr
-0 94
11719 kW

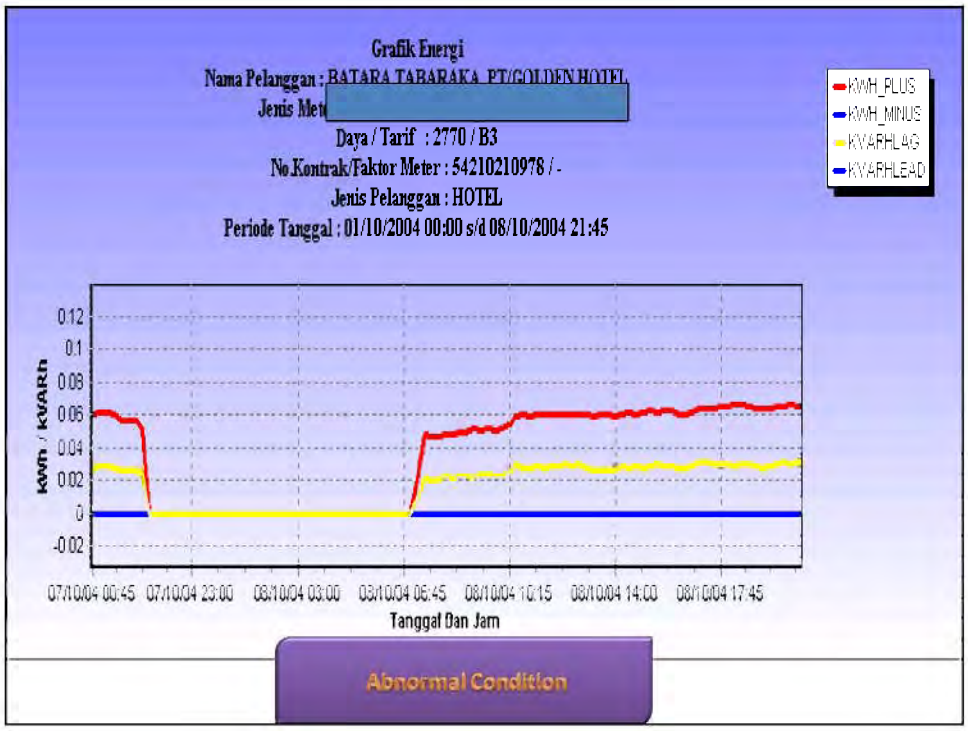

Shunt Reactor
solution
problem
Flywheel


KWH calculation of loss due to the illegal installation
ombeiros-audian-belarminio lobo, bidau metiaut pas ane laulara
1. The number of consumers with illegal Connection 258 Houses
2. The number of consumers (KWH COMBO/Conventional) 550 Houses
3. The number of Ex. Illegal 39 Houses
4. The number of not installed /house closed 269 Houses
Total 1.116 Houses
total 5.251-1.116 = 4.135
PROBLEM
ORDERLY
Load per/house = 6 Ampere (1300 VA)
Number of Load 1116 Houses = 1300 x 1116 x 0.8 = 1160.64 Kwh
Kwh /day = 24 X 1160.64 = 27,855.36 Kwh
$ /Kwh = $ 0.12 cen
❖ Loss $/Day
= 27,855.36 X 0.12 = $ 3,342.64
❖ Loss $/Month
= $ 3,342.64 X 30 Days=
$ 100,279.20
❖ Loss $/Year
= $ 100,279.20 X 12 Month
$1,203,350.40

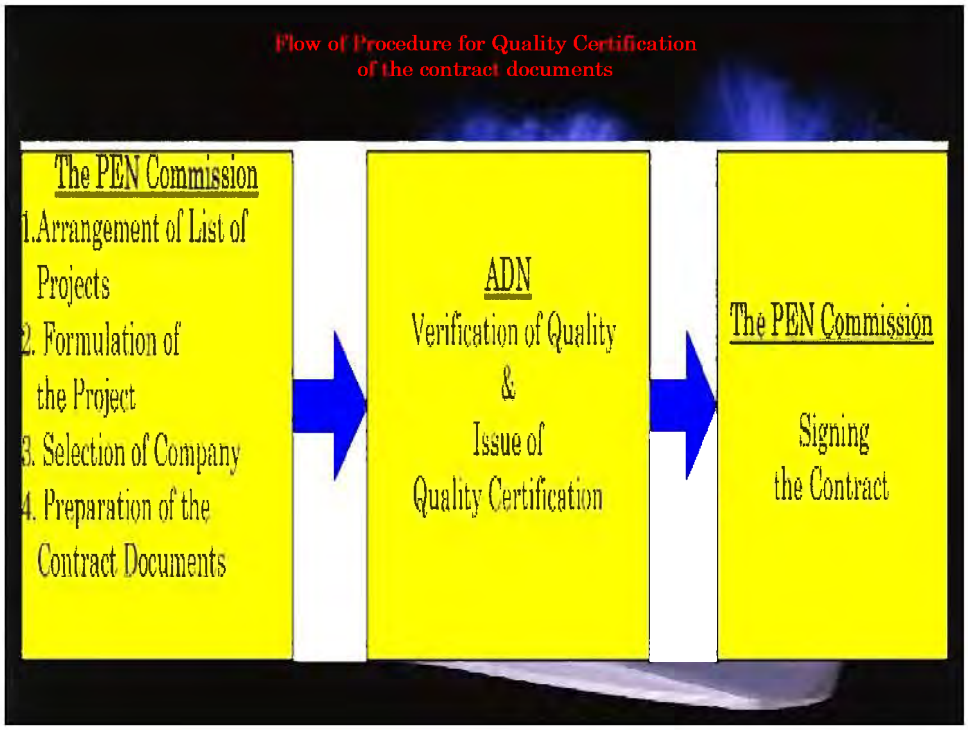

Incom Securty Program
CONTROL
KANTOR DISTRIBUSI
STORAGE
DB Server
Data Management
PSTN/GSM
INDIGO
EDMI
SL 7000
Landis Gyr
PMR
WAN
L A N EXISTING
Konfigurasi Hardware Sistem AMR
PT. PLN (Persero) Distribusi Jakarta Raya dan Tangerang


Grafik Arus
Nama Pelanggan : HOTAN JAYA, PT
Jenis Meter/ID Meter : Landys&gyr / 76834561
Daya / Tarif : 1040 / I3
No.Kontrak/Faktor Meter : - / -
Jenis Pelanggan : -
Periode Tanggal : 17/09/2004 00:00 s/d 08/10/2004 00:00
Ampere
Tanggal Dan Jam
Normal Condition

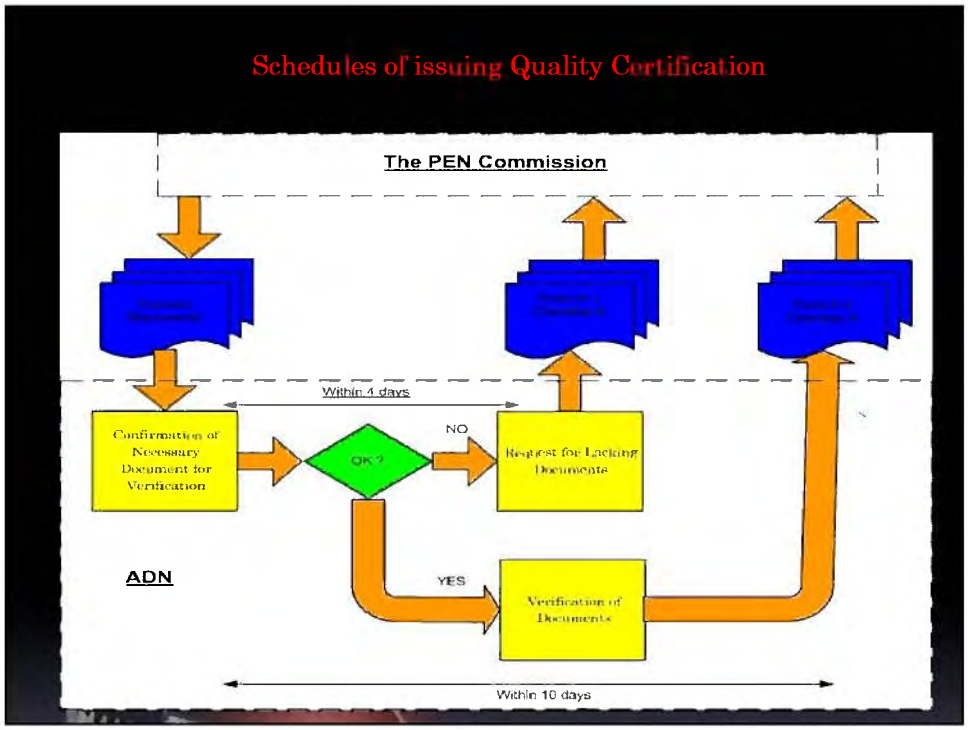

Grafik Arus
Nama Pelangg
Jenis Meter/ID Meter : Landys&gyr / 76834561
Daya / Tarif : 1040 / I3
No.Kontrak/Faktor Meter : - / -
Jenis Pelanggan : -
Periode Tanggal : 01/05/2004 00:00 s/d 15/08/2004 00:00
IA
IB
IC
Ampere
1
0
06/05/04 14:45
09/05/04 07:45
12/05/04 07:00
15/05/04 06:30
18/05/04 05:45
21/05/04 05:15
24/05/04 04:30
27/05/04 03:45
Tanggal Dan Jam
Abnormal Condition


Grafik Energi
Nama Pelanggan : BATARA TABARAKA PT/GOLDEN HOTEL
Jenis Met
Daya / Tarif : 2770 / B3
No.Kontrak/Faktor Meter : 54210210978 / -
Jenis Pelanggan : HOTEL
Periode Tanggal : 01/10/2004 00:00 s/d 08/10/2004 21:45
KWH_PLUS
KWH_MINUS
KVARHLAG
KVARHLEAD
kWh / kVARh
0.12
0.1
0.08
0.06
0.04
0.02
0
-0.02
07/10/04 00:45
07/10/04 23:00
08/10/04 03:00
08/10/04 06:45
08/10/04 10:15
08/10/04 14:00
08/10/04 17:45
Tanggal Dan Jam
Abnormal Condition

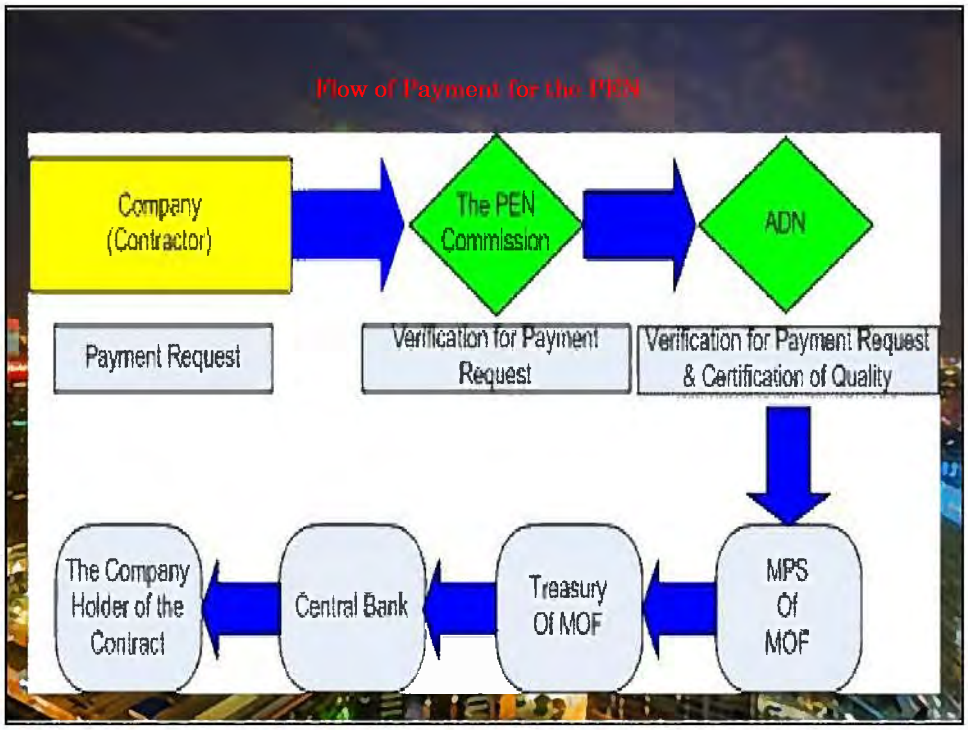
Flow of Procedure for Quality Certification of the contract documents



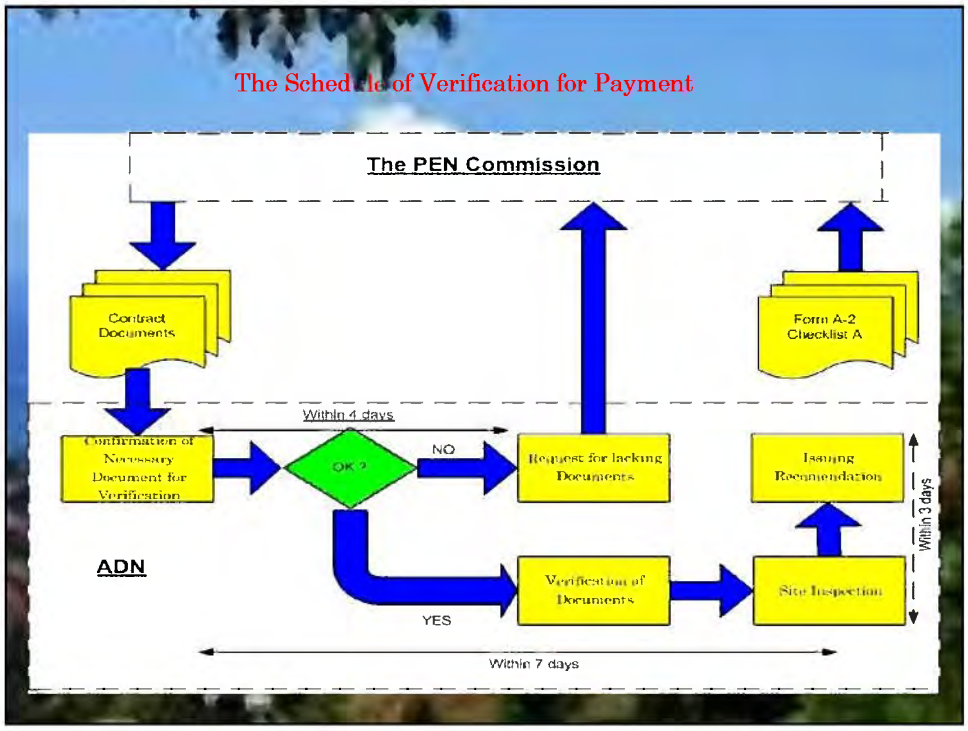
Schedules of issuing Quality Certification



Flow of Payment for the PEN



The Schedule of Verification for Payment



Checklist A(Document to be submitted)

AGÊNCIA DE DESENVOLVIMENTO NACIONAL
GABINETE DO PRIMEIRO MINISTRO
REPÚBLICA DEMOCRÁTICA DE TIMOR-LESTE

Checklist A

Checklist for Necessary Documents from the Committee and Verification				Inspected by	Approved by
Project Name					
Stage	Issue of Quality Certification before signing Contract		Date of Inspection of ADN		
Fund	Infrastructure Fund	Type of Project	National Electrification Program (PEN)	Implementing Agency	EDTL
Project Site	a) District	(b) Sub district		(c) Village /Hamlet	

		Check of Confirmation of Documents	Check Point for Verification	Checking	Remarks & Remarks
1	A List of Projects				
	①	Location map and diagrams of lines	Maps for projects	Yes / No	
			Diagrams of planned and existing 20kv distribution lines	Yes / No	
	②	Sheet of the list of projects	Name and approx. population of each non electrified village for each project	Yes / No	
			The approx. length of new lines of 20kv for each project	Yes / No	
			Rate of the population and length of the line for the effect and cost	Yes / No	
			Order of priority for the implementation of projects	Yes / No	
	③	Criteria of priority for the selection	Reason for putting the order of priority	Yes / No	
2	Formulation of the Project				
	①	The justification of the project	Reason of priority of the project in the district and sub-district	Yes / No	
			Summery of cost and benefit (effect)	Yes / No	
	②	The location map	The maps with the area of the works and villages and existing lines	Yes / No	
	③	Outline of villages to be electrified	The name, numbers of household, population and income houses	Yes / No	
	④	Salient features of the Project	Location, name of sub district & district, length of 20kv & 380v lines, numbers of houses, budget, name of company, etc	Yes / No	
3	Selection of the Company				
	①	Publicity of the project	The documents related to publicity through the public newspaper	Yes / No	
	②	Justification of the Company	Including evaluation of the selection with criteria by the Committee	Yes / No	
	③	The minute of meeting for selection	Record of minute of the district and MPS as well as their attendance	Yes / No	
	④	Eligibility of Company	The proof of tax payment in the last quarter and certification of registration	Yes / No	
	⑤	The list of similar previous experiences	Name, contract price, type of the works, year of implementation, etc	Yes / No	
	⑥	The list of engineers for the project	One electrical & civil engineer are minimum requirements with name, years and list of experiences	Yes / No	
	⑦	Information on involvement of Veteran	involvement, or not and if any, what kinds involvement?	Yes / No	
4	The Contract Documents				
	①	Salient features of the Project	Location, name of sub district & district, length of 20kv & 380v lines, numbers of houses, budget, name of company, etc	Yes / No	
	②	Contract Agreement (without signing)	Contract price, start day and intended completion day	Yes / No	
	③	General Condition with Contract Data	Payment conditions such as advance payment, retention, bank security	Yes / No	
	④	Technical Specifications	Prescription of quality of materials & components listed in the BOQ	Yes / No	
	⑤	Standard Construction	Construction method for main components	Yes / No	
	⑥	Design Drawings	Description of main items of BOQ in the drawings	Yes / No	
	⑦	BOQ	Estimated quantities and unit price	Yes / No	

Note: The circled numbers shows minimum requirement of documents submitted by the Commission for verification by the ADN

Confirmation of Payment Request by the PEN Commission

REPUBLICA DEMOCRATICA DE TIMOR LESTE
GABINETE DO PRIMEIRO MINISTRO
AGÊNCIA DE DESENVOLVIMENTO NACIONAL — Form A-1

Date : 25 October, 2012

To : Sr. Kassius Klei
Head of the Management and Implementation Commission of PEN

From : Sr. Samuel Marcal
General Director of the Agencia de Desenvolvimento Nacional

CC : S.E. Januario da Costa Pereira
Secretary of State of the Electricity

Ref : _____RDTL/GPM/ADN/X/2012

Subject : Necessary Documents Submitted by the Commission of PEN

With respect,
Based on Decree Law No. 11/2011: Agência Desenvolvimentu Nacional (ADN) and Decree Law No. 40/2012: Programa Eletrificação Nacional (PEN) which gives role to the ADN as Quality Control & Auditing to the all Project funded by government budget, the Team has carried out confirmation of the documents which is submitted by the Management and Implementation Commission to the ADN.
Result of confirmation of the necessary documents to be submitted is shown as follows with the result of Checklist A (Attachment):

Project Name : _____
Project Site : _____
Company Name : _____
Type of Verification : 1. List of Project ☐
2. Formulation of the Project ☐
3. Selection of the company ☐
4. Contract Document ☐

Result of Confirmation of the Document: **APPROVES/ APPROVES with NOTE /PENDING/REJECT**

RECOMMENDATION BY ADN

Thank you for your attention and collaboration.

