DEMOCRATIC REPUBLIC OF TIMOR-LESTE

ADN

EXPERT FOR STRENGTHENING INSTITUTIONAL CAPACITY OF NATIONAL DEVELOPMENT AGENCY

FINAL REPORT (1/2)

OCTOBER 2013

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

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JAPANESE TECHNICAL ASSISTANCE ON STRENGTHENING INSTITUTIONAL CAPACITY OF NATIONAL DEVELOPMENT AGENCY (ADN) IN DEMOCRATIC REPUBLIC OF TIMOR-LESTE

FINAL REPORT

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Abbreviation

AASHTO	American Association of State Highway and Transportation Officials
ADB	Asian Development Bank
ADN	National Development Agency (Agencia de Desenvolvimento Nacional)
APORTIL	Port Administration of Timor-Leste
AS	Australian Standard (for Building)
AS/NZS	Australian / New Zealand Standard (for Building)
AusAID	Australian Agency for International Development
BC	Timor Leste Central Bank
BCA	Building Code of Australia
BESIK	Be, Saneamento, Ijiene iha Komunidade (Timor-Leste Rural Water Supply and Sanitation Program (RWSSP))
BoQ	Bill of Quantities
CAFi	Conselho de Administracao do Fundo das Infra-estruturas
CKP	Charles Kendal & Partners
CPV	Commitment Payment Voucher
DC	District Committee
DNSA	National Directorate of Water Supply
DNSAS	National Directorate of Water and Sanitation (former organization)
DPP	Project Planning Deportment (Departermentu Projetu Planeiametu)
DRBFC	National Directorate of Road, Bridge and Flood Control
EDTL	Electricity of East Timor（Electicidade de Timor-Leste）
ESTATAL	Ministry of State Administration and Territorial Management (MAEOT)
ESPOP	Heavy Oil Project Service Team (Ekipa Servisu Projetu Oil Pezado)
FAQ	Frequently Asked Question
FI	Infrastructure Fund
GPMT	Medium Voltage Project Management (Gerente Project Media Tensao)
JICA	Japan International Cooperation Agency
KDD	Development District Commission
LM	Line Ministry
MDG	Millennium Development Goal
MOF	Ministry of Finance
MOI	Ministry of Infrastructure
MPS	Major Project Secretariat
MPW	Ministry of Public Works
NPC	National Procurement Commission
OJT	On the Job Training
O&M	Operation and Maintenance
PC	Personal Computer
PDD I	Package of Decentralized Development I
PDD II	Package of Decentralized Development II
PDID	Integrated District Development Plan
PDIDS	Integrated Development Project in Suco
PDL	Programa de Desenvolvimento Local
PEN	National Electrification Program (Programa da Electrificacao Nacional)
PO	Purchase Order
RDTL	The independent Democratic Republic of Timor-Leste
RWS	Rural Water Supply
SAS	Water and Sanitation Service
SDP	Timor-Leste Strategic Development Plan 2011-2030
SEFOPE	Secretary of State for Policy of Provincial Training and Employment
SGP	Secretariat of Large Project (MPS)
SNI	Serviços Nacional de Inteligência
SOS	Secretary of State (Secretario de Estado)

TPO	Treasury Payment Order
UNDP	United Nations Development Program
WB	World Bank
W/C	Water Cement Ratio

1. Background

The Government of the Democratic Republic of Timor-Leste (hereinafter referred to as "GOTL") issued the Strategic Development Plan 2011-2030 (hereinafter referred to as "SDP") in July 2011. The National Development Agency (hereinafter referred to as ADN) was established by Decree-Law No.11/2011 on March 2011 as the implementing agency for the SDP.

This Act stipulates that ADN has the power to assess more rigorously capital development projects, based on cost-benefit analyses, and through monitoring the implementation and execution of projects through a system of quality certification, thus contributing to the rationalization of financial resources available for national development and economic activity, at national and local levels.

ADN has responsibility for the quality assessment of infrastructure and proper execution of infrastructure development contracts under Decree-Law No.11/2011, as well as the efficient implementation of major infrastructure development projects as planned in SDP. The organization framework of ADN, however, is still in the process of stabilization. At present ADN engineers have neither sufficient experience or knowledge for the effective implementation of SDP policy.

The Japanese Technical Assistance Project for Strengthening Institutional Capacity of the National Development Agency in Democratic Republic of Timor-Leste in 2012 (Phase I) and 2013 (Phase II) has been carried out under these conditions. JICA proposed to develop effective capacity building methodologies and activities and these were presented in a manual published by the JICA-ADN team in 2012. Phase II was planned that the capacity of ADN would be strengthened through the use of the ADN Manual and ADN engineers' capacity would be built by classroom lessons and OJT of proper verification and inspection.

2. Project Organization

2.1 Outline of Project Organization

The project is managed and implemented by the following setup:

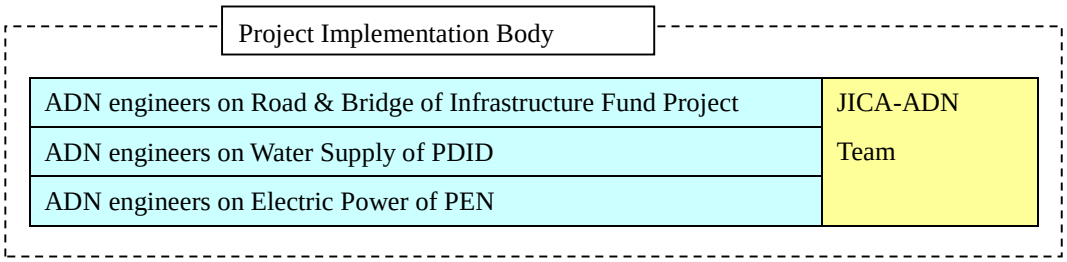


Figure 2-1 Organization for Project Implementation and Management

2.2 Counterpart

Existing organization structure of ADN engineering section is as presented in Figure 2-2.
The number in brackets is the number of ADN engineers in each section.

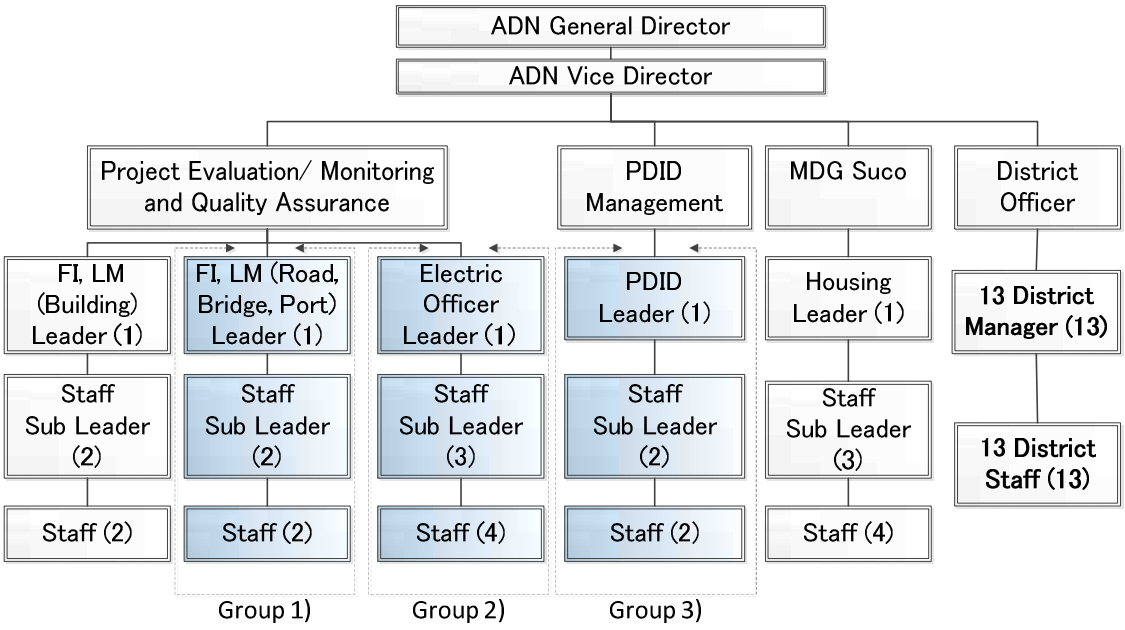


Figure 2-2 Existing organization structure of ADN

The Counterpart for Group 1), Group 2) and Group 3) are as follows:. Group 1) are the engineers in charge of Infrastructure Fund Projects & Line Ministries (LM), Group 2) are the

engineers responsible for Electric infrastructure, and Group 3) are the engineers with responsibility for PDID projects, which are represented in the blue color portion in Figure 2-2.

2.3 Japanese Experts

The five experts dispatched as the short term experts of JICA-ADN Phase 2 Team, are as follows;

(1). Road & Bridges expert #1: Mr. Hideo MATSUSHIMA
(2). Road & Bridges expert #2: Mr. Jiro KOYAMA
(3). Water expert #1: Mr. Hideo HIGUCHI, (assistant: Mr. Takeo SAKAMOTO)
(4). Water expert #2: Mr. Hiroyasu YODA
(5). Power expert: Mr. Koichi UCHIDA

3. Core Subjects Delivered by the Project

3.1 Consulting Services Undertaken by the Japanese Experts

JICA-ADN Phase 2 Team delivered the following consulting services.

Table 3.1 Consulting Services

No	Consulting Services	Period engaged
1	The Revision of ADN Manual	April 2013 to August 2013
2	Core technologies on evaluation, monitoring and inspection of infrastructure projects by use of ADN Manual.	July 2013 to September 2013
3	Fundamental knowledge on evaluation, monitoring and inspection of infrastructure projects by class room lessons.	April 2013 to August 2013
4	Coordination with relevant Ministries/Agencies	April 2013 to September 2013
5	Suggestion on Human resource development plan	September 2013
6	Workshop on Quality Control through ADN Work	September 2013
7	Reporting	September 2013

3.2 Schedule

Schedule of JICA-ADN Phase 2 Team is shown in Table 3.2.

Table 3.2 Schedule of JICA-ADN Phase 2 Team

Item	Apr	May	Jun	Jul	Aug	Sep	Oct
The Revision of ADN Manual							
Core technologies by use of ADN Manual							
Fundamental knowledge by class room lessons							
Coordination with relevant Ministries/Agencies							
Human resource development plan							
Workshop on Quality Control through ADN Work							
Reporting							

3.3 Japanese Expert's Detailed Assignments and Terms

JICA-ADN Team Assignments and Terms is shown in Table 3.3.

Table 3.3 JICA-ADN Team Assignments and Terms

JICA-ADN TEAM PHASE 2 for Strengthening Institutional Capacity of ADN

Field	Apr	May	Jun	Jul	Aug	Sep	Oct
Team Leader/Road & Bridges #1 Mr. Hideo MATSUSHIMA	8th～		1st Dispatch		～16th 23rd～	2nd Dispatch	～6th
Sub Team Leader/Road & Bridges #2 Mr. Jiro KOYAMA	16th～	1st Dispatch		～3rd 16th～	2nd Dispatch	～29th	
Water #1 Mr. Hideo HIGUCHI	16th～	1st Dispatch	～16th	4th～	2nd Dispatch	～29th	
Water #1 Assist. Mr.Takeo SAKAMOTO	16th～	1st Dispatch	～16th		12th～2nd Dispatch	～29th	
Water #2 Mr. Hiroyasu YODA	22nd～	Dispatch ～22nd					
Power Mr. Koichi UCHIDA	16th～	1st Dispatch ～29th	11th～		2nd Dispatch	～29th	

Team Leader/Road & Bridges #1	8th Apr ～16th Aug (131days)、23rd Aug ～6th Oct (45days)
Sub Team Leader/Road & Bridges #2	16th Apr ～3rd Jul (79days)、16th Jul ～29th Sep (76days)
Water #1	16th Apr ～16th Jun (62days)、4th Jul ～29th Sep (88days)
Water #1 Assist.	16th Apr ～16th Jun (62days)、12th Aug ～29th Sep (49days)
Water #2	22nd Apr ～22nd May (31days)
Power	16th Apr ～29th May (44days)、11th Jun ～29th Sep (111days)

3.4 Reporting and Deliverables

JICA-ADN team prepared the following report and submitted them to ADN.

(1) Inception Report: Project objectives, policy, activities, schedule and so on

(2) Technical Assistance Plan: Detail Activities Plan of JICA-ADN team through the discussion with C/P

(3) Final Report: all activities and achievements of this project

(4) Human Resource Development Plan

(5) Revised ADN Manual

4. Road, Bridge and Flood Control in the Infrastructure Fund Project

4.1 Background

4.1.1. An overview of Road, Bridge and Flood Control sector

An efficient transport network in Timor-Leste is central to economic diversification and national integration. The currently poor condition of roads results in high costs and unreliable services. The core network comprises 1,426 km of national roads and 869 km of district roads. Rural roads, about 3,000 km in length, provide access to villages and more remote areas. Almost the entire core road network cannot be economically maintained. Only about 8% of the core road network is assessed to be in fair condition and about 70% in very poor condition. This is a constraining the country's efforts to emerge from fragility.

Upgrading of roads is emphasized in the SDP, so Prime Minister addressed for the Fifth Constitutional Government on 12th Sep 2012 as follows.

Infrastructure development is the driving force of national development. Basic infrastructure will enable us to development social capital and a dynamic and productive economy that can create jobs and consolidate a strong and organized institutional framework throughout our nations. Government will invest on Road, Bridge, Building, Port and Aviation in the following.

1) The full reconstruction of all national, district and rural roads, including the connections between Dili, Manatuto and Baucau; the connection between Manatuto and Natarbora; the road project linking Dili, Liquica and Bobonaro; and Government will begin the road project linking Dili, Aileu, Maubisse, Aituto, Ainaro and Cassa.
2) The design of a national motorway ring road
3) Begin the reconstruction and maintenance of over 450 bridges in the country, both large and small.
4) Construction of a new multi-purpose national port in Tibar able to receive commercial and passenger vessels.
5) Design and deliver a regional port-building program in order to build, repair and expand facilities in Laga, Lautem, Atauro, Kairabela, Oecussi and Manatuto.
6) Expansion of President Nicolau International Airport, in Dili, and develop of an aviation plan for the districts to rehabilitate runways in the districts of Suai, Oecussi, Lospalos,

Maliana, Viqueque, Atauro and Same.

Road, Bridge and Flood Control sector in ADN deal with projects of Road, Bridge, Flood Control, Irrigation, Port and aviation. They do not deal with Building.
Regarding category of projects on Road, Bridge and Flood Control sector, they deal with Infrastructure Fund Project, Line Ministries Fund Project, Emergency, Additional, SEFOPE, PDID Fund Project and Special Project under ADN. They do not deal with MDG, and National Electrification Program (PEN).

4.1.2. Infrastructure Fund (FI) Project

(1) Governing Laws

ADN was established by Decree-Law No.11/ 2011 (**ADN Decree-Law**) as one of the government 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.

Road, Bridge and Flood Control sector in ADN must follow ADN Decree-Law.

(2) Operational Structure

Regarding Infrastructure Fund (FI), ADN Decree-Law requires 1) assessing merit and feasibility of capital development projects and 2) -supervising, inspecting and certifying capital development projects.
Old and heavily damaged bridges have been replaced and inefficient roads have been widened and rehabilitated as part of the Infrastructure Fund (FI) and Line Ministry (LM) projects. ADN activities cover a wide variety of engineering fields such as roads, bridges, water supply, electric power etc. and this wide range of fields is too large for young engineers to learn in a short period.
Organization structure of Road, Bridge and Flood Control sector in ADN is as follows. The number in brackets is the number of engineers.

1) Team Leader (1)
2) Sub Team Leader (2)

3) Assistant Engineers (2)
4) Junior Engineers (District Engineers 26, additional post)
5) Indonesian Advisor (4)

4.1.3. Issue of Infrastructure Fund (FI) Project on Road, Bridge and Flood Control Sector

In the course of these works by the ADN engineers, the difficulties and problems outlined below were found during the Technical Assistance (TA) Phase-1:

(1) Limited capacity to evaluate proposals.

The evaluation of project proposal requires widespread fundamental knowledge, but young engineers sometimes lack sufficient experience to carry out effective project evaluations.

(2) Delay in verification of tender documents

It is frequently claimed by MPW that the verification of tender documents by ADN is delayed. This is partly because of a lack of communication between ADN and relevant organizations and ADN engineers' unfamiliarity with tender documents.

(3) Delay in inspection of payment requests

Delays in the verification of payment requests by MPW are caused by inefficient communication with relevant organizations and complicated verification procedures for young engineers to follow.

Regarding Phase-2 TA, the key issues observed at the beginning of phase-2 by the experts are as follows;

(1) Difficulty in the Verification of Monthly Report

Monthly project reports submitted by the MPW need to be verified by ADN before payment requests can be processed. This enables ADN to monitor quality and progress, and uncover any underlying problems. Delays in the verification of these reports may also cause a delay in payment, and failure to uncover any problems hidden in the report may result in even greater long term issues arising. ADN staff should be equipped with the fundamental skills needed for the effective verification of reports.

(2) Mobile Team

In March 2013, ADN's Mobile Team was established to strengthen the performance of ADN Technical Staff, and dispatched to every district of the entire territory of Timor-Leste to carry out the management of administration, monitoring, inspection and quality control of projects. ADN's Mobile Team also aims to strengthen the quality control of

infrastructure work by local contractors, coaching in fundamental technique and specification. The Mobile Team was dispatched to all districts until August 2013. It is necessary to assess the effectiveness of improvement in quality of projects by Mobile Team.

(3) Fundamental engineering knowledge required

Fundamental knowledge about roads and bridges are essential in order to properly evaluate a new project which may be submitted by a contractor or consultant. Since young engineers are not familiar with the necessary knowledge, Indonesian Advisors evaluate these projects instead. Young engineers shall obtain engineering knowledge necessary for project evaluation to strengthen ADN's organizational capacity.

4.2 Technical Assistance Plan

To achieve the objectives of Phase-II, ADN engineers should first utilize the ADN Manual in their daily jobs. Then the Manual is revised accordingly. The increased distribution of the Manual, classroom lectures and OJT is carried out for ADN engineers to acquire basic knowledge on evaluation, monitoring and inspection of Road, Bridge and Flood Control projects.

From all the above, it is considered appropriate that the technical assistance plan of Phase-II covered the following contents:

4.2.1 Human resource development

(1) Road, Bridge and Flood Control Engineers

At present, Team leaders carry out the general verification of tender documents and conduct inspections for payment of FI projects. It is expected that sub-team leaders are expected to replace these team leaders in the near future in practicing these works.

Junior engineers work on the day-to-day operations in each district, but they still lack the necessary capability for the effective inspection and verification of projects. They work not only in the areas of road and bridge construction and improvement but also in the areas of water supply, irrigation and school building. As a result of working in such a wide variety of fields, they need wide and multiple, if somewhat shallow, knowledge. For these reasons sub-team leaders and junior engineers attend the classroom lectures also.

a. Targeted Engineers

Targeted engineers are sub-team leaders who are expected to work in the verification and the inspection of FI projects. The classroom lectures are given to the targeted individuals in the areas of site investigation, planning, outline of detailed design, construction methods, quality control, tender documents amongst others. Participants are also instructed on how to use the ADN Manual and the importance and convenience of the Manual for their work.

Junior engineers also attend the lectures, although the contents of the lectures mentioned above are sometimes too difficult for them to fully comprehend. As the junior engineers work someday in verifying and inspecting road, bridge and flood control projects, lectures are given on the names and functions of the elements and accessories related to bridges, roads and other structures and also how to read drawings.

The names listed below are the ADN engineers who mainly work on roads and bridges as the core engineers or engineers who often work in this field, or are interested and orientated in this field;

Mr. Alexio Amaral do Carno

Mr. Adilio Ximenes

Ms. Emernciana da Cost Maria Freits

Mr. Nunu da Costa

Mr. Elisabeth Felizarda

b. Level of engineering knowledge prior to the commencement of capacity building activities

Indonesian advisers to the ADN in charge of road, bridge and flood control are, of course, experts in each field. The ADN sub-team leaders lack sufficient knowledge on road, bridge and flood control, thus they have the limited capability to cope with problems occurring at the verification and inspection levels. Measures to counter this lack of knowledge, is taken, mainly by the Indonesian advisers, against the problems encountered.

c. Targeted Level

The target level for ADN sub-team leaders is to be able to work on the verification and inspection activities outlined above with assistance from the Indonesian advisers using the ADN Manual. In the event of a sub-team leader encountering a serious technical problem they have to depend on the Indonesian advisers for the time being. In order to make technical judgments by themselves, further practical experience is required in addition to the basic knowledge that is transferred through the JICA-ADN Project.

Targeted capacity building activities to support the verification and inspection processes that are

conducted by JICA-ADN project during Phase 2 are mentioned below;

1. Knowledge to enable participants to identify problems and instruction on the verification process for tender documents.

- Basic knowledge on planning superstructure, substructure, foundation and accessories,
- Basic knowledge on road alignment, pavement, earthwork, drainage, retaining wall and culvert,
- Basic knowledge on river dike, bank protection, riverbed treatment, spur dike and so on,
- Basic knowledge on detailed design and drawings,
- Basic knowledge on construction method,
- Basic knowledge on tender documents, and
- Basic knowledge on BoQ and cost estimation.

2. Knowledge to enable participants to point out problems and instruct participants in the inspection of interim payments & final payment.

- Basic knowledge on flow of procedures for interim payment of FI projects,
- Basic knowledge on inspection of documents,
- Basic knowledge on site inspection,
- Basic knowledge on quality control using ADN Manual,
- Basic knowledge on measurement of the work completed so far, and
- Basic knowledge on referring technical specifications.

(2) Lecture in classroom

Lectures are held on Saturday for one hour on issues relating to bridge engineering and for a further hour on road and flood control issues.

(3) On the Job Training (OJT)

a. During site inspections of road, bridge and flood control projects, the JICA experts go together with ADN engineers to instruct on the inspection procedures and to show the engineers how to use the ADN Manual, and
b. Exchanging views/opinions through daily activities.

4.2.2 Revision of the ADN Manual

a. The ADN Manual is revised to further incorporate the daily reality which engineers are faced with during the verification and inspection processes.
b. Further useful data is added for the user's convenience,

4.2.3 Coordination with relevant Ministries/Agencies

a. Coordination through ADN Manual

MPW is the organization with which ADN works most frequently for FI projects. But unfortunately communication and coordination between the two organizations do not function efficiently.

ADN Manual is prepared mainly for the convenience of ADN engineers when they work on the verification and inspection process. However, some portions of the Manual such as the flow chart of the procedures and documents required for these works are useful for both parties. Therefore, JICA-ADN team also present and explain the purpose of the Manual to MPW and receive their advice on ways to improve it.

b. Advance information about schedule for the verification and inspection of public works

Usually documents or requests concerning verification and inspection works are delivered to under a short time-frame and ADN have to arrange staff to deal with these works almost immediately, or rush directly to the site for inspection. It is proposed that advance information on the schedule of the projects that require inspection or verification is delivered by MPW to the ADN.

4.3 Activities

4.3.1 Lecture in classroom

The following classroom lectures on road, bridge and flood control were carried out:

(1) Road

Lecture of Road aimed to give fundamental knowledge of road design, soil condition, retaining wall, box culvert, construction and cost estimate. Especially lesson of slope stability analysis was required heartily due to a lot of retaining walls damaged by landslide.

Table 4-1 Classroom Lectures on Road Engineering Issues

No	Date		SUBJECT	Participants
1	5/11	Saturday	Pavement	19
2	5/18	Saturday	Road width & landslides, slope stability analysis	10
3	6/01	Saturday	Design speed, plan & profile	3
4	6/08	Saturday	Soil condition, design of retaining wall, box culvert, landslide	4
5	6/29	Saturday	Construction of road, payment	25
6	7/06	Saturday	Review of No's.1 & 2 above	17
7	7/13	Saturday	Review of above No's 3 & 4 above	14

8	7/27	Saturday	Comments on Comoro bridge	14
9	8/03	Saturday	Comment on pavement materials in Oecussi, cold mix etc	2
Sub Total				**108**

(2) Bridge

Lecture of Bridge aimed to give fundamental knowledge of Superstructure, Substructure and foundation. In Timor-Leste, there are a lot of Truss Bridges. Comoro Bridge adopted post-tension concrete girder with segmentation girder from Indonesia. The structure and erection method was first time in Timor-Leste. They requested to have lecture about the detail of Comoro Bridge.

Table 4-2 Class Room Lecture on Bridge

No	**Date**		**SUBJECT**	**Participants**
1	5/11	Saturday	Flow of bridge work & site investigation	19
2	5/18	Saturday	Bridge plan (Superstructure)	10
3	6/01	Saturday	Bridge plan (Substructure, Foundation & Accessories)	3
4	6/08	Saturday	Detailed design & how to read bridge drawings	4
5	6/29	Saturday	Construction method & tender documents	25
6	7/06	Saturday	Review of above No.1 & No. 2	17
7	7/13	Saturday	Review of above No.3 & No. 4	14
8	7/27	Saturday	Use of ADN Manual	14
9	8/03	Saturday	Specifications	2
Sub Total				**108**

(3) Flood Control

Lecture of Flood Control aimed to give fundamental knowledge of flood control design, construction of dike & revetment. Almost of river structures were damaged by flood due to poor countermeasure against local scouring. In Timor-Leste, there were no data of hydraulic data, so that it was not clear the general velocity and local velocity. JICA expert explained these data was important for calculation of scouring analysis.

Table 4-3 Class Room Lecture on Flood Control

No	Date		SUBJECT	Participants
1	5/11	Saturday	Countermeasures against flooding	19
2	5/18	Saturday	Topographic data, hydraulic data, design discharge	10
3	6/01	Saturday	Channel characteristic, revetment, foot protection	3
4	6/08	Saturday	Construction of dike, revetment	4
5	6/29	Saturday	Construction of spur dike, weir	25
6	7/06	Saturday	Review of above No.1 & No. 2	17
7	7/13	Saturday	Review of above No.3 & No. 4	14
8	7/27	Saturday	Comment on Loes river and so on	14
9	8/03	Saturday	Comment on Tono river and so on	2
Sub Total				**108**

4.3.2 OJT

ADN engineers had OJT of verification and inspection with JICA-ADN Team. Checkpoints of OJT were to check documents with use of ADN Manual in advance of evaluation or inspection.

(1) Advice given at site inspection

a. Inspection of Bidau upstream River rehabilitation project
   Date: 24 April, 1day
   Place: Bidau, Dili

b. Inspection of TASI TOLU DRY PORT project by Administrates the Seaports and Civil Aviation Authority of Timor-Leste administrates Airports (APORTL)
   Date: 25 April, 1 day
   Place: Dili

c. Inspection of a PDID project (Retaining Wall)
   Date: 24 May, 1 day
   Place: Maubisse Villa
   Advice: Checkpoints related to verification for tender drawings
   Place: Dili

d. Inspection of Loes River and Bridge
   Date: 8 Jul, 1 day
   Place: Loes, Liquica
   Advice: Checkpoints related to local scour

e. Inspection of Lospalos - Iliomar Road
   Date: 2 Aug, 1 day
   Place: Losparos
   Advice: Checkpoints related to inspection for payment

(2) Daily advices/assistances

a. Meeting for Bidau Bridge
   Date: 15 May, 1 day
   Place: ADN
   Advice: How to design Bidau Bridge superstructure

b. Meeting for Dilor Bridge sedimentation
   Date: 6 Jun, 1 day
   Place: ADN
   Advice: Checkpoints related to local scour and sedimentation

c. Meeting for Road Rehabilitation Design from Christo Rei to Hera
   Date: 4 Jul, 1 day
   Place: ADN
   Advice: Checkpoints related to local scour by wave

d. Meeting for Tono Bridge & River Irrigation
   Date: 13 Jun, 1 day
   Place: ADN
   Advice: Checkpoints related to verification of tender drawings

e. Meeting for Comoro Bridge Drawings

Date: 25 Jul, 1 day
Place: ADN
Advice: Checkpoints related to verification of as-stake drawings

f. Meeting for Loes Bridge Drawings
Date: 29 Jul, 1 day
Place: ADN
Advice: Checkpoints related to verification of tender drawings

g. Meeting for Pavement in Oecussi
Date: 1 Aug, 1 day
Place: ADN
Advice: Checkpoints related to size of pavement material

4.3.3 Revision of 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 as mentioned below;

a. Verification of Tender Documents

ⅰ) Verification of Revised Contents Replaced with what is actually used at present by ADN

Reason for Revision : Fitting in with the actual practices used by and at present

ⅱ) “Checklist B”

Revised Contents : Addition of actual percentages commonly used in actual projects

Reason for Revision : Convenient for ADN Manual users

ⅲ) “Checklist C1”

Revised Contents : Addition of detailed information

Reason for Revision : Convenient for ADN Manual users

ⅳ) “Table A”

Revised Contents : Addition of the table, note below, regarding conditions of contract as stipulated in the tender documents of the last six projects, also simplification of the contents of the ADN Manual

- Implementing Agency
- Time for Completion
- Maintenance Period
- Governing Law
- Ruling Language
- Performance Security
- Delay Damage
- Maximum Amount of Delay Damages

- Provisional Sum
- Total Advance Payment
- Percentage of Retention
- Limit of Retention Money
- Minimum Amount of Interim Payment）

Reason for Revision : Provision of further information to the tender document verifier for decision making and simplification of contents of the ADN Manual

v) “FAQ Book”

Revised Contents : Addition of FAQ Book

Reason for Revision : Showing examples of how to record problems and solutions

b. Inspection for Interim Payment Certificate

i) “Form B”

Revised Contents : Modification of attendants at the site inspection

Reason for Revision : Results from discussion with ADN staff

ii) “Checklist D”

Revised Contents : Replaced with what is used at present by ADN

Reason for Revision : Adaption to the material in use by ADN at present

iii) “Checklist E”

Revised Contents : Addition of check items and clause numbers of the RED Book Specifications corresponding to the items in the Checklist E, the technical checklist

Reason for Revision : Provision of further detailed information, taking into consideration convenience to the ADN Inspector resulting from inspection of Los Palos road project

4.3.4 Coordination between ADN and Line Ministries

a. Explanation of ADN Manual

Most of FI projects which ADN deals with were from MPW. Coordination and communication between the two organizations were unfortunately not close enough.

JICA-ADN Team revised the ADN Manual and explained the significance and contents of the Manual to the MPW engineers in charge of road and bridge projects.

b. Schedule of Verification of Tender Documents and Inspection for Payment

Generally a request for verification and inspection or public works projects came to MPW suddenly, without any advance notice, and consequentially this also resulted in disturbances to ADN activities. JICA-ADN Team talked on this matter with MPW, who noted that they

also received invoices from contractors without any advance notice. The Team proposed to MPW that they provided direction to contractors to inform MPW of an incoming invoice in advance, one month before the handing in of the final invoice so that MPW would have time to advise and who in turn could allot a time in the inspection schedule.

4.4 Achievements

4.4.1 Human resource development

Strong points of achievement of JICA-ADN Team phase-2 are 1) ADN engineers modified the form of ADN Manual by themselves, and 2) they modified check sheet to be submitted of ADN Manual by themselves. Based on the developments, JICA-ADN Team supported to strengthen capacity of ADN engineers effectively

As a result of classroom lectures and direct instruction at project sites, the technical capacity of sub-leaders and junior engineers increased as mentioned below;

(1) Sub-leaders and junior engineers are now equipped with the knowledge necessary to be able to point out problems and effectively record these issues during the verification of tender documents.

a. Basic knowledge on planning superstructure, substructure, foundation and accessories;
   Sub-team leaders: Have an adequate grasp of the relevant information concerning the above topics and are able to analyse projects from this perspective in a clear and logical manner.
   Junior engineers: Now have a clear understanding of the technical terms related to this area and the functions of these terms as applied to their areas of work.
b. Basic knowledge on road alignment, pavement, earthwork, drainage, retaining wall and culvert;
   Sub-team leaders: Have an adequate grasp of the relevant information concerning the above topics and are able to analyse projects from this perspective in a clear and logical manner
   Junior engineers: Now have a clear understanding of the technical terms related to this area and the functions of these terms as applied to inspection and verification of road works.
c. Basic knowledge on river dike, bank protection, reverbed treatment, spur dike and so on;
   Sub-team leaders: Have an adequate grasp of the relevant information concerning the above topics and are able to analyse projects from this perspective in a clear and logical manner

Junior engineers: Now have a clear understanding of the technical terms related to river works and the functions of these terms as applied to inspection and verification of road works.

d. Basic knowledge on detailed design and drawings;
   Sub-team leaders: Now understood technical aspects related to design specifications required for detailed designs.
   Junior engineers: Now understood the composition of designs and drawings.
e. Basic knowledge on construction methods;
   Sub-team leaders: Now understood that there are various methods of construction that should be used according to the conditions and situations of the site.
   Junior engineers: Now have an active interest in construction methods.
f. Basic knowledge on tender documents;
   Sub-team leaders: Now understood the composition of tender documents, the significance of such documents and key points that need to be verified for each document.
   Junior engineers: Still lack an interest in, and a comprehension of, this area..
g. Basic knowledge on Bill of Quantities (BoQ) and cost estimation;
   Sub-team leaders: Now have an effective understanding of the composition of BoQ's and the cost estimation process, and of the key points that need to be verified on any given BoQ.
   Junior engineers: now have a limited understanding of BoQ's

(2) Knowledge to enable ADN participants to point out problems and incorporate analyses of such problems into their inspections for interim payments.

a. Basic knowledge on flow of procedures for interim payment of FI projects;
   Sub-team leaders: Had a comprehensive prior understanding of this area.
   Junior engineers: Now understand the procedural flow concerning interim payments of FI projects
b. Basic knowledge on inspection of documents;
   Sub-team leaders: Had a comprehensive prior understanding of this area
   Junior engineers: Did not show much interest in this area and do not adequately comprehend the issues pertaining to this topic.
c. Basic knowledge on-site inspection;
   Sub-team leaders: They understood items and points to inspect on site.
   Junior engineers: Did not show much interest in this topic and still do not have an adequate comprehension of the issues pertaining to it.

d. Basic knowledge on quality control using ADN Manual;
   Sub-team leader: They understood the items and points to inspect.
   Junior engineer: Did not show an interest in the topic.
e. Basic knowledge on measurement of the work completed so far;
   Sub-team leader: They had some prior knowledge of the topic and are able to adequately measure work completed thus far.
   Junior engineer: Did not show an interest in the topic.
f. Basic knowledge on referring technical specifications;
   Sub-team leader: They understood how to find out objective in clause of the specifications.
   Junior engineer: Showed little interest in the topic and have little comprehension as a result.

Good Practice No.1 of Training at site is shown in Table 4-4

Table 4-4 Good Practice No.1 of Training at site

Advice on payment of Lospalos Road Project
(Problem) It is frequently complained by MPW and contractors that interim payments are delayed. The interim payment is made after completing both inspection of documents and that of the work accomplished so far on site. One cause of the delay in inspection for payments is that MPW does not deliver full required documents in a proper time. The other cause is slow process of inspection by ADN. Processes of inspection are tough and complicated especially for inexperienced engineers in a road and bridge field. (Countermeasures) JICA expert supported ADN engineers to check payment conditions, billing sheets, measurement of the completed work in accordance with the checklists and by calculation at district office. Quality and quantity measurement were checked at district office using the checklists, drawings and some equipment with JICA Expert. ADN engineers pointed out MPW did not deliver all of documents after checking the requirement by the form, and ADN engineers understood the reason of delay of payment. (Output) ADN engineers were able to explain the ADN work according to" the Schedule of the Work" in the ADN Manual to keep the time schedule for a smooth inspection for the payment to Contractor on site.

Good Practice No.2 of Training at site is shown in Table 4-5

Table 4-5 Good Practice No.2 of Training at site

Construction works have finished, but Damaged Loes Bridge and river protection for verification was found in Loes River
(Problem) It is the biggest problem that Loes Bridge and river protection was damaged by flood easily in 5 years after completion. Almost of infrastructure in Timor-Leste are fragile against natural disaster. Second main flow of Loes River occurred local scour at abutment and upstream retaining wall. Settlement of abutment occurred wide crack on abutment wall. The reason of damage is local scouring at

bottom of Abutment and retaining wall. It is necessary not only to put foot protection for local scour, but also to set spur dike (groin) for redirection of river flow away from the riverbank.
(Countermeasures)
JICA-ADN Team explained about the reason with ADN Manual and classroom lesson material at site and also at classroom lesson. ADN engineers were interested in actual case study. ADN engineers required fundamental knowledge of local scour.
(Output)
ADN engineers were able to instruct the countermeasure of local scour and abutment location at Tono Bridge to engineers of Ministry of Public Works.

(3) Progress

The results of the evaluation were summarized in the following table:

Table 4-6 Result of Evaluation on Road/ Bridge/Flood Control

Items to be acquired	Progress	
	Sub-team Leader	Junior Engineer
(1) Knowledge to enable to point out problems and instruct these in verification of tender documents.		
a. Basic knowledge on planning superstructure, substructure, foundation and accessories	○	△
b. Basic knowledge on road alignment, pavement, earthwork, drainage, retaining wall and culvert	○	△
c. Basic knowledge on river dike, bank protection, reverbed treatment, spur dike and so on	○	△
d. Basic knowledge on detailed design and drawings	○	△
e. Basic knowledge on construction method	○	△
f. Basic knowledge on tender documents	○	×
g. Basic knowledge on BoQ and cost estimation	○	△
(2) Knowledge to enable to point out problems and instruct these in inspection for interim payment.		
a. Basic knowledge on flow of procedures for interim payment of FI projects	◎	△
b. Basic knowledge on inspection of documents	◎	×
c. Basic knowledge on site inspection	○	×
d. Basic knowledge on quality control using ADN Manual	○	×
e. Basic knowledge on measurement of the work completed so far	◎	×
f. Basic knowledge on referring technical specifications	○	×

Valuation basis ◎: Sufficient level for practical jobs

○: Understand enough knowledge but need of further practical experience

△: Understand knowledge at a beginner's level

×: Do not understand

－: No evaluation

4.4.2 Materials produced

Materials for classroom lessens were prepared regarding road, bridge and flood control, and they are saved in ADN server. They are listed in the table below:

(1) Materials prepared for classroom lessons on Roads

Table 4-7 Classroom Lesson Materials on Road

Subjects	Sub No.	Material Name	File	Language	
				Eng	Tetum
CLASSROOM LESSON	**1**	Lesson 1. Pavements	PPT	✔	✔
	2	Lesson 2. Road width & landslide, slope stability analysis	PPT	✔	✔
	3	Lesson 3. Design speed, plan & profile	PPT	✔	✔
	4	Lesson 4. Soil condition, design of retaining wall, box culvert, landslide	PPT	✔	✔
	5	Lesson 5. Construction of road, payment	PPT	✔	✔

(2)Materials prepared for classroom lessons on Bridge

Table 4-8 Classroom Lesson Materials on Bridge

Subjects	Sub No.	Material Name	File	Language	
				Eng	Tetum
CLASSROOM LESSON	1	Lesson 1. Flow of Bridge Work $ Site Investigation	PPT	✔	✔
	2	Lesson2. Bridge Plan (Superstructure)	PPT	✔	✔
	3	Lesson3. Bridge Plan (Substructure, Foundation & Accessories)	PPT	✔	✔
	4	Lesson4. Detailed Design & How to Read Bridge Drawings	PPT	✔	✔
	5	Lesson5. Construction method & Tender Documents	PPT	✔	✔
	6	Lesson6. Use of ADN Manuals	PPT	✔	✔

(2) Materials prepared for classroom lessons on Flood Control

Table 4-9 Classroom Lesson Materials on Flood Control

Subjects	Sub No.	Material Name	File	Language	
				Eng	Tetum
CLASSROOM LESSON	1	Lesson 1. Countermeasures against flood	PPT	✔	✔
	2	Lesson 2. Topographic data, hydraulic data, design discharge	PPT	✔	✔
	3	Lesson 3. Channel characteristic, revetment, foot protection	PPT	✔	✔
	4	Lesson 4. Construction of dike, revetment	PPT	✔	✔
	5	Lesson 5. Construction of spur dike, weir	PPT	✔	✔

4.4.3 Revision of ADN Manual

The ADN Manual was revised as mentioned in 4.3.3. The Manual became much easier and convenient for users, and more useful to users also through the inclusion of additional information and examples such as “Attachment A, Past Data of Contract Conditions” and “Attachment B, FAQ Book”.

Regarding ADN Manual on Infrastructure Fund, ADN engineers revised almost of Form and checklist by themselves. Current condition of ADN Manual on Infrastructure Fund is shown in Table 4-10.

Table 4-10 Current condition of ADN Manual on FI

Infrastructure Fund (FI)		By Whom
Form-A1	Project Outline for Bridge	JICA-ADN Team support
Form-A2	Project Outline for Road	JICA-ADN Team support
Form-B	Request of Preparation for Site Inspection	ADN
Form-C	Inspection Report and Recommendation for Payment	ADN
Checklist A	Documents to be submitted for Tender Documents	ADN
Checklist B	Payment Conditions	ADN
Checklist C	Technical Verification	JICA-ADN Team support
Checklist D	Documents to be submitted for Payment Request	ADN
Checklist E	Quality Control	JICA-ADN Team support
Checklist F	Measurement	JICA-ADN Team support

Regarding ADN Manual on Line Ministries, ADN engineers revised almost of Form and checklist by themselves. Current condition of ADN Manual on Line Ministries is shown in Table 4-11.

Table 4-11 Current condition of ADN Manual on LM

Line Ministries Project		By Whom
Form-A	Request Letter of Inspection for Payment Request	ADN
Form-B	Project Outline prepared by LM	ADN
Form-C	Request Letter of Verification from LM to ADN	ADN
Form-D	Inspection Report and Recommendation for Payment	ADN
Form-E	Request of Preparation for Site Inspection	ADN
Checklist-A	Documents to be submitted	ADN
Checklist-B	Payment Condition	ADN
Checklist-C	Technical Verification	ADN
Checklist-D	Documents to be submitted	ADN
Checklist-E	Quality Control)	ADN

4.4.4 Coordination between ADN and Line Ministries

a. Explanation of ADN Manual

Attendance of an MPW engineer, the consultant and the contractor is essential at all site inspections in order for interim payments to be processed. But in several cases which

JICA-ADN Team attended in Los Palos, where an FI road project was inspected for the interim payment, no engineer from MPW attended. It is specified that ADN needs to send a letter of request as part of their preparation for an inspection to MPW, and MPW invites engineers from consultant and contractor's firms to attend, and prepares all necessary documents such as quality control and the latest drawings and measurement equipment for the inspection.

Mr. Alexio da Costa, team leader in charge of road and bridge recognized the importance of having an MPW engineer, consultant and contractor's in attendance during inspection. The necessity of their attendance was mentioned in his presentation at the workshop held on 20th of September, 2013.

b. Schedule of Verification of Tender Documents and Inspection for Payment

A MPW engineer agreed to issue a recommendation that contactors should send advance notice of invoice for interim payment, but the result was not confirmed because there have not been any inspections since then.

4.5 Recommendation

Such matters as described below are recommended to improve the operation of ADN;

4.5.1 Human Resource Development of Road and Bridge Specialists

ADN has to verify and inspect many kinds of FI projects including roads, bridges, irrigation, buildings, ports and airports. As a result of this wide variety of fields ADN needs to cover various kinds of engineering fields. Unfortunately, it is almost impossible for an engineer to have expertise in multiple engineering fields.

Many of the FI projects which ADN deals with are road projects and bridge projects. It is recommended that ADN develops the capacity of several road and bridge engineers who generally work only on road projects and bridge projects.

4.5.2 Establishment of Sustainable Training System

JICA-ADN Team recommends to ADN that they establish a periodical and sustainable training system which utilizes instructors and suitable text books and course materials. Without such a system in place engineers who are deployed to the districts will not have the level of theoretical knowledge necessary to conduct their functions effectively.

4.5.3 Familiarity to Tender Documents, especially Specifications

FI projects are generally made through requests for international bids. Usually tender

documents for international bidding are written in English, but many engineers of ADN are not familiar with English language documents.

Project specifications are especially important for effective quality control. In addition to technical terms and expressions in English, the technical specifications are based on engineering theories which may be unfamiliar to some of the junior engineers and this might lead to some confusion. In order to work effectively, ADN engineers need to familiarize themselves with the specifications written in the English language.

Also payment conditions, as contained in the conditions of contract, are written in English and are of great importance not only for the verification of documents but also for the inspection of interim payments.

4.5.4 Cooperation with MPW

As written in **4.4.4**, close cooperation with MPW is of the utmost importance for the efficient verification of tender documents and inspection for payment to occur in a timely fashion. Best cooperation is to set steering committee in near future. First step is to start the monthly meeting about monthly schedule of verification and inspection between MPW and ADN. MPW should instruct contractor to submit monthly schedule every month.

4.5.5 Preparation before inspection

The road and bridge experts of JICA-ADN Team went to evaluate the site inspection of an FI road project. The engineer in charge of the site inspection did not turn up on the allocated day and after being informed that the JICA-ADN Team was waiting at the site, made his way hurriedly to the site the following day. Upon meeting the Team he informed them that he had only taken the BoQ documents and it was clear to the team that he had not made any effort to study the documents related to the project in advance.

Commonly each project has particular peculiar situations that must be dealt with, and thus an engineer should study these situations together with all supporting documentation for several days before making a site inspection,

4.5.6 Necessity of Comparative study

The Terms of Reference for the recruitment of consultants to undertake bridge engineering services should include bridge locating studies for the bridges. The consultants should undertake technical and other surveys as necessary to determine the preferred bridge site for each stream or river, as required, and determine the extent and requirements for scour protection and river training for each of the sites studied. The consultants should compare permanent river training and proactive river management for streams where stable bridge sites cannot be identified. LM & ADN should make adequate preparations prior to the publication of tenders to include a budget for the comparative study of different bridge sites.

4.5.7 Wide use of Database

It is important to use the database of ADN widely.
JICA-ADN Team saved 1) materials of class room lesson, 2) short reports on site training, 3) materials of MPW guidelines, and 4) Revised ADN Manual in ADN share folder. It is useful for ADN engineers.
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.

(b) Down load of Template, ADN Manual

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.

5. Power

5.1 Background

5.1.1 An overview of Power Sector

Development projects in the power sector in Timor-Leste are divided roughly into two principal parts, the project ‘Construction Supervision Services of the Nationwide Electrical Power Grid and Power Plants and its Facilities’ and the project ‘Installation Middle Voltage and Low Voltage line, House Connection and Home Installation (The Power Distribution Line Extension’.
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. For the most part, these constructions have been completed as of September, 2013. Concerning the distribution substations, about 1,400km of medium voltage (20kV) distribution lines have been installed while a further 5,000km of lines are expected to be installed in order to reach a 100% electrification rate (at present about 40% of the population have electricity according to data published in 2011). As seen from these statistics, the improvement of power distribution lines remains an important task for the continued development of Timor-leste.

Prime Minister addressed for the Fifth Constitutional Government on 12th Sep 2012 as follows.
1) Expansion of the power network to provide reliable electricity throughout the country.
2) Use of renewable energies including solar and wind power projects.

"The power distribution line extension project" which is a power distribution line improvement plan had been defined by the Prime-Ministers Office as an emergency infrastructure project.. Project Management of Medium Voltage (Gerente Projecto Media Tensao, GPMT) is organized under the Secretary of State for Electricity (SOS for Electricity) of the Ministry of Public Works which has acted as the supervising organization of this project since October, 2012. It was decided that contracts, supervision, payment inspection, etc. of this project would be carried out by GPMT.

Technical issues, including the investigation, design, preparation of contract books, and testing is carried out by Project Planning Department (Departermentu Projetu Planeiametu, DPP) of

Timor-Leste Electricity (Electicidade de Timor-Leste, EDTL).

Electrical Team (Power Sector) in ADN deals with projects of Power. Regarding category of projects on Power, Electrical Team deals with Infrastructure Fund Project, Line Ministries Fund Project, Emergency, PDID, and National Electrification Program (PEN).

5.1.2 PEN Project on Electrical Team of ADN

(1) Governing laws

The Electrical Team is part of the mandate of the ADN as established by Decree-Law No: 11/2011 (**ADN Decree-Law**) as outlined below.

The National Development Agency was established in March 2011 by Decree-Law No: 11/2011, ADN, is one of a number of government initiatives to establish, reform and strengthen the organizational structure of the public administration.

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

(a) assessing merit and feasibility of capital development projects;
(b) supervising, inspecting and certifying capital development projects;
(c) managing construction projects under PDD II[1]; and
(d) providing support to the MDG[2] program for Sucos[3].

The ADN Electrical Team must cooperate closely with the DPP of EDTL which has the responsibility to carry out all works concerning the installation of middle and low voltage power lines, house connections and home installations as mandated by Decree Law No: 40/2012 (**PEN Decree-Law**). Decree-Law for National Electrification Program (Programa da Electrificacao Nacional, NO.40/2012) (PEN Decree-Law) issued in September, 2012. The detail of PEN Decree-Law is as follows:

(a) This law regulates the special procedure for award of works of the rehabilitation and new installation of distribution lines of electrical power with a value from U.S. $ 100,000 to $4,500,000, hereinafter referred to as National Electrification Program (PEN; Programa de Electrificação Nacional).

1 Package of Decentralized Development II
2 Millennium Development Goal
3 Villages in Timor-Leste

(b) The Administration Council of the Infrastructure Fund has maximum responsibility for PEN, and may delegate the responsibility for administration in the area of electricity and implementation of the PEN to a member of the government.
(c) The National Development Agency (Agência de Desenvolvimento Nacional, ADN), in close coordination with the Government, is responsible for performing the control and supervision of the implementation of PEN.

(2) Operational Structure

Article 6 of Decree-Law No: 11/2011 (ADN Decree-Law) notes that ADN will establish the following 4 teams as its operational structure:

(a) Evaluation of Projects Feasibility Team;
(b) Fiscal and Certification of Quality Team ;
(c) DDP II Management Team;
(d) MDG Suco Support Team.

As a result of the Article above, a structure was established that included the above new teams. Two "Electricity Sub-Teams/ Renewable Alternative Energy" were established under "Evaluation of Projects Feasibility Team" and "Fiscal and Certification of Quality Team". The missions of the teams and sub-teams are the following:

(a) Evaluation of Projects Feasibility Team
    a. Report on developments concerning the Infrastructure Plan through the request of competent entities;
    b. Issue opinions on the merit and feasibility on ADN's behalf, concerning the ante-project and project implementation phases;
    c. Make detailed evaluation of the projects, verify all technical aspects including cost and quantity and if necessary propose any necessary alterations;
    d. Verify if the project follows the norms/regulation;
    e. Publish the opinion before adjustment of the projects;
    f. Lead coordination between the teams and other departments inside the ADN concerning the evaluation of the feasibility of projects;
    g. Do other services where relevant and necessary

(b) Sub-Team of Renewable Electricity/ Alternative Energy
    a. Evaluate technical documents related to the construction or rehabilitation of electricity/Renewable Alternative Energy
    b. Publish expert opinions about technical documents related to the construction or

rehabilitation of renewable electricity or Alternative Energy sources before recommending such sources to the tender process.

c. Make evaluation of the technical documents through the conduction of a feasibility study which relates to the construction or rehabilitation of Electricity projects using renewable or alternative energy.
d. Do other services which relate to the evaluation of project feasibility in the area of Renewable or Alternative Energy projects.

(c) Fiscal and Certification of Quality Team

a. Supervise and accompany the evaluation of the implementation of projects
b. Assess the projects fiscal reports
c. Evaluate, verify and recommend the alteration or any adjustment in the construction phase or projects implementation.
d. Recommend the payment according to the project execution scale and quality.
e. Propose the issuance of quality certificates for infrastructure construction or other projects that reach recommended stipulations
f. Elaborate or propose guidelines with particular reference to regulations to certify the quality of project.
g. Coordinate with the teams and other departments inside the ADN about fiscal evaluation issues.
h. Issue expert opinions before adjudicating contracts for physical executing, construction and project fiscalisation

(d) Electricity/ Renewable Alternative Energy Sub-team 2

a. Supervise the construction and implementation of Electricity/ Renewable Alternative Energy projects.
b. Certify the quality of construction projects related to Electricity/ Renewable Alternative Energy and recommend payment to the project contractors.
c. Make alteration of constructions related to Electricity/ Renewable Alternative Energy where needed.
d. Undertake other services regarding the Fiscal and Certification of Quality for Electricity/ Renewable Alternative Energy.

As described in '(1) Governing laws', in accordance with the PEN Decree-Law, an inspection before the conclusion of a contract besides payment inspection was added to the work of ADN Electrical Team. This procedure is used by ADN to inspect the contract documents prepared by

the PEN Commission.
In addition, since electrical engineers are not based in ADN local offices, the electrical team covers nationwide work.

Organization structure of Power sector in ADN is as follows. The number in brackets is the number of engineers.

1) Team Leader (1)
2) Sub Team Leader (3)
3) Assistant Engineers (4)

5.1.3 Issue of PEN Project

The domain of power system engineering is very wide. Therefore, generally, although specialized with generation, transmission, transformation, and distribution in many cases, considering the present condition of ADN, it is necessary to bring up the power system engineer who learned the knowledge of all the domains to some extent. However, it is difficult to acquire the knowledge of a wide domain for a short period of time. Issues to be overcome are summarized as follows.

(1) Issue of inspection of PEN or EDTL

The part of the ADN manual relating to Power, made during Phase 1, was prepared with tasks covering the National Electrification Program (PEN Decree-Law NO.40/2012) in mind. Now, the forms defined in the ADN manual are actually used and the exchanges are carried out between ADN and the PEN Commission.

However, the JICA-ADN team considers that the manual is often hard to utilize concerning power issues, particularly "Guideline for Technical Inspection of Distribution Line". These guidelines were primarily extracted from the technical guidelines of Indonesia National Power Corporation, PLN which the electric power team used. The technical guidelines of PLN consists of five separate volumes of hundreds of pages, and it is impossible to deny that it is sometimes hard to refer to it on site. However, the extracts from these guidelines included in the Manual are sometimes not enough of a reference for engineers looking for advice for an evaluation.

Besides this, an inspection of quality which uses the guidelines mentioned above is often considered by engineers to be equivalent to a payment inspection, and this is a tendency which the lack of implementation time often exacerbates. For example, the JICA-ADN team accompanied payment inspection of the middle voltage distribution lines in seven places in the

eastern districts during a four day trip. An average of 200 poles are constructed as part of the middle voltage distribution line of one place, and the inspection of quality of all these poles, and of the equipment for power distribution such as involved insulator, etc. is impossible during such a short time frame..

Moreover, essentially, after the PEN commission or EDTL fully finishes the inspection from an engineering perspective, it is premised on a payment requirement being sent to ADN, but the result of the inspection is not trusted by engineers of the Electrical Team. Therefore, the electric power analyzer (measuring devices, such as power, voltage, and current), which is the electrical team itself does not need essentially to own it. It has been purchased, and reconfirmation of the test is tried using it by the Electrical Team.

(2) Insufficient fundamental knowledge

The Electrical Team was organized in August, 2011. A team leader and young engineers worked in the office in Dili and processed electrical power related matters for the entire country. The target of their work could be divided roughly into the following three areas:

a. National Transmission Lines and Power Plant Projects
b. Emergency Projects
c. National Electrification Program

Regarding the National Electrification Program (PEN; Programa Eletificasun Nacional), Decree Law No: 40/2012 was enacted and Management & Implementation Commission (CGI; Comisaun Gestaun e Implementasaun, hereinafter referred to as CGI-PEN) was established as the implementation organization of the program in September, 2012. Implementation of Emergency Projects was also taken over to CGI-PEN. Since there are a large number of works which check the inspection result of CGI-PEN in Electrical Team, the electric power related part in the ADN Manual drawn up in Phase I was confirmed by Decree Law No: 40/2012.

During phase I, a JICA Power Expert evaluated the problems of Electrical Team as follows: (i) Shortage of work experience and lack of knowledge about electric power, (ii) Lack of a proactive stance in resolving issues, (iii) Absence of those who educate young engineers, (iv) Unconcern about the improvement of their work, (v) Inspections start with insufficient documents, (vi) Insufficient inspection of quality, (vii) Lack of knowledge for inspection of quality and absence of the methodology of inspection of quality, and (viii) Lack of inspection result being communicated to all relevant parties.

It seemed that the team itself was organized well as each engineer had the special domain in his/her duty as shown below. However, according to the team leader, their fundamental

knowledge about electrical power engineering was not enough. Since the fundamental knowledge would contribute to ensuring the quality of daily work of the engineers as well as making the relationship with engineers of relevant organizations smooth, lectures in classroom about electrical power engineering were highly encouraged.

(3) Infrequent Use of the Guidelines

Since importance was attached to the problem about inspection of quality, and "Guideline of Technical Inspection for Distribution Line" (hereinafter referred to as "the Guideline") which was an annex of the ADN Manual, was drawn up for the smooth and efficient implementation of technical site inspection, based on "Distribution Line Standard" of PLN (Indonesia State Owned Electricity Corporation; Perusahaan Listrik Negara Persoro) which Electrical Team had been using.

The Guideline seemed to be seldom used. It had been established for the smooth and efficient implementation of technical site inspection during phase I. Therefore, it was necessary to investigate the causes as to why it was not used and to improve the situation.

(4) Shortage of information sharing with the relevant organizations about the ADN Manual

Observation of the inspection results using the check list of the ADN Manual shows that there was often a lack of documents from CGI-PEN. It is thought that this was because the sharing of the contents of the ADN Manual with CGI-PEN had not worked. Since the coordination with relevant organizations was very important in order to work efficiently also for Electrical Team itself, sharing information about the ADN Manual with CGI-PEN and the other relevant organizations was encouraged.

5.2 Technical Assistance Plan

To achieve the objectives of Phase-II, ADN engineers should first utilize the ADN Manual in their daily jobs. Then the Manual will be revised accordingly. the increased distribution of the Manual, classroom lectures and OJT will be carried out for ADN engineers to acquire basic knowledge on evaluation, monitoring and inspection of Power projects.

From all the above, it is considered appropriate that the technical assistance plan of Phase-II covered the following contents:

5.2.1 Human resource development

(1) Power Engineers

In ADN, the Electrical Team consists of 8 members, an increase by two over the previous year. The team leader, (Mr. Miguel) and seven staff carry out electric power-related work in the form where it belongs to two or more sections defined with lows across boundaries.

a. Targeted Engineers

The names listed are the engineers who work for Electrical Team;

Mr. Miguel M. M. De Jesus (Team Leader; National Adviser – Electrical)
Mr. Maximum dos Santos (Power Plant)
Ms. Ana Maria Guterres (Transmission Line)
Mr. Camilio de Jesus (Transformer & Grounding)
Mrs. Angelica da Costa (Lightning Insulation)
Mr. Deolindo de Fatima Marques (Distribution Line)
Ms. Suzana Silnala (Protection System)
Mr. Olivio Marcus (Substation)

b. Level of engineering prior to the commencement of capacity building activities

The immaturity of the engineer's inspection capability is pointed out in Phase I. However, according to the observation in Phase II, the noticeable immaturity in inspection capability is not able to be seen. Although it cannot be said that they have sufficient basic power engineering-related knowledge and work experiences, if it limits to the inspection in sites, each member reaches the level which can inspect in a pair. It is thought that the reason for the differences notice between Phase 1 and Phase 2 is that the major portion of work undertaken by the present Electrical Team is inspection of medium and low voltage distribution lines, and even if the construction places of the lines differ, the technical checking point of the construction work does not have much of a difference. Therefore, while the team member inspects many projects as routine work, it is thought that OJT is carried out automatically. Of course, it is certain that it is a result of efforts of the team leaders also.

c. Targeted Level

As stated above, the members of the Electrical Team carry out the present daily work without problems. Regarding the ADN manual, the Forms and Checklists are smoothly used between ADN and the PEN commission (EDTL).

For the member of the Electrical Team, the capability for carrying out the check after EDTL etc. clears a technical problem point is essentially requested. However, under present conditions, the team is forced to point out and provide guidelines and solutions to problems to design/construction contractors directly without any liaison with the PEN Commission. Furthermore, since the 2nd power station will commence operations in the near future, being involved in load dispatching instruction related facilities is also expected. Moreover, the maintenance of power stations, substations, and transmission lines will be carried out, and the knowledge of the field will be required from now on in that case. Therefore, it is necessary to acquire all-round basic knowledge regarding power engineering concerning generation, transmission, transformation and distribution.

The knowledge regarding the following fields is needed in detail, and that knowledge is mastered in order to provide adequate technical competency through on-the-spot trainings (OJT).

1. Knowledge required for a payment inspection etc.

- Knowledge regarding power station (mainly diesel power station).
- Knowledge regarding substations.
- Knowledge regarding transmission and distribution system.
- Knowledge regarding renewable energy (mainly photovoltaic).

2. Knowledge required as an electric power engineer.

- Knowledge regarding power flow analysis.
- Knowledge regarding the stability of power systems.
- Knowledge regarding evaluation of power system analysis result.

Moreover, it is necessary to inspect not only the work regarding an electric power system but the projects regarding "electric construction", such as wiring in facilities, and home connections, and the capability for such activities is also required. However, essentially, since electric construction completely differs from power engineering, it is not taken as an object here.

(2) Lecture in classroom

It is considered as the schedule that about eight classroom lectures is given once or twice a month on Saturdays to Electrical Teams for the purpose of acquiring the fundamental knowledge of electrical power engineering.

(3) On the Job Training (OJT)

The plan is made as follows.

a. Questions and problems coming out of daily works is discussed and solved among the team leader, engineers, and Power Experts usually at the office or on site.
b. Practical assistance on making inspection reports is done by accompanying to the site inspection.

5.2.2 Revision of the ADN Manual

Regarding the revision of the ADN Manual, the plan is made as follows.

a. Revision of the Checklists/Forms resulting from actual use by Electrical Teams;
b. Revision of the Checklists/Forms according to the discussion results, mentioned below in (4), emphasizing the convenient utilization of the Checklists and Forms;
c. Revising the Guideline resulting from JICA-ADN team accompanying engineers to site inspections and supporting given in the making of inspection reports;
d. Revising the Guideline if/when Electricity of East Timor (Electicidate de Timor Leste; EDTL) completes its Technical Standards

5.2.3 Coordination with relevant Ministries/Agencies

To coordinate with CGI-PEN, the plan is made as follows.

a. Explaining the ADN Manual to the relevant organization (The key persons are PEN commission and EDTL).
b. Holding discussions with the relevant organization on the ADN Manual.

5.3 Activities

5.3.1 Lecture in classroom

The following classroom lectures on power were carried out:

Table 5-1 Classroom Lectures on Power

No	Date	SUBJECT	Attendant
1	5/25 Saturday	Introduction, Power Engineering, Transmission & Distribution	7
2	6/29 Saturday	Power Station (Mainly Diesel Power Station)	7
Sub Total			**14**

Although about eight classroom lectures was planned in 'Technical Assistance Plan', it was able to hold only twice for the following reasons: after consultations with the Electrical Team Leader at the beginning, we decided to hold classroom lecture on Saturday mornings. However, this overlapped with the time when many inspections must be carried out, and so many Team members were not in Dili on Saturdays. As a result of consulting with Electrical Team Leader, we decided to carry out classroom lectures on weekdays. And we also decided that the Electrical Team Leaders would inform the Lecturers when the majority of Electrical Team members would be present. However, the busy working conditions meant that the JICA-ADN team was not able to hold any further lectures. So, the JICA-ADN team explained Electrical Team the abstract and checkpoints of all of classroom lessons materials as shown in Table 5-2.

Regarding classroom lessons, a syllabus was prepared and preparation of the materials for lectures in alignment with the syllabus was arranged. A list of the materials for lectures is shown in Table 5.2. In addition, although the number of pages of each material was shown in this table, one material was not necessarily equivalent to one lecture, and it was arranged to divide some topics into two or more lectures and to carry out.

Table5-2 Classroom Lesson Materials on Power

Chapter No	Lesson No (File No)	SUBJECT	No. of Pages
1	1	Introduction	19
2	1	Quick Review of Basic Power Engineering	16
3	1	INTRODUCTION to Electric Power Transmission & Distribution	26
4	2	POWER STATION (Diesel)	139
5	3	SUBSTATION	95
6	4	Transmission and Distribution System	260
7	5	Power System Study	57
8	6	Power FLOW ANALYSIS	37
9	7	Power System Stability	69
10	8	An Example of Power System Analysis (Using PSS/E)	29
11	9	How to Use the Result of Power System Analysis	80

5.3.2 OJT

(1) Advices given at project sites

JICA-ADN Team visited site with ADN engineers and found the issues, and explained the reason and countermeasure against problems.

a. Observation of Hera Power Plant

Date: 18 Jun (Tue.)

b. Business trip to an eastern part district.
   Date: 9 July (Tue.) to 12 July (Fri.) 4days
   Place: Hera, Manatuto, Viqueque, Baucau, Lospalos, Iliomar
   Situation:
   ♦ Inspection of middle / low voltage distribution lines
   ♦ Observation of photovoltaic pump system

c. Observation of Betano Power Plant
   Date: 6 Aug (Tue.)
   Situation:
   ♦ checking the condition of the collapse of the completed brick wall fence and V-ditch

d. Observation of Hera Power Plant
   Date: 5 Sep (Thu.)
   Situation:
   ♦ Checking the status of the pump system of the temporary pipe line

(2) Daily advices/assistances

a. How to use power analyzers
b. Brief research of solar street lights

5.3.3 Revise of ADN Manual

a. The Checklists/Forms were revised from actual use by Electrical Team
b. The descriptive contents and figures of the ADN Manual were revised extensively because there were many inadequacies in the previous one. The reason was that PEN decree law was issued at the end of duration of JICA-ADN Team phase-1, so that a lot of mistakes were found in Phase-2 due to busy schedule.
c. The Guidelines were also revised extensively because there were many inadequacies in the previous one.
d. Since it became clear that these were criteria more complex than the descriptive contents of the guidelines when the contents of the Technical Standard of EDTL were checked, revision of the guidelines by the Technical Standards of EDTL was not carried out.

5.3.4 Coordination between ADN and Line Ministries

The head of the PEN commission which is the management and implementation organization of PEN which is an object of an ADN manual is Director of EDTL, and frequent exchange is

between him and the leader of Electrical Team. Therefore, the special matter did not carry out about the relation between ADN and PEN.

Regarding coordination between ADN and EDTL, arrangements were made between these parties and the manager of the distribution section of EDTL on the following areas:

a. Quality checking in a laboratory of the equipment for distribution (underground cable);
b. About Japanese manufacturers of bucket trucks.

5.4 Achievement

5.4.1 Human resource development

Although Classroom lessons were not able to be carried out, the engineers managed to raise their technical capability by learning the materials prepared for lessons regarding a wide range of power engineering. That is, the environment for their improvement in technical capability was able to be improved through these materials and the OJT that JICA-ADN undertook.

(1) Knowledge required for work such as payment inspections (For work such as payment inspections, knowledge regarding equipment which exit in the power system.)

a. Knowledge regarding power stations (mainly diesel power station).
   The knowledge regarding power station was able to be acquired by attendance at the second Classroom lecture (Chapter No.4 of the classroom material).
b. Knowledge regarding substation.
   Chapter No.5 of the classroom material which can acquire the knowledge regarding substation was prepared.
c. Knowledge regarding transmission and distribution system.
   The knowledge regarding transmission and distribution systems was able to be acquired by attendance at the first Classroom lecture (Chapter No.3 of the classroom material). Chapter No.6 of the classroom material which can acquire the knowledge regarding transmission and distribution system was prepared.
d. Knowledge regarding renewable energy (mainly photovoltaic).
   The knowledge regarding renewable energy was able to be acquired by attendance at the first Classroom lecture (Chapter No.1 of the classroom material). Although it was not the material for Classroom, an open material which can acquire the knowledge of photovoltaic generation was prepared.

(2) Knowledge required as an electric power engineer.