REPUBLICA DEMOCRATICA DE TIMOR LESTE
GABINETE DO PRIMEIRO MINISTRO
AGÊNCIA DE DESENVOLVIMENTO NACIONAL — Form A-2

Date : 25 October, 2012

To : Sr. Kassius Klei
Head of the Management and Implementation Commission of PEN

From : Sr. Samuel Marcal
General Director of the Agencia de Desenvolvimento Nacional

CC : S.E. Januario da Costa Pereira
Secretary of State of the Electricity

Ref : _____RDTL/GPM/ADN/X/2012

Subject : Result of Verification of Documents of the Project of PEN

With respect,
Based on Decree Law No. 11/2011: Agência Desenvolvimentu Nacional (ADN) and Decree Law No. 40/2012: Programa Eletrificação Nacional (PEN) which gives role to the ADN as Quality Control & Auditing to the all Project funded by government budget, the Team has carried out verification of the documents which is submitted by the Management and Implementation Commission to the ADN.
Result of Verification of the documents is shown as follows with the result of Checklist A (Attachment):

Project Name : _____
Project Site : _____
Company Name : _____
Type of Verification : 1. List of Project ☐
2. Formulation of the Project ☐
3. Selection of the company ☐
4. Contract Document ☐

Result of Verification of the Document : **APPROVES/ APPROVES with NOTE /PENDING/REJECT**

RECOMMENDATION BY ADN

Thank you for your attention and collaboration.

AGÊNCIA DE DESENVOLVIMENTO NACIONAL
GABINETE DO PRIMEIRO MINISTRO
REPÚBLICA DEMOCRÁTICA DE TIMOR-LESTE

format 5

INSPECTION REPORT AND RECOMMENDATION FOR PAYMENT

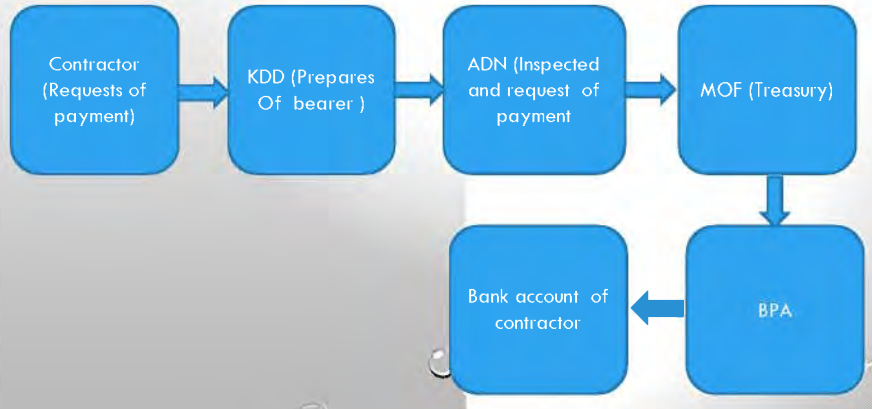
1	Name of Project			
2	Type of Project	National Electrification Program		
3	PO Number (Purchase Order)			
4	Name of Contractor			
5	Type of Payment Request	Interim Payment (First, Second, Third), Provisional Handover, Final Handover		
6	Schedule to the Work	Start day: Intended Completion day: Defect Libiary Peariod :		
7	Payment conditions	Advance payment (%), Retention (%), Repay of Retention (% at Completion day), etc.		
8	Project site	District & Sub district Village/aamlet		
9	Contract Price			$ 1,000,000.00
10	Gross Payment until now			$ 800,000.00
11	Billing in this invoice from the Contractor			$ 200,000.00
12	Billing verified by the Inspector			$ 100,000.00
13	Advance payment: (10 %) of Contract Value	(9)x10%		$ 100,000.00
14	Reduction for advance payment	(13)=((12)/(9))		$ 10,000.00
15	Reduction for retention (10 %)	(12)x10%		$ 10,000.00
16	Payment after reduction	(12) (14) (15)		$ 80,000.00
17	Repaay for previous retention			$ -
18	Payment for this month	(14)-(15)		$ 80,000.00
19	Balance after this paymnt	(9) (10) (18)		$ 420,000.00
20	Progress for previous paymnt (%)	(10)/(9)		80%
21	Progress for this payment (%)	(10?/(9)		10%
22	Inspection of Documents	Documents	Any Problems & Comments	
a	Contract Document	Yes/No		
b	BOQ of completed quantities	Yes/No		
c	As-Build Drawing at Handover	Yes/No		
d	Program _Schegule of the work	Yes/No		
e	Testing Result for handover	Yes/No		
f	Inspection Report	Yes/No		
g	Pictures for completed works	Yes/No		
23	Result of inspection (Result of Document Inspection) Check items as reference * Documents for invoice are prepared correctly ? * This payment request meets payment conditions such as retention and taxation? * Calculation of billing is correct ? * Completion day will be kept ? * Any remedy orders by the Committee? * Testing result meets the criteria ? (Result of Site Inspection) Check items as reference: * The Committee is attended at the site and gives explanation? * The important components for function and big value of quantities in the BoQ are checked ? * Any problems in qualities (Poor quality of material and installation, etc.)? * Any problems in quantities (Difference between Actual and that in BoQ) ? (Judgment for payment) Check items as reference * The recommendation payment is the same as this invoice or not ? * if not, the reason of severe evaluation ? * What is recommendation of remedy against defect ?			
27	Proposed payment in the invoice from the Contractor (USD)			
28	Recommendation for payment to MPS-MoF (USD)			80,000.00
24	Site inspection day		Date Month	Year:
25	Inspector		Signature:	Date :
	1. Maximos dos Santos			
	2. Ana Maria Gutierres			Date :
	Verified by :		Signature:	Date :
	Miguel Marques Monteiro de Jesus			
26	D.C.		Signature:	Date :
	Efrain ST. Hanuk			
27	Approved by :		Signature:	Date :
	Sr. Samuel Marcal			
28	Director General - ADN.			
29	Annex : Employer1			

THE PRESENTATION OF ADN MANUAL REGARDING PDID PROJECT

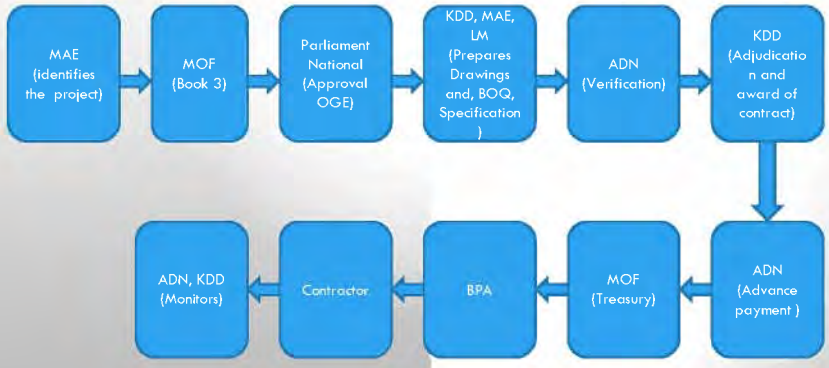
BY

Demistocles Cabral

FLOW CHART PDID PROCESS INSPECTION AND PAYMENT



FLOW CHART PDID PROCESS OF PROJECT WORK



PROBLEM AND RECOMMENDATION

Problem

- ❑ Without Line coordinated with Ministry and other District
- ❑ Design Document and BOQ submitted delay will be impacted to implementation process
- ❑ Many failure were found in implementation because the design not to reflect the actual site condition.

Recommendation

- ❑ To make coordinated with other Ministry (LM)
- ❑ Requested to all Ministry to submitted Design and BOQ base on schedule were determinate.
- ❑ Requested to all Ministry to controlling their Consultant and avoided to have reserve fund.

PAYMENT FORMAT OF CHECK LIST

Format: Payment

REPÚBLICA DEMOCRÁTICA DE TIMOR LESTE
GABINETE DO PRIMEIRO MINISTRO
AGENCIA DESENVOLVIMENTO NACIONAL

NO	INSPECTION REPORT AND RECOMMENDATION FOR PAYMENT			
1	Name of Project			
2	Ministry/Project Owner			
3	Sources of funds			
4	Contractor			
5	PO Number (Purchase Order)			
6	Project site :	a. District : Manufahi b. Sub District : Same c. Villag/Hamlet : Letefoho		
a	Contract Value	a	$	125,398.59
b	Progress for previous payment	b		80.00%
c	Progress for this payment	c		100.00%
d	Gross Payment until now	(c-b)*a	$	25,079.71
e	Advance payment: (10%) of Contract Value	...%*a	$	-
f	Reduction for advance payment	e	$	-
g	Reduction for retention	0.1*d		
h	Payment after reduction for retention	d-g	$	25,079.71
i	Release for (50%) previous retention	h-f	$	25,075.71
j	Total Net Payment until now		$	112,858.70
k	Balance after this payment	(100%-c)*a	$	
7	Observation or comment : ADN team, based on inspection of the potable water supply project in Fatumea that relies its power source on the solar panel system, verifies that the project has been reached to 95%, and therefore we ensure to take necessary procedures for the payment of the 90% physical progress.			

8	Recommendation for payment toTreasurer-MoF/Ministry/Agency Tutela (USD)		12,600.00		
9	Observation :		YES	Any comments	NO
a	Drawings		√		
b	BOQ		√		
c	Technical specification		√		
d	Schedule of S shape curve		√		
e	Payment conditions in the contract		√		
10	Inspection date		Date:	Month:	Year:
11	Inspector :	Signature:			Date :
	1. Lourdes Pereira				
	2. Manuel Martins	Signature:			Date :
	Verified by :	Signature:			Date :
	Sònia Freitas Moreira				
12	Q.A	Signature:			Date :
	Esron St. Henuk				
13	Approved by :	Assinatura:			Date :
	Sr. Samuel Marçal				
	General Director - ADN.				
14	Annex :	Some photographys of Site inspection			

Format : Check List

REPUBLICA DEMOCRÁTICA DE TIMOR LESTE
GABINETE DO PRIMEIRO MINISTRO
AGENCIA DESENVOLVIMENTO NACIONAL

No.	Name of Document	Condition						Remark
		Yes	No	Completed	Uncompleted	Yes	No	
1	Requested payment from Company to KDD (Original)							
2	Inclusion letter from KDD Coordinator (Original)							
3	Copy Contract document /if the project is handed over while the contract is expired, it should attach with a Original document or copy of valid contract at minimum until the first date of provisional hand over of the project .							
4	The payment certificate which prepared by manager of Public Works/ KDD technique, verified by District ADN engineer and approved by KDD Coordinator (Original) - **for payment of II PDD Project at 2012 and PDID only.**							
5	Term of Hand over of final project (Original)							
6	Final Inspection Sheet for retention							
7	Copy the Term of first/provisional Hand over of the Project							
8	Copy the document of the Valid Economic Activity License, minimum until one month from submission date of payment request (legalized). it **is not applied for KIK (Communitarian Project)**							
9	Copy document of the Valid Company Birth Certificate, minimum until one month from submission date of payment request **(legalized)**- it **is not applied to KIK(Communitarian Project)**							
10	Copy document of TIN(Identification of the Taxpayer contributions) it **is not applied to KIK(Communitarian Project)**							
11	Copy document of Company Ownership License – it **is not applied to KIK(Community Project)**							
12	Copy Bank Account Number of Company							
13	Copy Electoral Card of Director Company							
14	Documentation (Picture based physical progress.							
15	As Built Drawing Based on result of implementation - **only for payment of PDID Project.**							
16	Copy Design and BoQ which already approved – **for PDD project at 2012 only.**							

PDID	CHECKLIST A			Verified by	Approved by
Type of Project	Water Supply	Objective	Required Documents to be submitted		

Contract/Project No.		Date of Submission	_____ 201__
Project Name		Stage	Verification of Draft Contract Documents
Implementing Agency			

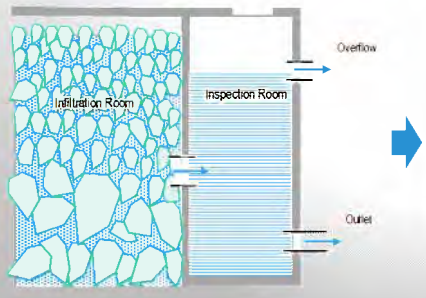
Check Item	Check Point	Date Checked	Tick	Remarks
	It is confirmed that all of those ducuments are submitted by KDD			Reasons of undelivered
1	Project Advertisement			
2	Conditions of Contract			
3	Contract Data			
4	Bill of Quantity			
5	Specifications			
6	Drawings			
7	Others if necessary			

Example Case

Issues 1: Construction

Design drawings are not necessarily accurate and not based on sound engineering. Therefore, majority of construction companies here related to water supply do not tend to rely on the drawings.

An Example: Good Design to Bad Result



Design of Intake Facilities

Construction without partition wall

Another Example: Bad Design to Bad Result

There is no monitoring tank in the design.

Issues 2: Inspection

Inspection is to ensure that the contractor's work is carried out in accordance with contract documents including design drawings and specifications of the project. The inspection is impossible theoretically when the drawings do not reflect the actual site condition.

The construction works has finished, but water cannot flow in the pipeline. Should the contract payment be paid?

Payment

In a case that water cannot flow

	Design	Construction	Payment
Case 1	Bad	Not carried out in accordance with contract documents	x
Case 2	Bad	Carried out in accordance with contract documents	?
Case 3	Good	Not carried out in accordance with contract documents	x

Thank You!!!
Obrigado Barak!!!

Overview of JICA Assistance to ADN and Way Forward

AND seminar on September 20, 2013

Southeast Asia and Pacific Department
Japan International Cooperation Agency (JICA)

Tasks of JICA Assistance to ADN

- Task #1) Facilitate efficient work flow of ADN and provide basic skill trainings for project inspection, review and monitoring (along with its Organic Law)
- Task #2) Clarify the role of ADN among Ministries; especially between ADN and MOF/MPS (development planning coordination), ADN and Line Ministries, such as MPW (technical operational coordination)

Overview of JICA Assistance (Initial Stage)

INPUTS	2011	2012				2013				2014
		I	II	III	IV	I	II	III	IV	
Dispatch of Short Term Experts		→								
- Expert on Road & Bridges		●	●							
- Expert on Ports		●								
- Water Sanitation			●							

Key Achievements: Developed training programs on basic skill development for major infra. project inspection, review, and monitoring, etc.