The knowledge regarding basic power engineering was able to be acquired by attendance at the first Classroom lecture (Chapter No.2 of the classroom material) and Chapter No.7 of the classroom material which concerns knowledge regarding power system study, was prepared.

a. Knowledge regarding power flow analysis.

Chapter No.8 of the classroom material concerning knowledge regarding power flow analysis was prepared.

b. Knowledge regarding the stability of power systems.

Chapter No.9 of the classroom material which concerns knowledge regarding the stability of power system was prepared.

c. Knowledge regarding evaluation of power system analysis result.

Chapter No.10 and No.11 of the classroom material which concerns knowledge regarding the evaluation of power system analysis results were prepared.

Good Practice No.1 of Training at site is shown in Table 5-3

Table 5-3 Good Practice No.1 of Training at site

Verification of progress of the work at Lospalos, Iliomar
Decree-Law NO. 40/2012 says CGI-PEN and ADN carry out verification of progress of the work, and submit the payment request to the Major Project Secretariat. By the Decree, Electrical Team carries out technical site inspections when necessary documents are received from CGI-PEN. (Problem) Electrical Team did not make inspection report. It was because the self-inspection by the contractor and inspection by CGI-PEN with technical knowledge more special than they are completed before their inspection. There was no document which showed their work assignments. (Countermeasure) As countermeasure, “Guideline of Technical Inspection for Distribution Line” was established. It is a document which shows items and criteria of inspection by Electrical Team. In other words, “Checklist for Necessary Items for Technical Inspection” in the ADN Manual can be easily checked, if the Guideline is used. JICA-expert introduced the Guideline on site. (Output) Electrical Team was able to use Guideline for inspection on distribution line.

Good Practice No.2 of Training at site is shown in Table 5-4

Table 5-4 Good Practice No.2 of Training at site

The example of acquiring the knowledge regarding power flow analysis
(Problem) When the ADN-JICA expert visited Hera power station for observation, the generators were operating as the condition of leading power factor operation (Reactive power output of generators was minus). (Countermeasure) JICA expert explained the cause and countermeasure briefly first. Furthermore, JICA expert prepared the model of the electric power system of Timor-Leste using the simulation tool. JICA expert carried out the simulation showing the phenomenon caused using the model. Moreover, JICA expert explained the simulation of the countermeasure, the actual condition and its usage of power flow analysis. ADN

engineer required the fundamental knowledge of maintenance & operation of power. (Output) Electrical Team was able to acquire the countermeasure of problem of power flow analysis. Team Leader was able to explain the problem and countermeasure at workshop.

(3) Progress

The results of the evaluation were summarized in the following table:

Table 5-5 Result of Evaluation on Power

Items to be acquired	Progress
(1) Knowledge on payment inspection	
i) Knowledge on power station	○
ii) Knowledge on substation	○
iii) Knowledge on transmission and distribution system	◎
iv) Knowledge on renewable energy (mainly photovoltaic)	－
(2) Knowledge on electric power engineer	
i) Knowledge on power flow analysis	△
ii) Knowledge on stability of power system	－
iii) Knowledge on evaluation of power system analysis result	△

Valuation basis ◎: Sufficient level for practical jobs

○: Understand enough knowledge but need of further practical experience

△: Understand knowledge at a beginner's level

×: Do not understand

－: No evaluation

5.4.2 Materials produced

Materials for classroom lessons were prepared regarding Power, and they are saved in ADN server. They are listed in the following table.

Table5-6 Classroom Lesson Materials on Power

Chapter No	Lesson No (File No)	SUBJECT	No. of Pages
1	1	Introduction	19
2	1	Quick Review of Basic Power Engineering	16
3	1	INTRODUCTION to Electric Power Transmission & Distribution	26
4	2	POWER STATION (Diesel)	139
5	3	SUBSTATION	95
6	4	Transmission and Distribution System	260

7	5	Power System Study	57
8	6	Power FLOW ANALYSIS	37
9	7	Power System Stability	69
10	8	An Example of Power System Analysis (Using PSS/E)	29
11	9	How to Use the Result of Power System Analysis	80

5.4.3 Revision of ADN Manual

The ADN Manual was revised as mentioned in 5.3.3. The Manual become much easier and convenient for users.

Regarding PEN, ADN engineers revised all of Form and checklist by themselves. Current condition of ADN Manual on PEN is shown in Table 5-7.

Table 5-7 Current condition of ADN Manual on PEN

National Electrification Program (PEN)		By Whom
Form-A-1	Conformation of Payment Request by the PEN Commission	ADN
Form-A-2	Verification of Payment Request by the PEN Commission	ADN
Form-B	Recommendation for Payment by the PEN commission	ADN
Form-C	Inspection Report and Recommendation for Payment	ADN
Form-D-1	Recommendation for Remedy	ADN
Form-D-2	Recommendation for Remedy	ADN
Form-D-3	Recommendation for Remedy	ADN
Checklist-A	Document to be submitted	ADN
Checklist- B-1	Inspection for the payment	ADN
Checklist- B-2	Inspection for the payment	ADN
Checklist- B-3	Inspection for the payment	ADN
Checklist-C	Technical Inspection for Distribution Line	ADN

5.4.4 Coordination between ADN and Line Ministries

The revision of ADN Manual was explained and utilized between ADN and PEN, and also between ADN and EDTL.

5.5 Recommendation

Such matters as described below are recommended to improve the operation of ADN;

5.5.1 Fixed Team assigned as Power

Power team is fixed team being assigned as Power. It is an advantage by comparison with another sector of ADN. It is effective to use continuous education. 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.

5.5.2 Revising ADN Manual

Moreover, effective use of Classroom Materials and ADN Manual is also recommended. Team Leader understands it is useful to do verification and inspection by systematic way with use of ADN Manual for quality control and to prevent mistake. If necessary, Team Leader wants to revise ADN Manual by Electrical Team. He requests Indonesia Advisor or International Advisor to support the revising ADN Manual in near future.

5.5 3 Application of PLN University

To continue training dispatch in PLN University which PLN (electric power company of Indonesia) is carrying out is also recommended.

5.5.4 Application of Other donor

Regarding the program of Power for the fifth constitutional government to the national parliament on Sep 2012, Prime Minister addressed as follows.

1) Expansion of the power network to provide reliable electricity throughout the country.
2) Use of renewable energies including solar and wind power projects.

Team leader concerns about 1) maintenance & operation of power network throughout the country and 2) knowledge of renewable energies including solar and wind power.

For development of above knowledge, it is useful to apply oversea training by other donors.

6. Water Supply in PDID

6.1 Background

6.1.1 An overview of Water Supply Sector

The National Census undertaken in 2010 revealed various socio-economic aspects of people's lives in Timor-Leste. As for water supply services, over 66% of people have an access to an improved drinking source (either piped water, protected well or hand pump, tanker or bottled water). In rural areas, a well or spring (25%) is the main source for drinking water, while in urban areas household taps (42%) are the main. Further, more than one third of Timorese families take ten or more minutes in their efforts to fetch water.

Prime Minister addressed for the Fifth Constitutional Government on 12th Sep 2012 as follows.

1) Installation of at least 400 drinking water systems providing for around 25,000 rural homes, the construction of community latrines, the provision of technical expertise and the recruitment of 88 water and sanitation facilitators.
2) The development of a District Center Master Plan, in order to gradually restore water and sanitation infrastructure, including piping, so as to provide clean water to the people.
3) The implementation of the Dili Drainage and Sanitation Master Plan to dramatically reduce drainage, address floods risks and improve sanitation and community health.

There are two types of water supply, classified by the scale of system. One is **urban water supply** under the control of DNSA, the Ministry of Public Works. The other is **rural water supply** managed by communities. Integrated District Development Plan (PDID) includes projects concerning many sectors managed by Districts with a budget scale under US$ 500,000. Rural water supply projects are dealt with under the category of PDID.

PDID Team in ADN deal with projects of road, building, bridge, flood control, irrigation, sanitation and water supply. The detail of project on PDID is not only new construction/replace but also widening and repair.

Regarding category of projects on water supply sector, PDID Team deals with rural water supply works on PDID Fund Projects. MDG Suco Team deals with rural water supply works for housing on MDG Fund Projects. Infrastructure Fund Team deals with urban water supply works on Infrastructure Fund Projects.

6.1.2 PDID Project

(1) Governing Law

ADN Decree-Law No.11/2011 on March 2011 (**ADN Decree-Law**) shows as following teams;

a) Project Evaluation Team;

b) Monitoring and Quality Assurance Team;

c) PDID Management Team;

d) Program MDG Suco Support Team.

Rural water supply projects of PDID are regulated by two Decree Laws, Decree-Law No.4/2004 on water supply for public consumption (**Water Supply Decree-Law**) and Decree-Law No.4/2012 Planning of Integrated District Development (**PDID Decree-Law**).

Task of PDID Management Team are as follows;

a) Ensure the management of projects under PDID, according to its legal regime;

b) Participate in special procedure for classification and selection of firms and the award of civil construction works in PDID;

c) Keep abreast of projects and approve reports on the progress and quality for payment;

d) Request opinions from the Project Evaluation and Monitoring and Quality Assurance Teams, when deemed appropriate.

(2) Operational Structure

Projects categorized as PDD-I and PDD-II in 2012 were approximately 500 in number, while 8 % of them projects related to water supply. Due to the limited human resources of ADN, it was a hard task for them to make a precise review and verification of all project documents within a limited time frame. PDID, newly introduced in 2013, intends to integrate PDL and PDD into a similar category. Classification by project cost expressed as PDD-I and PDD-II still remains. In the Book-3 which summarizes the annual project budgets of PDID, 903 projects of PDID in 2013 are scheduled, which are quoted in a table below.

Table 6-1 Total projects and Water supply projects in PDID

Category		Total projects	Water supply
PDID	PDD-I	314	31
	PDD-II	161	12
PDD-I	Continuing projects from 2012	351	32
PDD-II	Continuing projects from 2012	77	3
Total		903	78

In general, simple designs have been applied for rural water supply projects. Springs or groundwater are used to directly distribute water by gravity to the people without treatment.

Disinfection by chlorine seldom occurs. The rural water supply consists of process of raw water intake, transmission, distribution, storage, service pipelines and public taps. Mechanical or electrical equipment which requires high skill maintenance is kept minimal. Maintenance free system thus adopted is considered appropriate to local conditions.

Many water supply projects have been planned in order to achieve the goal of 75% of the rural population having access to safe potable water by 2020. Finding water sources and arranging adequate yet easy to implement systems is getting harder year by year. There are many technical issues to be immediately overcome. ADN engineers are, therefore, required to acquire basic knowledge on evaluation, monitoring and inspection of rural water supply projects.

Organization structure of PDID in ADN is as follows. The number in brackets is the number of engineers.

1) Team Leader (1)
2) Sub Team Leader (2)
3) Assistant Engineers (2)
4) Assistant Engineers & Junior Engineers (District Engineers 26)

However, organization structure of water supply sector in ADN is as follows. The number in brackets is the number of engineers.

1) Team Leader (2) : PDID Team Leader & MDG Suco Team Leader, additional post
2) Assistant Engineers (2) : in PDID Team, additional post

(3) MDG Suco Project

MDG Suco projects, which are housing projects, also have problems. A team of MDG Suco organized under ADN consists of architect engineers who are in charge of building. As for water supply, geographical surveys on water sources are not necessarily conducted in an effective and timely manner.

6.1.3 Issue of PDID Project on Water Supply Sector

Despite the simplicity of the project, design of project facilities often lacks a sound base. Drawings of intake facilities, storage tank and public taps can be prepared by copying them from other projects or through reference to other similar activities. They might be useful for construction of the standardized facilities or equipment. Duplication or copying of the pipeline drawings, however, is no more useful because pipeline routes and their surrounding conditions/topography are entirely different to each other. Several layers of drawings for pipe laying works must be prepared based on the exact information on actual site conditions. They can be obtained from site surveys. Our review of the drawings prepared for 2011 and 2012

projects verified that pipe laying works had been carried out in situ, not based on any drawings. This often results in serious problem of no water flow in designed pipes during commissioning.

In addition to the insufficient design drawings, any as-built drawings are not submitted to the community, local administration or ADN after construction. This makes the situation worse. ADN is not in a position to carry out proper inspection to examine whether contractor's works are in conformity with contract documents and specifications. This is one of most critical issues related to PDID projects.
Issues to be overcome are summarized as follows:

(1) Delay of verification and imperfect verification of project proposals:

The delay and imperfect verification of project proposals are judged to derive from a lack of experience and engineering capacity of the relevant staff and engineers of the related organizations, including ADN.

(2) Poor quality of infrastructure:

The quality of facilities constructed under the PDD I and PDD II schemes are not necessarily satisfactory to the owner. This is due to several reasons; poor quality materials, a lack of experienced construction companies and skilled staff and engineers of the related organization including ADN.

(3) Inaccurate design drawings:

There are many inconsistencies between the design drawings and the project sites. Pipeline drawings, in particular, do not reflect the actual conditions of the designed pipeline route. Pipe laying works, therefore, cannot be made properly in accordance with the design drawings.

(4) No pipeline profiles are attached:

Design drawings usually submitted to ADN do not provide any information on pipeline profiles. When contractors lack the necessary knowledge about pipeline hydraulics, pipes are not laid in a proper way, resulting in no water flow to service tanks or end-users.

(5) Delayed finding of failures:

Site inspection after completion often identifies fundamental errors or failures in contractors' works. It is, however, too late at this stage to give change orders for demolishing and

reconstruction of the whole work.

As the improper design and construction technology is being applied in the construction of potable water projects, it is imperative that the ADN's Management take decisive steps to realize a better infrastructural quality for public works projects. The ADN engineers, therefore, are required to acquire not only basic knowledge on water supply engineering, but also know how to lead up consultants and contractors to a normal implementation of the water supply projects.

The ADN Manual, prepared during the Technical Assistance Phase-I, envisages countermeasures to overcome the difficulties mentioned above. The objectives of the Phase-II (Water Supply) are to assist ADN engineers in capacity building for implementation of water supply projects in a proper and efficient way in accordance with the ADN Manual.

(6) Issues of Rural Water Projects

There are many issues concerning small scale rural water supply projects to be overcome urgently. Structure of a whole project from project planning to inspection is shown in Figure 6-1. Letters in a dark blue color are governmental tasks in public projects. In the figure verification and inspection are tasks to be carried out by ADN.

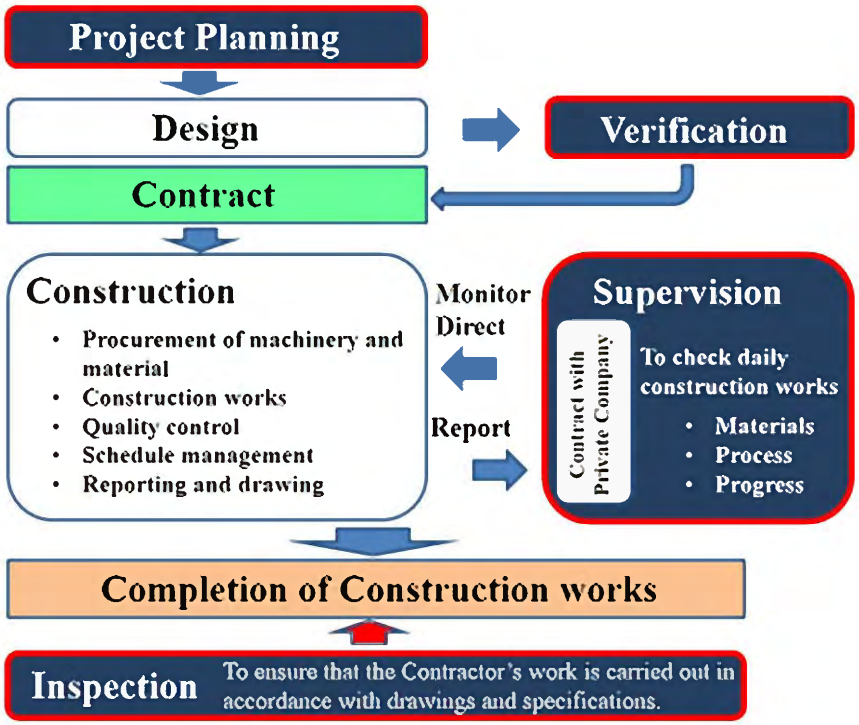


Figure 6-1 Structure of a whole project from project planning to inspection

Design drawings are far different from the real project site, and construction companies do not

have a sufficient level of technical knowledge and experience. These problems cannot be resolved only by ADN engineers' capacity building. The project control or management should be carried out through the evaluation and development of sufficient institutional and individual capacity of whole stages of a project. There are several issues at each stage.

a. Design stage

The design of rural water supply systems is not necessarily prepared based on site surveys. It is often found that design drawings contain many inconsistencies with the actual topography. Typical examples are seen on transmission pipelines from water sources to distribution tanks.

The rural water supply projects generally rely on springs as water sources, which are located in deep mountains. Local conditions restrict human access to the area. As a result of these conditions, topographical surveys that decide pipeline route require huge energy and manpower as well as costly survey instruments. Even if technically sound design drawings are prepared based on the site survey, there is no guarantee that the built facilities will be of good quality. Because there is no guarantee that the contractors can understand the aim of the design in the first place.

b. Verification stage

Many rural water supply projects are planned to be implemented in the year 2013. To verify all projects within a limited duration is considered to be hard task. When the designs handed over to ADN by contractors are often so far removed fromthe actual conditions of project site, the technical verification of such projects through the hard work of ADN engineers becomes quite useless.

c. Construction stage

As stated in **Design stage A** above, design drawings may not be necessarily be entirely accurate and not based on sound engineering. Therefore, the majority of construction companies related to rural water supply projects may not tend to rely on the drawings presented to ADN. Additional reasons are:

- Small scale companies do not have sufficient capacity and experience to undertake the design of public works projects.
- Professional drawing and design materials, particularly IT software is hard to obtain or very expensive.

Infrastructure quality, hence, may largely depend on the capability of construction companies.

d. Inspection stage

Inspections are conducted in order 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 conditions. Instead of checking whether the constructed facilities would meet with the design drawings, inspectors can only measure the dimensions of facilities and check the BOQ.

Contractors resist any repair or correction ordered by inspectors as they say that it is too difficult to correct the failures after the completion of construction. This sometimes means the destruction and re-construction are very costly. It is too late to order correction of some failures which were found at the inspection after completion.

6.2 Technical Assistance Plan

To achieve the objectives of Phase-II, ADN engineers should first utilize the ADN Manual in their daily jobs. Then the Manual is revised accordingly. The increased distribution of the Manual, classroom lectures and OJT is carried out for ADN engineers to acquire basic knowledge on evaluation, monitoring and inspection of rural water supply projects.

From all the above, it is considered appropriate that the technical assistance plan of Phase-II covered the following contents:

6.2.1 Human resource development

(1) Water Supply Engineer

Civil engineers of the ADN are working in sectors such as road, bridge, flood control, irrigation, water supply, and so on. There is no section/engineer in charge of water supply. Major activities concerning the inspection and verification of PDD water supply projects are carried out by the district offices. The PDD group in the National Office is mainly working as project supervisors, facilitators or auditors.

The Mobile Team, newly organized in early 2013, has jurisdiction over all PDD projects in the state, including water supply projects which account for less than 10 % of all PDD projects in number.

Rural water supply, deemed as one of the most important national schemes, faces several difficulties in human resource development as mentioned above.

a. Targeted Engineers

It is difficult to select targeted engineers for technology transfer, as there are no relevant sections or engineers in charge of water supply projects in the ADN.

First, officials and engineers listed below are temporarily selected as targeted engineers:

Mr. Demistocles; Leader of PDD I & II team

Mr. Paul : Water supply engineer under PDD I & II team

Ms. Sheila Marinha: leader of MDG Suco Human Settlement Program

Young engineers of ADN in Dili and other Districts

As requested by JICA-ADN Team, three further engineers were designated in August 2013. They were Melenia da c. Barros, Vidal Guteres and Lisandro Manuel, all of whom have showed their keen concerns and interest in water supply engineering.

b. Engineering Level at the Beginning

The majority of engineers in the ADN are not specialist but generalist. There are no water supply engineers who have long term experiences in water supply projects. They are, however, capable of checking BOQ for project verification and inspection, although their engineering capacity needs to be improved further.

c. Targeted Level

ADN engineers are required to improve their capacity in the areas listed below:

- To check design documents and point out errors or mistakes,
- To check construction works and point out errors or mistakes, and
- To order contractors to demolish, repair and amend any of the constructed facilities/equipment when deemed necessary.

To direct the contractors in a proper way, the ADN engineers need to acquire both basic and specific knowledge supported by OTJ experiences. It is, however, impossible for them to look into complex aspects of water supply engineering within a short term of project cooperation between ADN and JICA. As the first step, targets of the JICA ADN Project assistance are the junior engineers. Basic knowledge of water supply engineering is of practical use, including areas listed below:

1. Knowledge required for verification of design documents

- Basic knowledge on determining key design factors for rural water supply systems
- Basic knowledge on the design concepts of rural water supply systems
- Practical knowledge on outline design of rural water supply systems
- Basic knowledge on pipeline hydraulics
- Practical knowledge on hydraulics calculation of simple pipelines using EPANET or PIPECAL
- Knowledge on the pipeline profiles and the function of air release valves
- Practical knowledge on how to prepare profiles using Google Earth

2. Knowledge for the inspection of construction works

- Basic knowledge on inspection procedures
- Basic knowledge on inspection of water source facilities
- Basic knowledge on inspection of storage tanks using concrete structures
- Basic knowledge on inspection of transmission and distribution pipelines

♦ Basic knowledge on inspection of public taps

(2) Lecture in classroom

Periodical lectures is carried out once or twice a week for 30 minutes on weekdays, or once or twice a month for half a day on Saturdays.

a. Specifying basic knowledge on water supply engineering related to PDD I & II; quality of water supply systems is largely affected by hydraulics. Sound knowledge on hydraulic gradient is essential especially in the case of planning pipelines to be installed in hilly area as PDD I & II,
b. Project evaluation; as the first step of the project, the verification of design documents, particularly of pipelines, is important. Insufficient verification may result in project faults. Case studies of "bad" examples are carried out in classroom lessons, and
c. Monitoring and inspection; finding failures in early stages is important for efficient project management. Problems are analyzed and the solutions are advised at projects sites to ADN engineers.

(3) On the Job Training (OJT)

a. Exchanging views/opinions with ADN engineers is conducted through daily activities, and
b. Practical technical assistance on supervision, monitoring and inspection of construction works is conducted at project sites.

6.2.2 Revision of the ADN Manual

a. Revising the ADN Manual based on new PDID Decree Law.
b. Making the job flowchart of PDID to understand it at a glance. Flowchart of ADN Manual to understand it at a glance is made to explain the job distinction,
c. Adding technical references to the checklists. The technical references will be linked to the classroom lectures.

6.2.3 Coordination with relevant Ministries/Agencies

As a first step, the Ministries/Agencies holding the mandate to provide, or with relevance to, rural water supply projects in PDID are identified. DNSA has jurisdiction over several aspects of water supply, while ESTATAL has jurisdiction over several aspects of PDID projects management through District Administrations. PDID projects are generally managed at the District level, so it was necessary to make the national level participation structure clear. Then,

when some coordination is necessary with a friction among DNSA, ESTATAL and ADN, technical assistance to ADN engineers by JICA experts should be done.

6.3 Activities

6.3.1 Lecture in classroom

Classroom lectures on water supply were carried out as follows:

(1) How to Use EPANET with Practice (39 persons/6 times)

EPANET is free computer software of pipe network analysis developed by USEPA. Lectures conducted to explain this software were first given to ADN engineers. To confirm a level of the understanding, their practical knowledge was examined after lectures through case analyses. These lectures were useful for participants to understand the pipeline design and to solve the problems mentioned in **6.1**. The Software and Users Manuals were downloaded to participants PCs and are saved in the ADN Server so that all ADN engineers may have access to and utilize the software.

Table 6-2 Lectures on How to Use EPANET

No	Date		SUBJECT	Attendance
1	4/29	Monday	How to Use EPANET with Case Analysis (1/6)	-
2	4/30	Tuesday	How to Use EPANET with Case Analysis (2/6)	10
3	5/03	Friday	How to Use EPANET with Case Analysis (3/6)	6
4	5/06	Monday	How to Use EPANET with Case Analysis (4/6)	5
5	5/08	Wednesday	How to Use EPANET with Case Analysis (5/6)	12
6	5/09	Thursday	How to Use EPANET with Case Analysis (6/6)	6
Sub Total				**39**

(2) Design of Rural Water Supply System (Case Study) (29 persons/5 times)

This course was planned after inspection of PDD projects in Rai Laku, Ermera District on 7th of May (Tue), 2013. It was confirmed that spring water does not flow down the pipeline to the storage tank. Causes of the situation and solutions on how to solve the problem were explained at the site.

Table 6-3 Lectures on Design of Rural Water Supply System

No	Date		SUBJECT	Attendance
1	5/13	Monday	Design of Rural Water Supply System (Case Study) (1/5)	7
2	5/14	Tuesday	Design of Rural Water Supply System (Case Study) (2/5)	8
3	5/16	Thursday	Design of Rural Water Supply System (Case Study) (3/5)	5
4	5/23	Thursday	Design of Rural Water Supply System (Case Study) (4/5)	5
5	5/28	Wednesday	Design of Rural Water Supply System (Case Study) (5/5)	4

Sub Total		**29**

(3) Saturday Morning Lecture (83 persons/9 times)

This course was focused on basic knowledge concerning rural water supply; part I is about the design and part II was about the construction inspection. Due to a limited time available, only a lecture of part II was carried out. Indonesian Advisers commenced "Saturday Lectures" on the 24th August.

Lecture materials consisted mainly of the reproduction of extracts from the "Rural Water Supply Manual" published by the World Bank Office, Manila. The manual consists of three volumes as follows:

Volume I: DESIGN MANUAL.

Volume II: CONSTRUCTION SUPERVISION MANUAL.

Volume III: OPERATION AND MAINTENANCE MANUAL.

These manuals is very useful when they are adopted for specific use in Timor-Leste. There is not a copy right problem because the World Bank Office Manila indicates that these manuals may be reproduced in full or in part for non-profit purposes without prior permission provided proper credit is given to the publisher. These manuals were saved in the ADN Server.

Table 6-4 Saturday Morning Lectures

No	Date	SUBJECT	Attendant
1	5/25 Saturday	How to Use EPANET & How to Use PIPECAL (1/1)	16
		Part I	
2	6/01 Saturday	Design of Rural Water Supply System (Introduction, Water Demand)	3
3	6/08 Saturday	Design of Rural Water Supply System (Water Source)	4
4	7/06 Saturday	Outline of Rural Water Supply System	17
5	7/13 Saturday	Diagnosis of Rural Water Supply System	14
6	7/27 Saturday	Design of Rural Water Supply System (Transmission and Distribution)	14
7	8/03 Saturday	One point lesson on air release valve	2
		Part II	
8	8/17 Saturday	Inspection on Rural Water Supply Project	13
Sub Total			**83**
Total		(19 lectures in total)	**151**

6.3.2 OJT

(1) Advices at project sites

Five site visits were carried out. Practical advices or comments were provided to ADN engineers accompanied with.

a. Inspection of MDG Suco Projects (by Mr.Yoda)

Date: 7 May (Tue) to 10 May (Fri) 4days

Place: Lospalos, Baucau, Viqueque, Manatuto

Advices/Comments:

- Water leaks repair
- Replacement of sands utilized for concrete constructions
- Coordination between DNSA and Community
- New installation of pumps and tanks
- New construction of boreholes

b. Inspection of a PDD project (by Mr. Higuchi and Mr. Sakamoto)

Date: 7 May (Tue)

Place: Rai Laku, Ermera District

ADN engineers accompanied: Joao do Rego

Advices/Comments:

Situation: Water could not flow from intake to storage tank.

- To check the profile of pipeline (topography)
- How to release the air in the pipeline

c. Survey for MDG Suco water supply (by Mr. Higuchi and Mr. Sakamoto)

Date: 11 June (Tue)

Place: Gleno, Ermera District

ADN engineers accompanied: João Gomes

Advices/Comments:

Situation: Houses were almost constructed but there was no water.

- How to design a rural water supply system.

d. Inspection of a PDD project (by Mr. Higuchi)

Date: 31 July (Tue)

Place: Lahane, Dili District

ADN engineers accompanied: Paul Abrantes, Lisandro Manuel

Advices/Comments:

Situation: There were several problems as follows;

Water could not flow from intake to storage tank.

There were no inlet and outlet valves at storage tank.

Bad structure of storage tank: manhole and air-ventilation.

e. Inspection of a PDD project (by Mr. Higuchi)

Date: 12 August (Mon) to 13 August (Tue)

Place: Viqueque District

ADN engineers accompanied: Demistocles G. X. F. Cabral and others Advice:

Check points of the inspection

Situation: Structure of raw water tank was different from the design.

- To construct additional tank to monitor the water quantity and quality.

(2) Daily advices/assistances

a. Design of rural water supply system

b. How to use pipe network analysis software, EPANET

c. Function of air release valves and solution of a problem related to air clogging

d. Profile drawings using Google Earth

6.3.3 Revise of ADN Manual

a. The ADN Manual was revised based on the new PDID Decree Law. The old Manual consisted of two parts, PDD-I and PDD-II. Revised Manual was integrated into one part, PDID.

b. The job flowchart of PDID was made to understand it easily and at a glance. The flowchart also explains the job distinction among related Ministries/Agencies.

c. Technical references were attached to the checklists. The technical references are helpful for ADN engineers to verify and inspect water supply projects. The references were linked to the classroom lectures.

6.3.4 Coordination between ADN and Line Ministries

PDID projects are currently implemented on a district basis. Most of the relevant staff and engineers do not recognize recent institutional changes to their roles and responsibility.

DNSA officials and JICA experts on water supply have discussed several times how to implement rural water supply projects effectively, and reached a consensus, reaffirming the importance of construction supervision for the purpose of quality control.

Issues to be focused and overcome by DNSA and ADN were listed below:

- DNSA submitted project documents to ADN who verified their appropriateness. Unit costs and project costs were a major concern. Documents received by ADN would be rejected if the cost was far higher than cost data collected by ADN concerning similar projects. To implement projects effectively, JICA-ADN experts had an opinion that ADN should provide basic information of such data to DNSA. ADN management expressed its

opinion that all data was confidential and only for use by ADN. It may be further required that both parties shall discuss this issue to find a solution.

- In case of water supply projects funded by the so called 'Infrastructure Fund", DNSA also submitted documents to ADN. It was often the case that ADN delayed verification without notice to DNSA, even when the documents were found to be insufficient.

6.4 Achievement

6.4.1 Human resource development

Classroom lectures and guidance at project sites has raised questions about the technical capabilities of several engineers.

(1) About knowledge for verification of design documents

a. Basic knowledge on how to determine key factors for rural water supply system:

   Several engineers gained the basic knowledge on rural water supply system through the classroom lectures. They successfully completed case studies to determine key design factors.

b. Basic knowledge on the design concept of rural water supply systems:

   The majority of engineers who attended the classroom lectures acquires sufficient knowledge on the design concepts of rural water supply systems.

c. Practical knowledge on outline design of rural water supply system:

   As many engineers have already undertaken and completed case studies, they have obtained basic knowledge on the design of rural water supply systems.

d. Basic knowledge on the basic hydraulics of pipelines:

   Junior engineers, in particular, have showed their interest in computer software, EPANET, but less concern on pipe flow hydraulics, which is one of the fundamental concepts behind the use of EPANET.

e. Practical knowledge on hydraulics calculation of simplified pipe networks using EPANET or PIPECAL:

   Despite their keen interest in EPANET, some of them did not understand the elementary level mathematical formulas and equations. It is, however, favorable that they frequently ask questions. Willingness or intention to improve their capacity is eminently high.

f. Knowledge on profile of pipeline and air release valve:

   Several engineers observed no water flow in the installed pipelines even after the project is completed. JICA-ADN experts explained to them about the importance of air release from the pipes. Eventually they recognized the function and structure of air release valves

to be installed.

g. Practical knowledge on drawing profile using Google Earth:

Attempts to use Google Earth by several engineers have confirmed an effectiveness of pipeline profile. This step is effective in obtaining general information about the project sites.

(2) Knowledge for inspection of construction works

a. Basic knowledge on inspection procedures.

The primary aim of inspection was to judge whether construction works are completed in conformity with the contract documents (design drawings and specification). In the case of rural water supply projects, water sources were normally located in a deep forest and mountain area. It was often observed that the actual site conditions differed much from the design drawings. In the course of the actual site inspections, therefore, key aspects and procedures were explained for the purpose of monitoring and evaluation of payments. The check of BOQ seems to be done to a high standard.

b. Basic knowledge on inspection of water source facilities

Several engineers understood normal structure of water source facilities. They got skills of flow rate measurement acquired by guidance at inspection sites. Against variety of water sources, engineers, however, were not capable of applying their knowledge for proper design of intake facilities.

c. Basic knowledge on inspection of concrete storage tank

ADN engineers understood how to measure tank dimensions. It might be easy to point out a lack of ventilators and manholes. It might become harder to recognize an absence of valves on inlets or outlets.

d. Basic knowledge on inspection of transmission and distribution pipelines

One of the serious problems that rural water supply projects encounter was that spring water hardly flowed into storage tanks through transmission pipelines. This was because of pipeline profiles. Air contained in a pipe summit clogged the pipe, resulting in no flow. JICA-ADN expert explained the phenomenon and its solution both at sites and classroom lessons repeatedly. As a result most of ADN engineers understood and had come to grips with the problem.

e. Basic knowledge on inspection of public taps

The structure of public taps was simple and easy to understand. ADN engineers pointed the failure out without JICA expert’s assistance.

Good Practice No.1 of Training at site is shown in Table 6-5

Table 6-5 Good Practice No.1 of Training at site

Inspection of a PDD project at Rai Laku, Ermera District
(Problem) Rural water supply system consists of (1) water source facilities, (2) reservoir, (3) transmission and distribution pipelines and (4) stand taps. In several projects of PDD I and PDD II design documents submitted by the relevant agencies do not provide sufficient information on pipeline profiles. In spite of insufficient drawings the design documents often pass the ADN's verification. As the result it sometimes happens that water cannot run from source to reservoir after the completion of whole construction works. Causes of inferior water supply facilities are as follows. 1. Typical drawings on (1) water source facilities, (2) reservoir and (4) stand taps as the references are existing. On the other hand there is no typical drawing on pipelines because a profile of pipeline is different one by one. 2. ADN cannot check pipelines design because of their shortage of basic knowledge on pipelines. (Countermeasures) JICA expert instructed ADN engineers and Contractor to check profile and design air release valve at summit of pipeline. (Output) ADN engineers and Contractor were able to solve the above problem at other area.

Good Practice No.2 of Training at site is shown in Table 6-6

Table 6-6 Good Practice No.2 of Training at site

Construction works have finished, but water hardly flows through pipeline from water source to storage tank at Lahane, Dili District.
(Problem) It is the biggest problem that water cannot be served to residents after the completion of water supply system in spite that there is sufficient amount of water source. It is not the hydraulics of the pipeline or the diameter of pipes. The main causes are (1) up-down profile of the pipeline, (2) no air release valve at summit of pipeline, and (3) insufficient air release from the pipeline when water was filled into the pipeline first. (Countermeasures) JICA-ADN expert explained the phenomenon and its solution at sites and classroom lessons repeatedly. As a result most of ADN engineers understand and have come to grips with the problem. (Output) ADN engineers and Contractor were able to make air release valve at summit of pipeline.

(3) Progress

The degrees of progress against the targeted levels were evaluated as (1) and (2) mentioned above and in the classroom. Results of the evaluation are summarized in the following table:

Table 6-7 Results of evaluation on Water

Items to be acquired	Progress
(1) Knowledge for verification of design documents	
Basic knowledge on rural water supply system	○
Basic knowledge on design of rural water supply system	○
Practical knowledge on outline 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 procedure of inspection	△
Basic knowledge on inspection of water source facilities	△
Basic knowledge on inspection of concrete storage tank	△
Basic knowledge on inspection of transmission and distribution pipelines	△
Basic knowledge on inspection of public taps	◎

Valuation basis ◎: Sufficient level for practical jobs

○: Understand enough knowledge but need of experiences for practical jobs

△: Understand knowledge of beginner's level

×: Not understand

－: No evaluation

6.4.2 Materials produced

In the course of the JICA experts activities many training materials were prepared and several references were downloaded through the internet. These materials are saved in the ADN server. They are listed in the table below:

Table 6-8 Classroom Lesson Materials on Water

No.	Subjects	Sub No.	Material Name	File	Language	
					Eng	Tetum
1	EPANET	1-1	How to use EPANET	PPT	✔	✔
		1-2	Practices of EPANET	Word	✔	✔
2	PIPECAL	2-1	How to use PIPECAL	PPT	✔	✔
		2-2	Basic Hydraulics for Water Supply Engineers	Word	✔	✔
3	CASE STUDY	3-1	Case Study RWS	PPT	✔	✔
		3-2	Worksheet Case Study	Word	✔	✔
4	CLASSROOM LESSON	4-1	Lesson1.Design of Rural Water Supply System	PPT	✔	✔
		4-2	Lesson2.Water Demand	PPT	✔	✔
		4-3	Lesson3.Water Sources	PPT	✔	✔
		4-4	Lesson4.Water Treatment	PPT	✔	✔
		4-5	Lesson5.Transmission and Distribution Systems	PPT	✔	✔
		4-6	Lesson6.Inspection for Rural Water Supply Project	PPT	✔	✔
		4-*	Diagnosis of Rural Water System	PPT	✔	✔

		4-*	Outline of Water Supply System	PPT	✔	✔
		4-*	WB Rural Water Supply Manual Vol.1 Contents	PPT	✔	✔
5	ADN MANUAL	5-1	PDID Job Flowchart	Word	✔	✔
		5-2	PDID Checklist	Excel	✔	✔
		5-3	Annex of Checklist	PPT	✔	✔
6	REPORT of FIELD SURVEY	6-1	MDGsuco Projects Inspection	Word	✔	✔
		6-2	Site Inspection Report (Gleno)	Word	✔	✔
		6-3	Site Inspection Report (Lahane)	Word	✔	✔
		6-4	Site Inspection Report (Viqueque)	Word	✔	✔
7	Reference	7-1	EPANET(Soft)		✔	
		7-2	EPANET2 MANUAL	PDF	✔	
		7-3	PIPECAL(Soft)	Excel	✔	
		7-4	RWS Vol-1 Design Manual	PDF	✔	
		7-5	WS Vol-2 Construction Supervision Manual	PDF	✔	
		7-6	RWS Vol-3 Operation Maintenance Manual	PDF	✔	

6.4.3 Revise of ADN Manual

The ADN Manual was amended as mentioned in 6.3.3. The Manual became much easier to use through the attachment in the annex of a Checklist entitles 'notes of basic technologies'.
Regarding PDID, ADN engineers revised almost of Form and checklist by themselves. Current condition of ADN Manual on PDID is shown in Table 6-9

Table 6-9 Current condition of ADN Manual

PDID		By Whom
Form-A	Project Outline prepared by LM	JICA-ADN Team support
Form-B	Inspection Report and Recommendation for Payment	ADN
Checklist-A	Documents to be submitted	ADN
Checklist-B-1	Technical Specification	JICA-ADN Team support
Checklist-B-2	Bill of Quantity	ADN
Checklist B-3	Planning and Design	JICA-ADN Team support
Checklist-C	Payment Condition	ADN
Checklist-D	Quality Control	JICA-ADN Team support
Checklist-E	Measurement of the Work Completed	JICA-ADN Team support

6.4.4 Coordination between ADN and Line Ministries

The study on Institutional Structure on Rural Water Supply was reported below. It was studied to make participation in rural water supply projects at the national level more clear.

Rural water supply projects of PDID are regulated by two Decree Laws, Decree-Law No.4/2004 on water supply for public consumption (**Water Supply Decree-Law**) and Decree-Law

No.4/2012 Planning of Integrated District Development (**PDID Decree-Law**).

According to Water Supply Decree-Law, the Water and Sanitation Service (SAS, the district level organization of DNSA) shall provide assistance to the community-run water supply system.

On the other hand, According to PDID Decree-Law, the planning and implementation of the PDID shall be undertaken by way of a consultation and monitoring process with the following bodies:

a) District Development Commission;
b) Sub-District Development Commission;
c) Territorial Delegations of Ministries in Districts and Sub-Districts;
d) Suco Council.

Also, the synchronization of the PDID at District and National level shall be done at the following Meetings:

Synchronization of the PDID at District and National level

a) The District Development Coordination Meeting; and
b) The National Development Coordination Meeting.

According to the two Decree Laws the relative state level organizations to water supply projects of PDID are the Ministry of State Administration and Territorial Management (ESTATAL), and DNSA of the Ministry of Public Works. But the PDID projects shall be executed at the District level.

Once projects are selected, they are administered through a district-level commission, known as KDD, who are responsible for assessing eligible local contractors to participate in the scheme, assessing and verifying approved PDID projects, and monitoring implementation**.**

The composition of KDD is,

a) District Administrator as Coordinator;
b) District Secretary as Vice Coordinator;
c) Director of Territorial Delegations of Ministries relevant at District level as members;
d) Sub-District Administrators as members;
e) Three representatives from among the members of the Suco Council, elected for each Sub-District Development commission.

Decree-Law-ADN provides that The ADN is responsible for:

(a) Reviewing the merit and feasibility of capital development projects;
(b) Supervising, verifying and certifying capital development projects, as well as their execution, in coordination with the relevant ministry;
(c) Managing construction projects up to two hundred and fifty thousand American dollars

allocated to local companies in the sub-districts, within the scope of the District Development Program II (DDP II);

(d) Providing support to the Millennium Development Goals Program for the Sucos (MDG Sucos).

Also, Decree-Law-PDID provides that KDD shall supervise and coordinate the implementation of the projects defined as PDD II in coordination with the National Development Agency.

The following figure was drawn, based on "Rural Water and Sanitation in Timor-Leste Concept Note" (Version 6: 22nd July, 2011), and Decree-Law-PDID, shows the current institutional arrangement on rural water supply.

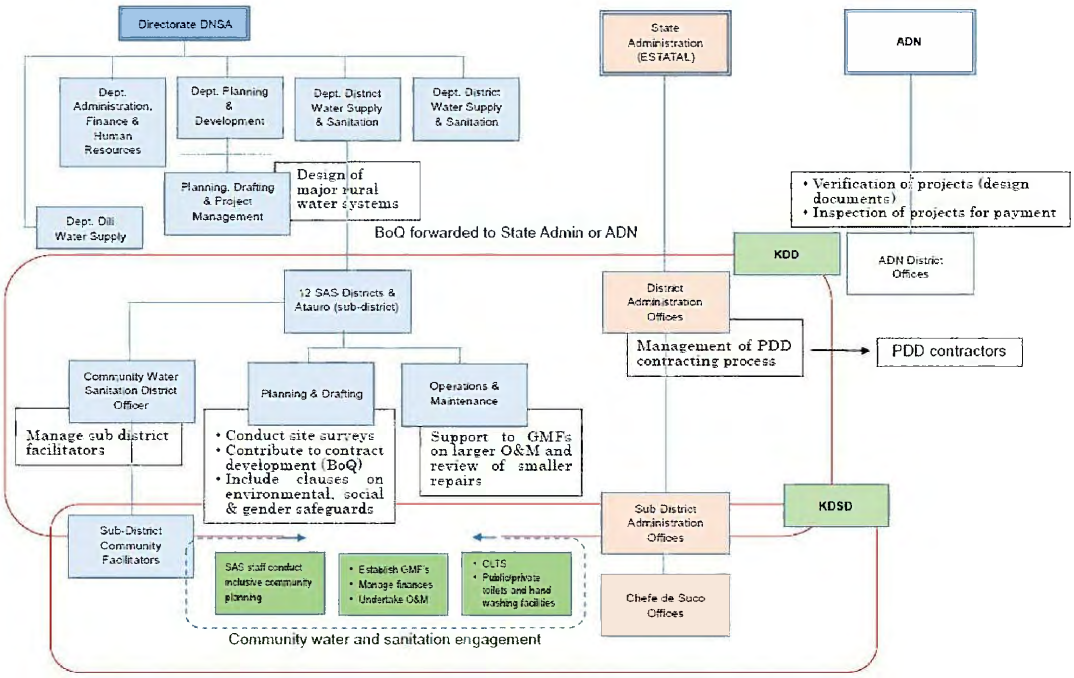


Figure 6-2 Current institutional arrangement on rural water supply

The results of studies on institutional structure were utilized in the revision of the ADN Manual. As information interchange between JICA-ADN experts and DNSA-besik, JICA-ADN experts provided "PDIP Job Flowchart" and "WB Rural Water Supply Manual (soft copy)" to DNSA-besik, and were provided "Timor Leste Rural Water Supply Guidelines" and a report "Technical Assessment of the 2011 PDD Rural Water Systems" from DNSA-besik.

6.5 Recommendation

The innovation to ensure better quality of rural water supply systems is impossible solely by ADN. All parties related to rural water supply must work in cooperation with each other. The number of ADN staff working in this area may be rather small but ADN engineers should be at the head of the long battle for positive innovation within this area.
Following suggestions are not an ideal solution rather they take into consideration the reality of the situation at present in Timor-Leste and try to take into consideration the international engineering standards that are used. The number of ADN staff should manage about rural water supply based on Decree-Law-ADN, and teach them with leadership.

6.5.1 Recommendation of Design stage

The ability to, and manner in which, the design of rural water supply systems under limited, minimum cost, conditions should be taken into consideration. Under the present situation design drawings can only be used as reference figures, rather than the detail blueprints which they are meant to be used as. Based on this perspective the, following recommendations are suggested:

- To clearly define in the specifications stage the minimum requirements that companies need to adhere to in areas such as design capacity population reach of the services contracted for.
- To adopt sample or standard drawings for design. Good sample drawings should be collected regularly on a quarterly basis, at least..
- To get relevant information from Google earth and prepare pipeline profiles as a minimum standard, when topographical and level surveys are hard to carry out.

6.5.2 Recommendation of Verification stage

Verification against tentative designs not based on field surveys may not be efficient. The verification should be done from a view point of designed system efficiency that can serve the planned amount of water that is meant to be delivered to a certain proportion of the population.

- It is reasonable that the project cost or BOQ should be prioritized and checked at an early stage of the project implementation
- To check whether the amount of source water is adequate during the dry season.
- To check the profiles of topographic levels between water source and distribution area, with particular reference to context between the profiles and the water distribution tank.
- To check whether the facilities are functional on the view of O&M; e.g. inlet and outlet valves of a storage tank.

6.5.3 Recommendation of Construction stage

This is the most important stage as the final quality of infrastructure may depend on construction works undertaken. A system which list quality contractors who have completed quality public works projects previously should be undertaken. The following steps are

recommended to be undertaken immediately after the award of any contract:

- To make clear who is the Project supervisor.
- To provide guidance of important points for contractors to consider, including minimum quality requirements to meet, at the beginning of the construction works by the supervisor.
- To visit the site as much as possible for supervising the construction works.
- To check photos on the works when site supervision is impossible.
- To create a system whereby the contractors are obliged to submit weekly reports to the supervisor.

6.5.4 Recommendation of Inspection stage

Prior to the issuance of completion certificates, ADN engineers or supervisors shall carry out inspections to confirm that all facilities are constructed in compliance with the contract documents. The contract shall be amended in event that case-specific needs arise. As-built drawings that show project facilities actually constructed shall be prepared and submitted to ADN before the inspection although this may be difficult in the case of PDID projects. Realistically, it is recommended that in consideration of the current situation, the following activities are carried out:

- To check BOQ by measuring the dimensions of facilities; pipe diameters, pipe length, pipe materials, tank capacity, and number of public taps
- To check whether the constructed facilities are satisfactory to the people or the community: capable of supplying water with sufficient water head to all end users.
- To check whether inlet and outlet valves of a storage tank are installed.
- To check the leakage from tank and pipeline.

The purpose of the rural water supply projects is to build facilities that can adequately supply safe water to a community or group of inhabitants. The first priority is to supply water to them. To fulfill the purpose, engineering capacity concerning water supply should be upgraded.

6.5.5 MDG Suco

There are several problems on water supply in MDG Suco projects. Water supply planning is not included in the design of MDG Suco housing projects. It sometimes happens that when the construction of houses is completed, water is not available to them. Water supply planning should be included in the design or its construction works should be initiated concurrently with the building of houses.

6.5.6 Research on Groundwater

Because of the terrain of this mountainous country, rainfall water flows down rapidly, emptying

into the sea. On the other hand, a small percentage of the rain water infiltrates into the underground aquifers due to the geological nature of the ground. This water is normally stored in an aquifer over the years, and rarely emerges as surface water. As a result, groundwater is widely used as a water source in this country. Unfortunately, river water as a water source is extremely low in quantity, particularly in dry seasons. But the underground water is available all year round and relatively stable.
If the groundwater survey technology spreads amongst engineers, underground water will be the most promising source of water in Timor-Leste for future generations.

6.5.7 Features of Rural water supply

The purpose of rural water supply is to develop small water supply systems in rural areas throughout the country. Areas, where easy water access is assured, should have the priority.
The number of staff of ADN is not sufficient in comparison with the amount of work necessary to guarantee water access to the entire population. This situation may become worse in the future. It is necessary to strengthen organizational structure and quality, taking into account the fact mentioned in this report.
As a measure to efficiently fulfill this type of work, state-of-the-art IT technology is a powerful tool. This includes the transfer of images and video for the onsite assessment, electronic decision systems, and simple design using Google Earth, etc.

6.5.8 Human Resource Development

The percentage of water supply projects as a proportion of all projects handled by ADN is not large. Engineers cannot master their area of work straight away; rather it will require several years. There is no specialized section to deal with water supply projects. Although State mechanisms grow continuously, the capacity building of water supply engineers takes time under the circumstances. To compound this issue, retaining expatriate engineers in the ADN may be too costly.
It is, however, desirable to carry out training periodically to all ADN engineers by hiring international advisor(s) on a short time basis. A handbook should be utilized for this purpose. The Rural Water Supply Manuals published by WB Manila Office is recommended to be used as handbook, although minor amendment or revision is required.

7. Seminar (Workshop on Quality Control through ADN Work)

Workshop on Quality Control through ADN Work

JICA-ADN Team supported the holding of a seminar named "**Workshop on Quality Control through ADN Work"** by ADN. This seminar included the announcement of the revised ADN Manual that can be used by related Line Ministries like Ministry of Public Works through the discussion with C/P. It was held at Meeting Room of Ministry of Finance (2nd Floor) on September 20, 2013.

Contents of Seminar were as follows;

1) Each presenter explained **Issues** During ADN performance verification for tender documents and conduct inspection at project. They also make a suggestion about them;
2) Each presenter explained process & procedure of ADN work;
3) Each presenter explained sample of bad quality control work/ good quality control work.

JICA-ADN Team explained achievements of JICA-ADN Team as follows;

1) The Revised ADN Manual
   JICA-ADN Team/ADN engineers revised ADN Manual.
2) Core technologies on evaluation, monitoring and inspection of infrastructure projects.
   ADN engineers acquire the core technologies by use of ADN Manual.
3) Fundamental knowledge on evaluation, monitoring and inspection of infrastructure projects.
   ADN engineers acquire the fundamental knowledge by class room lessons.
4) Coordination with relevant Ministries/Agencies
5) Workshop
6) Suggestion on Human resource development plan
7) Finding and recommendations

Discussion points of seminar were as follows;

1) Opening speech by Director General of ADN, Mr. Samuel addressed ADN manual shows the procedure and process of ADN work.
2) Bridge national engineer of MPW, Abrao asked bad coordination like demolish project and Tono bridge. Mr. Alexandre replied demolish of works caused by poor quality, not following technical specification and Tono bridge is discussed already.
3) Procurement Director of UNTL, Mr. Martinho asked the procedure of PDID. Mr. Alexandre replied explanation of Decree-Law and uncertainly demarcation line between ADN and MPW.
Almost discussion points were problems of 1) unclear form and checklist, 2) uncertainly demarcation line between ADN and MPW, 3) unclear procedure and process of ADN work. So, this seminar was useful for understanding each other.

Schedule of seminar

Schedule of seminar was shown in Table 7-1.

Table 7-1 Schedule of Seminar

Item		Presenter	Time (applx.)
	Guest Arrival		8:30-
1)	Greeting	Mr. Samuel Marçal, General Director ADN	9:00-9:10
2)	Activities of JICA-ADN Team	Mr. Matsushima, JICA- ADN Team	9:10-9:50
3)	Quality Control and Use of ADN Manual on Infrastructure Fund Projects	Ms. Emernciana da Costa Maia Freitas, Engineering Civil/Tecnik	9:50-10:30
4)	Questions and answers/ comments for the above	All attendance	10:30-10:50
5)	Coffee Break		10:50-11:10
6)	Rapid Assessment of ADN ADN's Role in the infrastructure Development Process	Ms. Carolyn Peterken, Consultant AusAID & ADN	11:10-11:20
7)	Questions and answers	All attendance	11:20-11:25
8)	Presentation ADN Manual for Line Ministry Project	Mr. Januario Maia Guteres, Engineering Civil/Tecnik	11:25-12:05
9)	Questions and answers/ comments for the above	All attendance	12:05-12:25
10)	Lunch		12:25-13:00
11)	Power Quality & Utilization ADN Manual Book	Mr. Miguel M.M.de jesus, Tecnico de ADN Power Team	13:00-13:40
12)	Questions and answers/ comments for the above	All attendance	13:40-14:00
13)	The Presentation of ADN Manual Regarding PDID Project	Mr. Demistocles G.X.F.Cabral, Tecnico Civil	14:00-14:40
14)	Questions and answers/ comments for the above	All attendance	14:40-15:00
15)	Overview of JICA Assistance to ADN and Way Forward	Mr. Horikoshi, JICA Head Office	15:00-15:20
16)	Closing Speech	Mr. Alexandre Bruno Sarmento, Vice Director ADN	15:20-15:30

Attendance group

Attendance group was shown in Table 7-2.

Table 7-2 Attendance Group

NO	Name of Group	Attendance
1	Road Bridge & Flood Control of Ministry of Public Works (EPCC)	6
2	National Housing & Urban Plan (DNHPU)	3
3	Water and Sanitation of MPW (DNSA)	1
4	Irrigation and Water management, Ministry of Agriculture (MAF/ DNIGA)	4
5	Ministry Commerce, Industry and Environment	1
6	APORTIL of Ministry of Public Works	4
7	SOS for Policy of Provincial Training and Employment (SEFOPE)	5
8	Ministry of State Administration and Territorial Management (ESTATAL)	1
9	International Labor of Organization (ILO)	2

10	National University of Timor Lorosa (UNTL)	3
11	Consultant KEI	3
12	Consultant (AusAID)	1
	Sub-total of Guest	33
13	ADN engineers, JICA-ADN Team	45
	Total	78

Handouts of seminar

Handouts of seminar were shown in Table 7-3.

Table 7-3 Handouts of Seminar

NO	Contents	Copy
1	ADN Manual (English Version)	40
2	ADN Manual (Tetum Version)	50
3	Handout of ppt data (English Version)	40
4	Handout of ppt data (Tetum Version)	50
5	Handout of ppt data (Indonesia Version)	20
6	Schedule of seminar	100

8. Human Resource Development Plan

Based on activities of this project, JICA-ADN Team suggested the creation of a human resource development plan of ADN engineers through discussion with C/P.
The plan is composed of a Background, Whole Plan and Plan of Each Sector. An outline of the plan was shown in Table 8-1.

Table 8-1 Outline of Plan

Goal	More effective management of Infrastructure Development is carried out and quality is assured through ADN.
Objective	A system of human resource development required in the field of infrastructure management will be established and human resources will be developed with better coordination with International Advisor.
Targeted Staff	All engineers of the ADN
Time Frame	Two years from 2013 to 2015.

Regarding the detail of human resource development plan, refer to Annex “Human Resource Development Plan”

ANNEX

ANNEX-1 REVISED ADN MANUAL

ANNEX-2 HUMAN RESPURCE DEVELOPMENT PLAN

ANNEX-3 HANDOUT OF PRESENTER (WORKSHOP ON QUALITY CONTROL THROUGH ADN MANUAL)

ANNEX-4 CLASSROOM LESSON ON BRIDGE

ANNEX-5 CLASSROOM LESSON ON ROAD

ANNEX-6 CLASSROOM LESSON ON FLOOD CONTROL

ANNEX-7 SHORT REPORT ON BRIDGE/ROAD

ANNEX-8 CLASSROOM LESSON ON POWER

ANNEX-9 CLASSROOM LESSON ON WATER SUPPLY

ANNEX-10 CASE STUDY ON WATER SUPPLY

ANNEX-11 PIPECAL ON WATER SUPPLY

ANNEX-12 EPANET ON WATER SUPPLY

ANNEX-13 SHORT REPORT ON WATER SUPPLY

ANNEX-1

REVISED ADN MANUAL

AGÉNCIA DE DESENVOLVIMENTO NAÇIONAL
REPÚBLICA DEMOCRÁTICA DE TIMOR-LESTE

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

ADN MANUAL

(Policies, Processes & Procedures, Products)

20 Oct, 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)

AGÉNCIA DE DESENVOLVIMENTO NAÇIONAL

(ADN)

Preface

ADN was established in March, 2011 through Decree-Law No.11/2011. Since its inauguration, ADN has been involved in infrastructural development, mainly through the processes of verifying tender documents and the inspection of payment requests. The ADN Manual is formulated through the arrangement of current work procedures and through the addition of several improvements for the smooth implementation of the above processes. It aims to assist not only ADN staff but also Line Ministries (LM) and other State Institution staff members who carry out work on these processes.

The draft ADN Manual was prepared and introduced at an Internal Seminar on 25 Oct, 2012, and the revised ADN Manual was introduced at a Workshop on Quality Control through ADN Work on 20 Sep, 2013.

This Manual is composed of three sections: general; project evaluation before contract award; and, project inspection and recommendation for payment. The Manual covers four categories: Infrastructure Fund, PDID, National Electrification Program, and LM Fund. However, each category is represented by a specific sector. Regarding the technical checklists, the Infrastructure Fund deals with the Road & Bridge sector, PDID with Water supply, the National Electrification Program with Electric Power and the LM Fund with Building. Special Projects under the ADN mandate including, the Emergency Fund, Sefope, and ADDT are not included.

One of the key components of this manual is to provide checklists and forms. The checklists are provided to make ADN's work clearer and the form is to make ADN and LM's communications clear, hence to clarify their roles and responsibilities. They both together are designed to make the processes to be conducted properly and smoothly.

The ADN Manual leaves technical issues such as standards and specifications with those of LM. The Manual will be revised to accommodate any improvement of collaboration work between ADN and LM.

Abbreviation

AASHTO	American Association of State Highway and Transportation Officials
ADB	Asian Development Bank
ADN	National Development Agency (Agencia de Desenvolvimento Nacional)
APORTIL	Port Administration of Timor-Leste
AS	Australian Standard (for Building)
AS/NZS	Australian / New Zealand Standard (for Building)
BC	Timor Leste Central Bank
BCA	Building Code of Australia
BoQ	Bill of Quantities
CAFi	Conselho de Administracao do Fundo das Infra-estruturas
CKP	Charles Kendal & Partners
CPV	Commitment Payment Voucher
DC	District Committee
DNSA	National Directorate of Water Supply
DNSAS	National Directorate of Water and Sanitation (former organization)
DRBFC	National Directorate of Road, Bridge and Flood Control
EDTL	Electricity of East Timor
ESTATAL	Ministry of State Administration and Territorial Management (MAEOT)
FAQ	Frequently Asked Question
FI	Infrastructure Fund
JICA	Japan International Cooperation Agency
KDD	Development District Commission
LM	Line Ministry
MAEOT	Ministry of State Administration and Territorial Management
MDG	Millennium Development Goal
MOF	Ministry of Finance
MOI	Former Ministry of Infrastructure
MPS	Major Project Secretariat
MPW	Ministry of Public Works
NPC	National Procurement Commission
PDD I	Package of Decentralized Development I
PDD II	Package of Decentralized Development II
PDIDS	Integrated Development Project in Suco
PDL	Programa de Desenvolvimento Local
PEN	National Electrification Program (Programa da

	Electrificacao Nacional)
PO	Purchase Order
RDTL	The independent Democratic Republic of Timor-Leste
RWS	Rural Water Supply
SDP	Timor-Leste Strategic Development Plan 2011-2030
SGP	Secretariat of Large Project
SNI	Serviços Nacional de Inteligência
Suco	Village in Timor-Leste
TPO	Treasury Payment Order
UNDP	United Nations Development Program
WB	World Bank
W/C	Water Cement Ratio
BPA	Banking & Payments Authority

ADN MANUAL (Policy, Process & Procedure, Products)

Table of Content

General

(Background)

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

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

-assessing the 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.

(Scope)

The ADN Manual aims at ADN being able 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 properly undertake their mandated roles and responsibilities during the provision of capital development projects.

The manual focuses specifically on the following processes as they are the most commonly handled at present.

-Verification of Tender Documents
-Inspection of Payment Requests

(Category of Projects/Funds)

The project categories that ADN worked on during 2012 are shown in Table 1. Project categories on ADN as of 2013 are in Table 2. . The proposed project categories for ADN during 2014 are found in Table 3.
Chapters in the manual are formulated seperately based on the differentproject categories that ADN must consider, also taking into account the different procedures uses by each of these categories.
The manual deals with Infrastructure Fund Projects, Line Ministries Fund Projects, PDID Fund Projects, and National Electrification Programs (PEN). The manual does not deal with Emergency, Additional, SEFOPE, MDG, and Special Project under ADN.

Table 1. Project Category on ADN as of 2012

Class of Project	Infrastructure Fund	Line Ministries	PDD I & II	PDID	PDL	MDG	Emergency Fund	National Electrification Program (PEN)	Contingency Fund	Special Projects under ADN
Note				[TBC]	Procurement is entirely in the District	Building House	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 Ministry Budget	PDD I – MAEOT PDD II ADN	[TBC]	MAEOT 1) and District Administration	ADN	Emergency Fund Managed by MoF	Infrastructure Fund	Contingency Fund managed by MoF	Funds allocated to ADN
Budget Range	Over US$1,000,000	US$500,000 to US$1,000,000	PDD I up to 150,000 PDD II 150,001 up to 500,000	[TBC]	1 to US$100,000	No Limit	US$100,000 to US$150,000	US$100,000 to US$4,500,000	Maximum 2,000,000 (Normal practice)	Up to 10,000,000

1) MAEOT: Ministry of State Administration and Territorial Management

Table 2. Project Category on ADN as of 2013

Class of Project	Infrastructure Fund	Line Ministries	PDD I & II	PDID	PDL	MDG	SEFOPE	Emergency Fund	National Electrification Program (PEN)	Additional	Special Projects under ADN
Note					Procurement is entirely in the District	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 Ministry Budget	PDD I – MAEOT PDD II ADN	ADN	MAEOT 1) and District Administration	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$500.000 to US$1.000.000	PDD I up to 150.000 PDD II 150.001 up to 500.000	(PDD I) up to 150.000 (PDD II) 150.001 up to 500.000	1 to US$100.000	No Limit	No Limit	US$100.000 to US$150.000	US$100.000 to US$4.500.000	Maximum 2.000.000 (Normal practice)	Up to 10.000.000

Table 3. Anticipated Project Category on ADN as of 2014

Class of Project	Infrastructure Fund	Line Ministries	PDID	MDG	SEFOPE	Emergency Fund	National Electrification Program (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 Ministry 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$500.000 to US$1.000.000	(PDD I) up to 150.000 (PDD II) 150.001 up to 500.000	No Limit	No Limit	US$100.000 to US$150.000	US$100.000 to US$4.500.000	Maximum 2.000.000 (Normal practice)	Up to 10.000.000

(Role and Responsibility)

The manual in principle expects that the procedure and responsibility for the implementation of infrastructural projects be divided amongst several key state institutions, namely:

-ADN shall verify and inspect documents regarding the above-mentioned works submitted by LM (Line Ministry)/ Agencies. ADN may request LM/ Agencies to provide additional documents and present detailed explanation, if necessary, during the verification and inspection process;

-LM Agencies and the project owners, shall produce documents required for verification and/or inspection as is its responsibility. LM/ Agencies will submit to ADN the documents with a letter that it has confirmed these documents with the project owner. This is applied to the additional documents requested by ADN; and

-The Consultant/Contractor shall submit required documents to LM/ Agencies based on the contract.

(Range of Application of Each Sector)

Regarding Sectors, the manual includes technical checklists for Roads & Bridges that are part of the Infrastructure Fund, Water Supply on PDID, and Electric Power on PEN. The technical checklist will be able to be used for other category partially also.

Please note as follows, when the application of these checklists can be used be another category.

-Regarding Roads & Bridges, the technical checklist aims to verify the tender documents and to inspect for payment, using core technology about them. The checklist does not include special projects. Special projects need to use the technical checklists on detail design and supervision of construction work. The PDID projects also cover a lot of repair works. The checklist does not include the repair design/ work.

-Regarding water supply, the technical checklist aims to verify the tender documents and to inspect for payment on Rural Water Supply Projects. It does not include Urban Water Supply Projects. The technical checklist is mainly applicable to the categories of PDID and MDG on Rural Water Supply by ESTATAL. The technical checklist is not applicable to Category of FI and LM on Urban Water Supply by DNSA. The checklist includes the design of pipelines. The checklist does not include the repair design/ work

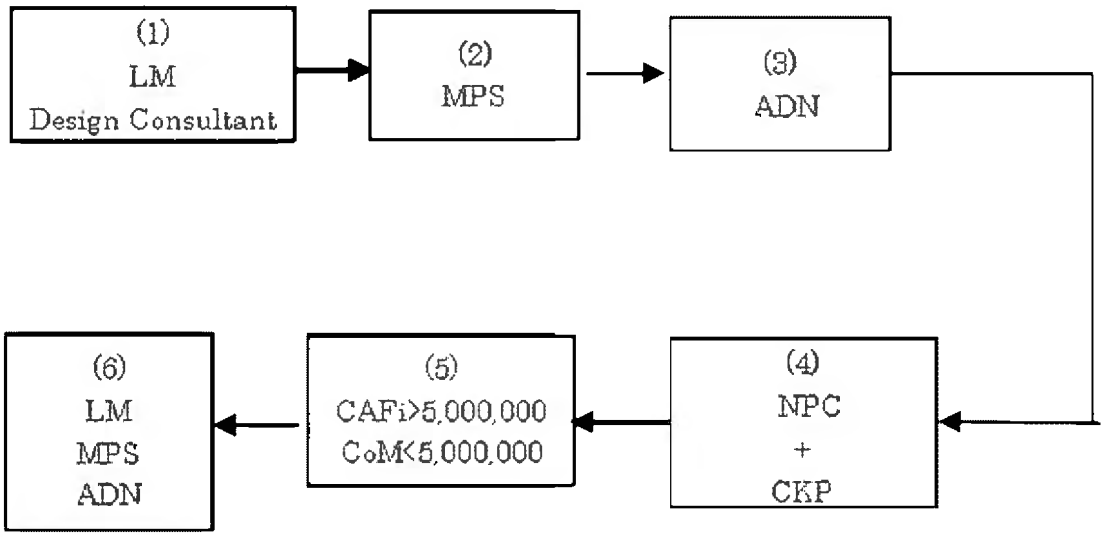
(Operation & Maintenance works).
-Regarding Power, the technical checklist aims to verify the tender and to inspect for payment on PEN, which is distribution project of power. The technical checklist is not applicable to generation project like FI & LM, transmission project like FI & LM, and home connection project like MDG.

1. Infrastructure Fund (FI) Project

1.1 Project Evaluation before Contract Award

1.1.1 Flow Chart

Figure 1-1 Flow Chart of Tender Documents



(1) LM/Design Consultant

LM provides TOR to one of its consultants to design according to the specificities of the project e.g. bridge or road project.

The design consultant completes the tender documents, and submits them to LM.