Overview of JICA Assistance (Basic Capacity Development)

INPUTS	2011	2012				2013				2014
		I	II	III	IV	I	II	III	IV	
Dispatch of JICA-ADN Expert Team				Phase I →			Phase II →			
- Expert on Road & Bridges #1				→			→			
- Expert on Road & Bridges #2				→			→			
- Expert on Power				→			→			
- Expert on Water				→			→			
- Expert on Port & Aviation				→						
Infrastructure Advisors (to supervise the team)				● ● ●			●	●		

Key Achievements: [Phase I:Jun -Nov, 2012] Development of ADN work manuals & check lists and OJT, etc / [Phase II: April – September, 2013] Harmonize ADN work manual & check lists with ADN daily work including updating them and OJT , etc

Overview of JICA Assistance (Planning for the Future)

INPUTS	2013				2014				2015			
	I	II	III	IV	I	II	III	IV	I	II	III	IV
Development Administration Advisor / Advisor to DG of ADN (Mr. Todoroki)												

Key Tasks: Assist in contract management / Assist in quality control of administrative works of ADN / Assist DG in designing organizational structure of ADN / Provide polic recommendations on establishment of EPIA based on PM's instruction/ Coordinate ADI with other JICA related assistance

Other Relevant Cooperation (Training Programs and Japan or Third Countries)

2011

- Training Program for Young Leaders for Timor-Leste/Urban Environmental Management Course

2012

- Economic Development Policies in Japan
- Maintenance of Mountain Road in Japan
- Road Administration in Japan
- Project Management Training in Philippines
- Study Visit to BAPPENAS, BAPPEDA, and NEDA

2013 (In Process)

- National Government Administration for Senior Officials in Japan
- Environmental Planning for Sustainable Tourism in Singapore

Other Relevant Cooperation

- Road Policy Advisor to MPW (~2014)
- Advisor on Improvement of Water Supply System to DNSA (~2014)
- Dili Urban Master Plan (~2014)
- Port Management Advisor (~2015)
- Aid Coordination Advisor to MOF (~2014)

Way Forward :JICA's future cooperation

- Identifying Concrete Roles of ADN in TL Government

  【Task 1】Defining the scope of works of ADN
- Designing Organizational Structure

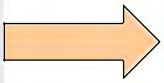
  【Task 2】Well designing organizational structure in accordance with the defined scope of works

→ **Development Administration Advisor could support**

Way Forward :JICA's future cooperation

- Strengthening Coordination Mechanism with Line Ministries

  【Task 3】Establishing coordination task forces and meeting bodies with line ministries

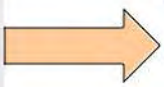


JICA-ADN Team is supporting the effort / relevant Advisors to line ministries, such as MPW, could support in facilitating coordination with the line ministries

Way Forward :JICA's future cooperation

- Continuing Improvement of Basic Skills in Engineering and Evaluation

  【Task 4】Promoting Self-study



JICA-ADN Team prepared educational materials, which will be useful for daily works, through the class room lectures / Opportunity of JICA's Long Term Training in Economics and Public Administration

Way Forward :JICA's future cooperation

- Strengthening Development Planning Capacity

  【Task 5】Capacity Development in socio-economic analysis, development planning and budgeting, etc.

Development Administration Advisor could support / Opportunity of JICA's Long term training / New Technical Cooperation Project for capacity development once PM's decision is made

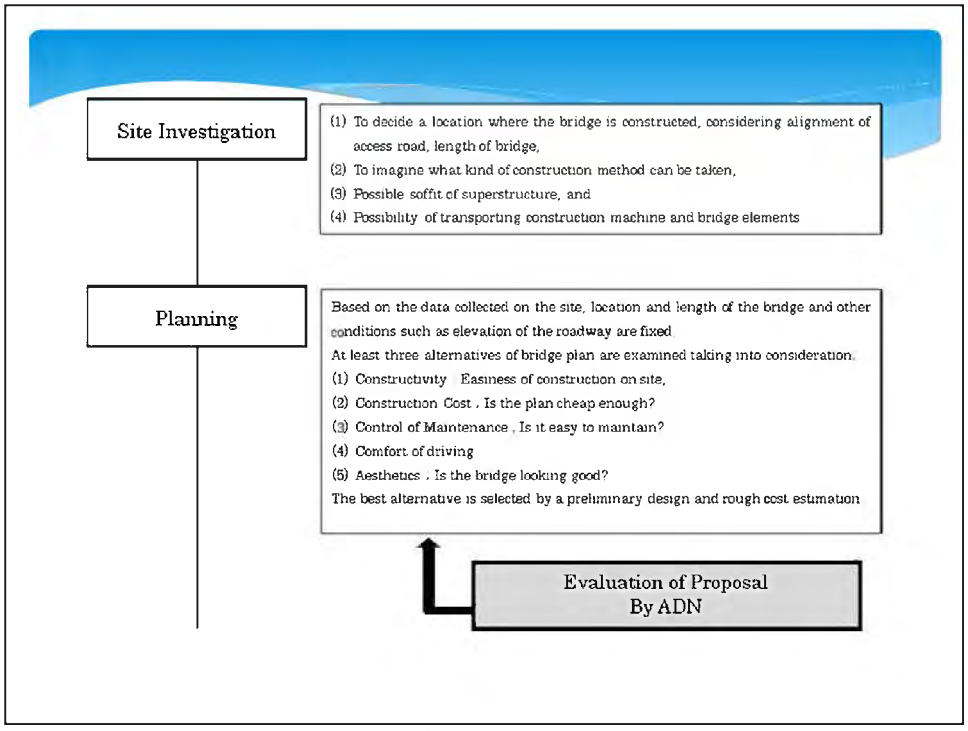
Thank you!

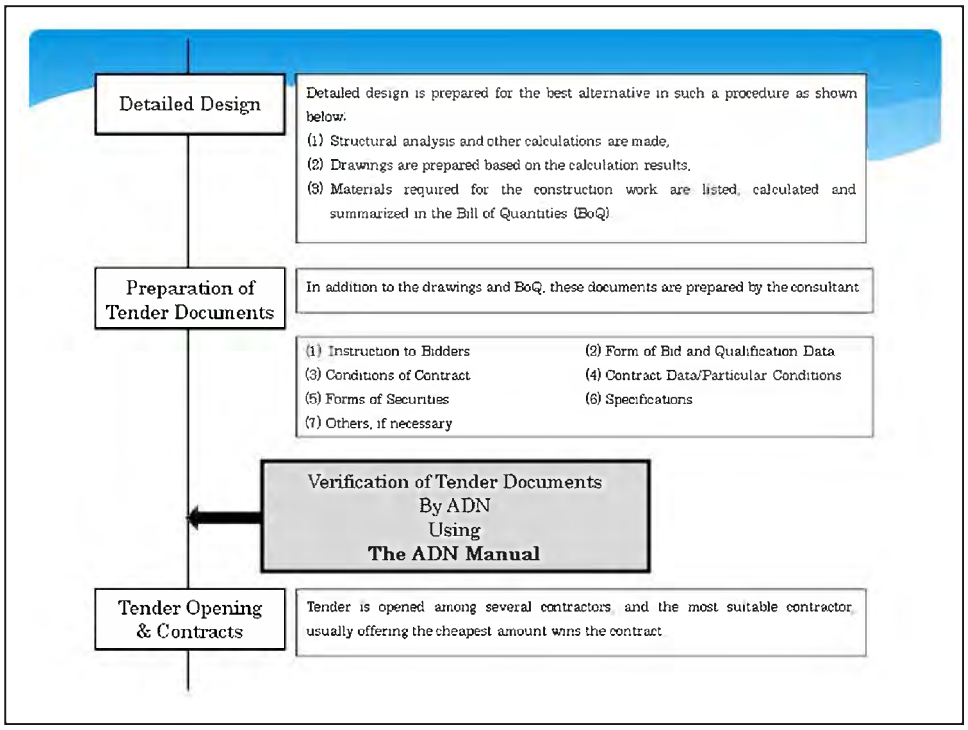
ANNEX-4

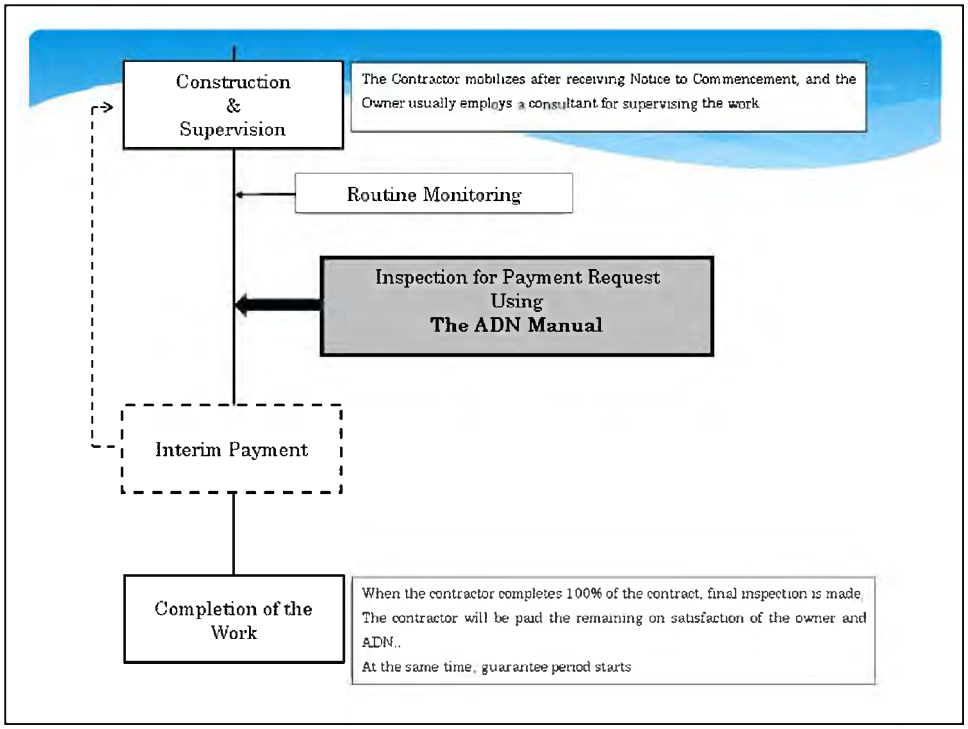
CLASSROOM LESSON ON BRIDGE

CLASSROOM LESSON (1)
ON
BRIDGE

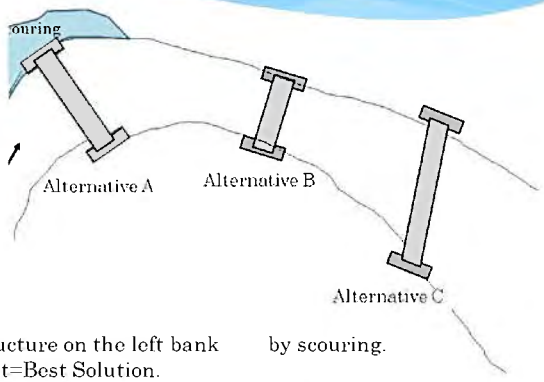
FLOW OF BRIDGE WOK
&
SITE INVESTIGATION




Detailed Design
Detailed design is prepared for the best alternative in such a procedure as shown below:
(1) Structural analysis and other calculations are made,
(2) Drawings are prepared based on the calculation results,
(3) Materials required for the construction work are listed, calculated and summarized in the Bill of Quantities (BoQ)
Preparation of Tender Documents
In addition to the drawings and BoQ, these documents are prepared by the consultant
(1) Instruction to Bidders
(2) Form of Bid and Qualification Data
(3) Conditions of Contract
(4) Contract Data/Particular Conditions
(5) Forms of Securities
(6) Specifications
(7) Others, if necessary
Verification of Tender Documents By ADN Using The ADN Manual
Tender Opening & Contracts
Tender is opened among several contractors and the most suitable contractor usually offering the cheapest amount wins the contract


Construction & Supervision
The Contractor mobilizes after receiving Notice to Commencement, and the Owner usually employs a consultant for supervising the work
Routine Monitoring
Inspection for Payment Request Using The ADN Manual
Interim Payment
Completion of the Work
When the contractor completes 100% of the contract, final inspection is made. The contractor will be paid the remaining on satisfaction of the owner and ADN..
At the same time, guarantee period starts

BRIDGE LOCATION



A: Risk of collapse of substructure on the left bank by scouring.
B: The shortest, the cheapest=Best Solution.
C: Longer the more costly, and skewed bridge is difficult and troublesome to build.

SITE OBSERVATION

1. Is the riverbed dry during construction?
   Or Detour of river flow is required?
2. What kind of construction is possible on site, then?
3. Is there any proper yards for stockpile, office and preparation work?
4. What kind of foundation is supposed?

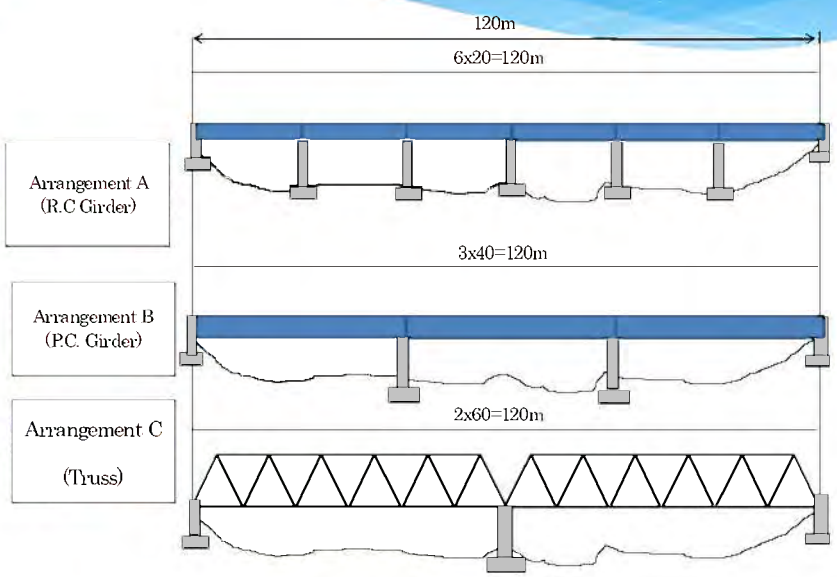
AYASA BR. Erected using temporary supports and crane

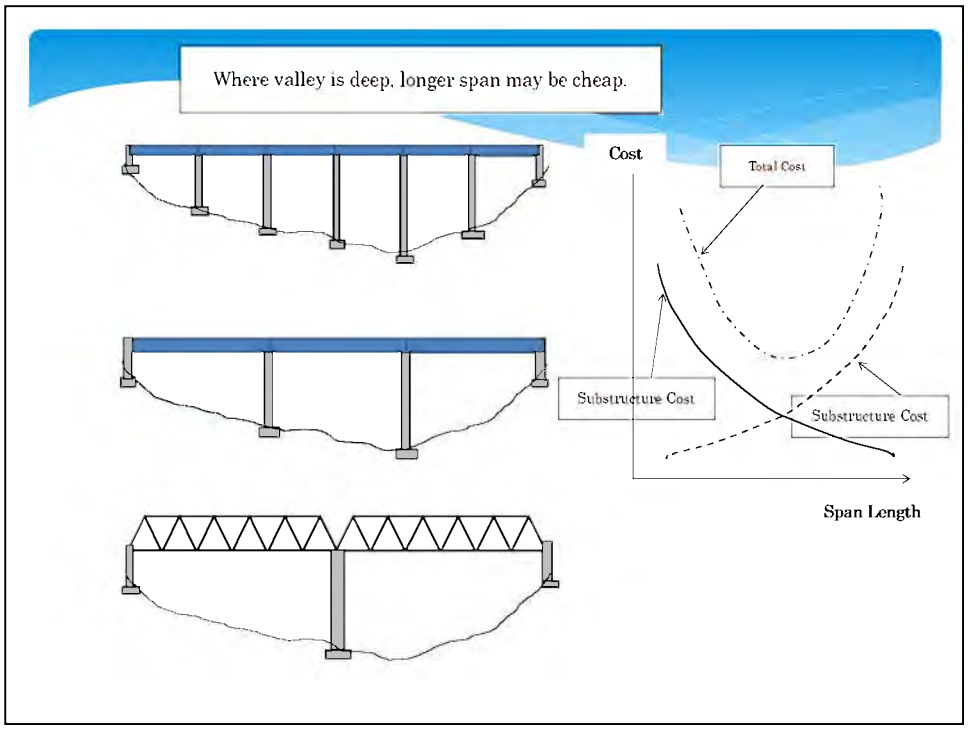
COMORO BR.
PC segments (about 6m long), imported from Indonesia, are stockpiled at a yard close to the site and transported to the site by a trailer.

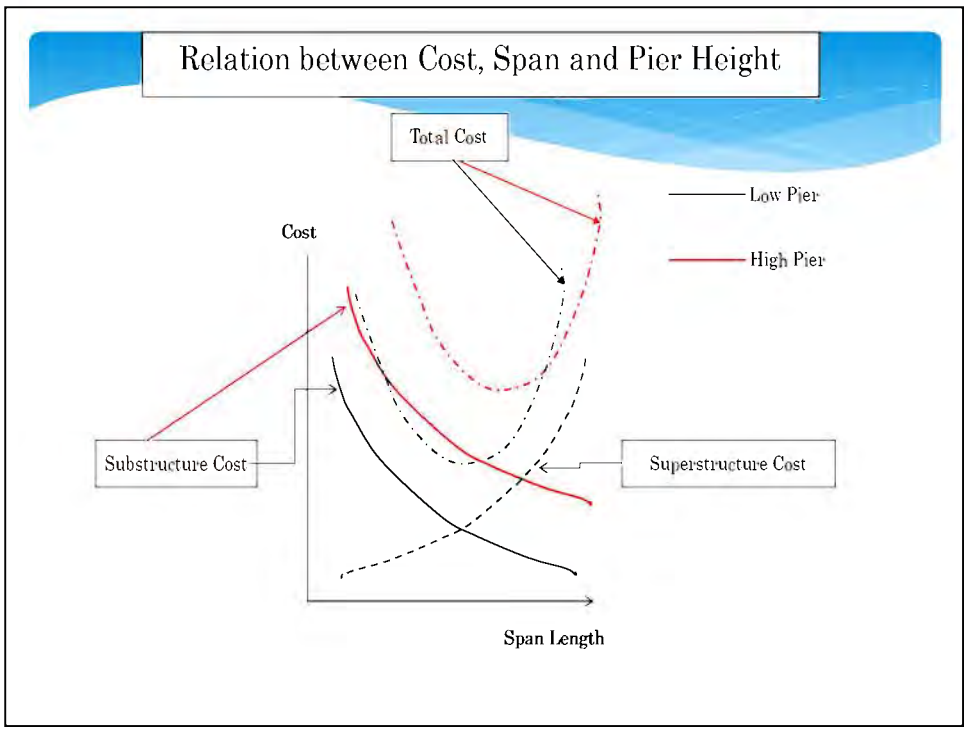
COMORO BR.

Assembled into a girder (40m long) , lifted up, moved laterally, and settled down

Span Arrangement



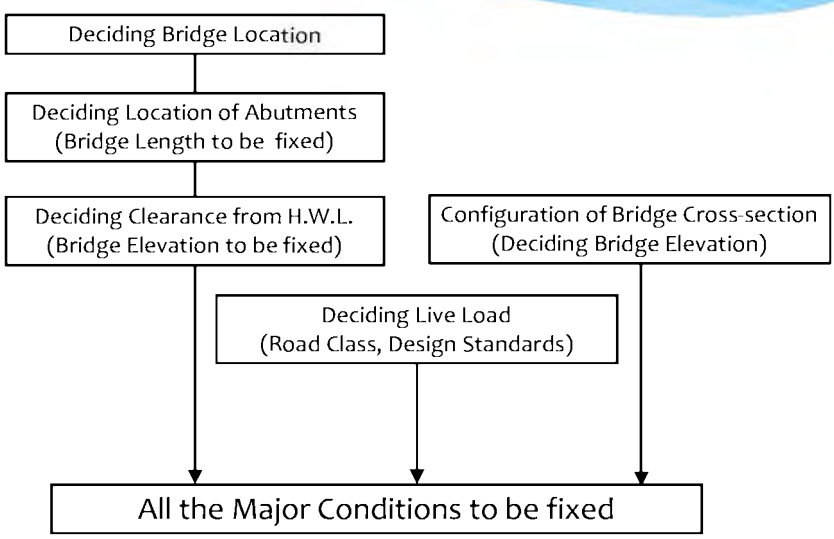

Where valley is deep, longer span may be cheap.
Cost
Total Cost
Substructure Cost
Substructure Cost
Span Length


Relation between Cost, Span and Pier Height
Total Cost
Low Pier
High Pier
Cost
Substructure Cost
Superstructure Cost
Span Length

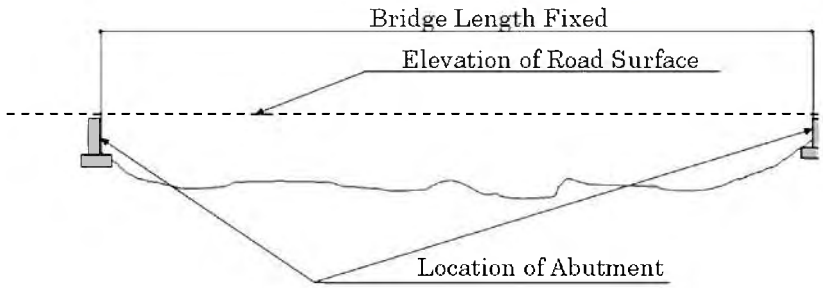
CLASSROOM LESSON (2)
ON
BRIDGE

BRIDGE PLAN
(Superstructure)

SEQUENCE OF BRIDGE PLANNING

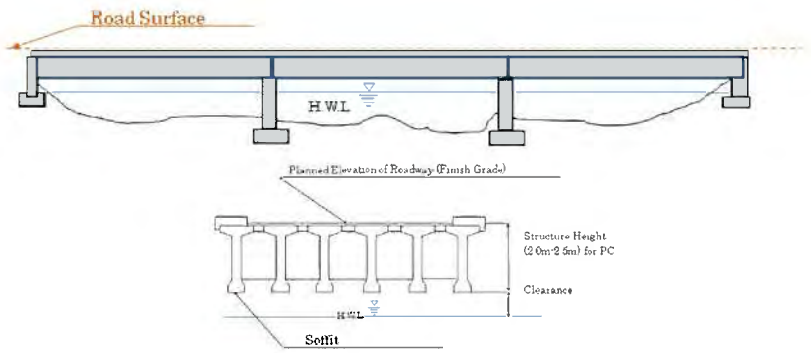


Location of Abutments, Bridge Length

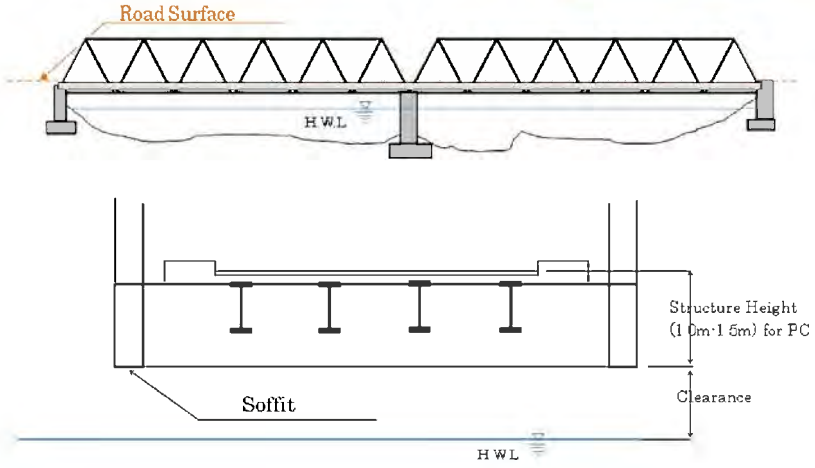


Elevation of Soffit
High Water Level
Elevation of Road Surface

Superstructure: PC Girder (Deck Type)



Superstructure: Steel Truss(Through Type)

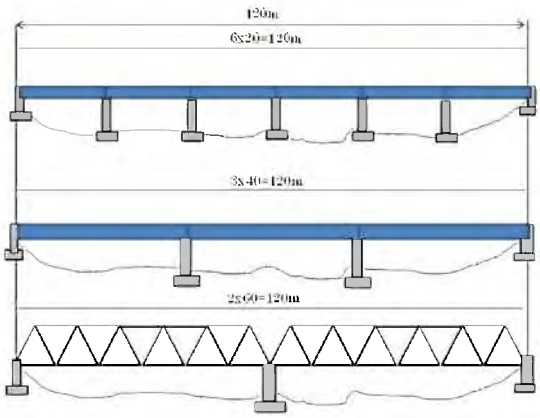


Three Alternatives

Arrangement A
(R.C Girder)

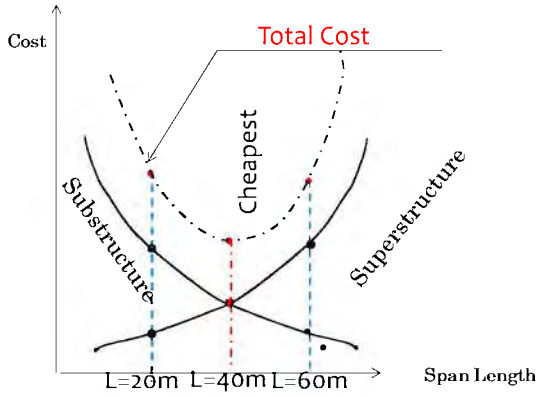
Arrangement B
(P.C. Girder)

Arrangement C
(Truss)

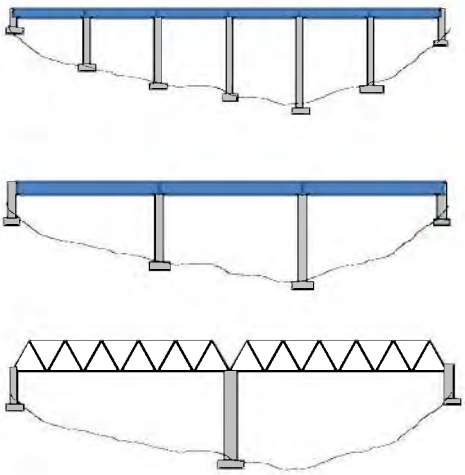


Cost for Superstructure and Substructure

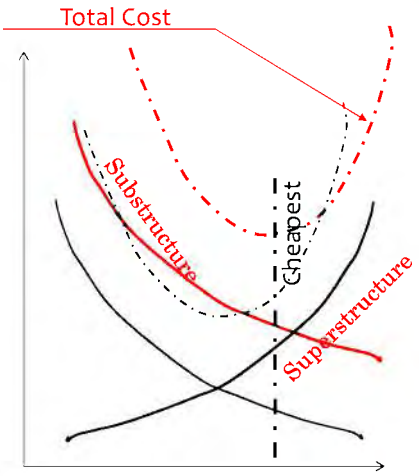
1. The longer the spans are, the higher the cost for superstructure is.
2. The longer the spans are, the cost for substructure is lower because number of piers decrease.



Where a valley is deep, as below;



Where a valley is deep, as below;



Samples of Span Arrangement

Where a river bed is flat, short multi-spans are cheaper.

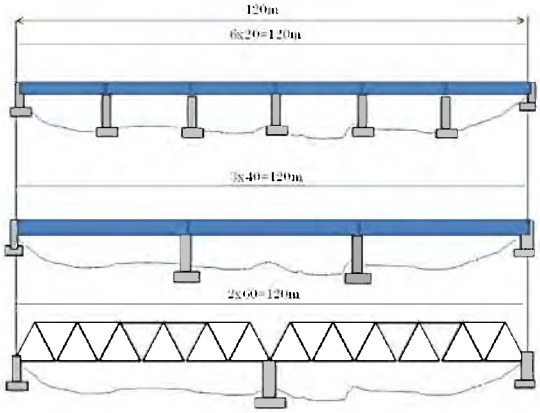
Where a valley is deep, longer spans are cheaper.

Span Arrangement

Arrangement A
(R.C Girder)

Arrangement B
(P.C. Girder)

Arrangement C
(Truss)



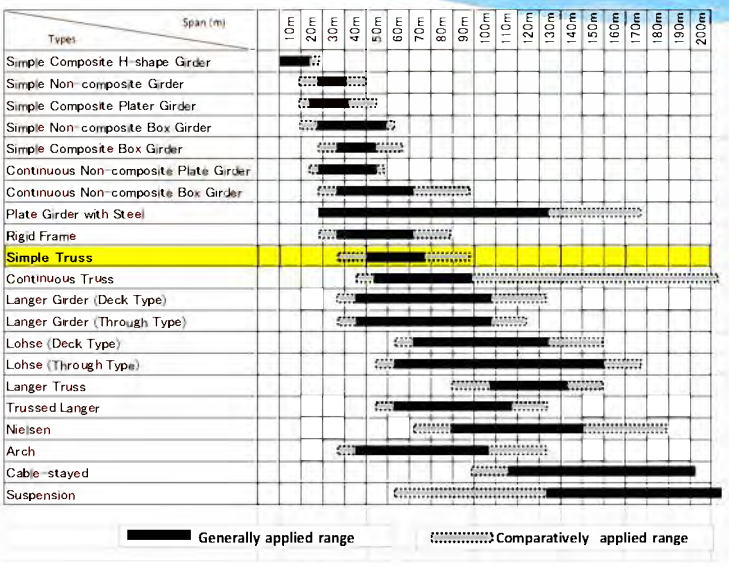
APPLICABLE SPAN LENGTH OF REINFORCED CONCRETE BRIDGE

Type	Applicable Span Length 20	40	60	80	Cross-section of the Bridge
Solid Slab Bridge					
Hollow Slab Bridge					
T-Girder Bridge					

APPLICABLE SPAN LENGTH OF PRESTRESSED CONCRETE BRIDGE

	Cross-section	Erected by	Applicable Span Length (20 / 40 / 60 / 80)
Pretension	Slab Bridge	Crane	
	T-Girder Bridge	Crane	
	T-Girder Bridge	Crane with Temporary Support	
	Composite Girder Bridge	Crane with Temporary Support	
Post-tension	Hollow Slab Bridge	Temporary Support	
	Box Girder Bridge	Temporary Support	

APPLICABLE SPAN LENGTH OF STEEL BRIDGE



SAMPLE PHOTOS OF STEEL BIRIDGE

PLATE GIRDER BRIDGE
(Anti-corrosive steel)

NIELSEN ARCH BRIDGE
(THROUGH TYPE)

TRUSS BRIDGE

ARCH BRIDGE (DECK TYPE)

COMPARISON BETWEEN STEEL BRIDGES & CONCRETE BRIDGES

	STEEL BRIDGE	CONCRETE BRIDGE
(1)CONSTRUCTIVITY	- Most elements prefabricated by > Good quality -Light elements> Heavy equipment no need	- Most work at site> Quality control on site - Launcher or erection girder required
(2)CONSTRUCTION COST	-Import necessary >Expensive	- Material & worker procured locally> Cheap
(3)MAINTENANCE	-Repaint every ten years (Galvanization, antirust	-Rust on rebar inside impossible to find
(4)COMFORT OF DRIVING	-Through type not comfortable	-Comfortable
(5)AESTHETICS	-Beautiful & can be painted into any color	-Not so beautiful

THE END

Next Lecture (3)
On
BRIDGE PLAN
(Substructure)

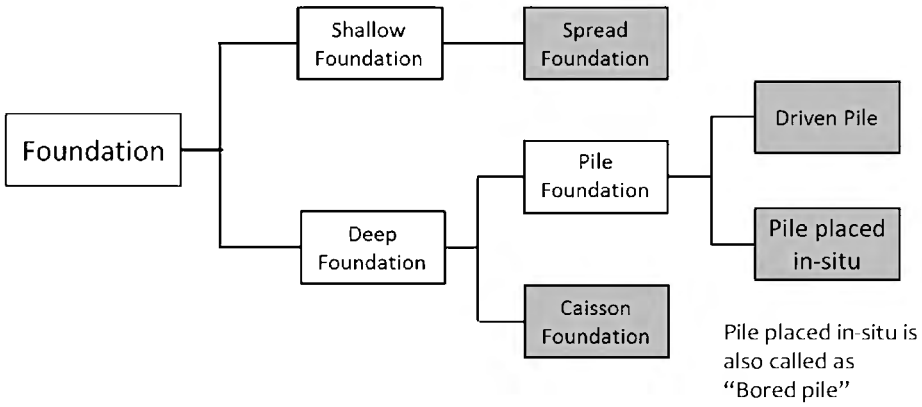
CLASSROOM LESSON (3)
ON
BRIDGE

BRIDGE PLAN
(Substructure, Foundation and Accessories)

PLAN ON FOUNDATION

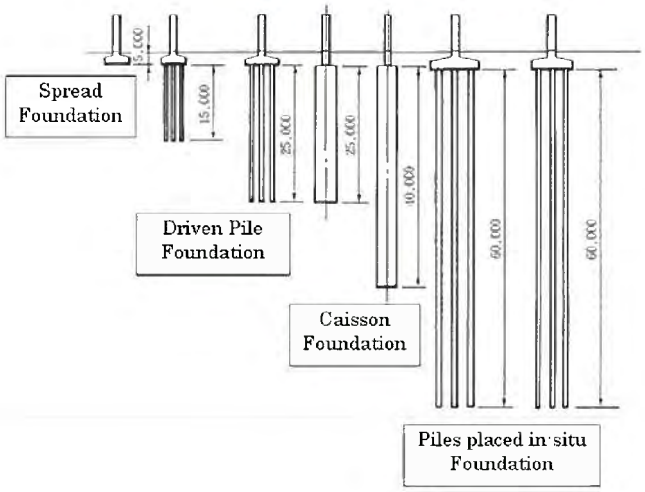
Type of foundation is selected considering terrain, geology, cost and constructivity.

CLASSIFICATION OF FOUNDATION



Pile placed in-situ is also called as "Bored pile"

TYPES OF FOUNDATION



ALPPLICABLE DEPTH OF BEARING LAYER FOR EACH PILE TYPE

In order to know the bearing layer, boring test are carried out.

Tpye	Applicable Depth of Foundation								
	10m	20m	30m	40m	50m	60m	70m	80m	90m
Spread Foundation	——····								
Driven Pile Foundation	————	————	————	————	————	·····			
Pile placed in-situ Foundation	·····	————	————	————	————	·····	·····	·····	·····
Caisson	····	————	————	————	·····	·····	·····		

CRITERIA FOR SELECTING FOUNDATION TYPES

SPREAD FOUNDATION

* Secure and cheap, where bearing layer is shallow (up to 5 or 6m) and strong enough,
* Used only where no fear of scouring, settlement

DRIVEN PILE FOUNDATION

* Steel, PC or RC pile products transported and driven on site,
* Heavy driving machine necessary,
* Applied to deeper bearing layers up to 60m

PILE PLACED IN-SITU FOUNDATION

* Piles constructed on site by digging holes, placing rebars and concrete,
* Applied to deeper bearing layers up to 60m

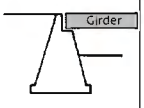
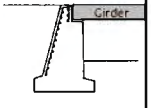
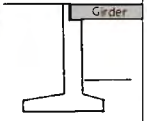
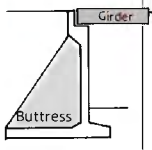
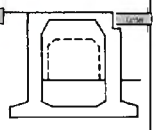
CAISSON FOUNDATION

* Rigid foundation with concrete constructed on site,
* Heavy facilities required,
* Applied to deeper bearing layers up to 40m

PLAN ON SUBSTRUCTURE

Types of abutments and piers are selected considering terrain, sizes of the superstructure, height, river flow, geology, cost and constructivity.