(2) MPS, Major Project Secretariat

LM passes those documents to MPS to review the viability of the project.

(3) ADN

ADN verifies all the documents, especially on the cost and construction. When the verification is completed, ADN then passes the documents to NPC+CKP, where NPC is National Procurement Commission, and CKP is Charles Kendal & Partners

(4) NPC+CKP

NPC, together with CKP will make tender.

(5) CAFi>5,000,000, Com<5,000,000

CAFi will make decision, who is going to win the project.

(6) LM, MPS, ADN

LM, MPS, ADN are responsible for the project while the project is still in the process of implementation.

1.1.2 Schedule of the Work

(1) Required time for verification at ADN

ADN completes the verification of tender documents within ten calendar days after receiving officially the documents required by ADN.

(2) Time of additional submission, resubmission or answer to ADN questions

LM shall submit, resubmit or answer to ADN what was required by ADN within ten calendar days after receiving notice of requiring further information.

(3) In case of the sub-clause (2) above, the time for ADN to complete the verification shall be delayed by the same time as the LM takes for the additional submission, resubmission or answer.

1.1.3 Confirmation of Documents submitted

ADN will check if all the required documents have been delivered. In case some are missing, ADN will inform the LM of it and instruct the LM to submit within the specified time.

(1) Request Letter of Verification of Tender Documents

(2) Project Outline prepared by LM: **Form A**

(3) Tender Documents: ADN will confirm the required documents are submitted, using **Checklist A**

1.1.4 Verification of Payment Conditions

ADN will verify that the payment conditions are adequate, using **Checklist B** as mentioned below.

(1) Time for Completion / Construction Period

ADN will verify the Time for Completion or Construction Period in such a manner,

1) Verify the detailed construction schedule provided by LM,
2) Ask for anexplanation from LM on how they decided the time or period
3) Compare with time for completion of other similar works.

Note: Past data of conditions of contract such as time for completion are shown in Attachment A attached hereto.

(2) Maintenance Period/ Defect Notification Period/Defect Liability Period

1) Ask for an explanation from LM on how they decided the time or period,
2) Compare with time needed for the completion of other similar works.

(3) Governing Law

Governing Law is the law of the Democratic Republic of Timor Leste.

(4) Ruling Language

Ruling Language is English.

(5) Performance Security/ Performance Bond

Minimum amount of performance bond is the percentage of the Contract Amount as the past data shown in **Attachment A** attached hereto.

(6) Delay Damages for the Work/Liquidated Damages

The Liquidated Damages for the whole works are 0.1% of the final Contract Price per day, as the past data shown in **Attachment A** attached hereto.

(7) Maximum Amount of Delay Damages

The Maximum amount of delay damages/liquidated damages for the past projects are shown in **Attachment A** attached hereto.

(8) Provisional Sum

The Provisional Sum for the past projects is shown in **Attachment A** attached hereto.

(9) Total Advance Payment

The Total Advance Payment for the past projects is shown in **Attachment A** attached hereto.

(10) Percentage of Retention

The Percentage of Retention for the past projects is shown in **Attachment A** attached hereto.

(11) Limit of Retention Money

The Limit of Retention Money for the past projects is shown in **Attachment A** attached hereto.

(12) Minimum Amount of Interim Payment Certificates

The Minimum Amount of Interim Payment Certificates for the past projects is shown in **Attachment A** attached hereto.

1.1.5 Technical check using checklist

ADN will technically verify those documents as BOQ, Drawings and Specifications, using **Checklist C**.

Checklist C1 is used for bridge projects and C2 for road projects.

1.1.5.1 Bridge Project (Checklist C1)

(1) Road Classification

Confirm class of the road connecting with the bridge;

1)National Road,

2)District Road or

3)Rural Road

(2) Live Load

Confirm that the live load category used in the design is adequate to the road class.

In case of national road, the bridge is preferably designed by Class A of the Indonesian "Bridge Design Code MBS" shown in the table below;

Road Class	Width (m)			Live Load
	Left	Roadway	Right	

	Footway		Footway	
Class A	1.0	7.0	1.0	BM-100
Class B	0.5	6.0	0.5	BM-100
Class C	0.5	4.5	0.5	BM-70

Note: the widths shown above are the minimum.

(3) Bridge Width

It is preferable to design in accordance with the table above.

(4) Constraint against Bridge Plan

1)Aerial Cable

If there are cables which may impede construction of the bridge or traffic after completion, confirm to LM that the cables can be removed or relocated,

2)Burial Cable/Pipe

If there are water/communication pipes which may be affected during or after completion, confirm to LM that the pipes can be removed or relocated.

3)Land Acquisition

Confirm to LM that there is no private land that may affect the construction.

(5) Geotechnical and Topographical Survey

1)Geotechnical Survey

ADN will confirm that a Geographical Survey was completed and the result was reflected in the design detail.

2)Topographical Survey

ADN will confirm that Topographical Survey was completed and the results were reflected in the design detail.

(6) Materials

1) Structural Concrete

Refer to the specifications below or some other specifications commonly used;

ⅰ) ITEM 506-Structural Concrete, "Standard Specifications, Roads, Bridges and Airport, MTCPW, 2005"

ⅱ) Section 7.1 Concrete & Section 7.2 Prestressed Concrete, "General Specifications, August 2010, The Eastern Indonesian National Road Improvement Project"

2) Reinforcing Steel

Refer to the specifications below or some other specifications commonly used;

ⅰ) ITEM 505-Reinforcing Steel, "Standard Specifications, Roads, Bridges and Airport, MTCPW, 2005"

ⅱ) Section 7.3 Reinforcing Steel, "General Specifications, August 2010, The Eastern Indonesian National Road Improvement Project"

(7) Countermeasures against River Flow

1)Protection of Abutment/Pier

Ask LM how abutments and piers are properly protected.

2)Freeboard

Ask LM how much is the freeboard, clearance between the high water level and the soffit of the bridge. It depends on discharge of the river, but it should be more than 1.0m against flood.

(8) Drawings

1)Major dimensions

Verify major dimensions such as bridge and span length, cross-section and vertical free head room as below;

-Bridge and Span Length

Is the relation between bridge length and span length correct?

-Cross-section

Is width of footway and roadway true to the road class?

-Vertical head room

In case of through bridge such as warren truss bridge, there should be enough room above vehicles passing the bridge. Usually it is preferable to have vertical clearance more than 5.0m above top of the pavement.

Road Class	Width (m)		
	Left Footway	Roadway	Right Footway
Class A	1.0	7.0	1.0
Class B	0.5	6.0	0.5
Class C	0.5	4.5	0.5

Note: the widths shown above are the minimum.

2)Contents of Drawings

Usually drawings of bridge structure have these contents as below:

-General View
-Location Map
-Details of Superstructure
-Details of Expansion Joints
-Details of Bearings
-Details of Drainage System
-Details of Substructure (Abutments/Piers)
-Details of Foundations
-Details of Bank Protection, Revetment
-Details of Access Road

3)Notes

Pay attention on "Notes" shown on the drawing and verify them, where these descriptions frequently found:
-Concrete Grade,
-Minimum cement content
-Maximum W/C ratio
-Properties of rebars
-Clear concrete coverage
-Standard rebar length

(9) Bill of Quantities

Generally Bill of Quantities consists of these items below;
1)General Requirement
2)Earthworks
3)Surface Course
4)Sub-base and Base Course
5)Bridge Construction
6)Drainage and Slope Protection
7)Miscellaneous Structure
8)Dayworks

-Out of these items, select some major items and ask LM how they work out the quantities, unit prices and amounts.

(10) Design Standards

Ask LM which design standard is used for the design,
-AASHTO Code" Standard Specifications for Highway Bridges", 16th Edition, 1996,
-Bridge Management System- Bridge Design Code (Indonesia), or
-Other Standards

(11) Technical Specifications

Ask LM which technical specification is used for the construction,
-The Ministero das Obras Publicas "Standard Specifications, for Roads, Bridges and Airport, 2005", or
-Other Specifications

1.1.5.2 Road Project (Checklist C2)

(1) Road Classification

Verify the road class and the width. Principally Class A Corresponds to National Road, Class B to District Road, and Class C to Rural Roads.

Road Class	Width (m)			
	Shoulder	Roadway	Shoulder	Total
Class A	1.0	7.0	1.0	9.0
Class B	0.5	6.0	0.5	7.0
Class C	0.5	4.5	0.5	5.5

Note: the widths shown above are the minimum.

(2) Design Load

Is wheel load used for the design proper? Ask LM how they decided the load.

(3) Construction Schedule

In Tender Documents, there should be a description of Construction Period.

Ask LM to show the construction schedule on which the Construction Period was decided, and confirm that rainy season is considered.

(4) Scope of Work

Verify the beginning point, end point and the total distance.

(5)Geometric Design

1) Minimum Curvature

Is the minimum curvature enough for the purposes of the Project?

Ask LM under which geometric design standard the curvature was decided.

Refer to "Road Geometric Design Standards, MOI, July 2010".

2) Steepest Gradient

Is the steepest gradient enough for the purpose of the Project?

Ask LM under which geometric design standard the gradient was decided.

Refer to "Road Geometric Design Standards, MOI, July 2010".

(6) Drainage System

Verify that type, dimension, and arrangement of drainage system are properly designed.

(7) Retaining Wall

Verify that retaining walls with proper type and dimension are arranged at proper locations.

(8) Culvert

1) Confirm that the earth covering over the culvert is enough.

2) Confirm that type and dimension of the culvert is proper.

(9) Alternative Roads

Confirm how the traffic will pass during the work in case of rehabilitation of existing road, or existence of alternative roads.

(10) Land Acquisition

Confirm that all the lands required for the work have been acquired.

(11) Geological Conditions

Confirm that there is no adverse geological conditions. If there are such problems as may result in landslide or soft soil, ask LM what countermeasures they will consider.

(12) Drawings

Verify that major dimensions such as length of roadway, width of roadway and shoulder comply with the road class and other tender

documents.

Also confirm that there are enough contents of drawings to construct the bridge?

(13) Bill of Quantity

Check quantities, unit prices and amounts of several major items?

It is recommended that unit cost per kilometer of each road construction work is recorded for the future so that rough evaluations of similar road projects can be undertaken.

1.1.6 Hearing from LM

ADN will hear from LM how they reach their final solution, in other words, whether they compared with other alternatives.

It is very tough to verify bulky Tender Documents received within a few days of . So it is very much recommendable for ADN's young engineers to study tender documents and prepare questions in accordance with this manual using the Check list attached hereto by himself beforehand, to call LM engineer and design consultants to ADN, and ask the questions and make considered judgements concerning the projects they are evaluating.

This will help ADN engineers to save the time for verification, and enhance their capacity.

1.1.7 Verification Schedule

ADN will prepare aschedule, which enables the ADN staff to complete verification work within the time set.

Verification schedule for the Tender Documents is very tight, only 10 calendar days after receiving the documents is given at present.

It is recommended to prepare schedules for the verification process, and follow the schedule by proceeding through the verification of projects one by one..

A sample of Verification Schedule is shown below for 10-day operation.

[1st to 3rd day]

(1)Check whether all the required documents are delivered using Checklist A.

If not, inform LM that the documents are not enough, and verification will start from the day proceeding the receipt of adequate documents.

(2)When all the required documents are delivered, start verifying Payment Conditions/Appendix to Tender/Particular Conditions, in accordance with this Manual using Checklist B.

(3)Prepare questions in accordance with this Manual using Checklist C, C1 for bridge project, C2 for road project.

(4)Arrange interviews with LM and his consultant for technical questioning on the Second day.

[4th to 6th day]

(1)Ask the questions on technical matters you prepared.

(2)If their answers are not satisfactory or the answer is not clear enough due to the lack of data, ask them to prepare enough data to provide an adequate explanation and then arrange a further interview. The day of the next interview is the second day of the verification.

(3)Tell LM to complete all the corrections, and resubmit them.

[7th to 10th day]

(1)Verify only the corrected portion, and send them to NPC, when the corrected documents are delivered.

(2)In case that the correction is not satisfactory, do as same as (3) above.

1.1.8 Remedy

In case that some problems are found as a result of verifying the Tender Documents, ADN will inform the LM of the problem and how to improve it.

Verification work will be delayed by the time lost for resubmission.

1.1.9 FAQ (Frequently Asked Questions)

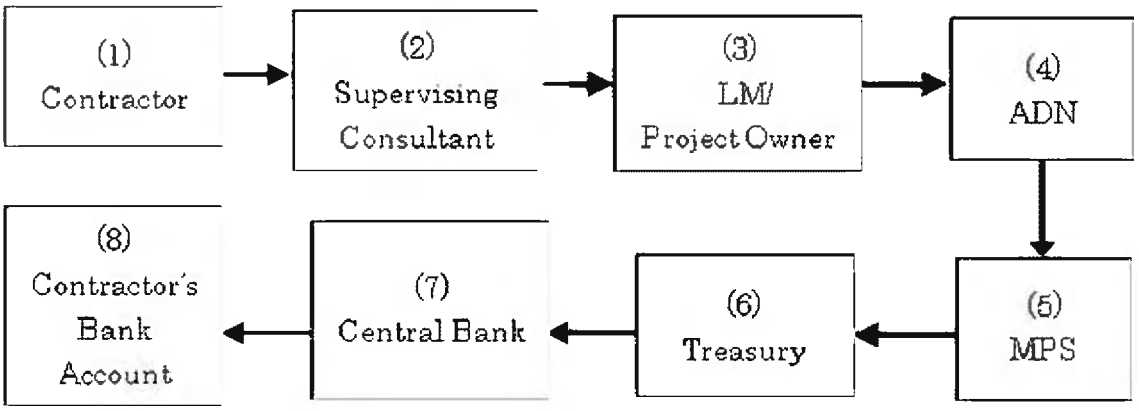
In the course of verifying tender documents, ADN engineers will have various questions and problems, and solve these with the help of their senior engineers. It is recommended for the engineers, who will have solved these problems, to keep records in a "FAQ Book".

The FAQ Book, of which samples are attached hereto as "Attachment B", may help other engineers encountering similar problems.

1.2 Project Inspection & Recommendation for Payment

1.2.1 Flow Chart

Figure 1-2Flow Chart of Tender Documents



(1) Contractor

The contractor prepares the required documents for payment, and sends them to the supervising consultant.

(2) Supervising Consultant

The supervising consultant reviews the documents, issues a Certificate for Payment when he accepts it, and sends it with other payment documents to LM/Project Owner.

(3) LM/Project Owner

The LM/Project Owner reviews the documents, approves the Payment when he accepts it, and sends one original and three copies of all the payment documents to ADN.

(4) ADN

The role of ADN is to inspect the project based on the documents and the project site situation.

(5) MPS

MPS issues Commitment, Payment Voucher and Purchase Order, and sends them to Treasury

(6) TREASURY

Treasury orders the Central Bank to pay to the contractor.

(7) CENTRAL BANK

The Central Bank remits the amount to the contractor's bank account below.

(8) Contractor's Bank Account

Contractor receives the payment in his bank account.

1.2.2 Schedule of the Work

(1) Required time for verification at ADN

ADN shall complete the inspection of a payment request within 10 calendar days after receiving officially the documents required by ADN.

(2) Time of additional submission, resubmission or answer to ADN questions

LM shall submit, resubmit or answer to ADN what was required by ADN within 10 calendar days after receiving notice of requiring further information.

(3) In case of the sub-clause (2) above, the time for ADN to complete the inspection shall be delayed by the same time as the LM has taken for the additional submission, resubmission or answer.

1.2.3 Document Inspection

(1) Confirmation of Documents submitted

ADN will receive one original and three copies of payment documents from LM/Project Owner, and check whether all the required documents shown below have been delivered using **Checklist D**. In case something is missing, ADN will inform the LM of it and instruct the LM to submit it within the specified time.

1) The Original Invoice submitted by Company
2) Submit the Original Payment Certificates 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 Physical Progress Report which is approved by the Owner of Project
5) No.TIN (Identification of the Taxpayer contributions Number)
6) Bank Account Number of company
7) Submit a valid Company Birth Certificate that has been legalized/notarised
8) Submit the Valid Economic Activity License that has been legalized/notarized.
9) Submit a valid Company Ownership License
10) If, the payment is for 100% of physical progress, it should be attached to the Terms of Pre-Handover Letter (PHO)

11) If, the Payment of retention, it should be attached to the Term of Final HandOver Letter for deduction of retention money (FHO)

(2) Confirmation of Payment conditions such as advanced payment and retention: ADN Inspector makes sure the payment conditions used for calculation of the amount to be paid are true to the description of the contract documents.

(3) Calculation in billing sheets

First of all, ADN inspector refers to the BoQ in the documents delivered from LM, and also the percentage of completed works in this period, demanded by the contractor in the invoice. Also he makes backup data according to the measurement made on his site inspection, and then calculates the quantity of each item. The formula is Progress x Total Contract Value.

(4) Confirmation of completed works in BoQ

ADN Inspector compares the amount demanded by the invoice with the amount calculated by him based on the site inspection. In case that the calculated amount differs from that of the invoice, ADN will call the contractor to show the calculated result and give him an opportunity to explain why he comes to this conclusion until the final decision is made.

(5) Confirmation of work schedule

ADN Inspector verifies the Consultant Monthly Report and compares progress of the planned schedule with the actual schedule.

1.2.4 Site Inspection

(1) Preparation

ADN sends Request of Preparation for Site Inspection to LM using **Form B**, 7 working days before the Inspection.

1) Attendants

LM will invite those persons below to the site inspection.

- Inspector from ADN
- Engineer from Line Ministry
- Supervising Consultant
- Contractor

2) Preparation

LM will arrange those below at the site inspection.

- Records on Quality Control
- Drawings
- Details of Bill of Quantities
- Measuring Devices
- Assistants for Measurement

(2) Verification of Schedule

ADN Inspector verifies the actual progress according to the Monthly Progress Report.

(3) Quality Control

Records of quality control are reviewed by ADN Inspector using **Checklist E.**

The check items in the Checklist are only samples, thus appropriate items must be added depending on the situation.

(4) Measurement of the Work Completed

The purpose of the measurement is to confirm that the actual quantity of each item completed is the same as the quantity demanded in the invoice.

Quantities of the work items completed are measured using **Checklist F.** Items in the Checklist and their explanation are only samples, and they will be changed and/or depending on the items at the time of inspection.

(5) Remedy

When ADN finds some non-conformant or unsatisfactory works, ADN shall instruct for the need to seekremedy.

1.2.5 Notice of Judgment on Payment

Finally ADN judges adequate payment amount, notices the result and recommends the payment to MPS, using **Form C.**

ADN sends one original and two copies of payment documents to MPS, and keeps one copy at the ADN Office.

1.2.6 FAQ (frequently asked questions)

In the course of inspection for payment, ADN engineers will have various questions and problems, and solve these with help of their senior engineers. It is recommended for the engineers, who will have solved these problems, to keep records in "FAQ Book" .

The FAQ Book, of which samples are attached hereto as "**Attachment B**", may help other engineers encountering similar problems.

FORM A1 (Project Outline for Bridge Project)

Date of Submission								
Project Name								
Implementing Agency					Contact Person			
Design Consultant					Contact Person			
Location of the Project								
River								
Category of Fund	Infrastructure Fund							
Category of Road	National Road		District Road		Rural Road			
Land Acquisition								
Natural Conditions Survey	Topographic Survey				Geotechnical Survey			
Live Load								
Type of Superstructure								
Type of Substructure								
Type of Foundation								
Technical Specifications								
Design Standards								
Freeboard above High Water Level	m							
Expected Schedule of Project	Start		End		Construction Period		days	
Total Amount of Estimated Cost								
Dimension of Bridge	Bridge Length	m	Span	m	Width	m		

Note; 1) LM shall fill in this form, and attach it to the Tender Documents for verification by AND

2) This form is applicable to bridge projects in other categories such as Line Ministry Fund Projects.

FORM A2 (Project Outline for Road Project)

Date of Submission								
Project Name								
Implementing Agency					Contact Person			
Design Consultant					Contact Person			
Location of the Project								
Category of Fund	Infrastructure Fund							
Category of Road	National Road		District Road		Rural Road			
Type of Pavement								
Mileage	Start		End		Total Distance		km	
Technical Specifications								
Design Standards								
Geometric Design Standards								
Steepest Gradient		%						
Minimum Curvature		m						
Expected Schedule of Project	Start		End		Construction Period		days	
Total Amount of Estimated Cost								

Note: 1) LM shall fill in this form, and attach it to the Tender Documents for verification by AND

2) This form is applicable to bridge projects in other categories such as Line Ministry Fund Projects.

FORM B (Request of Preparation for Site Inspection)

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

DATE

(TO WHOM)
LM

(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) Engineer(s) in charge from LM
   2) Supervising Consultant(s)
   3) Site Manager 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

By ADN

CC.
to Relevant Organizations if any

FORM C (Inspection Report and Recommendation for Payment)

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

No	INSPECTION REPORT AND RECOMMENDATION FOR PAYMENT				
1	Name of Project	*Sculpturing and installation of statues for santa cruz, Memorial Monument and King Dom Boaventura*			
2	Ministry/Project Owner	*Agencia Dezenvolvimento Nacional*			
3	Sources of funds (PDD I, PDD II ,MP, Emergencia, etc)				
4	Contractor	*PT. Siluet Nyoman Nuarta*			
5	PO Number (Purchase Order)				
6		a. District : Dili b. Sub district : c. Village/Hamlet :			
a	Contract Value	a	$	738.888.00	
b	Physical Progress last month	b		0.00%	
c	Physical Progress until now	c		50.00%	
d	Gross Payment until now	(c-b)*a	$	369.444.00	
e	Advance payment which received ....%	....%*a	$	-	
f	Reduction for advance payment ..%	(c-b)*e	$	-	
g	Reduction for retention 10%	0.1*d	$	36.944.40	
h	Net Payment after reduction of retention	d-g	$	332.499.60	
i	Net Payment wich will pay in this payment	h-f	$	332.499.60	
j	Total net Payment until today		$	332.499.60	
k	Balance after this payment	(100%-c)*a	$	369.444.00	
7	Observation or other comment:				
8	Recommendation to MPS-Mof/Treasurer-MdF/Ministery/Representative Agency and Quantity (USD)				
9	Observation		SIM	Any Problems & Comments	NO
a	Design?				
b	BOQ ?				
c	Technical specification				
d	Schedule of S shape curve (for MP)				
e	Payment conditions in the contract				
10	Date of inspection		Date :	Month:	Year:
11	Inspector :	Signature:			Date :
	1				
	2	Signature:			Data :
12	Verified by :	Signature:			Date :
	Eng. Alejxo A. do Carmo				
13	Q A	Signature:			Date :
	Ir. Esron St. Henuk MM, MPU				
14	Approved by :	Signature:			Date :
	Sr. Samuel Marçal Directur Geral - ADN				
15	Annex :	Pictures from the project site			

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 Public Works 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.

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

INFRASTRUCTURE FUND	CHECKLIST B (Conditions of Contract)			Verified by	Approved by
Type of Project	General	Objective	Conditions of Contract)		

Contract No.			Submit Date	
Project Name			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?			**Past Common Data**
1	Time for completeion/Construction Period			Detailed Time Schedule Hearing from LM Past Data
2	Maintenance Period/Defect Notification Period			Hearing from LM Past Data
3	Governing Law			The Law of Democratic Republic of Timor Leste
4	Ruling Language			English
5	Performance Security/Perfirmance Bond			5-10% of Contract Amount
6	Delay damanges for the Work/Liquidated Damages			0.1%/day
7	Maximum amount of delay damages			5-10% of Contract Amount
8	Provisional Sum			15%
9	Total Advance Payment			10-20%
10	Percentage of Retention			5-10%
11	Limit of Retention Money			5-10%
12	Minimum Amount of Interim Payment Certificates			1-5%

Note: These past data of contract conditions can also be used as reference to other Infrastructure Fund Projects than road and bridge project.

INFRASTRUCTURE FUND	CHECKLIST C1(Technical Verification for Bridge)			Verified by	Approved by
Type of Project	Bridge	Objective	Technical Verification for Bridge		

Contract No.		Submit Date	, 2012	
Project Name		Stage	Verification of Tender Documents	
Implementing Agency				

	Check Item	Check Point	Check Date	Check Mark	Remarks
					Referred Data
1	Road Classification	Road classification was confirmed?			Hearing from LM
2	Live Load	Is the adopted live load adquate to the load class?			Hearing from LM
3	Bridge Width	Are the carriage width and number of lanes appropriate?			Hearing from LM
		Is the width of footpath appropriate?			Hearing from LM
4	Constraints against bridge plan	Is it confirmed that there's no arial power/communication cable above the bridge location?			Hearing from LM
		Is it confirmed that there's no burial cable nor pipe?			Hearing from LM
		Is it confirmed that there's no land acquisition issue?			Hearing from LM
5	Geotechnical & Topographical Survey	Was topographica survey carried out, required for the detailed design?			Hearing from LM
		Was geotechnical survey carried out, required for the detailed design?			Hearing from LM
6	Materials	Are concrete strengths adequate? Are strengths of reinforcing steel bars adequate?			Hearing from LM
7	Countermeasures against River Flow	Is protection of abutment/pier properly considered?			Hearing from LM
		Is freeboard, clearance below soffit above high water level, enough?			Hearing from LM Refer to Materials of Bridge Classroom Lesson (2)
8	Drawings	Verify major dimensions.			Drawings Refer to Materials of Bridge Classroom Lesson (2)
		Are there enough contents of drawings to construct the bridge?			
		Is vertical clearance between the deck and the upper cross frame enough for the vehicle in case of deck-type truss?			
9	Bill of Quantities	Check quantities, unit prices and amounts of several major items?			BoQ/Hearing from LM Refer to Materials of Classroom Lesson (5)
10	Design Standards	Check which Design Standard is adopted.			
11	Technical Specifications	Check which Technical Specification is adopted.			Refer to Materials of Bridge Classroom Lesson (5)

Note: This Checklist can be used as reference to bridge project in other categories such as Line Ministry Fund Project.

INFRASTRUCTURE FUND	CHECKLIST C2 (Technical Verification for Road)			Verified by	Approved by
Type of Project	Road	Objective	Technical Verification for Road		

Contract No.				Submit Date	
Project Name				Stage	Verification of Tender Documents
Implementing Agency					

	Check Item	Check Point	Check Date	Check Mark	Referrence
1	Road Classification	What is the class of the road ?			Hearing from LM
2	Design Load	What design load is used for design of the road?			Hearing from LM
3	Construction Schedule	Is the construction periode appropriate?			Hearing from LM Detailed Time Schedule
4	Scope of Work	Confirm origin, end and length of the road.			Hearing from LM Drawings
5	Geometric Design	Is the minimum turning curvature proper?			Hearing from LM Refer to Material for Bridge Classroom Lesson (7)
		Is the steepest gradient proper?			
6	Dranage System	Is the drainage system proper?			Hearing from LM
7	Retaining Wall	Are location, type, height of the retaining walls proper?			Hearing from LM Drawings
8	Culvert	Is the earth covering over the culvert?			Hearing from LM Drawings
		Is type and dimension of the culvert proper?			Hearing from LM Drawings
9	Alternative Road	In case of Rehabilitation of existing road, is there an alternative road?			Hearing from LM Drawings
10	Land Acquisition	All the required lands are acquired?			Hearing from LM
11	Geological Conditions	Is soft ground or landslide considered?			Hearing from LM
12	Drawings	Verify major dimensions.			Drawings
		Are there enough contents of drawings to construct the bridge?			Drawings
13	Bill of Quantities	Check quantities, unit prices and amounts of several major items?			Drawings, BoQ Hearing from LM

Note: This Checklist can be used as reference to road project in other categories such as Line Ministry Fund Project.

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 inspection of payment of Infrastructure Fund project of Road, Bridge, Port & Irrigation.

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 Weekly Progress Report			
12	International Company should attached the certificates from International Standard Organization (ISO)			

Note: This checklist is used to confirm that all the required documents are submitted for inspection of payment of Infrastructure Fund project of Buildings.

INFRASTRUCTURE FUND	CHECKLIST E (Quality Control)			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			506.4.1 Table 506.2 RED BOOK, MTCPW, 2005
2		Slump Loss			506.4.1 Table 506.2 RED BOOK, MTCPW, 2005
3		Designated Size of Coarse Aggregate			506.4.1 Table 506.2 RED BOOK, MTCPW, 2005
4	Rebar	Usually deformed bar for concrete reinforcement is used in accodance with AASHTO M 31 (Grade 400)			911.1 RED BOOK, MTCPW, 2005
5	Weep Holes	Weep holes on walls are usually spaced not more than 2 meters center to center and the diameter is 50mm.			606.3.7 RED BOOK, MTCPW, 2005
6	Cement	Portland cement , AASHTO M85, is frequently used for structural concrete.			901.1 RED BOOK, MTCPW, 2005
7	Piling	Scope, test piles and load tests			ITEM 501 RED BOOK, MTCPW, 2005
8	Subgrade	Subgrade surface tolerances			206.3.2 RED BOOK, MTCPW, 2005
9	Subbase	Material Requirements for Subbase			301.2 RED BOOK, MTCPW, 2005
10		Subbase surface tolerances			301.3.5 RED BOOK, MTCPW, 2005
11	Base Course	Material Requirements for Base Course			302.2 RED BOOK, MTCPW, 2005
12		Base Course surface tolerances			302.3.5 RED BOOK, MTCPW, 2005
13	Surface Course	Aggregate Surface Course			401 RED BOOK, MTCPW, 2005
14		Bituminous Surface Treatment			405 RED BOOK, MTCPW, 2005
15		Bituminou Penetration Macadam Pavement			406 RED BOOK, MTCPW, 2005
16		Bituminou Road Mix Surface Course			407 RED BOOK, MTCPW, 2005

Note: 1) When using this checklist, also refer to materials of Bridge Classroom Lesson (5).
2) This Checklist can be used as reference to road and bridge project in other categories such as Line Ministry Projects.

Infrastructure Fund	CHECKLIST F (Measurement)			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 Quantiites
2	Pavement	Measure length and width of the work completed in this period, calculate the pavement area			Drawings & Bill of Quantiites
3	Drainage Cleaning	Measure length of the draingage cleaning work completed in this period			Drawings & Bill of Quantiites
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 Quantiites
5	Railings	Measrue total length and number of Guide Post			Drawings & Bill of Quantiites
6	Road Marking	Measure total length			Drawings & Bill of Quantiites
7	Road Signs	Count number of road signs			Drawings & Bill of Quantiites
8	Wing Wall	Measure dimensions and compare with the drawings			Drawings & Bill of Quantiites
9	Deck Slab	Measure dimensions and compare with the drawings			Drawings & Bill of Quantiites
10	Approach Slab	Measure dimensions and compare with the drawings			Drawings & Bill of Quantiites

Note: This Checklist can be used as reference to road and bridge project in other categories such as Line Ministry Projects.

Attachment A (Past Data of Contract Conditions)

Table A

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
Maximum 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%

Note: These past data of contract conditions can also be used as reference to other Infrastructure Fund Projects than road and bridge project.

Attachment B1 FAQ Book

FAQ Book

Who encountered problems or questions, and found solutions/answers shall keep records to help his colleagues who may encounter similar problems in the future.

Project Name		Tono Bridge		
☐ Road	☑Bridge	☐Irrigation	☐Port	☐Others
Verification of Tender Documents		☐Inspection for Interim Payment		
Name	XXX	Date	04 Sept. 2013	
Problems or Questions encountered				
Problem/Question The drawings of the bridge show that the bridge length is 360 meters, but on the hand width of the river to cross seems almost 500 meters. How the bridge length should be decided?				
Solutions or answers found				
Solution/Answer Usually it is desirable that the bridge is equal to or longer than the river width. But taking into consideration the fact that constructing long bridge is expensive, strong and safe bank protection may be reasonable. Before deciding bridge length, the two alternatives, longer bridge or safe bank protection, should be compared.				
Name of Senior Engineer to consult with	Mr. YYY			

Attachment B2 FAQ Book

FAQ Book

Who encountered problems or questions, and found solutions/answers shall keep records to help his colleagues who may encounter similar problems in the future.

Project Name		XXX Bridge		
☐Road	☑Bridge	☐Irrigation	☐Port	☐Others
Verification of Tender Documents		☐Inspection for Interim Payment		
Name	XXX	Date	04 Sept. 2013	
Problems or Questions encountered				
Problem/Question In a drawing of bridge, elevation of the road surface is shown. How shall we verify the elevation is reasonable?				
Solutions or answers found				
Solution/Answer At least the three points mentioned below shall be checked; 1) Vertical curve of the road elevation on the bridge should connect smoothly with that of the access road? 2) Elevation of the road surface on the bridge high enough than that of the access road. Otherwise, there may be a puddle on the middle of the bridge after rain. 3) Bottom of the bridge structure should be at least one meter higher than the high water level of the river.				
Name of Senior Engineer to consult with		Mr. YYY		

Attachment B3 FAQ Book

FAQ Book

Who encountered problems or questions, and found solutions/answers shall keep records to help his colleagues who may encounter similar problems in the future.