Selection of Abutment Type Depending on the height

	Gravity Type	Semi- Gravity Type	Invert-T Type	Buttress Type	Rigid Frame Type
Types of Abutment					
Applicable Height	H< 5m	4m < H< 6m	5m < H< 10m	10m < H< 15m	H> 15m

Abutment Type	Applicable Height																		
	2m	3m	4m	5m	6m	7m	8m	9m	10m	11m	12m	13m	14m	15m	16m	17m	18m	19m	20m
Gravity Type	———	———	———																
Semi-Gravity Type			———	———															
Invert T Type				———	———	———	———	———											
Buttress Type									———	———	———	———	———						
Rigid Frame Type														———	———	———	———		

Selection of Pier Type Depending on the height

Pier Type	Height (m)			Notes
	10	20	30	
Column / Wall Type	———	———	———	
Rigid Frame Type (1-Story)	5 — 15			
Rigid Frame Type (2-Story)		15 — 25		
Two Column Type	———	15 ···		For Hollow Slab 

Major Accessories of Bridge

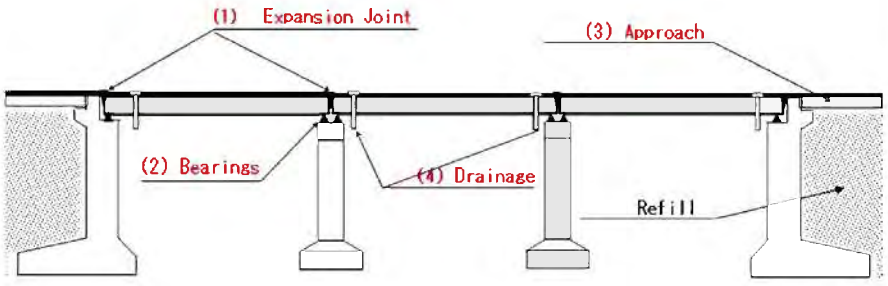
(1) Expansion Joints

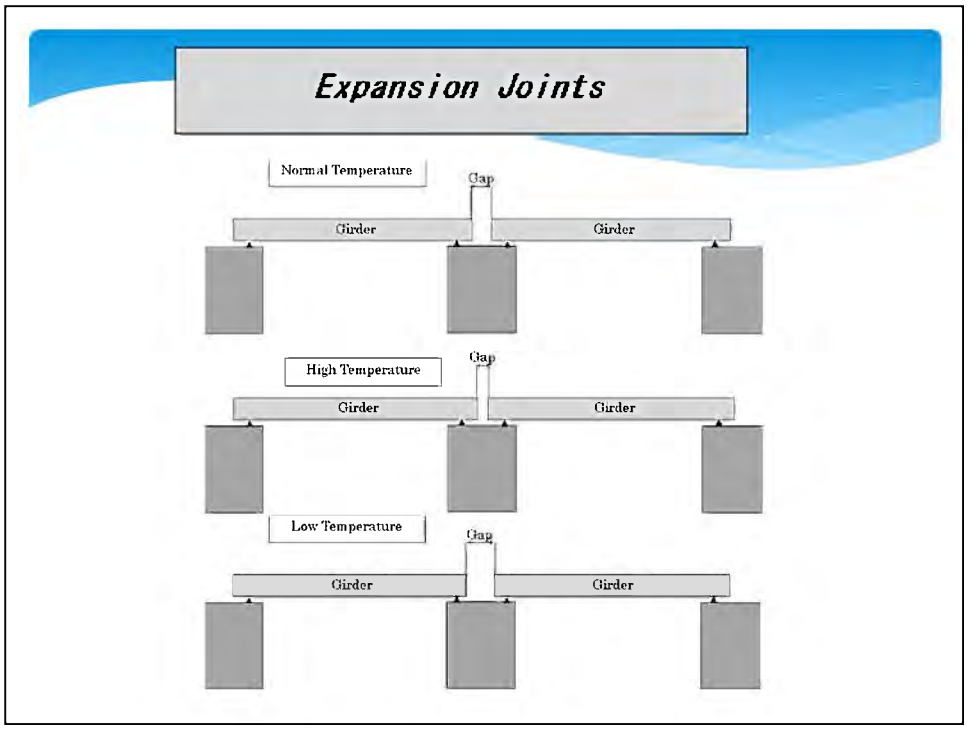
(2) Bearings

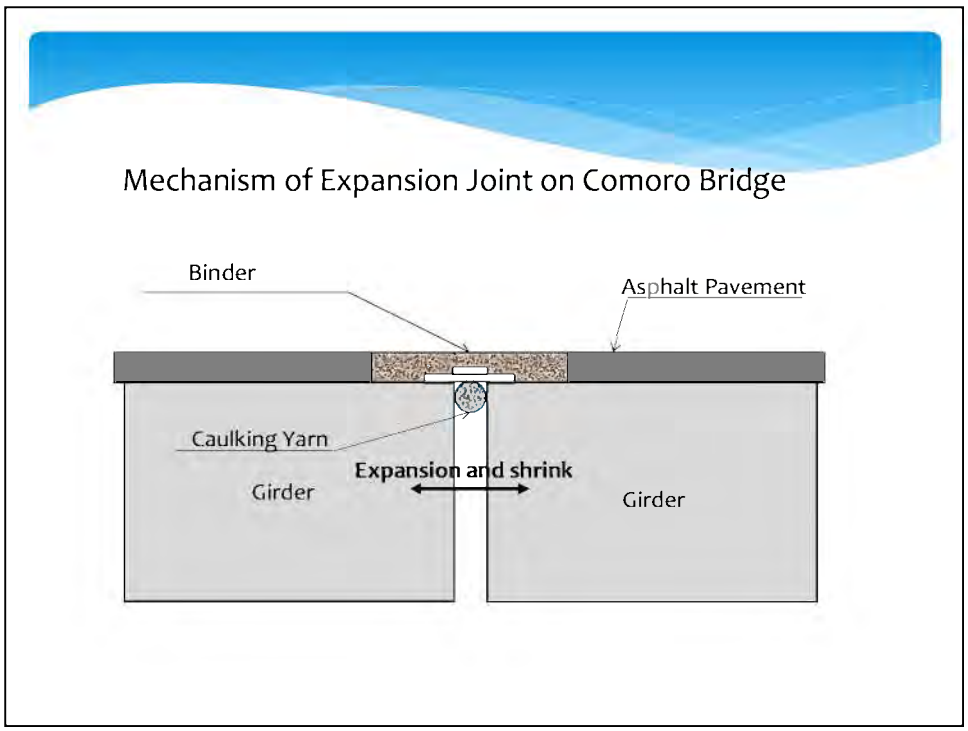
(3) Approach Slab

(4) Drainage

Location of Accessories




Expansion Joints
Normal Temperature
Gap
Girder
Girder
High Temperature
Gap
Girder
Girder
Low Temperature
Gap
Girder
Girder


Mechanism of Expansion Joint on Comoro Bridge
Binder
Asphalt Pavement
Caulking Yarn
Expansion and shrink
Girder
Girder

Bearings and Anchor

Function:

(1) To support the superstructure and transfer the vertical and horizontal reaction forces to the substructure,

(2) To allow longitudinal displacement due to deflection and temperature change,

(3) To allow rotation due to deflection of the superstructure.

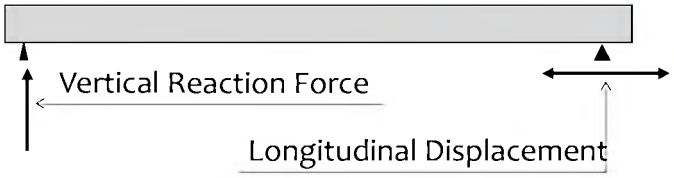
Materials:

(1) Neoprene (Elastomeric bearing pad,

(2) Metal.

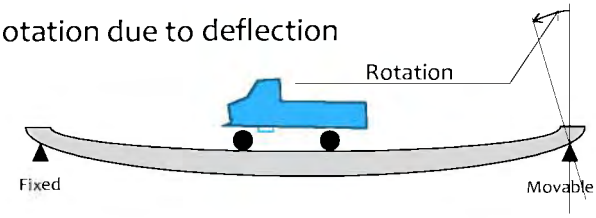
Functions of Bearing

(1) Supporting Vertical Reaction force



(2) Longitudinal displacement due to temperature change

(3) Rotation due to deflection

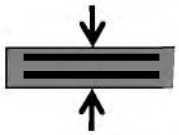


Elastomeric Bearing Pad

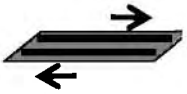
Structure: Sandwich of steel plates and rub

Mechanism of elastomeric bearing:

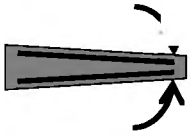
Reaction force

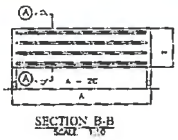


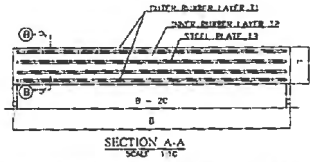
Expansion/Shrink



Rotation





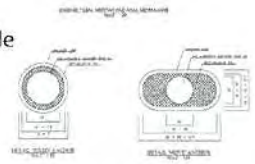


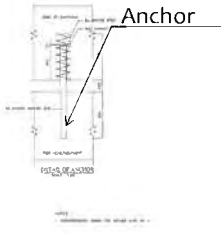
DETAIL ELASTOMERIC BEARING PAD GIRDER 30&40

Bearing Pad used in Comoro Br.

Anchor

Function: Restraining horizontal movement of the superstructure within a limit

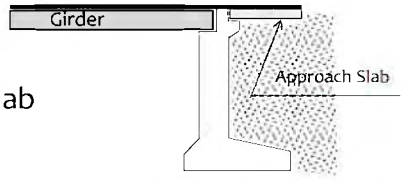




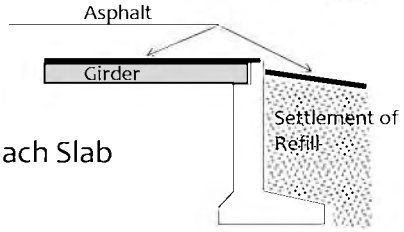
Approach Slab

Function: Countermeasure against elevation gap due to settlement of refill behind abutment

With Approach Slab



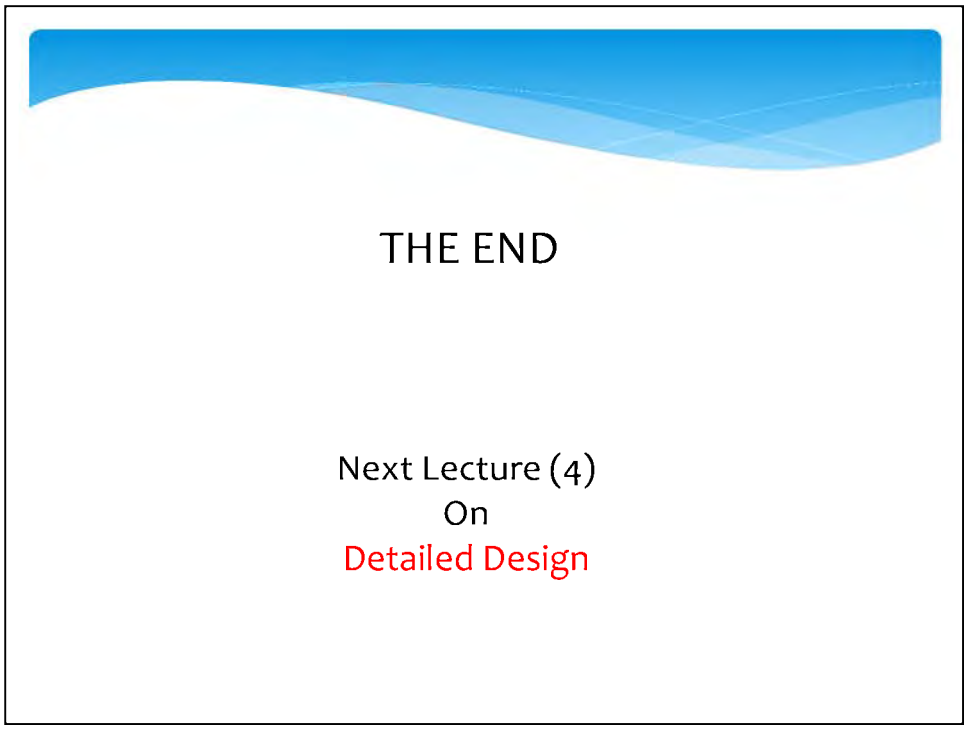
Without Approach Slab



Drainage

On designing drainage system,
consider those below;

(1) Rainfall intensity (mm/hr)
(2) Catchment area (Area of roadsurface:m^2)
(3) Slope of the bridge surface (%)

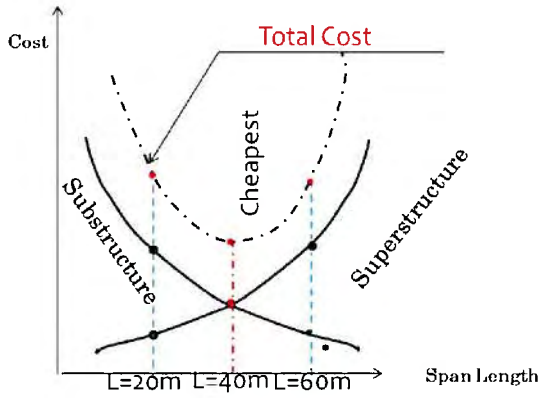

THE END
Next Lecture (4)
On
Detailed Design

CLASSROOM LESSON (4)
ON
BRIDGE

Detailed Design
&
How to Read Bridge Drawings

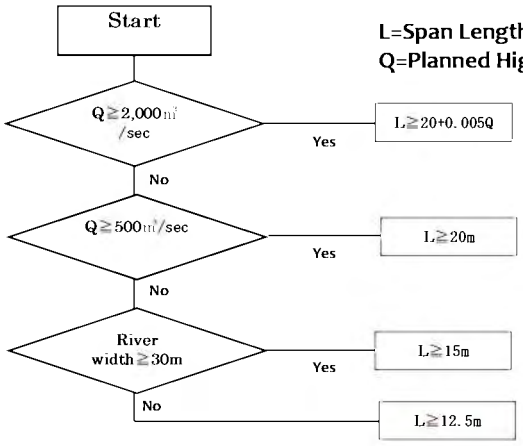
Review of the Past Lesson

If there is no constraint in selecting the most reasonable span length , the idea that the graph below shows can be applied. But actually there are some constraints to decide the span length such as river conditions, difficulties of construction and environment.



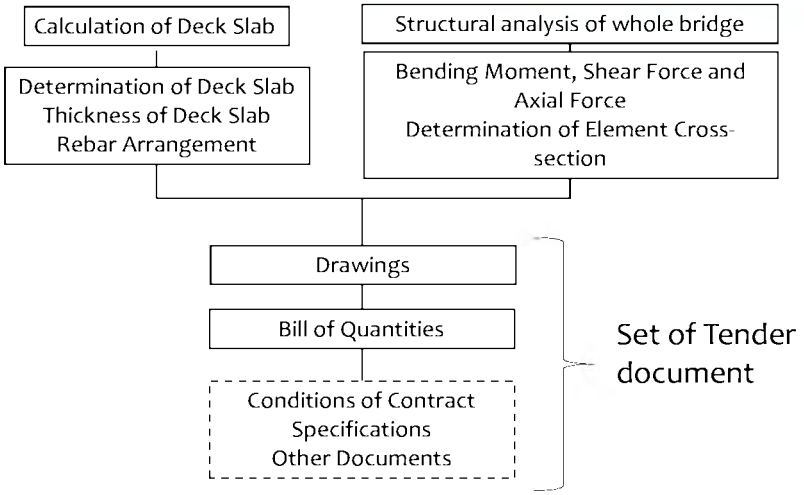
Minimum Span Length to be secured

The Japanese River Control Law specifies the minimum span length to be secured as shown in the flowchart below. This can be applied only to the second class river controlled by local districts, not by the government in Japan.
The Japanese law is so strict that the bridge cost may become higher if you severely take into consideration the law in designing bridges in this country.