Project Name		Tono Bridge		
☐Road	☑Bridge	☐Irrigation	☐Port	☐Others
Verification of Tender Documents		Inspection for Interim Payment		
Name	XXX	Date	04 Sept. 2013	
Problems or Questions encountered				
Problem/Question Is there any good method of checking roughly the construction cost of a bridge delivered to ADN from LM for verification of the Tender Documents?				
Solutions or answers found				
Solution/Answer Unit cost, total construction cost divided by bridge road surface area, of the New Comoro bridge is more than $8000 per square meter of the road surface area. It is apparently expensive from the past experience. It is recommended that ADN will collect the unit cost of the bridges, with which a unit cost of a new bridge is compared and checked if it is not too far from the accumulated data.				
Name of Senior Engineer to consult with	Mr. YYY			

2. PDID Project

2.1 Project Evaluation before Contrac

2. PDID Project

2.1. Project Avaluation before Contract Award

2.1.1 Flow Chart

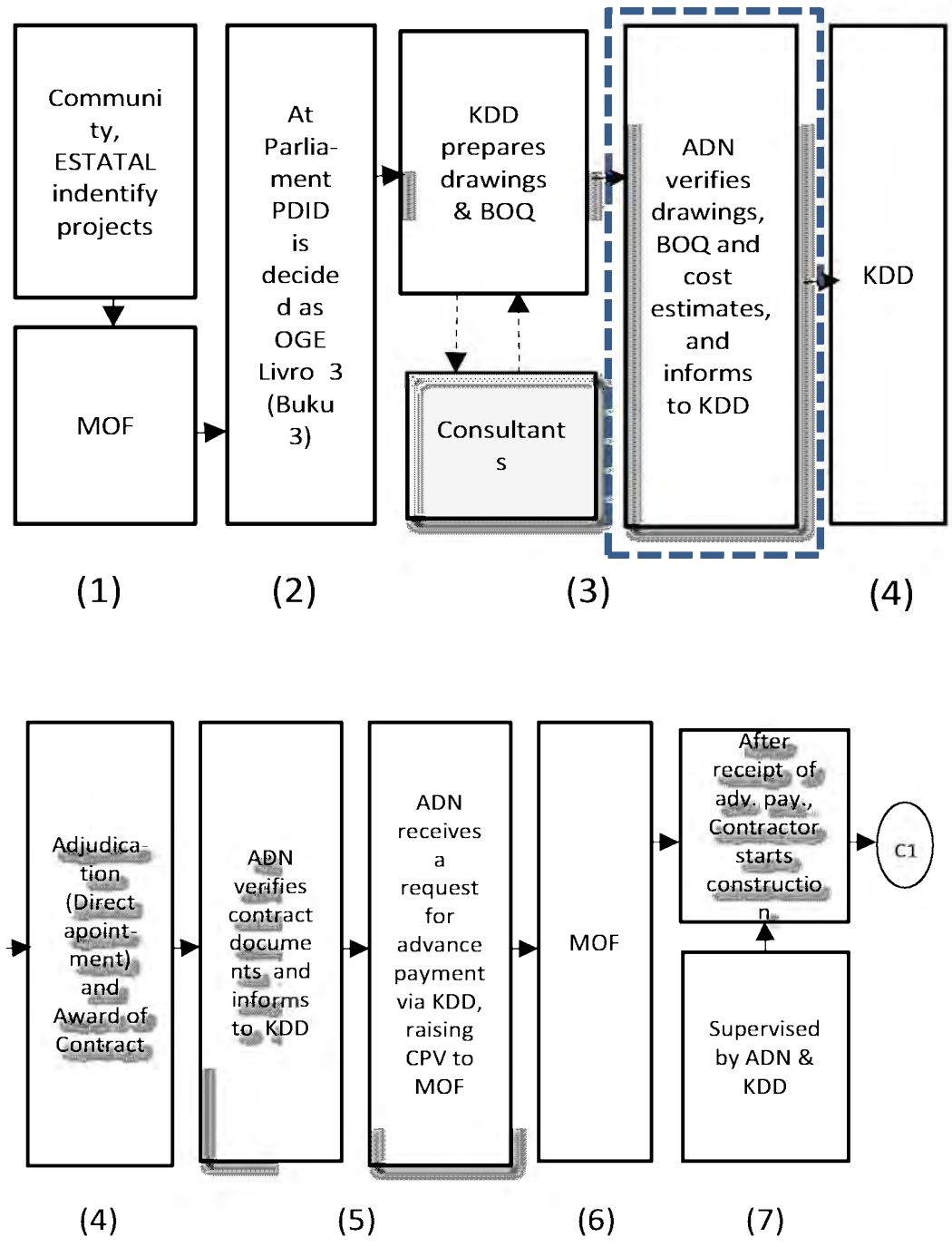


Figure 2-1. Flow Chart of Project Evaluation before Contract Award

(1) Project Identification by ESTATAL for Submission to MoF
Community gives proposal to ESTATAL for project identification as PDID. ESTATAL submit outcome of project identification to MoF for realization of the plan and budget allocation to be registered on a list of PDID's.

(2) Parliament Approval
MoF, after realization of the plan and budget allocation, prepares project lists (Libro Tres) and submits them to Parliament for official approval so that PDID projects may be implemented on a district basis.

(3) Design and BOQ Verification by KDD
KDD and/or Consultants will prepare design and BOQ, for submission to ADN which verifies appropriateness of the project, and soundness of BOQ and project cost.

(4) Verification Results
The verification results are submitted to KDD which prepares contract documents and proceeds to a contract award with the contractor for project initiation.

(5) Verification of the Contract Documents by ADN
ADN (ADN Engineers in District) verifies the contract documents and inform KDD of appropriateness of the documents prepared on sound engineering basis. ADN prepares CPV (Commitment Payment Voucher) to process 25 % of advance payment.

(6) ADN and MoF
ADN prepares both CPV and PO (Purchase Order) for submission to MoF (Treasury). In review of them, MoF sends them to BC (Timor Leste Central Bank) which proceeds to remit a sum of advance payment to the contractor's bank account.

(7) Contractor and ADN
The contractor receives the advance payment from the bank, to initiate the work. Entire works shall be completed within a construction period set forth in the Contract. Throughout the period of PDDII, ADN monitors and supervises progress of the Projects.

2.1.2 Schedule of the Work

(1) Required time for verification at ADN
ADN shall complete the verification of draft contract document within three 3 days after officially receiving them from KDD.

(2) Time of additional submission, resubmission or answer to ADN questions
KDD shall submit, resubmit or answer to ADN within one (1) week after issuance of notice by ADN that requests further information.

(3) In case of the sub-clause (2) above, the time for ADN to complete the verification shall be delayed by the same time as the KDD takes for the additional submission, resubmission or answer.

2.1.3 Confirmation of Documents submitted (Applicable to Rural Water Supply Sector)

ADN will check if all the required documents have been received. In case some are missing, ADN will inform KDD of it and instruct KDD to submit within the specified time.

(1) Project Outline prepared by KDD

This is basic information required for verification by ADN. KDD shall prepare outline of the project in **Form-A** and **Form-B**.

(2) Draft Contract Documents:

ADN will confirm the required documents are submitted, using **Checklist-A**.

1) Project Advertisement
2) Conditions of Contract
3) Contract Data
4) Bill of Quantity
5) Technical specifications
6) Drawings
7) Others, if necessary

2.1.4 Technical check using checklist (Applicable to Rural Water Supply Sector)

ADN will technically verify those documents as BOQ, Drawings and Specifications, using **Checklists B1 to B3 for Rural Water Supply Sector.**

Checklists B1 and B2 are prepared to check and verify contents of technical specification and BOQ respectively, from engineering points of view. As a review of the guideline of the standard technical specification, BOQ and drawings for RWS (Rural Water Supply) is currently underway by DNSA, these checklists shall be revised accordingly after completion.

Checklists B3-1 to B3-2 relate to planning and design aspects of the RWS. Checklist B3-1 is specifically for the RWS depending on spring/riverbed water as its water source, while B3-2 for those depending on hand pumps or hand dug wells.

2.1.5 Hearing from KDD

ADN will hear from KDD how they reached their final decision, in other words, whether they compared with other alternatives. Data and information required for verification of draft contract documents are specified in the table of forms and checklists above.

2.1.6 Verification Schedule

ADN shall verify all draft contract documents within three (3) working days

using Forms A to B and Checklists A to C. In case the documents are incompletely submitted or not in accordance with the ADN Manual, ADN will take proper procedures for clarification including issuance of a letter of clarification and arrangement of meeting for confirmation with KDD.

2.1.7 Remedy

In case some problems are found in the Draft Contract Documents, ADN shall inform KDD of the problem and how to improve it. Verification process will be delayed accordingly.

2.1.8 FAQ (frequently asked questions)

In the course of verifying tender documents, ADN engineers will have various questions and problems, and solve these with the help of their senior engineers. It is recommended for the engineers, who will have solved these problems, to keep records in "FAQ Book".

The FAQ Book, of which samples are attached hereto as "Attachment B", may help other engineers encountering similar problems.

2.2 Project Inspection for Payment & Recommendation for Payment

2.2.1 Flow Chart

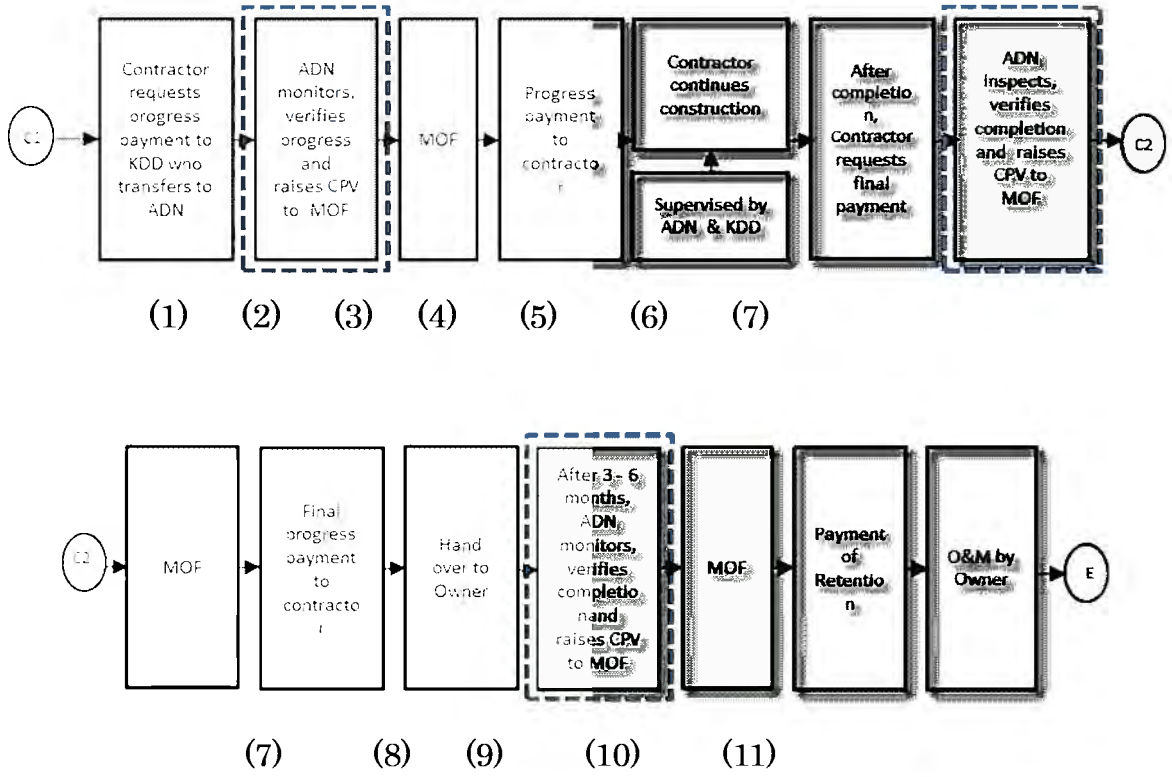


Figure 2-2. Flow Chart of Payment

(1) Request of Progress Payment by the Contractor
The Contractor requests the progress payment to ADN through KDD.

(2) Monitoring by ADN
Contractor requests progress payment to KDD which is transfered to ADN. Upon its receipt by ADN, ADN engineer/s monitor and inspect progress of the work at the project site, preparing a payment certificate for the progress when verified reasonable and making the recomendation to ADN(finance) for processing of payment.

(3) Preparation of CPV & Submission to MoF by ADN
ADN engineer prepares a form of recomendation for the progress payment to ADN(finance). ADN (finance) prepares CPV based on the recomendation for submission to MoF (Treasury).

(4) Payment Procedures by MoF
MoF make a review of the CPV and the recommendation by ADN. MoF sends it to BC which proceeds to remit a sum of advance payment to the contractor's bank account.

(5) Continuation of the Work by Contractor
The Contractor receives the progress payment from the bank for continuation of the work. During the construction period, ADN & KDD

cooperate to monitor and supervise the work.

(6) Submission of Request for Final Progress Payment by the Contractor

If the physical progress of the construction reaches 100%, the Contractor requests final progress payments to ADN through KDD. The ADN engineer then carries out the site inspection for verification and recommendation to ADN (finance), which will prepare CPV for processing of the final payment.

(7) ADN & MoF

Based on a request by the Contractor and recomendation by ADN engineer, ADN (finance) prepares CPV to submit to MoF (Treasury) for final progress payment.

(8) Hand Over

When construction has been reached to 100% and progress payment also has been reached to 100%, all the facilities are provisionally handed over to the project owner.

(9) Retention

If any defects or deficiency have not been found within a period of 3-6 months after the hand over to the owner, the Contractor would request retention payment to KDD. KDD then reports to ADN for inspection. Based on results of the inspection, the ADN engineer prepares a form of recomendation for payment retention to submit to ADN (finance).

(10) Preparation of CPV by ADN

Based on recomendations by the ADN engineers, ADN (finance) prepares CPV and submits it to the MoF (Treasury) for processing retention payments to the Contractor.

(11) Operation and Maintenance

Project owner initiates operation and maintenance of the completed facilites handed over by the Contractor.

2.2.2 Schedule of the Work

(1) Required time for verification at ADN

ADN shall complete the verification of the document for payment request within 10 working days after officially receiving them.

(2) Time of additional submission, resubmission or answer to ADN questions

KDD shall submit, resubmit or answer to ADN within 10 working days after issuance of notice by ADN that requests further information.

(3) In case of the sub-clause (2) above, the time for ADN to complete the verification shall be accordingly adjusted as the amount of time that KDD takes for the additional submission, resubmission or answer.

2.2.3 Document Inspection (Applicable to Rural Water Supply Sector)

(1) Confirmation of Documents submitted:

ADN will check if all the required documents have been received using **Checklist-C**. In case something is missing, ADN will inform KDD of it and instruct KDD to submit it within the specified time.

1) A letter of request payment from Contractor

2) Request letter of verification from KDD to ADN
3) Parts of Contract Document, showing the contract amount and payment conditions
4) Bill of Quantities showing unit prices and quantities
5) Progress report showing actual/planned work progress change orders or variation, progress photographs and legal documents of Contractor
6) Site Inspection Report by KDD
7) Certificates of negotiation license and dividends
8) Digital data of BOQ

(2) Confirmation of Payment conditions for advanced payment and retention

ADN inspector makes sure the payment conditions used for calculation of the amount to be paid are in compliance with the description of the contract documents.

(3)Calculation in billing sheets

ADN inspector refers to the BOQ in the documents delivered from KDD, and also percentage of completed works in this period, demanded by the contractor in the invoice. Also he makes backup data according to the measurement made on his site inspection, and then calculates the quantity of each item. The formula is Progress x Total Contract Value.

(4) Confirmation of completed works in BOQ, drawings and photos

ADN inspector in cooperation with KDD engineer compares the amount demanded by the invoice with the amount calculated by him based on the site inspection. In case that the calculated amount differs from that of the invoice, ADN will call the contractor to show the calculated result and give him an opportunity to explain why he comes to this conclusion until the final decision is made.

(5) Confirmation of work schedule

ADN Inspector verifies the Contractor Monthly Report and compares progress of the planned schedule with the actual schedule.

2.2.4 Site Inspection (Applicable to Rural Water Supply Sector)

(1) Preparation

1) Attendants

KDD shall invite those below to the site inspection.

- Inspector from ADN
- Engineer from KDD
- Contractor

2) Preparation

KDD shall arrange those below at the site inspection.

- Records of Quality Control
- Drawings
- Details of Bill of Quantities
- Measuring Devices
- Assistants for Measurement

(2) Quality Control

Records of quality control are reviewed by ADN using **Checklist-D.**
The check items in the Checklist are only samples, thus appropriate items must be added depending on the situation.

(3) Measurement of the Work Completed
The purpose of the measurement is to confirm that the actual quantity of each item completed is the same as the quantity demanded in the invoice.
Quantities of the work items completed are measured using **Checklist-E.**
Items in the Checklist are only samples, and they will be changed and/or depending on the items at the time of inspection.

(4) Hearing from KDD engineer
ADN shall hear from KDD when deemed necessary.

(5) Remedy
In case ADN finds some faulty or unsatisfactory work, ADN may instruct the remedy.

(6) Inspection Report and Recommendation
ADN shall prepare Inspection Report and Recommendation for the payment to MoF: **Form B.**

2.2.5 Notice of Judgment on Payment

Finally ADN shall judge the payment amount. Based on the judgment made by ADN engineer, ADN (finance) raises notice (CPV) to MOF for commitment of funds.

2.2.6 FAQ (frequently asked questions)

In the course of verifying tender documents, ADN engineers will have various questions and problems, and solve these with help of their senior engineers. It is recommended for the engineers, who will have solved these problems, to keep records in "FAQ Book".

The FAQ Book, of which samples are attached hereto as "Attachment B", may help other engineers encountering similar problems.

Annex 2. (PDID)
Form-A (Project Outline prepared by LM)

PDID	Form A			Prepared by	Approved by
Type of Project	Water Supply	Objective	Project Outline		

Contract/Project No.		Date of Submission	_____, 201_
Project Name/Location		Stage	Verification of Draft Contract Documents
Consultants	Implementing Agency		

(Existing conditions)

Number of households	
Major water sources:	
Major income sources:	
Health conditions:	
Other salient features:	

(Construction Schedule)

Supervised by:	
Project cost:	
Construction period:	
Expected starting date:	
Expected completion date:	

(Photo- Water source)

(Photo-Project area)

(Water supply plan)

Target year:	
Water source:	
Yields:	
Number of households to be serviced:	
Supply pattern (house connections and/or public taps):	
Unit water consumption:	
Future water demand:	
Intake method:	
Number of tanks, BTPs, reservoirs to be constructed:	
Length of transmission main:	
Length of distribution mains:	
Number of public taps:	

(Contract conditions)

Expected date of Advertisement	
Advance payment(%):	_____(%)
Retention (%):	_____(%)
Documents reviewed by ADN:	within three days
Reply or resubmission by KDD/LM after official request:	within one week
Verification by ADN after receipt of peyment request:	within ten(10) working days
Reply or resubmission by KDD/LM after receipt of official request:	within ten(10) working days

(Sketch of Project Outline)

Form-B (Inspection Report and Recommendation for Payment)

Form B

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 : Covalima			
		b. Sub District : Fatumea			
		c. Villag/Hamlet : Belulic Leten			
a	Contract Value	a	$	180,000.00	
b	Progress for previous payment	b		83.00%	
c	Progress for this payment	c		90.00%	
d	Gross Payment until now	(c-b)*a	$	12,600.00	
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	$	12,600.00	
i	Release for (50%) previous retention	h-f	$	12,600.00	
j	Total Net Payment until now		$	162,000.00	
k	Balance after this payment	(100%-c)*a	$	18,000.00	
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			

Checklist-A (Documents to be submitted)

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			

PDID	CHECKLIST B1			Verified by	Approved by
Type of Project	Water Supply	Objective	Technical Specification		

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
Purpose and Use	Does the Specification cover all aspects of the civil work required for implementing the project?			
Codes and Standards	Are all Standards and Codes of Practice used in the Specification those internationally accepted and clearly stated their sources for reference?			
Name and Abbreviation	Are name and abbreviation of the relevant agencies, committees, organization and/or standards stipulated in the technical specification updated to the latest?			
Outcome of Surveys, Measurement and Testing	Is outcome of site surveys, measurement and testing executed in the course of the project design attached to the documents so as to comply with the quality assurance and control requirements specified in General Conditions of Contract?			
Safety	Are all works executed so as to comply with the safety requirements set out in the Contract and any specified safety requirements?			
Access	Are temporary access roads to and from the Site provided?			
Signboards	Are signboards provided and erected by the Contractor for safety and warning signs?			
Figures and Tables	Are figures and tables indicated in the technical specification attached in the text or shown clearly their sources?			
Environmental Requirements	Are all works executed so as to comply with the environmental requirements set out in any specific environmental requirements?			

PDID	CHECKLIST B2			Verified by	Approved by
Type of Project	Water Supply	Objective	Bill of Quantity		

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
Work items	Are work items listed in the BOQ those of civil works and/or materials required for construction of project facilites, including mobilization, preparatory works, test operation and demolition?			
	Do all work items/materials specify their quality referring to class, strength or standards, and conform to the requirements set forth in the technical specification?			
Quantity	Is quantity of civil works and materials based on drawings, measurement and survey results provided by the contractor?			
Unit Price	Is unit price based on "Unit Cost Analysis" provided by ADN or unit cost estimated on the sound basis?			

PDID	CHECKLIST B3-1			Verified by	Approved by
Type of Project	Water Supply - spring/river bed water	Objective	Planning and Design		

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
Project concept	Is the project proposed in accordance with Government Strategy (rural and urban water supply development strategy)?			
Coordination	Was all coordination made between the relevant agencies?			
Project area	Are data/information available, including; ☐ number of present population and households, ☐ major income sources, ☐ development history of the villages/towns, ☐ rainfalls?			
	Are the area frequently affected by natural disaster like ☐ floods or ☐ landslides?			
Project target	Target year: _____			Annex: Project target No.1
	Number of households to be served: _____			
Existing condition	Are data are available on:			
	☐ What are the present water sources for people's daily lives?			
	☐ What are their major problems (☐quantity, ☐quality, ☐distance)?			
	☐ What are health condition of the people? (morbidity rate of water borne diseases)			
Planned water source	Is water source sufficient in quantity and quality? Quantiy: _____ L/sec, Quality: ☐ turbid, ☐ not turbid			Annex: Planned water source No.1 Planned water source No.2
	Is its yield stable throughout the year? ☐yes, ☐no			
	Is gravity flow system applied for water transmission? ☐ yes, ☐ no			Annex: Planned water source No.3
	Is catchment area of the source sufficient?: ☐yes, ☐no			Annex: Planned water source No.4

PDID	CHECKLIST B3-1			Verified by	Approved by
Type of Project	Water Supply - spring/river bed water	Objective	Planning and Design		

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
Future water demand	Supply water to the people via ☐ house taps or ☐ public taps?			Annex: Future water demand No.1
	Design value of unit water consumption per capita per day: _____L/c/d			Annex: Future water demand No.2
	Is calculation for future water demand by the service population made or not? ☐yes, ☐no			Annex: Future water demand No.3
Pipeline design	Is pipe diameter estimated using pipe-flow formula with variables of distance, height and flow rate? ☐yes, ☐no			Annex: Pipeline design No.1
	Are drawings of hydraulic profile based on field survey attached? ☐yes, ☐no			Annex: Pipeline design No.2
	Are pipe accessories such as gate valves, air valves, wash-outs properly designed? ☐yes, ☐no			Annex: Pipeline design No.3
Service reservoir design	Is the reservoir equipped with ☐ inlet valves, ☐ outlet valves, ☐ drain pipes, ☐ overflow pipes, ☐ air ventilator.			Annex: Service reservoir design No.1
	Is concrete structure with reinforcement bars normally designed: ☐yes, ☐no			
Public taps	Number of faucets equipped at a tap:____ faucets			Annex: Public taps No.1
	Number of households to be served by one tap: _____ households			
	Are concrete apron properly designed: ☐yes, ☐no			
	Are drain pipes equipped at the concrete apron: ☐yes, ☐no			

PDID	CHECKLIST B3-1			Verified by	Approved by
Type of Project	Water Supply - spring/river bed water	Objective	Planning and Design		

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
Operation & maintenance after construction	Is water user committee planned to organize in the village/town: ☐yes, ☐no			
	Is an operation plan (cleaning, valve control, etc.) prepared: ☐yes, ☐no			
	Will fixed amount of fees for O&M be collected from the households: US$_____ /month/household			
People's awareness	Do people have an awareness to pay for O&M fees: ☐yes, ☐no			
	Do people have a willingness to be serviced: _____ households out of _____ households			

PDID	CHECKLIST B3-2			Verified by	Approved by
Type of Project	Water Supply hand pumps or hand dug wells	Objective	Planning and Design		

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
Project concept	Is the project proposed in accordance with Government Strategy (rural and urban water supply development strategy)?			
Coordination	Was all coordination made between the relevant agencies?			
Project area	Are data/information available, including; ☐ number of present population and households, ☐ major income sources, ☐ development history of the villages/towns, ☐ rainfalls?			
	Are the area frequently affected by natural disaster like ☐ floods or ☐ land slides?			
Project target	Number of households to be served: _____			
Existing condition	Are data available on:			
	☐ What are the present water sources for people's daily lives?			
	☐ What are their major problems (☐quantity, ☐quality, ☐distance)?			
	☐ What are health condition of the people? (morbidity rate of water borne diseases)			
	☐ In the area, sanitary facilities, health center, or clinic are available?			
Planned water source	Are ther any hand dug wells or boreholes constructed near the planned site? ☐yes, ☐no			
	If data is availabe, are their yields stable throughout the year? ☐yes, ☐no			
	If not available, are the surrounding topographical conditions considered suitable for borehole construction: ☐yes, ☐no			
	Hand pumps are of type:_____, made in:_____.			
Operation & maintenance after construction	Is water user committee planned to organize in the village/town: ☐yes, ☐no			
	Will fixed amount of fees for O&M be collected from the households: US$_____ /month/household			
People's awareness	Has people has an awareness to pay for O&M fees: ☐yes, ☐no			
	Has people a willingness to be serviced: _____ households out of _____ households			

Checklist-C (Payment Condition)

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 Court 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 attached the certificates from International Standard Organization (ISO)			

DEMOCRATIC REPUBLIC OF TIMOR LESTE

CABINET OF PRIME MINISTER

NATIONAL DEVOLOPMENT AGENCY

CHECKLIST OF PDID PROJECT PAYMENT

Advance Payment

N0	Name of Document	Condition						Remark
		Yes	No	Complete	Uncompleted	Yes	No	
1	Request payment from Company to KDD (Original)							
2	Inclusion letter from KDD Coordinator (Original)							
3	Document Contract							
4	Activity License, minimum until one month from submission date of payment request (legalized)							
5	Copy the document of the Valid Company Birth Certificate, minimum until one month from submission date of payment request (legalized).							
6	Copy document of TIN (Identification of the Taxpayer contributions).							
7	Copy document of Company Ownership License							
8	Copy Bank Account Number of Company							
9	Copy Electoral Card of Director Company							

DEMOCRATIC REPUBLIC OF TIMOR LESTE

CABINET OF PRIME MINISTER

NATIONAL DEVOLOPMENT AGENCY

CHECKLIST OF PAYMENT FOR PDL/PDD/PDID

RETENTION PAYMENT (10 %)

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.	Terms of handover 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(Communitarian 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 D			Verified by	Approved by
Type of Project	Water Supply	Objective	Quality Control		

Contract/Project No.			Date of Submission	_____, 201___	
Project Name			Stage	Regular Inspection for Payment	
Name of Contractor		Implementation Agency			
Check Item	**Check Point**		**Date Checked**	**Tick**	**Remarks**
Technical dimensions	Are technical dimensions of all project facilities including tanks, reservoir, BPT, equipment, pipelines, fittings, etc. are in accordance with the technical specification and drawings?				
Materials	Are all materials new and of the kinds and qualities described in the Contract?				
Concrete	Is good quality cement used? Is stored cement randomly reweighed to check the quality?				Annex: Concrete No.1
	Is best quality sand that contains no organic materials and less fine materials (dust) procured? Isn't sea beach sand used?				Annex: Concrete No.2
	Does the aggregate (gravel) have no organic material in it? Isn't sea aggregate used? Is maximum allowable aggregate size 25mm?				
	Is slump test carried out? Is the slump between 70 to 90mm (Guideline CWSS)?				Annex: Concrete No.3
	Is Hammer test conducted at representative parts of all concrete structure to confirm its strength in accodance with the Contract?				
Reinforcement Bars	Is steel for reinforcement of concrete a hot rolled deformed bar in accordance with internationally accepted standards? Are copies of test certificate provided to the Engineer?				
	Are all bars supplied in the straight form from the manufaturing plant?				
	Free of loose mill scale, rust, oil grease, mud or other materials.				Annex: Reinforcement bars No.1

PDID	CHECKLIST D			Verified by	Approved by
Type of Project	Water Supply	Objective	Quality Control		

Contract/Project No.			Date of Submission	_____, 201___	
Project Name			Stage	Regular Inspection for Payment	
Name of Contractor		Implementation Agency			

Check Item	Check Point	Date Checked	Tick	Remarks
Pipes and Fittings	Are pipe materials provided in accordance with the requirements specified in the Contract? Are copies of manufacturers' certificates provided to the Engineer for approval?			
	Are pipelines equipped with sluice valves, check valves, air valves, wash-outs, and concrete thrust blocks at the designated points in accordance with the Contract?			Annex: Pipes and Fittings No.1, No.1-2, No.1-3
	After installation, all pipelines are pressure tested. Any leaks detected are repaired and the pipeline re-tested.			
Tanks	Are all tanks including reservoirs, BPTs, sedimentation tanks, etc. tested for leaks after construction?			
	Inlet pipe & valve, outlet pipe & valve, overflow pipe, drain pipe & valve, air vent and manhole are installed correctly.			Annex: Tanks No.1
Aprons & drains	Are aprons on wells, community tanks and standpipes not cracked? Do all water flow from the apron and flow down the drain?			Annex: Apron & drains No.1

PDID	CHECKLIST E			Verified by	Approved by
Type of Project	Water Supply	Objective	Measurement of the Work Completed		

Contract/Project No.		Date of Submission	_____, 201___
Project Name		Stage	Regular Inspection for Payment
Name of Contractor		Implementation Agency	

Check Item	Check Point	Date Checked	Tick	Remarks
Tanks	Measurement of tanks, reservoirs and BPTs to confirm numbers, width, length and height			
Pipelines	Measurement of pipeline length by photographs and field surveys			
Concrete	Number of cement bags based on logistic data			
Reinforcement bars	Number of reinforcement bars based on logistic data			

Checklist-E (Measurement of the Work Completed)

【Attachment】Annex of Checklist

Project target No.1

Target year: _____

Target year (DESIGN PERIOD)

In commercial utility models, the design period normally spans long periods involving decades within which the initial capital outlay and succeeding outlays for expansion and rehabilitation can be rationally recovered. For small water utilities, including those owned by the local governments, such large outlays are not available and cannot be matched by the rural population's capacity to pay. For these reasons, the design period or horizon in this Manual is set at 5 or 10 years. In fact, these are the design periods frequently decided by agreements among the funder, the implementing agency, and the community. In setting the design period, the designer should take into account the terms of the financing package and the potential consumers' capability and willingness to pay the amounts needed to support repayment.(WB Mannual)

	Advantages	Disadvantages
Five-year design period	Low initial capital cost.	Need for new capital outlays after five (5) years to upgrade system capacity.
Ten-year design period	The water system facilities are capable of meeting the demand over a longer period.	The higher initial capital cost.

TLRWSG by DENSA

Design period: 10 years (Minimum requirements) , 20 years (Recommended standards)

Planned water source No.1

Is water source sufficient in quantity and quality?
Quantity:_____ L/sec,

Measurements of Water quantity

Check the quantity in rainy season and dry season.

1. Volumetric Method

Determine the yield of the well using the volumetric method

Data:

Volume of oil drum used : 200 liters

Number of drums used : 1

Time to fill the drum : 30 seconds

Required: Well yield

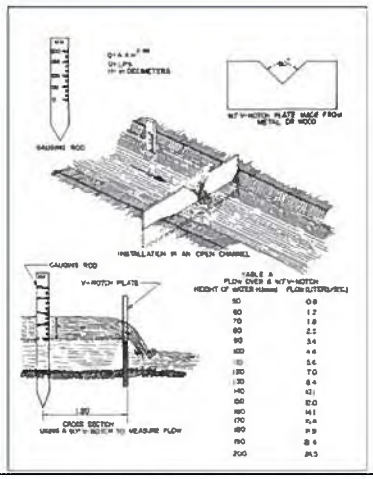
1. **Calculate the total volume of water collected, V**

$$V = Volume\ of\ container\ used = 200\ liters$$

2. **Calculate the yield of well, Q**

$$Q = \frac{Volume\ of\ water\ collected}{time\ in\ seconds} = \frac{200\ l}{30\ s} = 6.67\ lps$$

2. V-Notch Weir



Planned water source No.2

Is water source sufficient in quantity and quality?
Quality: ☐ turbid, ☐ not turbid

Water quality: High Priority (critical) Parameters

Parameters
1. Microbiological : (Total Coliform, Fecal Coliform)
2. Turbidity
3. Color
4. pH
5. Iron
6. Manganese
7. Chloride
8. Arsenic
9. Cadmium
10. Nitrate
11. Sulfate
12. Total Dissolved Solids (TDS)

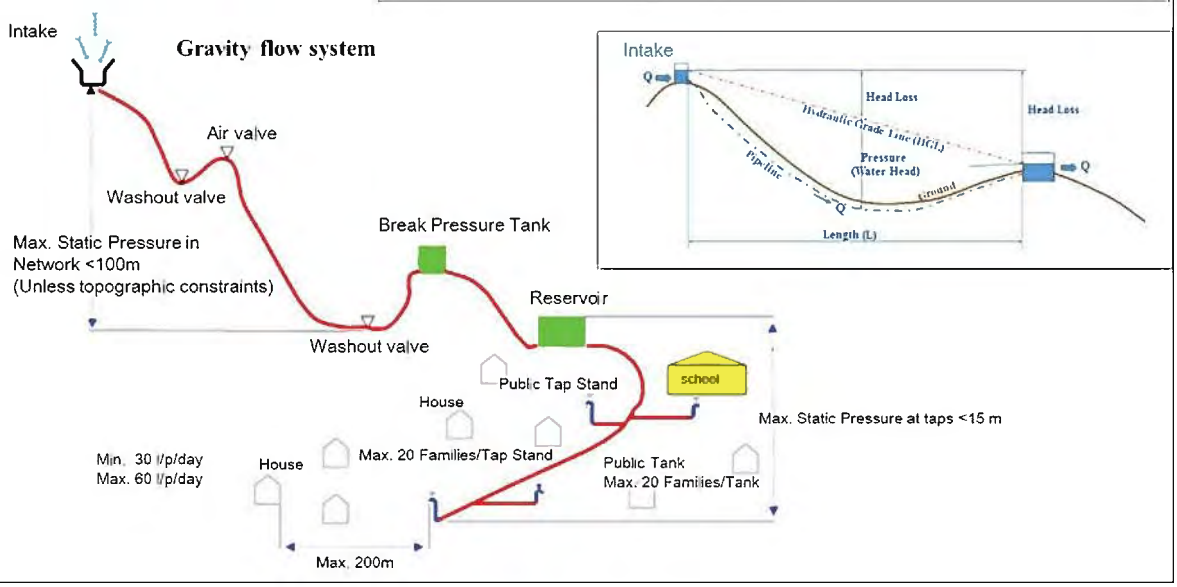
TLRWSG by DENSA
Quality of water at water collection point

(Minimum requirements)
Not cloudy, no smell, taste or colour.
Water must be boiled before drinking.
Sanitation survey is completed and risks are minimized.

(Recommended standards)
Meet WHO guidelines as per government indicators

Planned water source No.3

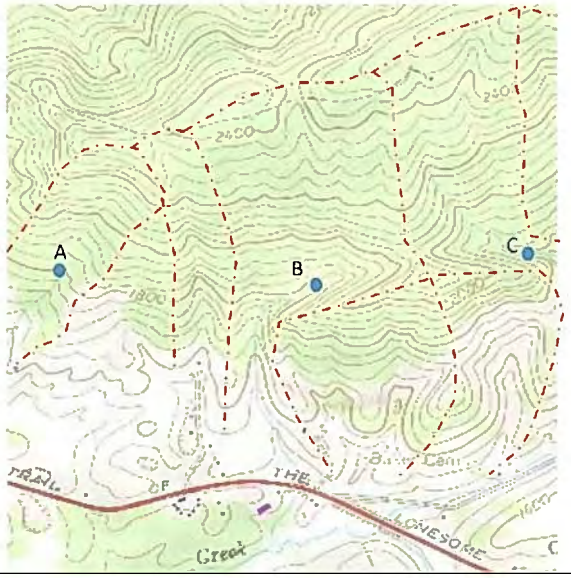
Is gravity flow system applied for water transmission?
☐ yes, ☐ no



Planned water source No.4

Is catchment area of the source sufficient?
☐ yes, ☐ no

Boundaries of the watershed (catchment area)



What is a Watershed?

By definition, a watershed is an area where all rainfall collects into a common location. The common location could be a stream, a pond, a river, etc.

The headwaters of a river are made up of first order streams. The watershed of a first order stream cannot be broken down into smaller watersheds because water feeding first order streams flows directly into the streams. The water may originate as runoff from rainfall or as groundwater welling up from below the earth's surface.

Each watershed has its own unique characteristics. Size, permeability of the soil, vegetation type, soil type, slope, microorganisms, pH, DO (Dissolved Oxygen), and temperature all affect the water in a watershed.

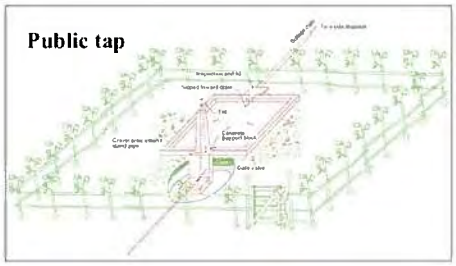
Altitude = Contour1800 at the water sources A, B and C.

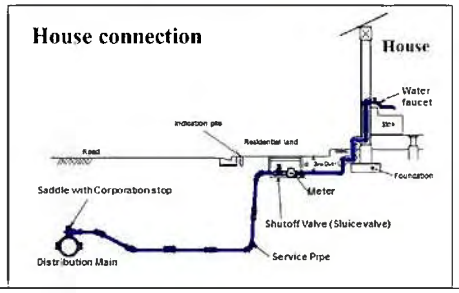
Catchment area : B > C > A

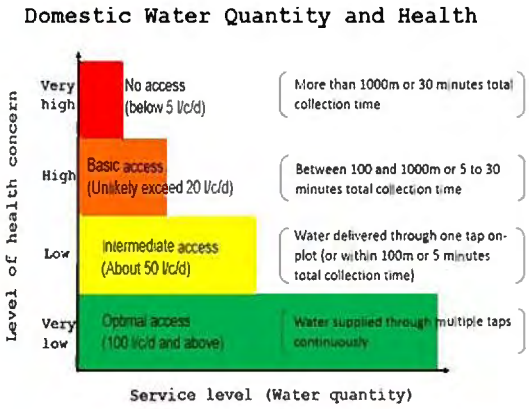
Future water demand No.1

Supply water to the people via
☐ house taps or ☐ public taps?

Public tap or House connection







THINKING POINT:
In the case of public tap the water carrying labor from the tap to house must be done by someone. By who? Until when?

Future water demand No.2

Design value of unit water consumption per capita per day: _____L/c/d

TLRWSG by DENSA

Water Quantity	Minimum requirements	Recommended standards
Household needs:		
Drinking	2 litres per day	5 litres per day
Cooking	5 litres per day	15 litres per day
Cleaning	10 litres per day	20 litres per day
Bathing	13 litres per day	20 litres per day
Total	30 litres per day	60 litres per day

Individuals: 15-20 Lpcd (sustainable for a few months)
- Drinking 3-4 Lpcd
- Food preparation, cleanup 2-3 Lpcd
- Personal hygiene 6-7 Lpcd
- Laundry 4-6 Lpcd

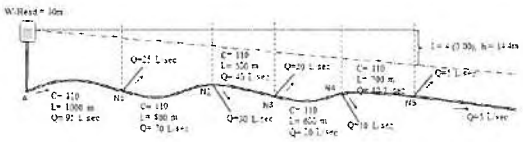
Livestock and agriculture
- Cattle, horses, mules 20-30 litres per head
- Goats, sheep, pigs 10-20 litres per head
- Chickens, 10-20 litres per 100
- Vegetable gardens, 3-6 litres per square metre

From "Minimum water quantity needed for domestic uses" WHO Regional Office for South-East Asia

Pipeline design No.1

Is pipe diameter estimated using pipe-flow formula with variables of distance, height and flow rate?
☐ yes, ☐ no

Pipe diameter must be estimated using pipe-flow formula (such as Hazen-Williams Formula) with variables of distance, height and flow rate. Then, the calculation results must be attached This is an example how to decide the pipe diameters (D) of each section when water head at the base (A in here), GL of nodes, water amount discharged from the nodes (consumption), pipe lengths (L), and flow coefficients (C_{HW}) are given. A reasonable pipeline hydraulic-gradient (h/L) must be assumed.
Use 'PIPECAL' or 'EPANET'.



An example of calculation results

Node	Gt(m)	Qout	W Head	Pipeline	D(mm)	L(m)	C	Qflow	I(0/00)	loss (m)
A	10	-	30.00		-	-	-	-	-	-
Node 1	10	25	26.0	A - N1	345.5	1000	110	85	4	4.0
Node 2	12	20	20.9	N1 - N2	307.6	900	110	70	4	3.1
Node 3	8	20	22.5	N2 - N3	248.7	300	110	40	4	2.0
Node 4	7	10	21.4	N3 - N4	191.1	600	110	20	4	2.4
Node 5	5	5	20.6	N4 - N5	148.9	700	110	10	4	2.8
To Ocean	-	5	-	N5 -	-	-	-	5		-

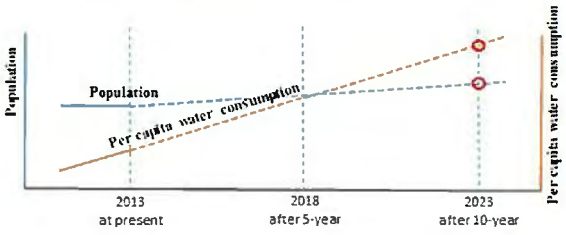
Future water demand No.3

Is calculation for future water demand by the service population made or not? ☐ yes, ☐ no

Water Demand = Per capita water consumption × Population + NRW

Water Demand Projections = Water Demand at Targeted year

example: Targeted year = after 10 years



Water Demand for Design of Facilities

Example: Community A
- **Households (HHs) = 100, average 1 HH = 6 persons**
- **Total served Population = 100 × 6 = 600**
- **Average Water demand = 600 × 50 lpcd = 30,000 l/d**

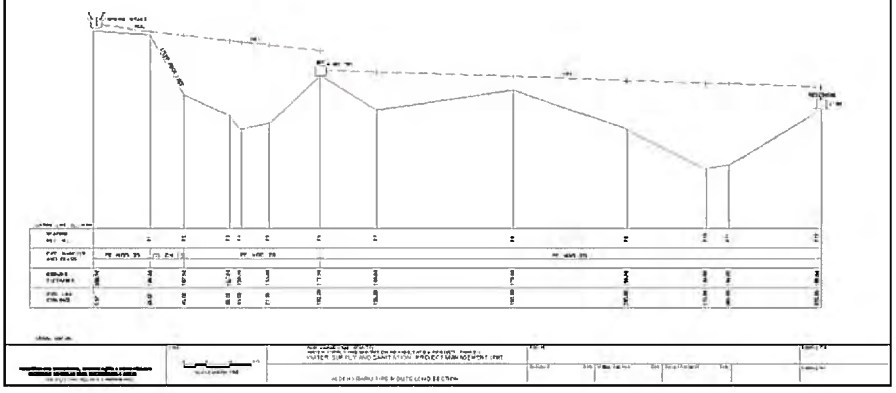
NRW (Leakage ratio) = 15 %
Distributed amount including Leakage
= 30,000 l/d / (1 – 0.15) / 86400 sec/d = 0.41 l/sec

Maximum Water demand
= Average Water demand (including NRW) × 1.30
= 0.41 l/sec × 1.30 = 0.53 l/sec

Pipeline design No.2

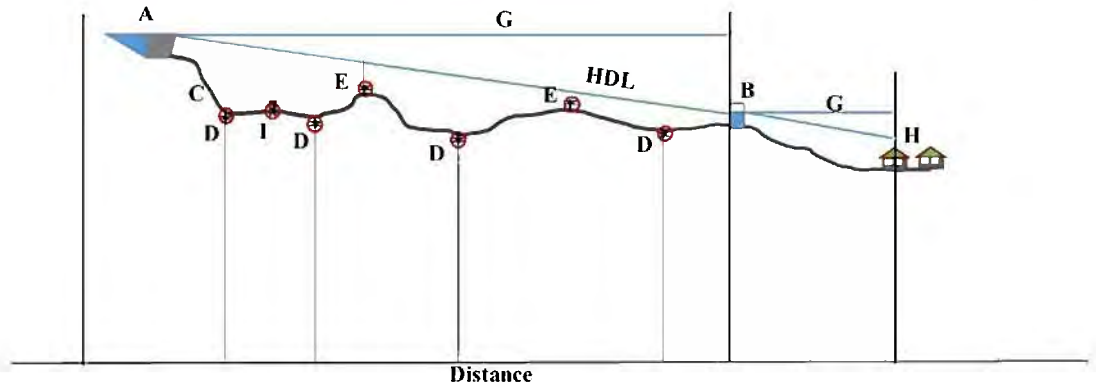
Are drawings of hydraulic profile based on field survey attached?
☐ yes, ☐ no

Example of hydraulic and land elevation profile



Pipeline design No.3

Are pipe accessories such as gate valves, air valves, wash-outs properly designed? ☐ yes, ☐ no

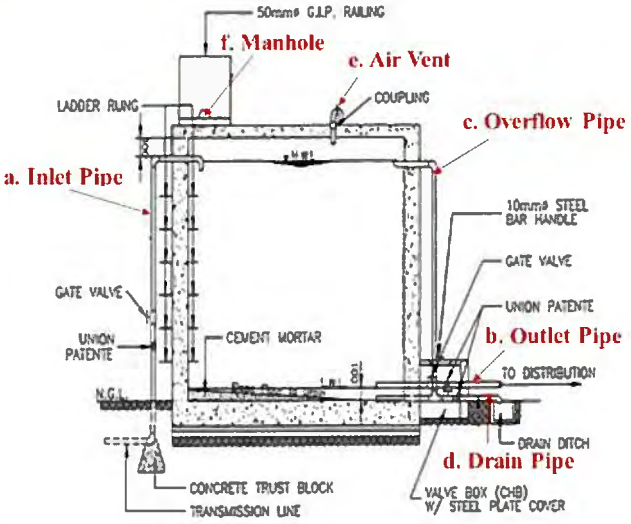


A = Intake structure
B = Storage reservoir
C = Pipeline
D = Blow-off valve
E = Air relief valve

HDL = Hydraulic grade line
G = Static head
H = Rural town or Village
I = Sectioning valve (every 1.5 km)

Service reservoir design No.1

Are pipe accessories such as gate valves, air valves, wash-outs properly designed? ☐ yes, ☐ no



GROUND LEVEL RESERVOIR
(CONCRETE)

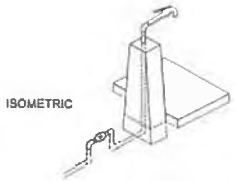
Check points

a. Inlet Pipe
Gate Valve
b. Outlet Pipe
Gate Valve
c. Overflow Pipe
Connect to drain pipe
d. Drain Pipe
Gate Valve, Drain Ditch
e. Air Vent
Insect Screen
f. Manhole
g. Water Level Indicator

Public taps No.1

Number of faucets equipped at a tap: ____ faucets

Number of households to be served by one tap: _____ households



PUBLIC FAUCET INSTALLATION
SINGLE TYPE FAUCET

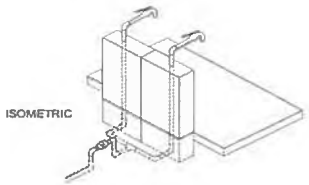
TLRWSG by DENSA

Minimum requirements

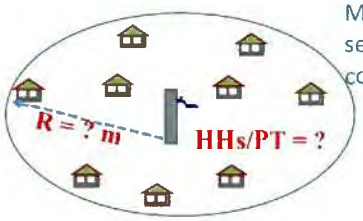
200 metres / less than 5 minutes round trip walking time

Recommended standards

100 metres



PUBLIC FAUCET INSTALLATION
DOUBLE TYPE FAUCET



Maximum number of people served at collection point

Minimum requirements

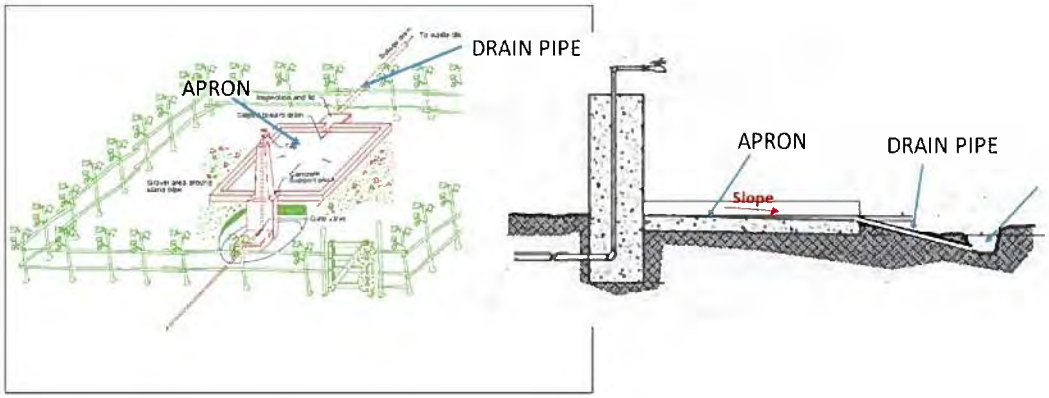
100 people

Recommended standards

50 people

Public taps No.2

Are concrete apron properly designed: ☐ yes, ☐ no	Are drain pipes equipped at the concrete apron: ☐ yes, ☐ no



Concrete No.1

Is good quality cement used? Is stored cement randomly reweighed to check the quality?

Storing Bagged Cement

1. Cement bagged in sacks should be stored in a warehouse or shed as nearly airtight as possible, with the bags stored close together to reduce air circulation, and away from outside walls.

2. If no shed is available, the bags should be placed on a raised wooden platform and a waterproof cover placed over and covering down the sides of the pile so that rain cannot reach the cement.

3. Sacked cement in storage will occasionally develop a "warehouse pack", a condition resulting from packing too tightly. The cement retains its quality in this condition, which can usually be corrected by rolling the bags on the floor.

Concrete No.2

Is good quality cement used? Is stored cement randomly reweighed to check the quality?

Fine Aggregates or Sand - Removing Clay and Silt -

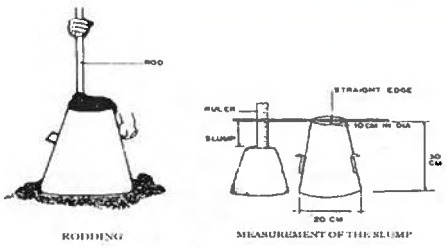
Clay and silt present in excessive quantities can be detected by conducting the following test:

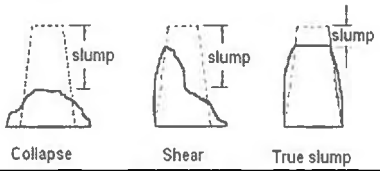
1. **Fill a quart jar (1.14 liter) or Erlenmeyer flask with sand to a depth of 5.0 cm (2 inches);**
2. **Add water until the jar or flask is 3/4 full;**
3. **Shake the contents for about one minute with the last few shakes in a sidewise direction;**
4. **Allow the jar to stand for 30 minutes;**
5. **Observe the top of the sand. If there is more than 3.2 mm layer of sediment, the sand where the sample was taken is unsuitable for construction purposes. However, the aggregates in question can be used after washing and removing the undesirable materials.**

Concrete No.3

Is slump test carried out? Is the slump between 70 to 90mm (Guideline CWSS)?

Note that the less the slump, the stronger and more waterproof the mixture will be.





- Very dry mixes with slumps of 0 – 25 mm are used in road making
- Low workability mixes with slumps of 10 – 40 mm are used for foundations with light reinforcement
- Medium workability mixes with slumps of 50 – 90 mm are used for normal reinforced concrete placed with vibration
- High workability mixes have slumps greater than 100 mm.

Reinforcement Bars No.1

Free of loose mill scale, rust, oil grease, mud or other materials.

Before and during fabrication of rebars, the following should be inspected:

1. Remove all loose rust and other related materials. Any loose rust and mill scale that fly off when the bar is bent or struck with a hammer must be removed.

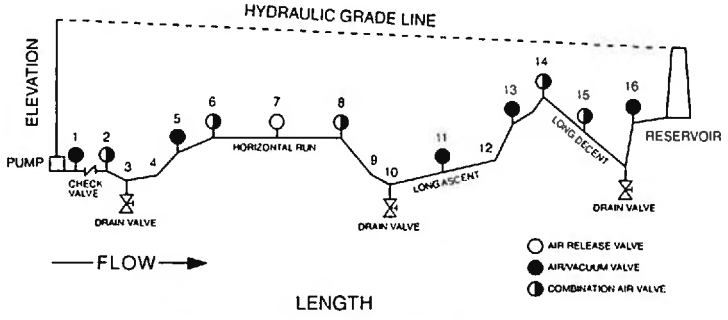
2. If the rust is firmly attached to the bar, it is recommended to leave it intact. This may improve the holding capacity of the bar and increase the bar-concrete bond.

3. If a bar appears to have rusted excessively and its cross-sectional area been reduced significantly, it is suggested that it should be rejected.

4. Remove all objectionable coatings such as paints, oils, grease, dried mud and loose concrete on bars because they tend to decrease the bar concrete bond.

Pipes and Fittings No.1

Are pipelines equipped with sluice valves, check valves, air valves, wash-outs, and concrete thrust blocks at the designated points in accordance with the Contract?



NO.	DESCRIPTION	RECOMMENDED TYPES	NO.	DESCRIPTION	RECOMMENDED TYPES
1	Pump Discharge	Air/Vacuum for Pumps	9	Decrease Downslope	No Valve Required
2	Incr. Downslope	Combination	10	Low Point	No Valve Required
3	Low Point	No Valve Required	11	Long Ascent	Air/Vac or Combination
4	Increase Upslope	No Valve Required	12	Increase Upslope	No Valve Required
5	Decrease Upslope	Air/Vac or Combination	13	Decrease Upslope	Air/Vac or Combination
6	Beginning Horizontal	Combination	14	High Point	Combination
7	Horizontal	Air/Rel or Combination	15	Long Descent	Air Release or Combination
8	End Horizontal	Combination	16	Decrease Upslope	Air/Vac or Combination

Pipes and Fittings No.1-2

Air Valve Locations Along a Pipeline

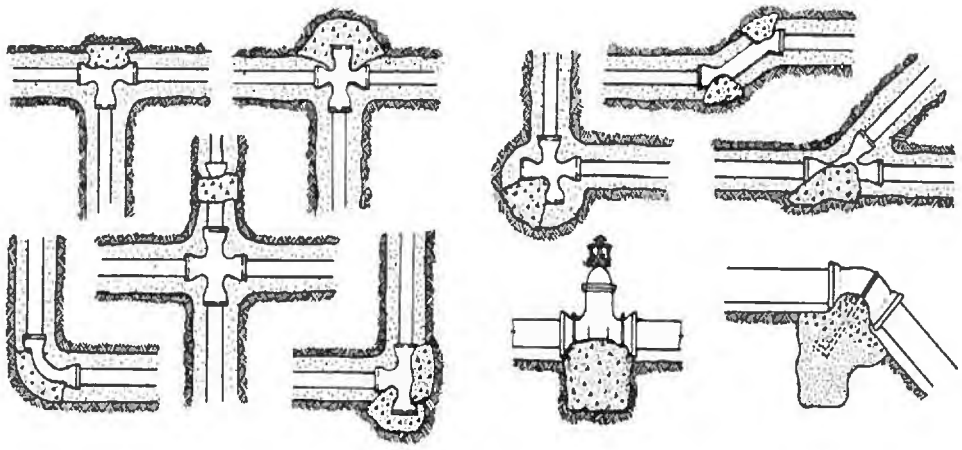
Air valves are installed on a pipeline to exhaust air and admit to prevent vacuum conditions and air-related surges. The AWWA Steel Pipe Manual recommends Air Valves at the following points along a pipeline.

1. **High Points:** Combination Air Valve
2. **Long Horizontal Runs:** Air Release or Combination Valve at 380 to 760 m intervals.
3. **Long Descents:** Combination Valve at 380 to 760 m intervals.
4. **Long Ascents:** Air/Vacuum Valve at 380 to 760 m intervals.
5. **Decrease in an Up Slope:** Air/Vacuum Valve
6. **Increase in a Down Slope:** Combination Air Valve

From "Theory, Application, and Sizing of Air Valves" (Val-Matic Valve and Manufacturing Corporation)

Pipes and Fittings No.1-3

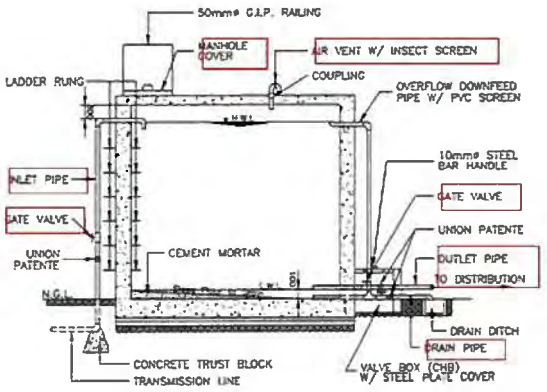
Thrust Blocks & Anchors



THRUST BLOCKS and ANCHORS

Tanks No.1

Inlet pipe & valve, outlet pipe & valve, overflow pipe, drain pipe & valve, air vent and manhole are installed correctly.



GROUND LEVEL RESERVOIR
(CONCRETE)

(1)Inlet Pipe & Valve

(2)Outlet Pipe & Valve

(3)Overflow Pipe

(4)Drain Pipe & Valve

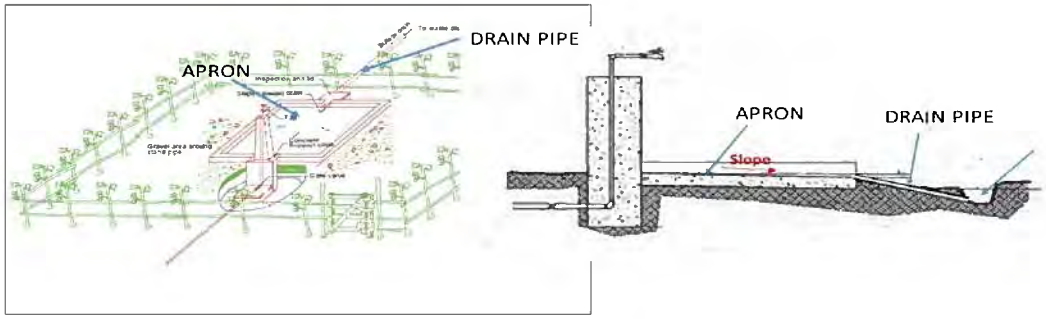
(5)Air Vent

(6)Manhole

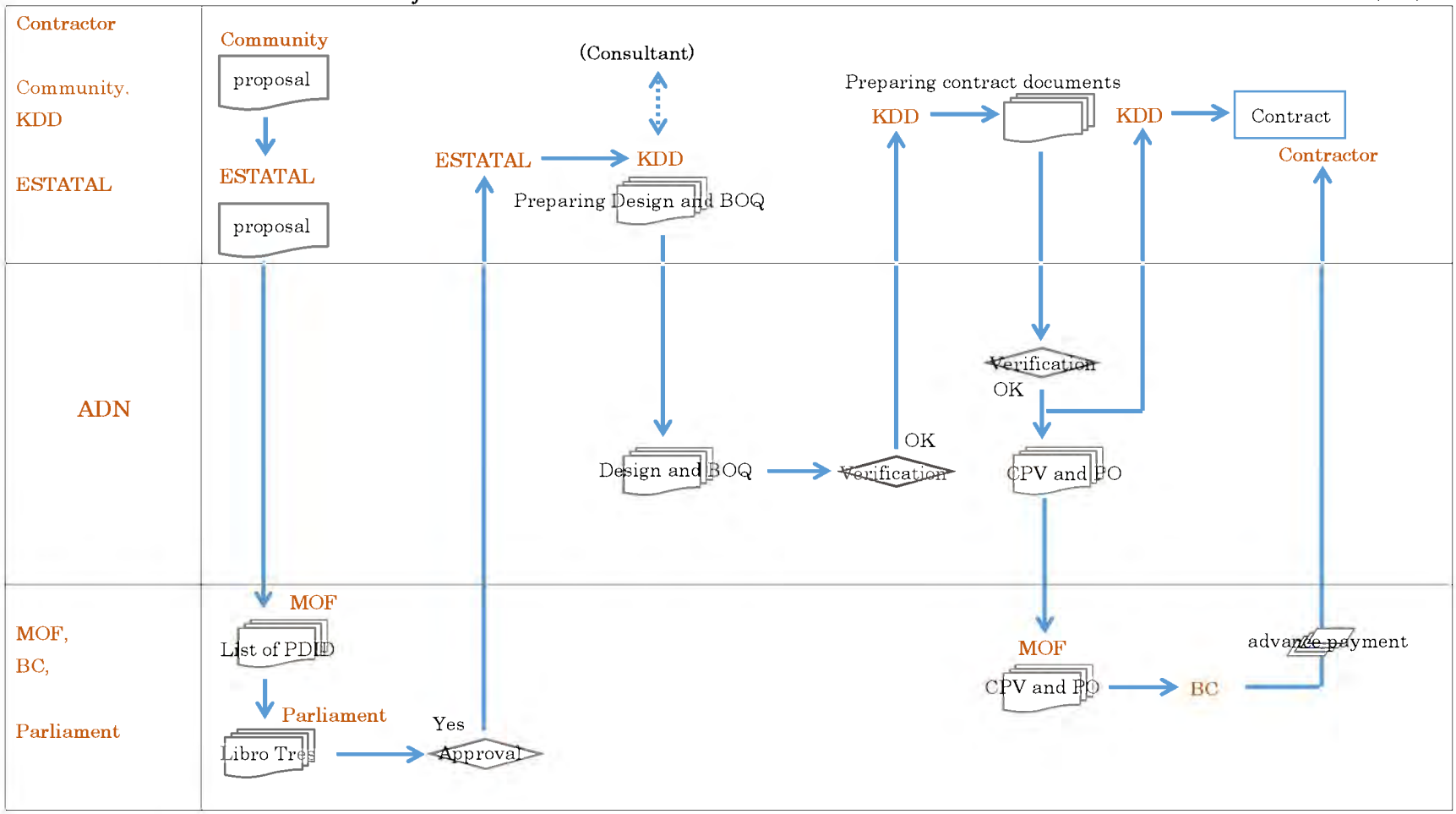
(7)Water Level Indicator

Apron & drains No.1

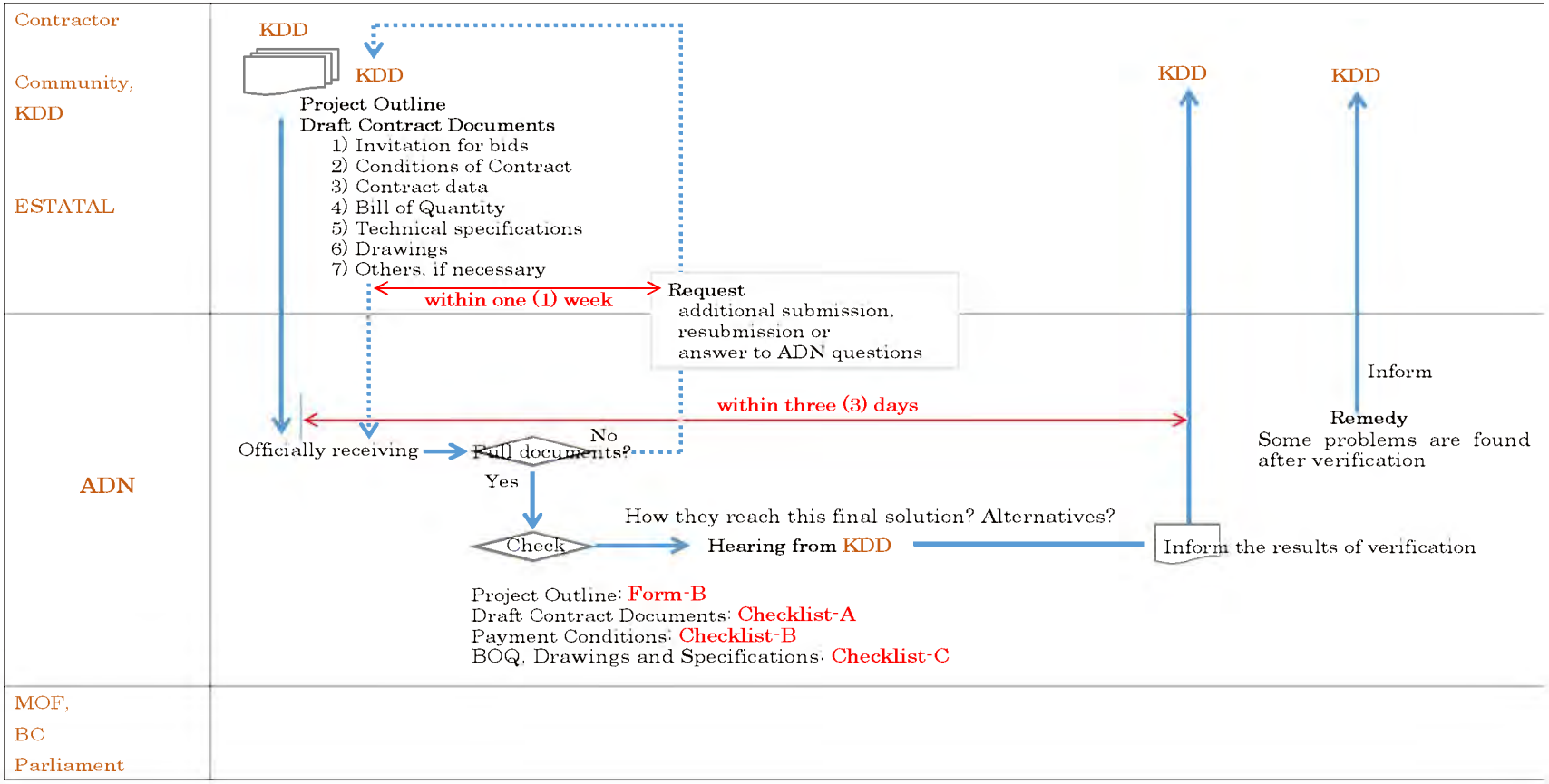
Are aprons on wells, community tanks and standpipes not cracked? Do all water flow from the apron and flow down the drain?