L=Span Length (m)
Q=Planned High Discharge (㎥)

Sequences of Detailed Design



Core Technology required by ADN Engineer on Design Calculation

- Core Technology Required by **Consultants** = ability of designing properly.
- Core Technology Required by **ADN Engineers** = ability of verifying design prepared by the **consultant** .
- Usually calculation of deck slab, structural analysis and determination of required cross-section of major elements are implemented using computer and specialized software.
- ADN does not have these software, but no need to buy it. It is completely the consultant's business and their responsibility to make proper design calculation.
- **Therefore it will be enough for the ADN engineers to have knowledge on how design calculation is carried out.**

Input and Output of Design Calculation

Calculation of Deck Slab:	
Input	**Output**
·Weight of Parapet ·Weight of Pavement ·Weight of Deck Slab ·Wheel Load	·Working bending moment ·Required rebar arrangement of deck slab

Structural Analysis of Bridge:	
Input	**Output**
·Dead load (including pave, deck slab, parapet and so on) · Self-weight (assumed) ·Live load (according to the design standard)	·Working forces (bending moment and shear at each element). ·Reaction force at support)

Calculation of Element Cross-section:	
Input	**Output**
·Bending moment and shearing forces ·Strength of materials used for the element	·Required cross-section of the elements

Composition of Bridge Drawings

- Check existence of drawings before verification, for usually a set of drawings of a bridge constitutes of such as shown below;

- Location Map
- General View of the Bridge
- Plan and Profile
- Typical Cross-section
- Details of Superstructure
- Details of Substructure
- Details of Foundation
- Ancillaries

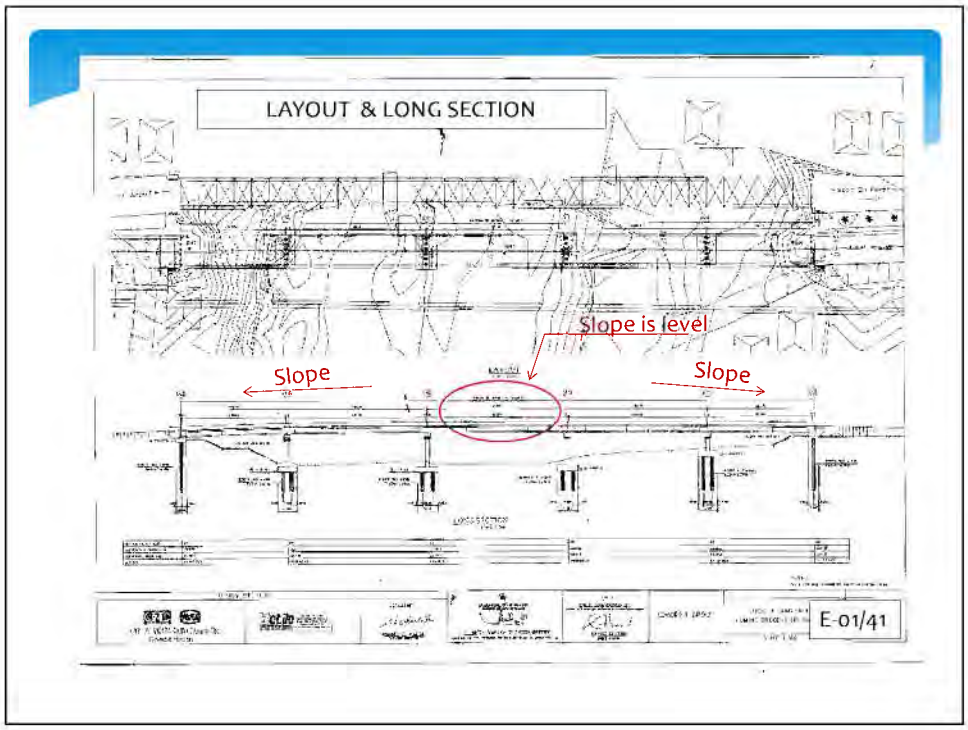
Let us learn how to read drawings using those of Comoro Bridge

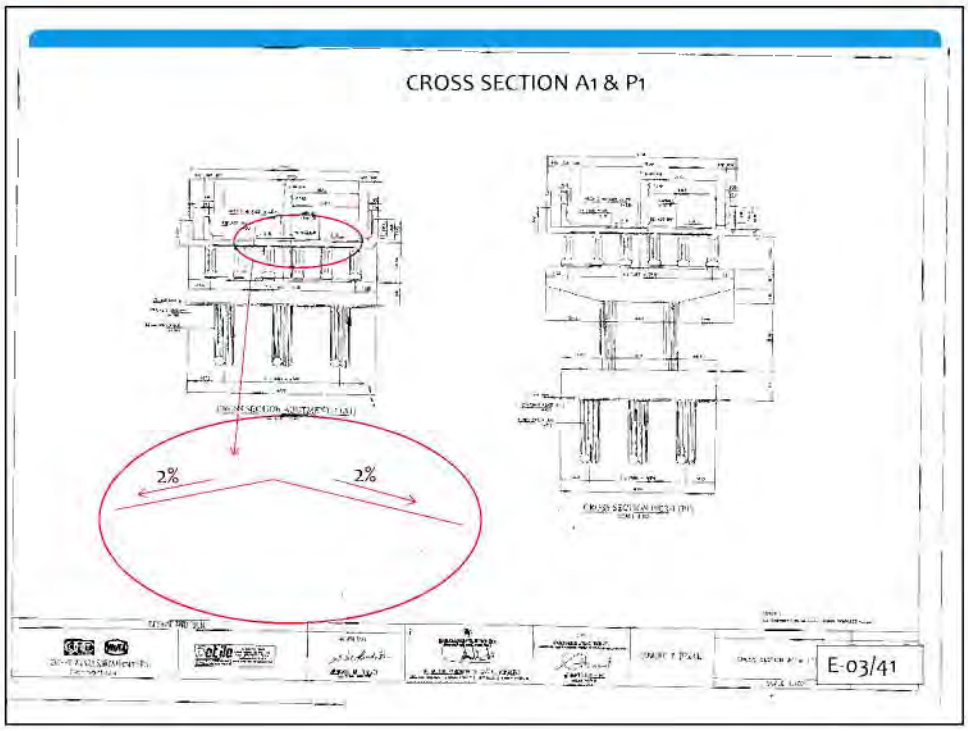
TABLE OF CONTENTS

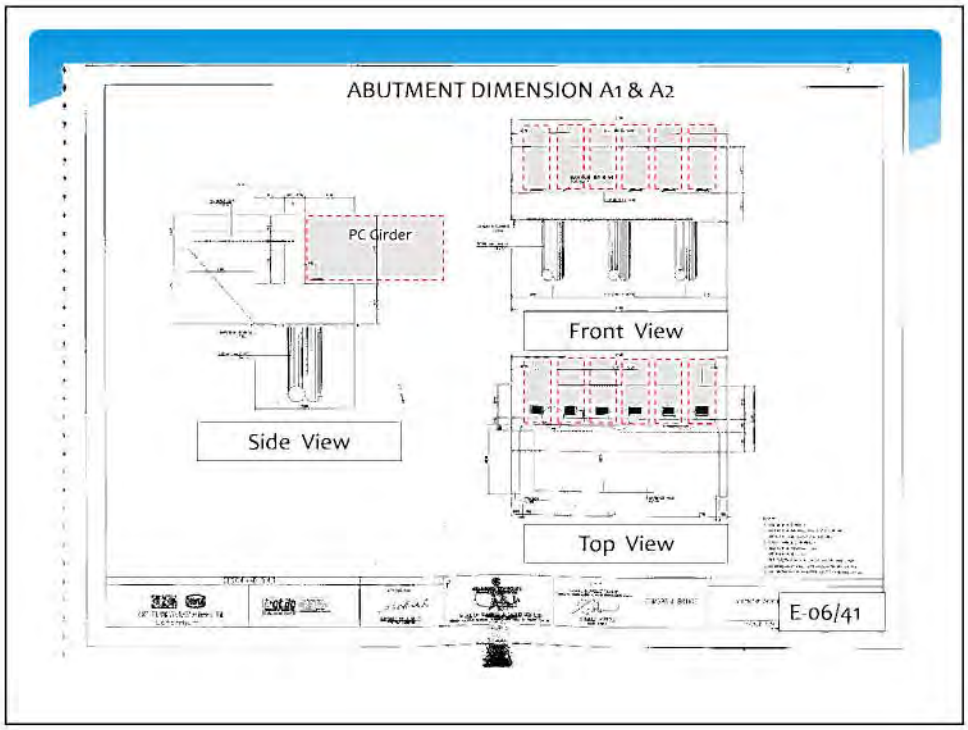
A. General
B. Typical Cross Section of Road and Bridge
C. Horizontal Alignment, Road Layout and Reference Point
D. Plan and Profile, Road and Bridge
E. Structure
F. Standard Drawings of Road
G. Typical Cross Section of Access Road

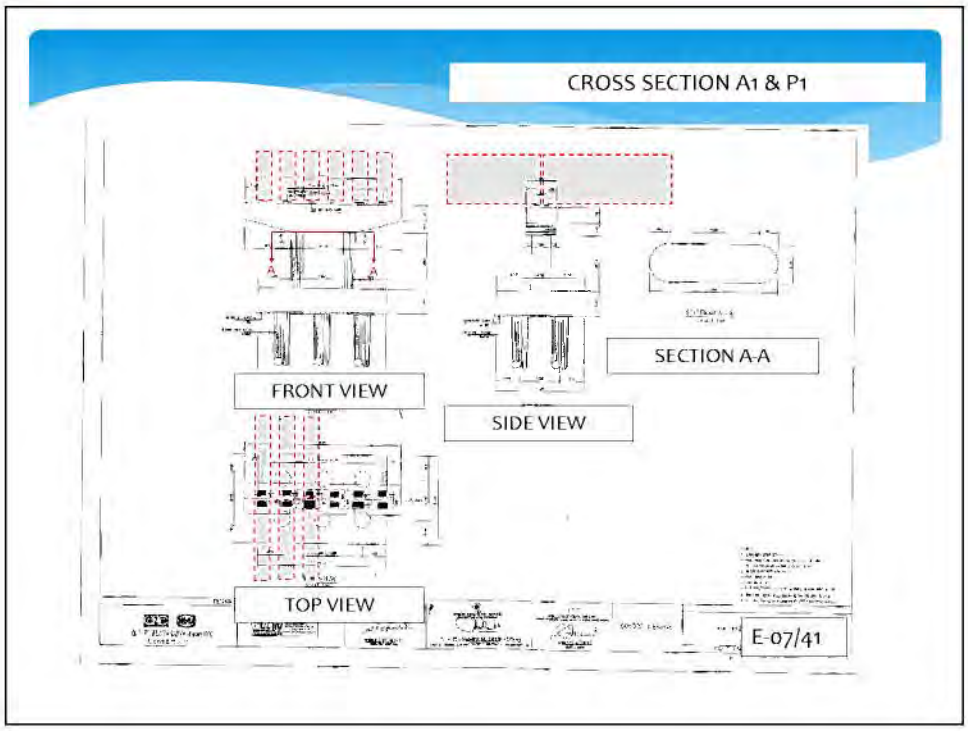
E. Structure

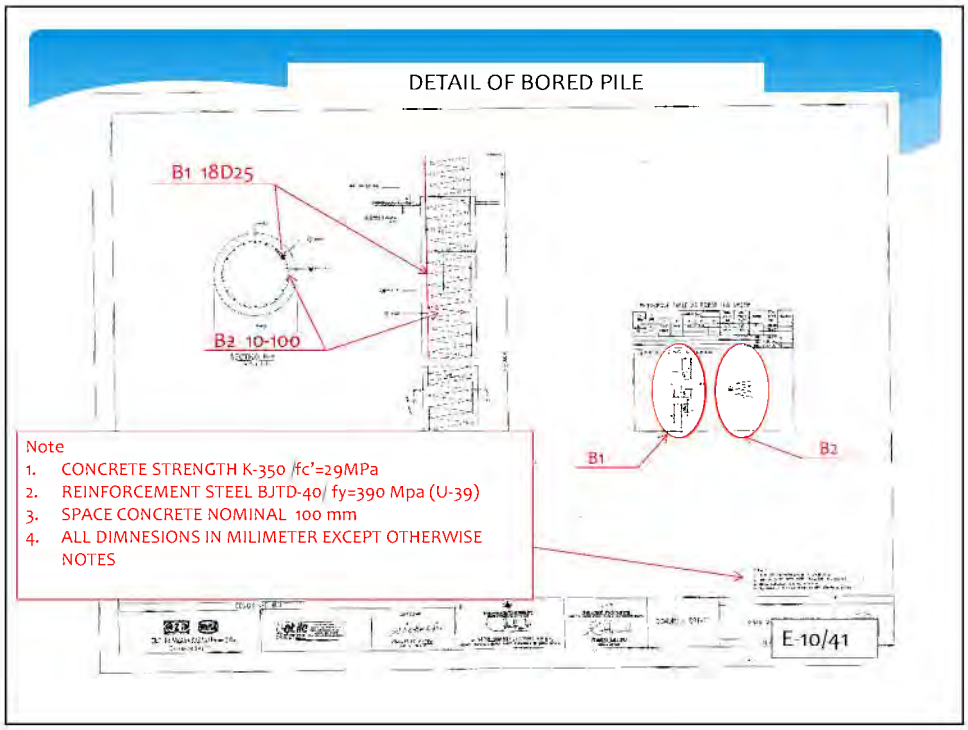
E-01 PLAN AND LONG SECTION BRIDGE
E-02 FRAMING PLAN
E-03 CROSS SECTION at A1, P1-P3, A2
E-06 DIMENSION of A1, P1-P3, A2
E-10 DETAIL OF BORED PILE
E-11 REINFORCEMENT of A1, P1-P3, A2
E-21 DETAIL OF PC GIRDER
E-33 ANCHOR PLACEMENT
E-37 DETAIL OF PARAPET
E-38 EXPANSION JOINT
E-39 DETAIL OF SLOPE PROTECTION
E-40 PLACEMENT OF DECK DRAIN
E-41 CROSS SECTION DECK DRAIN AND WATER FLOW

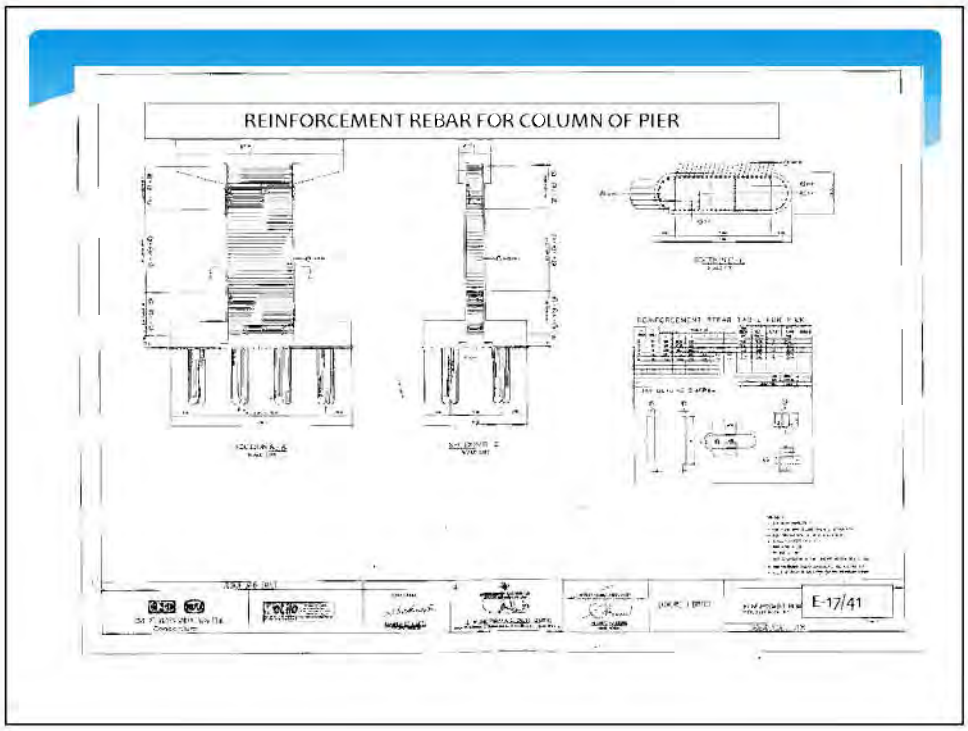

LAYOUT & LONG SECTION
Slope is level
Slope
Slope
E-01/41

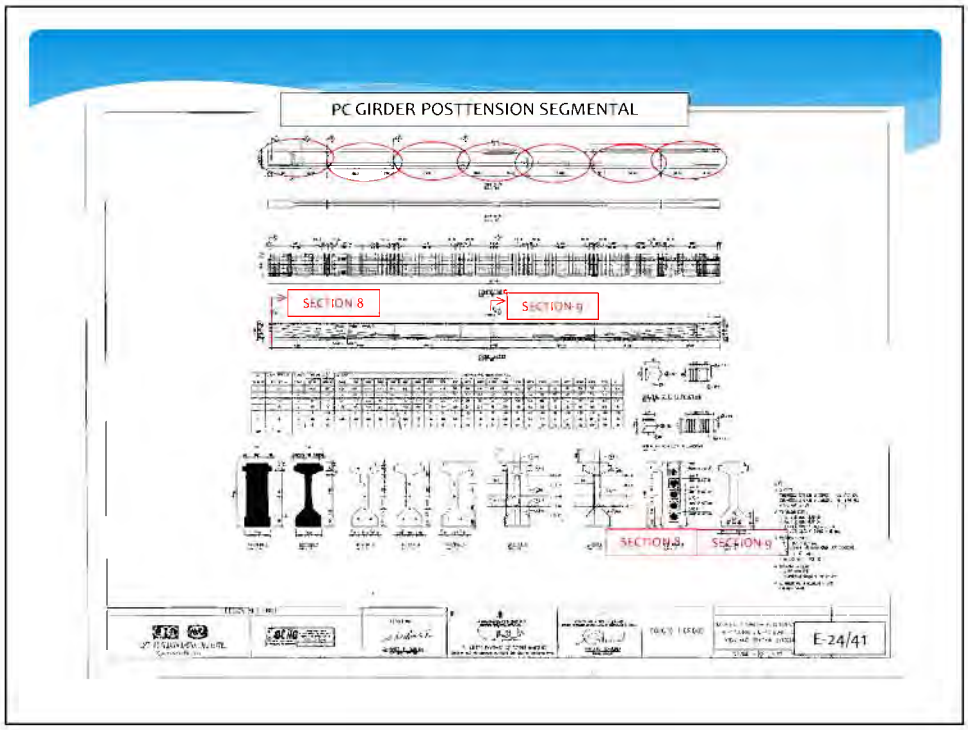

CROSS SECTION A1 & P1
2%
2%
E-03/41

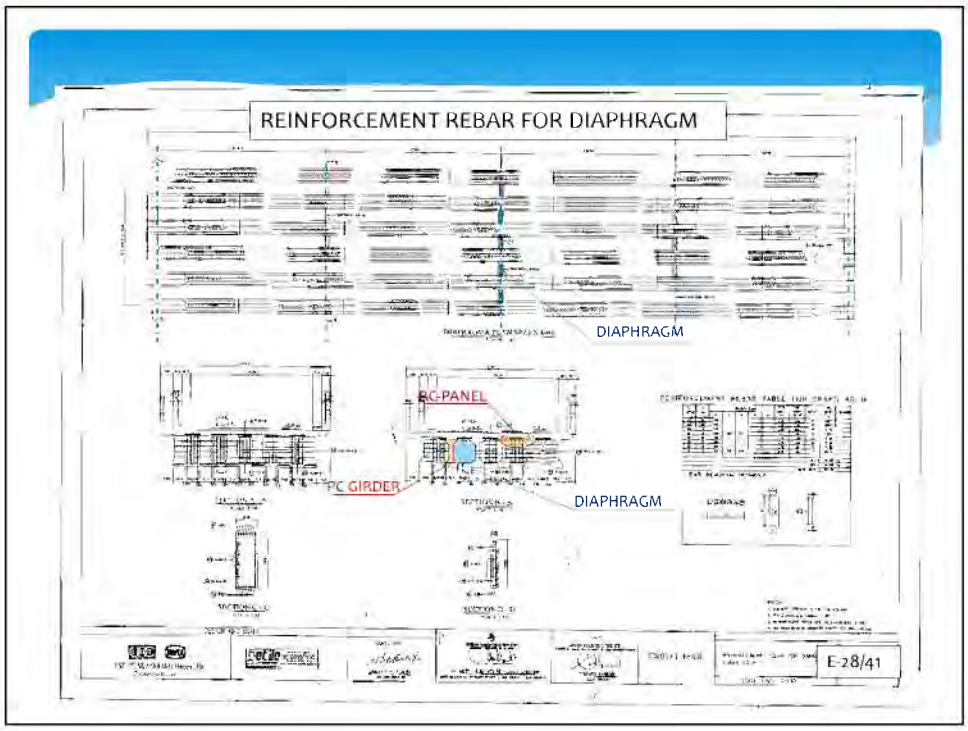

ABUTMENT DIMENSION A1 & A2
PC Girder
Front View
Side View
Top View
E-06/41

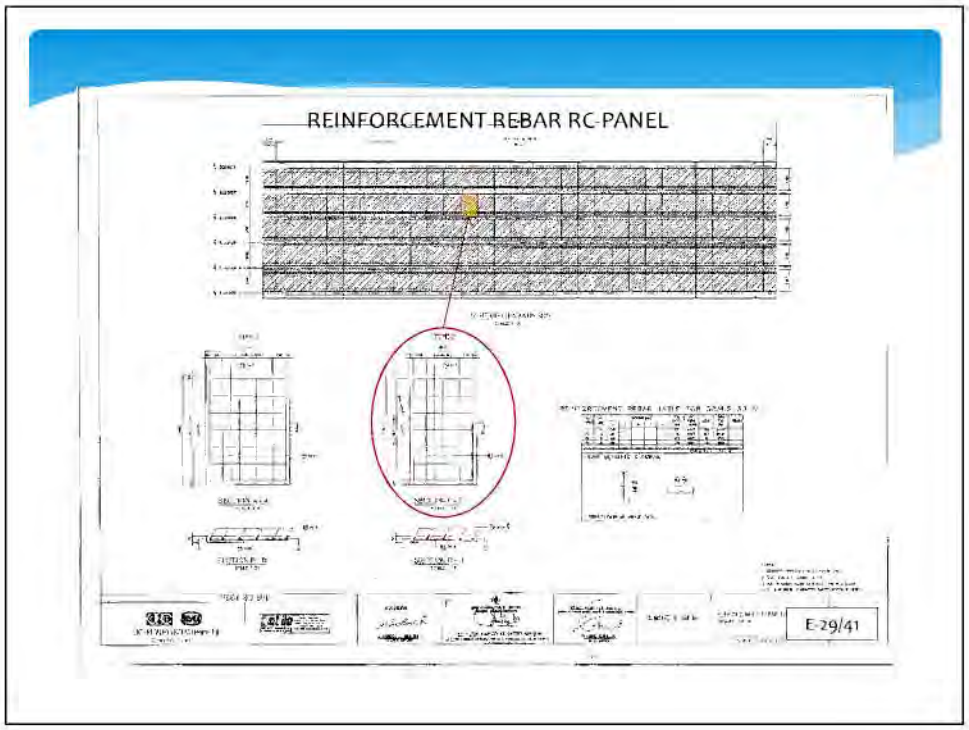

CROSS SECTION A1 & P1
SECTION A-A
FRONT VIEW
SIDE VIEW
TOP VIEW
E-07/41

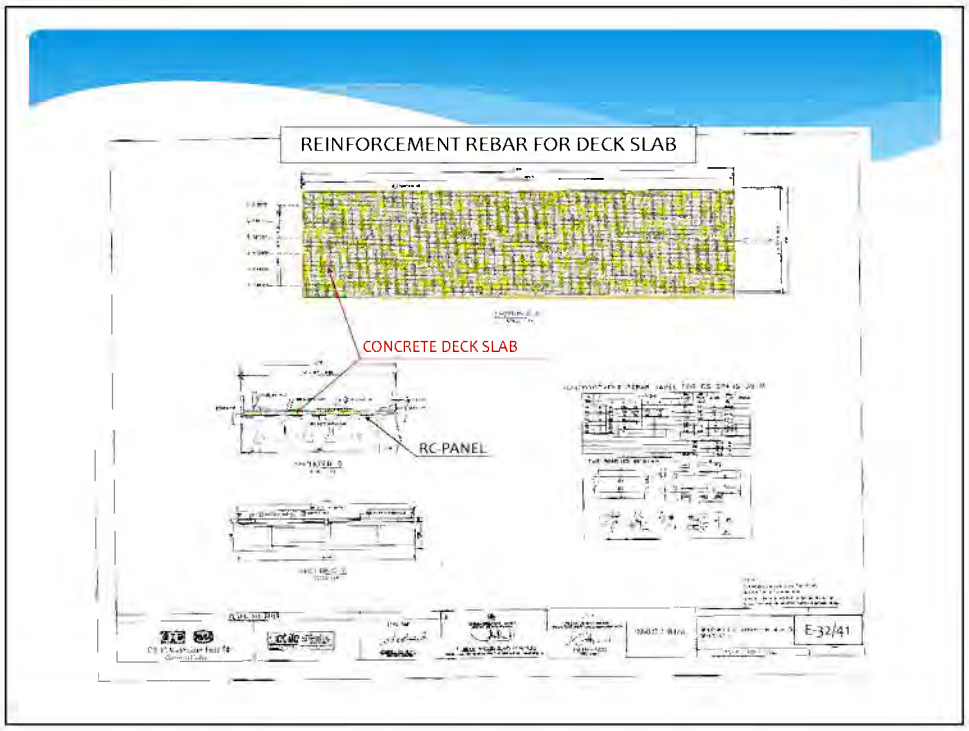

DETAIL OF BORED PILE
B1 18D25
B2 10-100
B1
B2
Note
1. CONCRETE STRENGTH K-350 /fc'=29MPa
2. REINFORCEMENT STEEL BJTD-40/ fy=390 Mpa (U-39)
3. SPACE CONCRETE NOMINAL 100 mm
4. ALL DIMNESIONS IN MILIMETER EXCEPT OTHERWISE NOTES
E-10/41


REINFORCEMENT REBAR FOR COLUMN OF PIER
E-17/41


PC GIRDER POSTTENSION SEGMENTAL
SECTION 8
SECTION 9
E-24/41


REINFORCEMENT REBAR FOR DIAPHRAGM
DIAPHRAGM
RC-PANEL
PC GIRDER
DIAPHRAGM
E-28/41


REINFORCEMENT REBAR RC-PANEL
E-29/41


REINFORCEMENT REBAR FOR DECK SLAB
CONCRETE DECK SLAB
RC-PANEL
E-32/41

THE END

Next Lecture (5)
On
Construction Method
Tender Documents

CLASSROOM LESSON (5)
ON
BRIDGE

Construction Method
&
Tender Documents
(Bidding Documents)

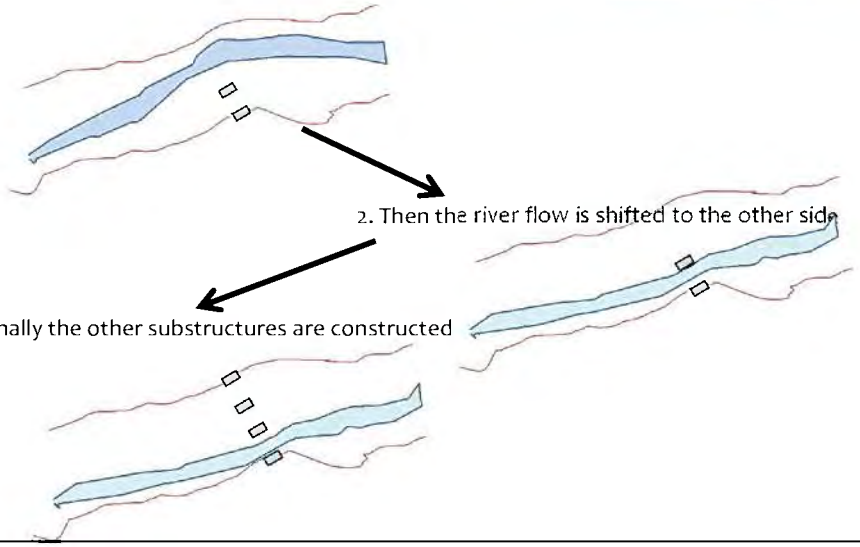
Construction of Substructure

It is preferable to construct foundations and substructures during dry season, when riverbed is available for the construction.
Cofferdam is constructed or main flow is shifted when river flow may obstruct the construction.

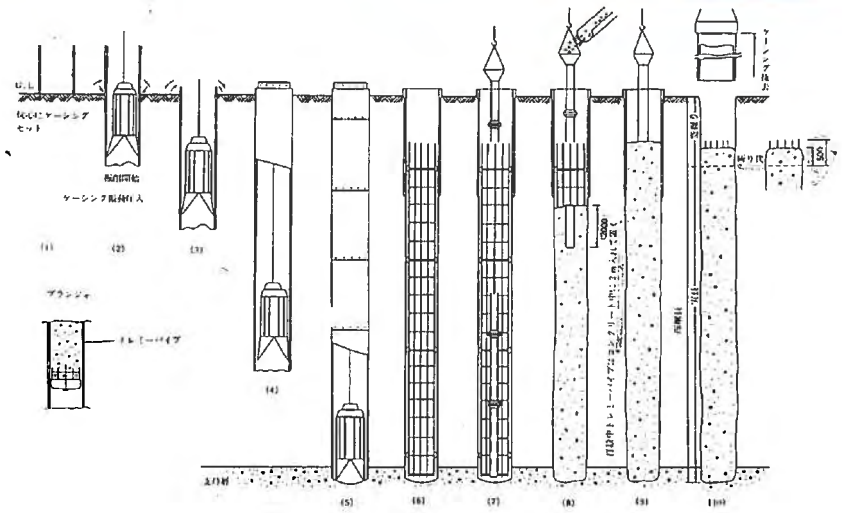
Cofferdam

Shifting River Flow

1. At first substructures are constructed where the riverbed is dry.



Sequences of bored piling



Construction of Bored Piles

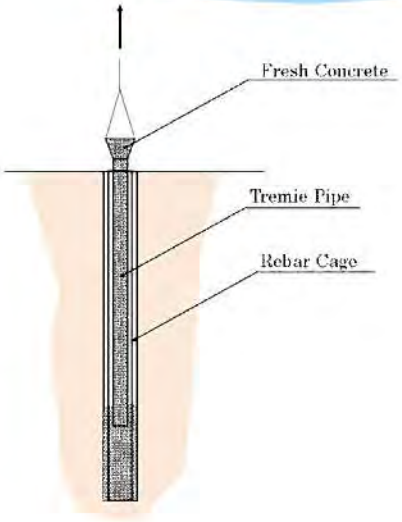
Setting Drilling Machine

Installation of Casing

Inserting Rebar Cage

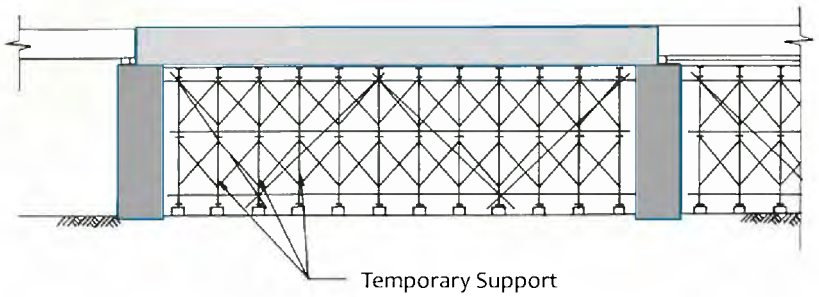
Countermeasure against Segregation of Aggregates

Tremie Pipes

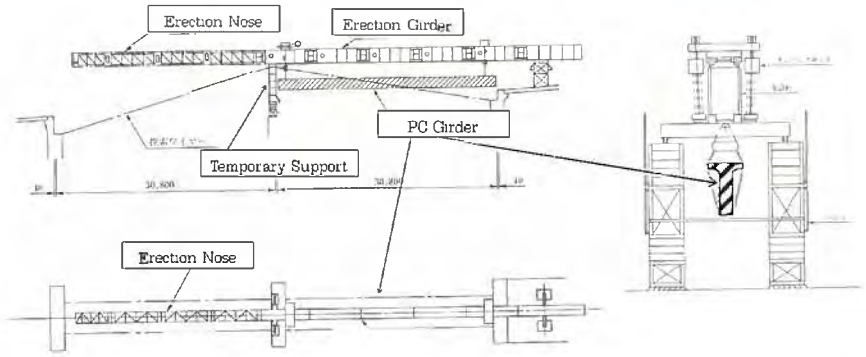


Konstruction of Superstructure

Girder constructed on temporary supports

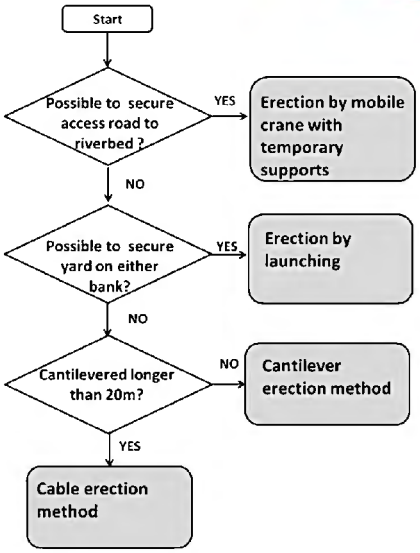


PC Girder suspended between steel erection girder,
And moved longitudinally

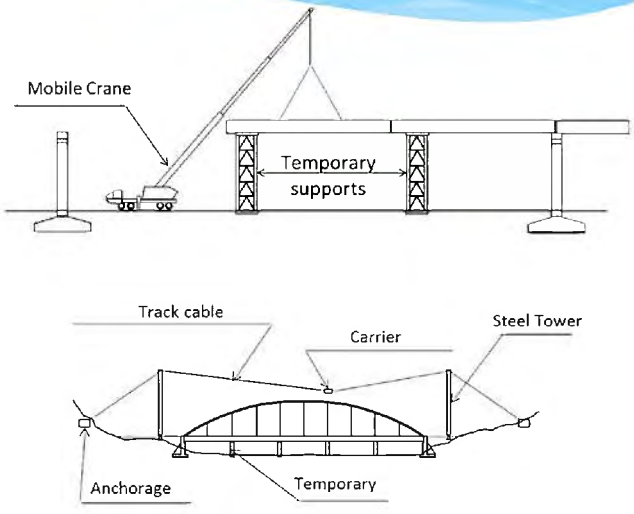


Erection Girder used for Comoro Bridge Construction

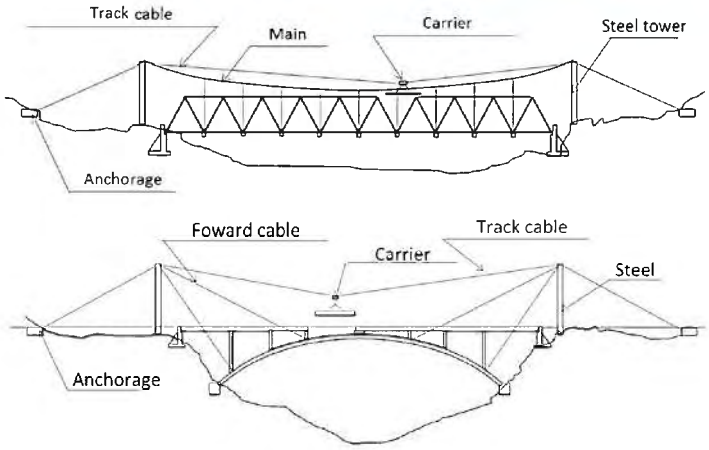
Decision flow of Steel Bridge Erection Method

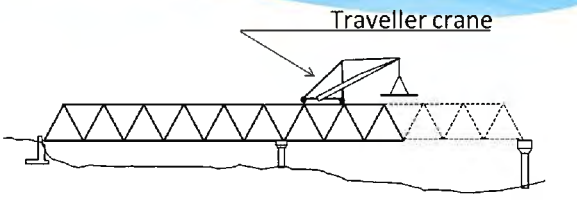


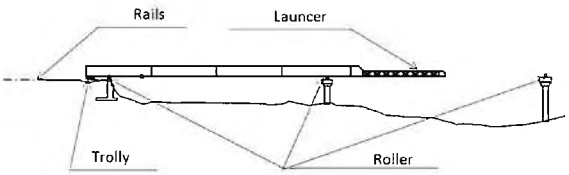
Truss bridges are assembled on temporary supports using truck crane.



Launching from right to left using erection nose
(Erection nose is cut off later)







TENDER DOCUMENTS (BIDDING DOCUMENTS)

Composition of Tender Documents

PART 1-BIDDING PROCEDURE
- Instruction to Bidders
- Bid Data Sheet
- Evaluation and Qualification Criteria
- Bidding Forms
- Eligible Countries

PART 2-WORKS REQUIREMENTS
- Work Requirements
- Scope of Work
- Specifications
- Drawings
- Bill of Quantities

Titles in red are especially important.

PART 3-CONDITIONS OF CONTRACTS AND CONTRACT FORMS
- General Conditions
- Particular Conditions
- Annex to the Particular Conditions – Contract Forms

General Conditions of Contract

Usually "FIDIC" General Conditions of Contract are used. It is very much general and standard for international contract.

Particular Conditions of Contract

Particular data are summarized in "CONTRACT DATA" to help you easily find important data, as shown below;

Conditions	Data
Defect Notification Period	365 days
Performance Security	5 percent of the Accepted Contract Amount
Normal working hours	8 hours per day
Delay damages for the works	0.1% of the Contract Amount
Maximum amount of delay damages	5% of the final Contract Price
Total advance payment	Maximum 15% of the Accepted Contract Amount

Conditions	Data
Percentage of Retention Money	5%
Limit of Retention Money	5% of the Accepted Contract Amount
Minimum Amount of Interim Payment Certificate	1.00% of the Accepted Contract Amount

Bill of Quantifies

	Description
1	General
2	Drainage
3	Earthworks
4	Pavement
5	Structures
6	Reinstatement and Minor Works
7	Daywork
8	

Specifications (RED BOOK)

RED BOOK, 2005 is frequently used for road and bridge works, but AASHTO is often referred. **Section 500** specifies technically Bridge works.

SECTION 500-BRIDGE CONSTRUCTION

ITEM 501 Piling
ITEM 502 Railings
ITEM 503 Timber Structures
ITEM 504 metal Structures
ITEM 505 Reinforcing Steel
ITEM 506 Structural Concrete
ITEM 507 Prestressed Concrete Structures
ITEM 508 Concrete Structures
ITEM 509 Steel Bridges
ITEM 510 Welded Structural Steel
ITEM 511 Treated and Untreated Timber
ITEM 512 Paint

ITEM 506 STRUCTURAL CONCRETE

506.1.2 Classes and Uses of Concrete
Class A: Superstructures, heavily reinforced
substructures, slabs, columns, beams, girders and box culverts

506.2.3 Coarse aggregate
Class A: Grading requirements

506.3 Sampling and Testing of Structural Concrete
One sample consisting of three concrete cylinder test specimens(150x300mm) from each 75cubic meters.

506.4.1 Minimum cement contents, maximum water/cement ratio, consistency range in slump, minimum compressive strength

SECTION 900-MATERIAL DETAILS

Section 900 deals with common materials such as cement, aggregate, rebar and structural metal.

ITEM 901- Hydraulic Cement
ITEM 902-Construction Lime
ITEM 903-Bituminous Materials
ITEM 904-AGGREGATES
ITEM 905-Masonry Units
ITEM 906-Joint Materials
ITEM 907-Concrete, Clay, Plastic and Fiber Pipe
ITEM 908-Metal Pipe
ITEM 909- Concrete Curing Materials and Admixtures
ITEM 910- Paints
ITEM 911- Reinforcing Steel and Wire Rope
ITEM 912-Fence and Guardrail
ITEM 913- Structural Metal
ITEM 914-Treated and Untreated Timber
ITEM 915- Water

CHECKLIST FOR REQUIRED DOCUMENTS TO BE SUBMITED

INFRASTRUCTURE FUND	CHECKLIST A			Verified by	Approved by
Type of Project	General	Objective	Required Documents to be submitted		

Contract No.	RDTL-1000645		Submit Date		
Project Name	TONO IRRIGATION SCHEME		Stage	Verification of Tender Documents	
Implementing Agency					
Check Item	Check Point		Check Date	Check Mark	Remarks
	It is confirmed that all of those documents are submitted by I.M.				Reasons of undelivered
1	Instruction to Bidders		12/06/2013	✔	
2	Form of Bid and Qualification Data/Bidding Documents		12/06/2013	✔	
3	Conditions of Contract		12/06/2013	✔	
4	Contract Data/Particular Conditions		12/06/2013	✔	
5	Bill of Quantity		12/06/2013	✔	
6	Forms of Securities/Security Forms		12/06/2013	✔	
7	Specifications/General Specifications, Technical Specifications		12/06/2013	✔	
8	Drawings		12/06/2013	✔	
9	Others, if necessary				

CHECKLIST FOR CONTRACT CONDITIONS

INFRASTRUCTURE FUND	CHECKLIST B			Verified by	Approved by
Type of Project	General	Objective	Payment Conditions		

Contract No.	RDTL-1000645		Submit Date		
Project Name	TONO IRRIGATION SCHEME		Stage	Verification of Tender Documents	
Implementing Agency					
Check Item	Check Point		Check Date	Check Mark	Remarks
	It is confirmed whether those below are reasonable or not?				Referred Data
1	Time for completion/Construction Period		12/06/2013	✔	To be Advised?
2	Maintenance Period/Defect Notification Period		12/06/2013	✔	90 days (Too short?)
3	Governing Law		12/06/2013	✔	The Law of Democratic Republic of Timor Leste
4	Ruling Language		12/06/2013	✔	English
5	Performance Security/Performance Bond		12/06/2013	✔	10% Bank Guarantee
6	Delay damanges for the Work/Liquidated Damages		12/06/2013	✔	0.1% of Final Contract Price
7	Maximum amount of delay damages		12/06/2013	✔	10% of Final Contract Price
8	Provisional Sum		12/06/2013	✔	N/A
9	Total Advance Payment		12/06/2013	✔	N/A
10	Percentage of Retention		12/06/2013	✔	N/A
11	Limit of Retention Money		12/06/2013	✔	N/A
12	Minimum Amount of Interim Payment Certificates		12/06/2013	✔	N/A

Common Contract Data in the Past Project

Project Name	Tono Irrigation Scheme	Suai-Beaco Highway Road Project	Comoro 2 Bridge	Baer Bridge	ADB Project	Caramlun Irrigation Project	Common Range in the Past Project
Implementing Agency	Ministry of Agreculture	Ministry of Public Works	AND	Ministry of Public Works			
Time for Completion	–	–	270 days	480 days			
Maintenance Period	90 days	365 days	90 days	540 days	365 days		90-540
Governing Law	The Law of Timor Leste	The Law of Timor Leste	The Law of Timor Leste	The Law of Timor Leste	The Law of Timor Leste		The Law of Timor Leste
Ruling Language	English	English	English	English	English		English
Performance Security	10%	5%	5%	10%	5%	7.50%	5-10%
Delay Damage	0.1%/day	0.1%/Day		0.1%/Day	0.1%/Day	0.1%/Day	0.1%/Day
Maximun Amount of Delay Damages	10%	5%		10%	10%		5-10%
Provisional Sum				15%	15%		15%
Total Advance Payment		15%	20%	10%	15%		10-20%
Percentage of Retention		5%	5%	10%	10%		5-10%
Limit of Retention Money		5%		10%	10%		5-10%
Minimum Amount of Interim Payment		1%		5%			1-5%

THE END

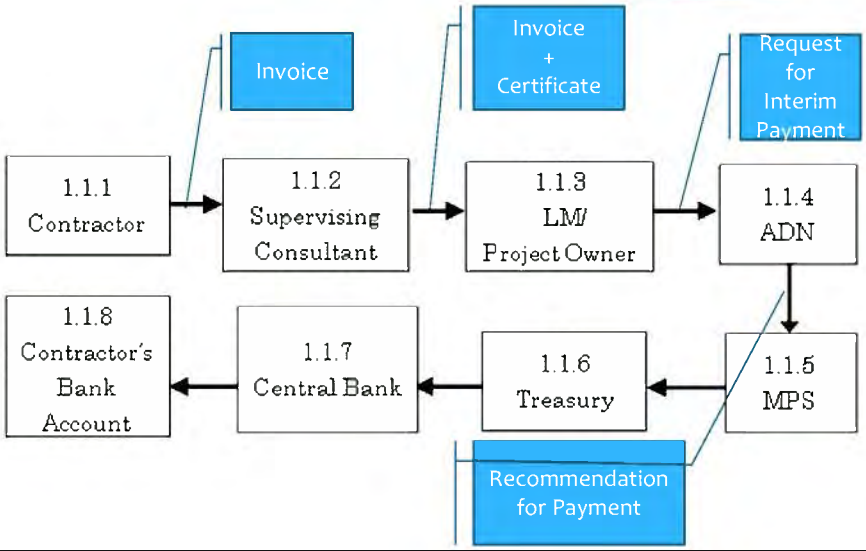
Next Lecture (6)

CLASSROOM LESSON (6)
ON
BRIDGE

Use of ADN-Manual

Regular Inspection and Recommendation for Payment

Flow Chart of Infrastructure Fund Project



SEQUENCES OF INSPECTION FOR INTERIM PAYMENT

1. Document Inspection
   Inspection of documents submitted by LM
2. Site Inspection
   Schedule, Quality Control, Measurement and Remedy
3. Notice of Judgment on Payment
   Recommendation for payment
4. FAQ
   Record of Frequently asked questions and answer

Document Inspection

1. Confirmation of Documents submitted ⇒ Checklist D
2. Confirmation of Payment conditions ⇒ Particular Conditions
3. Calculation in Billing Sheets ⇒ BoQ Digital Data
4. Confirmation of completed works in BoQ ⇒ BoQ Digital Data
5. Confirmation of work schedule ⇒ Monthly Report

Checklist for submitted documents for Payment Request

CTURE	CHECKLIST D			Verified by
oject	Road & Bridge	Objective	Required Documents to be submitted	

No.		Submit Date	
ame		Stage	Inspection of Payment R
ementing Agency			

em	Check Point	Check Date	Check Mark	Reme
	It is confirmed that all of those documents are submitted by LM.			Reasons of
1	Request Letter of Inspection from LV to ADN			
2	Invoice from Contractor to LM/Project Owner			
3	Parts of Contract Document, showing the contract amount and payment conditions			
4	Bill of Quantities showing unit prices and quantities			
5	Certificate for Payment by Supervising Consultant			
6	Approval for Payment by LM			
7	Interim Monthly Certificate			
8	Description of changes, alteration or variations, if any			
9	Digital data of BOQ			

PAYMENT CONDITIONS

Conditions	Data
Defect Notification Period	365 days
Performance Security	5 percent of the Accepted Contract Amount
Normal working hours	8 hours per day
Delay damages for the works	0.1% of the Contract Amount
Maximum amount of delay damages	5% of the final Contract Price
Total advance payment	Maximum 15% of the Accepted Contract Amount
Percentage of Retention Money	5%
Limit of Retention Money	5% of the Accepted Contract Amount
Minimum Amount of Interim Payment Certificate	1.00% of the Accepted Contract Amount

Site Inspection

1. Preparation ⇒ Request Letter for Preparation (Form E)
2. Verification of Schedule ⇒ Monthly Report
3. Quality Control ⇒ Checklist E
4. Measurement of the Work Completed ⇒ Checklist F
5. Remedy ⇒ AND-MANUAL

Section 2: Regular Inspection for Payment & Recommendation for Payment

1. Infrastructure Fund

1.4 Site Inspection

(5) Remedy

When ADN finds some non-conformant or unsatisfactory works, AND shall instruct the remedy.

REQUEST LETTER FOR PREPARATION

(SUBJECT) REQUEST OF PREPARATION FOR SITE INSPECTION

In response to payment request submitted to ADN, ADN informs that ……. …… ADN requests LM to prepare the followings in order to conduct a site inspection properly and orderly.

1. Name of Project
2. Date of Site Inspection
3. Attendants required
1) Supervisor and Engineer(s) in charge from **LM**
2) Supervising **Consultant**(s)
3) Site Manager and Chief Engineer from **Contractor**
4. Preparation at site arranged by LM
1) **Records on Quality Control**
2) Drawings with completed construction included
3) Details of BoQ
4) Measuring Devices, if necessary Destructive Testing
5) Assistants for Measurement

Checklist on Quality Control

INFRASTRUCTURE FUND	CHECKLIST E			Verified by	Approved by
Type of Project	Road & Bridge	Objective	Quality Control		

Contract No.		Submit Date	
Project Name		Stage	Inspection of Payment Request
Implementing Agency			

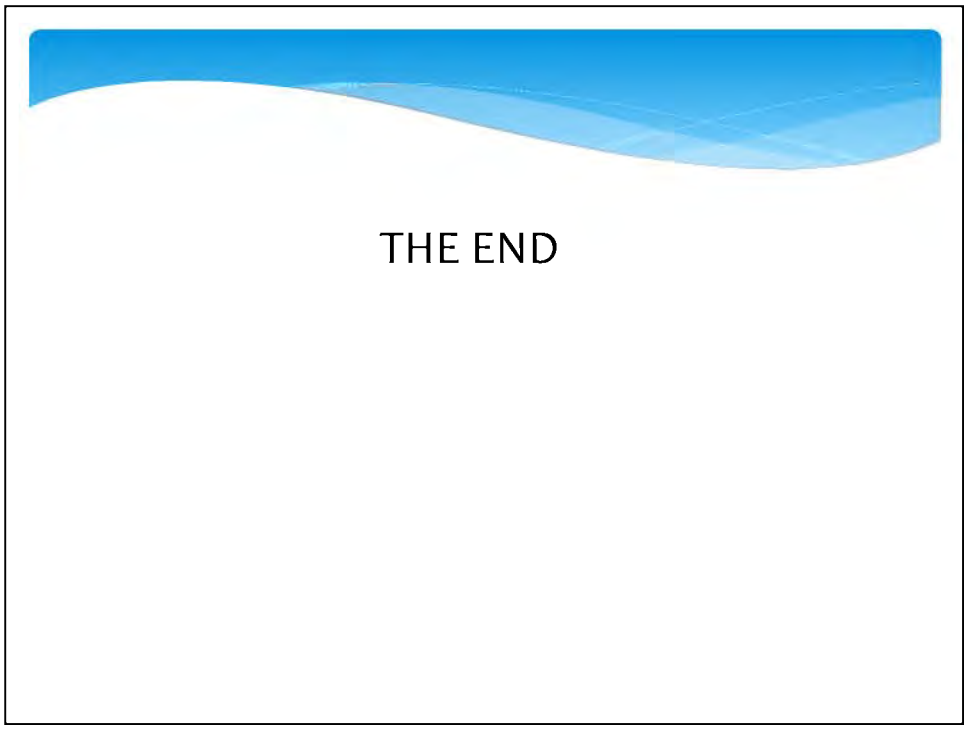
	Check Item	Check Point	Check Date	Check Mark	Referrence
1	Concrete	Compressive Strength at 28th day			Technical Specifications
2		Slump Loss			Technical Specifications
3		Minimum time and minimum percentage design strecgth for removal of forms are specified in 508.3.14 of the Standard Specifications.			MTCPW Standard Specification_ 2005
4	Rebar	Usually deformed bar for concrete reinforcement is used in accodance with AASHTO M 31 (Grade 400)			
5	Weep Holes	Weep holes on walls are usually spaced not more than 2 meters center to center and the diameter is 50mm.			
6	Cement	Portland cement . AASHTO M85 is frequently used for structural concrete.			MTCPW Standard Specification_ 2005
7	Piling	Scope, test piles and load tests are specified in the Standard Specifications Item 501			MTCPW Standard Specification_ 2005
8	Subgrade	Subgrade surface tolerances are specified in 206.3.2 of the Standrd Specifications.			MTCPW Standard Specification_ 2005
8	Subbase	Allowable tolerances are specified in Section 300 of the Standrd Specifications			MTCPW Standard Specification_ 2005
9	Base Course	Allowable tolerances are specified in Section 300 of the Standrd Specifications			MTCPW Standard Specification_ 2005
10					

Checklist on Measurement

Infrastructure Fund	CHECKLIST F			Verified by	Approved by
Type of Project	Road & Bridge	Objective	Measurement		

Contract No.		Submit Date	
Project Name		Stage	Inspection of Payment Request
Implementing Agency			

	Check Item	Check Point	Check Date	Check Mark	Referrence
1	Base Course	Measure length and width of the work completed in this period, calculate the base course volume using design thickness of the base			Drawings & Bill of Quantities
2	Pavement	Measure length and width of the work completed in this period, calculate the pavement area			Drawings & Bill of Quantities
3	Drainage Cleaning	Measure length of the draingage cleaning work completed in this period			Drawings & Bill of Quantities
4	StoneMasonry Side Ditch	Measure necessary lengthes of each side and length, culculate the volume of the work completed in this period			Drawings & Bill of Quantities
5	Railings	Measrue total length and number of Guide Post			Drawings & Bill of Quantities
6	Road Marking	Measure total length			Drawings & Bill of Quantities
7	Road Signs	Count number of road signs			Drawings & Bill of Quantities
8	Wing Wall	Measure dimensions and compare with the drawings			Drawings & Bill of Quantities
9	Deck Slab	Measure dimensions and compare with the drawings			Drawings & Bill of Quantities
10	Approach Slab	Measure dimensions and compare with the drawings			Drawings & Bill of Quantities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