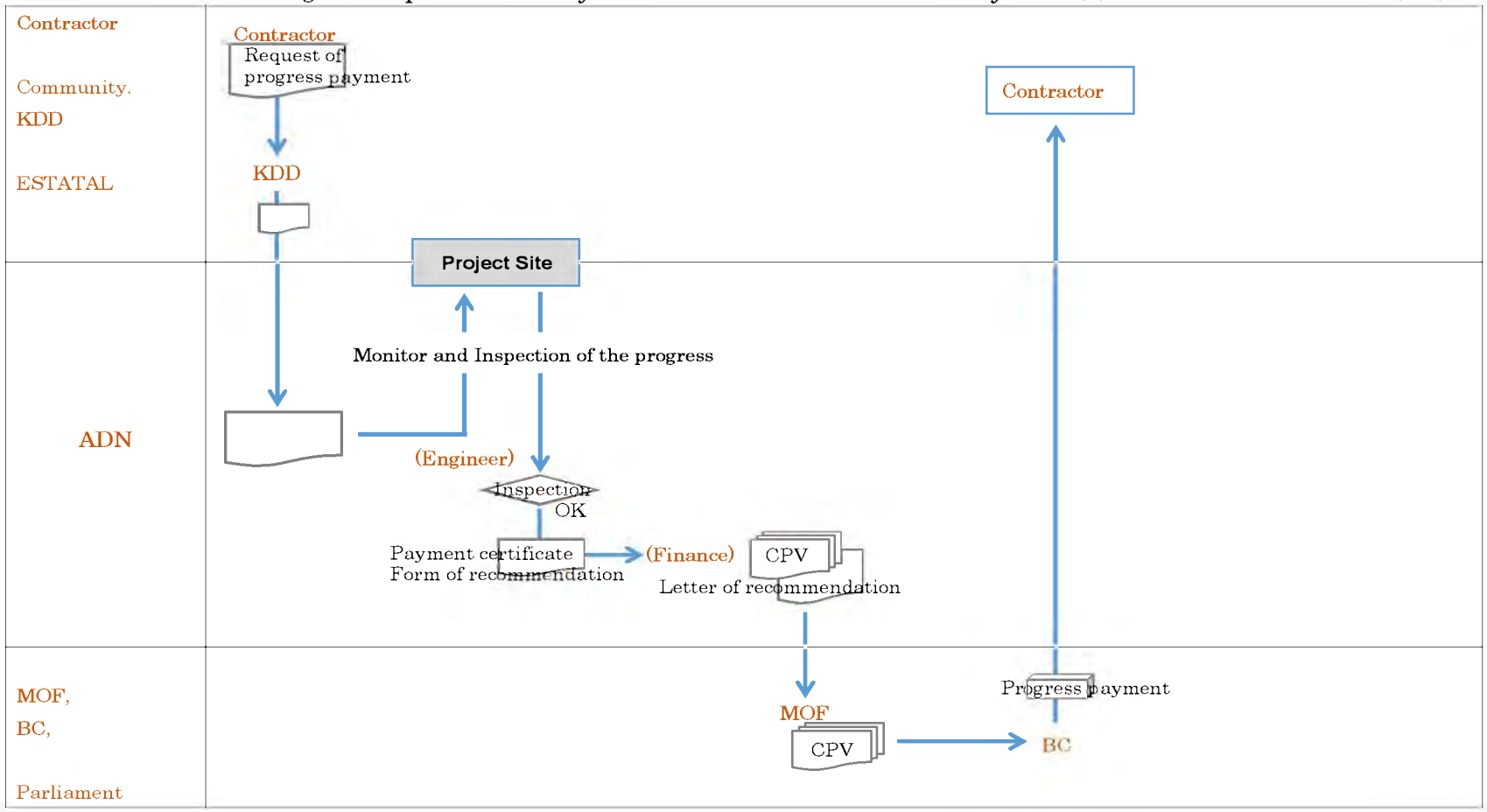
PDID Process Workflow for PDID: Project Evaluation before Contract Award (1/5)



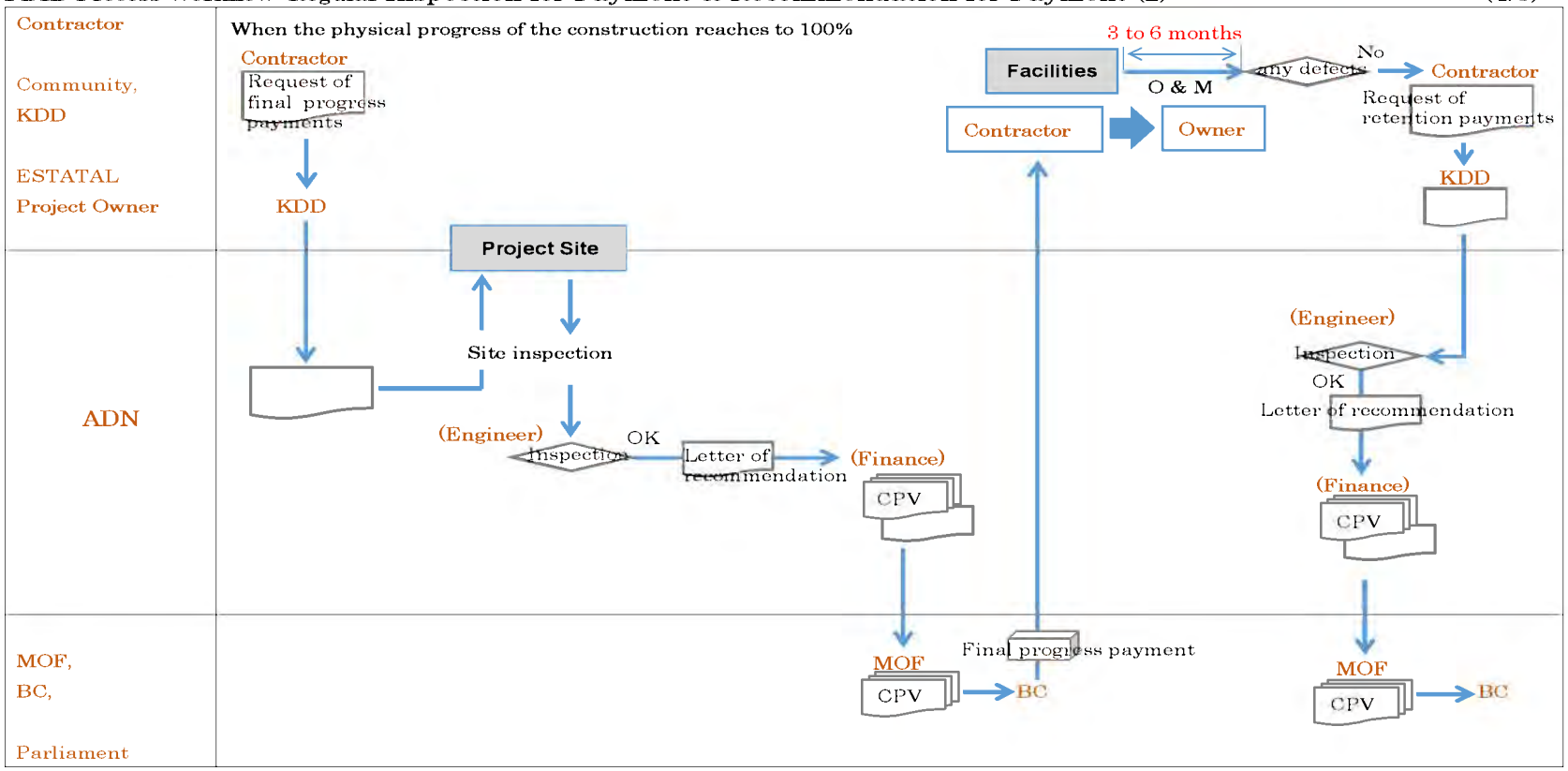
PDID Schedule of Works: Verification (2/5)



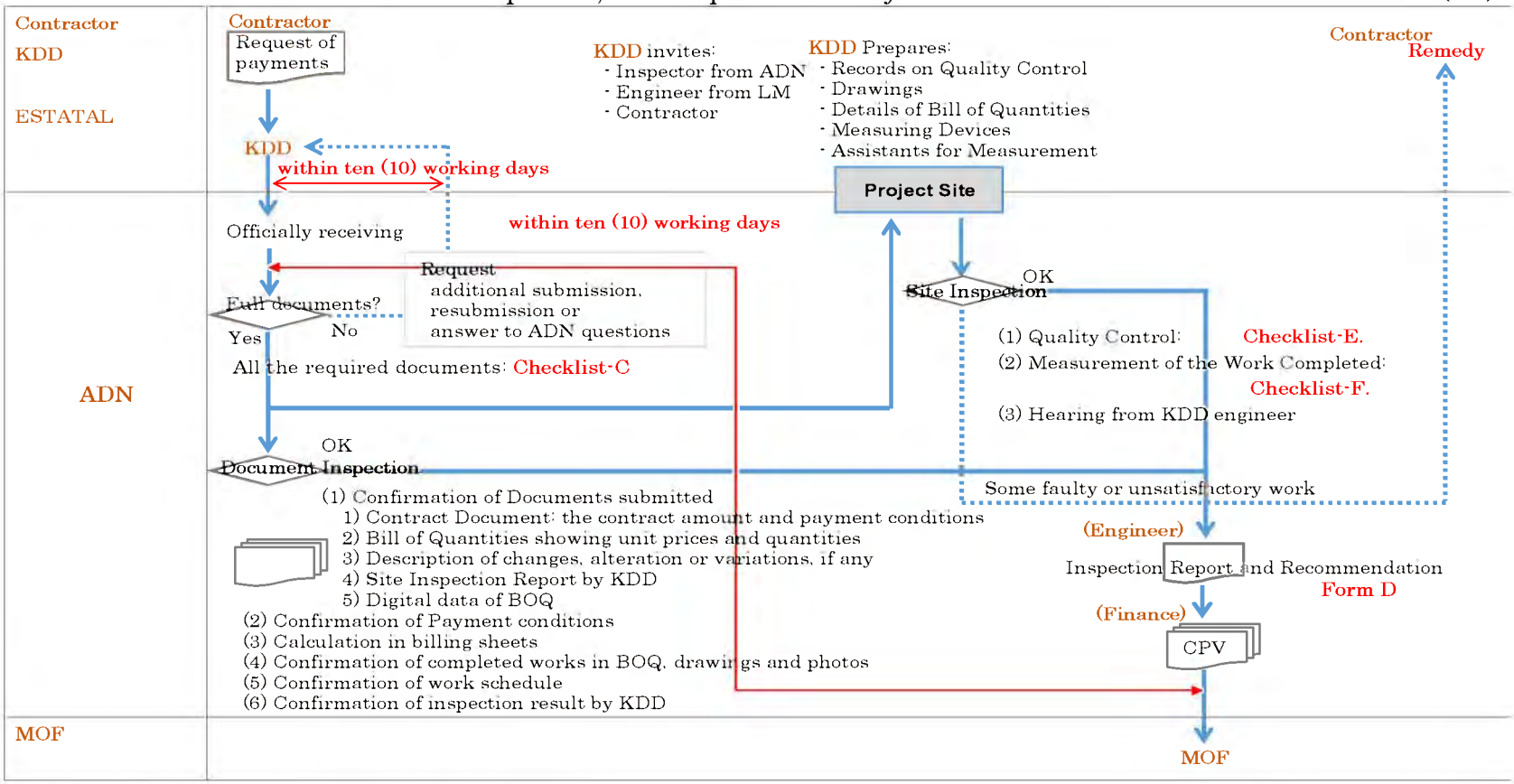
PDID Process Workflow: Regular Inspection for Payment & Recommendation for Payment (1) (3/5)



PDID Process Workflow: Regular Inspection for Payment & Recommendation for Payment (2) (4/5)



PDID Schedule of Works: Document Inspection, Site Inspection for Payment (5/5)



3. National Electrification Program

3.1 Project Evaluation before contract Award

3.1.1 General

The National Electrification Program (Programa da Electrificação Nacional, hereinafter referred to as "the PEN") is the program for promoting dissemination of rural electrification by means of the extension of distribution lines (20kV and 380V) throughout Timor-Leste.

Decree-Law No. 40/2012 5 September[1] says in the preamble that;

Local development and mass increase in business at the districts are promoted through the works of which will rehabilitate or install new distribution lines of electrical power with knowledge and responsibility.

The PEN is as an urgent and essential measure for the growth of the economy, to create the job while at the same time increasing the capacity of local businesses. Furthermore, the implementation of the similar programs in previous years will enable more effective implementation by this law.

"Article1.Object" prescribes that;

1. This law regulates the special procedure for award of works of the rehabilitation and new installation of distribution lines of electrical power value from U.S. $ 100,000 to U.S. $4,500,000 as the PEN.
2. The Counsel of Administration of Infrastructure Fund has maximum responsibility for the PEN, and may delegate the responsibility for administration in the area of electricity and implementation of the PEN to a member of the government.
3. The National Development Agency, (Agência de Desenvolvimento Nacional, ADN), which is in close coordination with the Government, is responsible in the area of electricity for performing the control and supervision of implementation of the PEN.

"Article 6. Management and Implementation Commission" prescribes that;

The Management and Implementation Commission (hereinafter referred

[1] This Decree-Law is described only in Portuguese and translated in the JICA project.

to as "the PEN Commission") consists of:

1. A head of the Commission appointed by the member of Government responsible for the area of electricity;
2. A representative of the National of Procurement Commission, as the secretary;
3. A representative of the Administration of Ministries of Infrastructure;
4. A representative of the Major Project Secretariat (MPS).
5. A representative of Department of Procurement of EDTL
6. Two engineers in EDTL responsible for the area of electricity;
7. A representative of Department of Finance of EDTL;
8. A representative of sub-district where the project is concerned.

The responsibilities and activities of the PEN Commission are shown on the basis of the Decree-Law No. 40/2012 as follows.

1. The PEN Commission arranges the list of projects to be undertaken.
2. The PEN Commission formulates the project and ensures the publicity of the project through the public newspaper.
3. The PEN Commission and MPS hold meetings for the selection of the Company. The PEN Commission selects the company for the project.
4. The PEN Commission holds meeting with the selected company in order to get agreement upon the term of the contract.
5. The payment request is submitted to the PEN Commission.
6. The PEN Commission and ADN carry out verification of progress of the work, and submit the payment request to the Major Project Secretariat.

3.1.2 Flow of Procedure for Quality Certification of the contract documents

Within Decree-Law No. 40/2012, Quality Certification of the contract documents by ADN is specified as a part of the procedure for the selection of companies. Flow of Procedure for issuing Quality Certification before signing the Contract is shown in Figure 0-1.

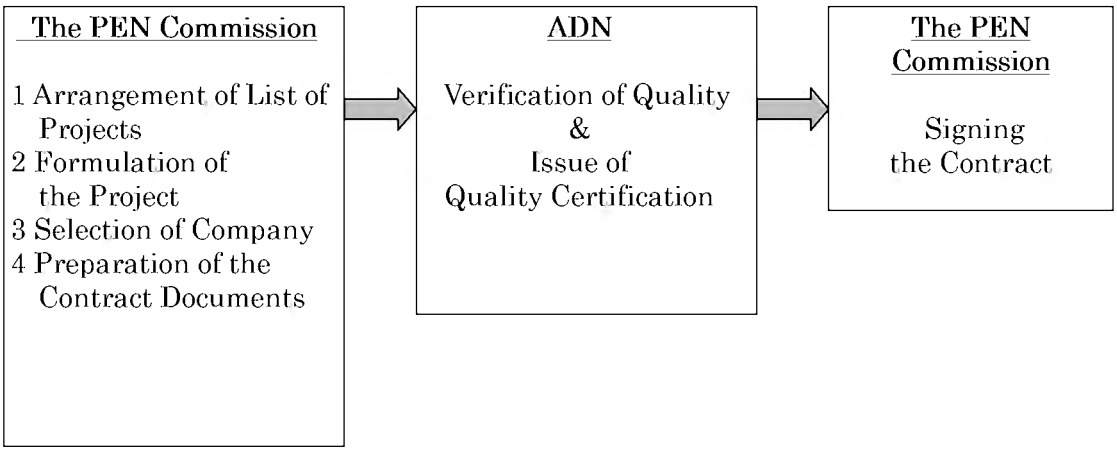


Figure 0-1 Flow of Procedure for Quality Certification of the contract documents

3.1.3 Schedules of issuing Quality Certification

The basic schedule

The issuing Quality Certification (the result of verification of the contract documents) before signing the contract should be completed within 10 days after receiving enough documents as shown in the flow chart in Figure 0-2. (The Contract should be signed within 8 days after the issuing Quality Certification.)

The confirmation of necessary documents for verification

Within 4 days after receipt of the document from the PEN Commission, ADN should instruct to the PEN Commission to submit lacking documents in writing and ask questions to the PEN Commission, if any.

The verification of the contract documents

Within 10 days after receipt of enough documents and answer to ADN's questions from the PEN Commission, ADN should submit the result of the verification in writing. If the result of verification is approval, the submitting the document by ADN will be considered as issuing Quality Certification by ADN.

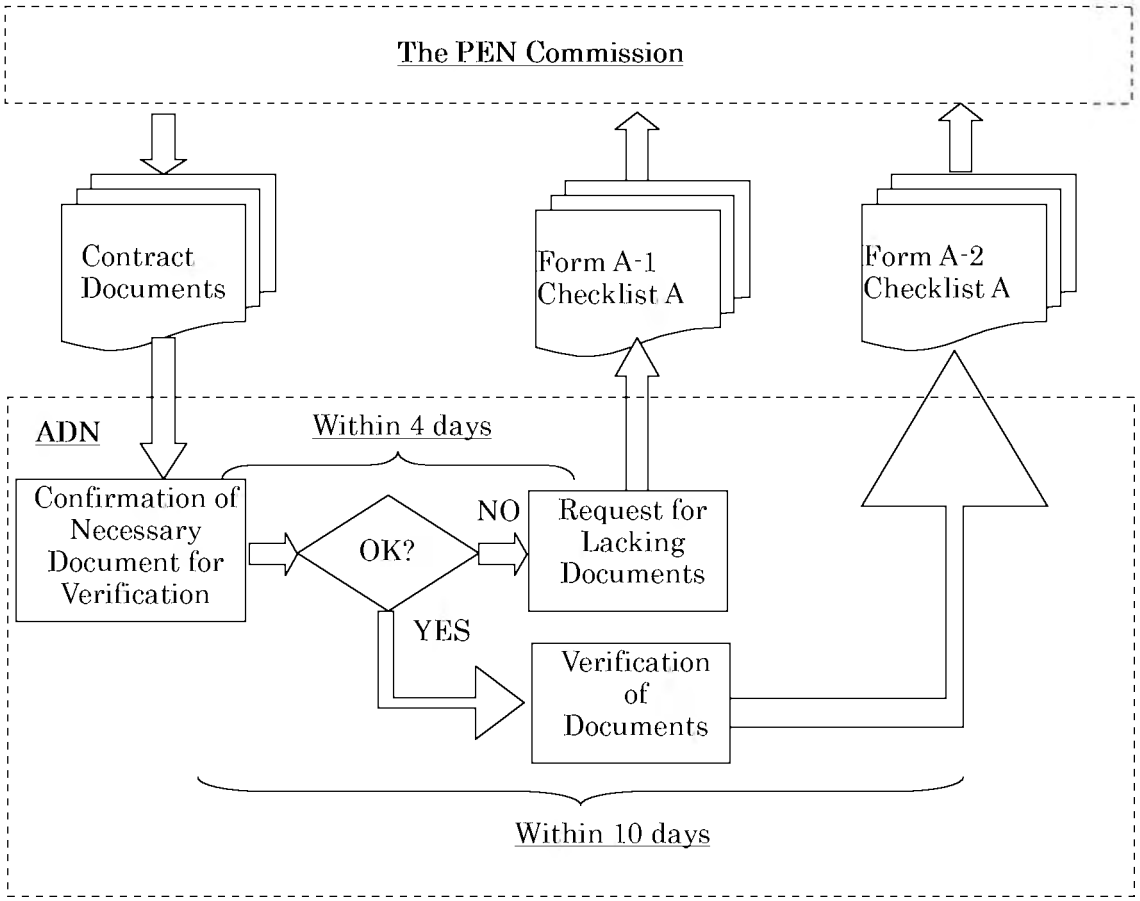


Figure 0-2 Schedules of issuing Quality Certification

3.1.4 Verification for Quality Certification

Necessary Documents to be submitted for Quality Certification

ADN should examine documents concerning the verification and issue of Quality Certification. The necessary documents to be submitted by the PEN Commission to ADN are shown below and its checkpoint is shown in Annex-3 as "**Checklist A**". If the documents from the PEN Commission are not enough, ADN should instruct the PEN Commission to submit enough documents by using "**Form A-1**".

A List of Projects

- Priority for the implementation of projects
- Information of non electrified villages
- Information of planed and existing lines

Formulation of the Project

- The justification of the project

- The area of the works
- The Outline of villages to be electrified
- The Outline of the Project
- The approx. length of distribution lines of 20kv and 380v
- The prospective start day of the project
- The publicity of the project

Selection of the Company

- Justification of the Company
- The minute of meeting for selection
- The Company taxation
- The list of similar previous experiences of the works
- The list of engineers in the Company for the works

The Contract Documents

- Contract Agreement
- General Condition with Contract Data
- Technical Specifications
- Standard Construction
- Design Drawings
- BoQ

Issue of Quality Certification

Signing the Contract shall be carried out after issuing the Quality Certification by ADN according the Decree-Law No.40/2012.

ADN should verify the above mentioned items by means of examination of the necessary documents to be submitted by the PEN Commission by use of attached "**Checklist A**".

ADN should issue the result of verification of documents to the PEN Commission by using "**Form A-2**".

3.2 Project Inspection & Recommendation for Payment

3.2.1 Flow of Procedure for Payment

Flow of Payment for the PEN is shown in Figure 0-3 as a flow chart based on the Decree-Law No.40/2012.

The Decree-Law prescribes that;

The payment request from the Company is submitted to the PEN Commission. After verification by the PEN Commission, ADN carry out verification of progress of the work and submit recommendation for payment request to the Major Project Secretariat (MPS).

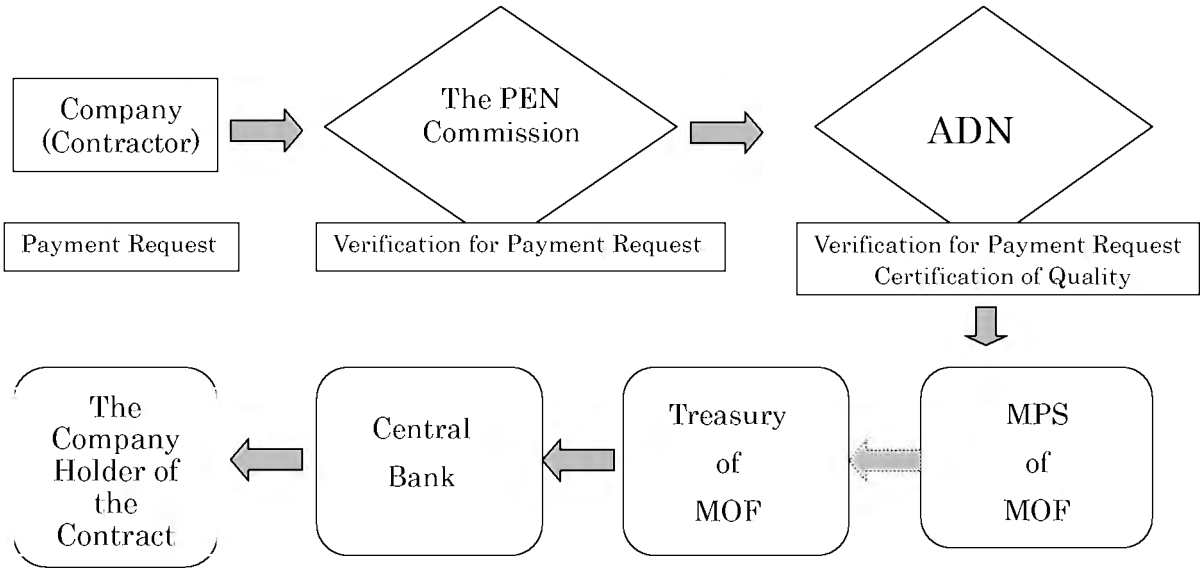


Figure 0-3 Flow of Payment for the PEN

3.2.2 Schedules of Verification for Payment

The basic schedule

The verification for payment should be completed within 10 days after receiving enough documents as the flow chart shown in Figure 0-4below. The value of the day shows the date of deadline.

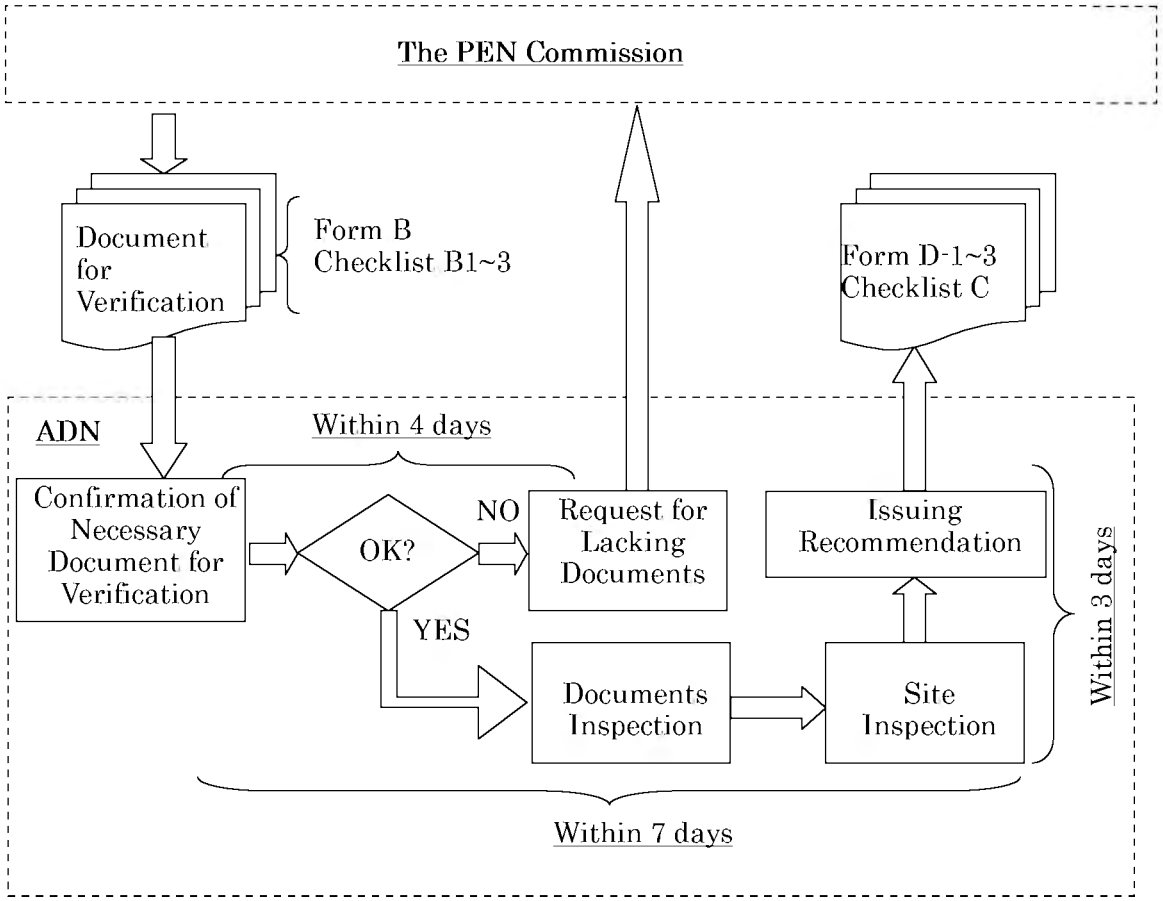


Figure 0-4 The Schedule of Verification for Payment

The confirmation of necessary documents for verification

Within 4 days after receipt of the Certificate for Payment by the PEN Commission, ADN should instruct the PEN Commission to submit any lacking documents in writing and ask questions to the PEN Commission, if any.

The document inspection and site inspection

Within 7 days after receipt of the necessary documents and answers

from the PEN Commission, ADN should carry out the site inspection, if necessary, through coordination with the PEN Commission of the day of the site visit in order to conduct any necessary hearings and give instruction.

The issuing of a recommendation of payment

Within 10 days after receipt of enough documents and answers to ADN's questions from the PEN Commission, ADN should issue a recommendation of payment for Verification to the MPS in the MOF.

3.2.3 Necessary Document to be submitted by the PEN Commission

The inspection reports of the PEN Commission should be submitted to ADN after the verification by the PEN Commission for payment.

The report for interim payment request should include the following:

- "Summary of Verification for Payment Request by the PEN Commission"
- "Company's Documents with Overwritten Signs of the PEN Commission on Each Page"
- "Result of Supervision by the PEN Commission"

The report for payment request of the Provisional Handover should include the following in addition.

- "Result of Functional Testing with criteria"

The report for payment request of the Final Handover should include the following in addition.

- "Report of operation and maintenance"

ADN should examine that the inspection report of the PEN Commission includes enough items for verification. The format for the summery of the inspection report of the PEN Commission is shown in Annex-3 as "Form B" and the necessary items in that report are shown in Annex-3 as "Checklist B-1~3".

3.2.4 Document Inspection

(1) General

The PEN Commission should submit their report as the result of their

verification. This report should include the Company's report with overwritten signs of the PEN Commission.

The verification by ADN should start from the document inspection when the report of the PEN Commission with necessary items arrives to ADN.

(2) Inspection for the Interim Payment

The verification of the interim payment request might be carried out by only Document Inspection if any outstanding problems are not recognized. When the site inspection for the interim payment is carried out, the reason should be clear and mentioned in the inspection report.

Checking Items for the reason for the implementation of site inspection for the interim payment are shown as follows.

a. Large amount (maybe over 100,000 USD) of billing for each interim payment
b. The report by the PEN Commission is not enough for verifying quantities

The verification of the interim payment request should examine mainly the calculation of billing sheet with payment conditions and approximate quantities of completion of the works.

The examination should be focused on important technical items that the route of the line should correspond to the drawings or type of foundation of poles should meet the requirement of technical specification etc.

The necessary items for verification should be included in the report of the PEN Commission as follows and the checklist is shown in Annex-3 as "**Checklist B-1**".

c. Summary of verification for payment request by the PEN Commission
d. Revision of the Works and detailed investigation according to geographical and geological aspect
e. Company's documents with overwritten signs of the PEN Commission on each page
f. Result of supervision by the PEN Commission
g. Digital data of billing sheets in the payment request

(3) Inspection for the payment at the Provisional Handover

The necessary items for verification should be included in the report of the PEN Commission as follows. The checklist for verification is shown in Annex-3 as "**Checklist B-2**" and the checklist for the technical inspection is shown as "**Checklist C**" with the "Guideline of Technical Inspection for Distribution Line".

The inspection should be focused on the documents of the PEN Commission upon the completed work for the remedy of defects as well.

h. Summary of verification for payment request by the PEN Commission
i. Revision of the Works and detailed investigation according to geographical and geological aspect
j. Company's documents with overwritten signs of the PEN Commission on each page
k. Result of Supervision by the PEN Commission
l. Result of Functional Testing and measurement with criteria
m. Digital data of billing sheets in the payment request

(4) Inspection for the payment at the Final Handover

The necessary items for verification should be included in the report of the PEN Commission as follows. The checklist for verification is shown in Annex-3 as "**Checklist B-3**" and the checklist for the technical inspection is shown as "**Checklist C**" with the "Guideline of Technical Inspection for Distribution Line".

The inspection should be focused on the documents of the PEN Commission upon the completed work for the remedy of defects as well.

a. Summary of verification for payment request by the PEN Commission
b. Revision of the Works and detailed investigation according to geographical and geological aspect
c. Company's documents with overwritten signs of the PEN Commission on each page
d. Report of operation and maintenance
e. Digital data of billing sheets in the payment request

3.2.5 Site Inspection

General

The verification of the payment request for Provisional and Final Handover should be carried out by the site inspection after the document inspection.

The smooth and efficient implementation of technical inspection upon the physical completion of the works, that is Provisional and Final Handover, should be carried out based on "**Checklist C**" shown in Annex-3 with the "Guideline of Technical Inspection for Distribution Line".

Preparation

Checking Items are shown as follows.

a. Preparation of the time schedule for site visits
b. Coordination of the PEN Commission's attendant for site visits
c. Asking the head of the PEN Commission whenwriting to cc the MPS, if no attendant from the PEN Commission
d. Selection of investigation items/components from the BoQ, such as important components for function and large amount items

Activities at the Site

Checking Items for site activities for inspection are shown as follows.

a. The outline of the completed components
b. The quantities completed by spot measuring
   - Difference between values completed actually and these in the BoQ
c. The quality of materials and installations
   - Reference to the "Checklist C" with the "Guideline of Technical Inspection for Distribution Line"
   - Result of Testing by the PEN Commission beyond the criteria
d. Other aspects
   - Schedule of the works
   - Constriction activities
   - Situation of beneficiaries
   - Problems with neighbors, etc.

3.2.6 Evaluation and Reporting

After implementation of the inspection and evaluation for the works completed, "recommendation for the payment" with "the recommendation for remedy" upon defects of the works, if any, should be reported in writing to the MPS as soon as possible.

The procedure of submission of report is shown as follows.

1) The inspector of ADN should verify the Payment Request according to the document and site inspection. The recommendations for the payment are reported by usage of "**Form C**" shown in Annex-3.

2) If ADN does not receive enough documents and answers from the PEN Commission within a reasonable number of days (roughly one week) ADN should report on the defective verification by the PEN Commission to the MPS.

3) If any defects of the works are observed, the recommendations for the remedy on defects should be instructed to the PEN Commission and the company in writing. ADN should get the signs from both sides on the attached "**Form D-1**", "**Form D-2**" and "**Form D-3**".

The recommendations for the payment, which includes reduction of payment request or pending of payment due to the wait for correction of defects by the company, should be reported to the MPS accordingly.

Annex-3 (National Electrification Program)

In this Annex, the forms and checklists used on the work described in ' 0. エラー! ブックマークが自己参照を行っています。' is shown.

The relation between the forms/checklists and the timing using them is shown in the following table.

Table Annex-3-1 The forms/checklists and their timing of the usage

Form/Checklist	Timing of the usage	User
Form A-1	Issuing the result of confirmation of documents for quality verification of contract	ADN
Form A-2	Issuing the result of verification for quality certification of contract	ADN
Form B	Issuing of certificate for payment	PEN/C
Form C	Issuing of recommendation for payment	ADN
Form D-1	Issuing of recommendation for interim payment	ADN
Form D-2	Issuing of recommendation for provisional payment	ADN
Form D-3	Issuing of recommendation for final payment	ADN
Checklist A	- Confirmation of documents for quality verification of contract - Verification for quality certification of contract	ADN
Checklist B-1	Issuing of certificate for interim payment	PEN/C
Checklist B-2	Issuing of certificate for provisional payment	PEN/C
Checklist B-3	Issuing of certificate for final payment	PEN/C
Checklist C	Site inspection	ADN

PEN/C : The PEN commission

The Attachment, 'Guideline of Technical Inspection for Distribution Line' is for the technical inspection using 'Checklist C'.

Form A-1 (Confirmation of Payment Request by the PEN Commission)

REPUBLICA DEMOCRATICA DE TIMOR LESTE
GABINETE DO PRIMEIRO MINISTRO
AGÉNCIA 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: Agéncia Desenvolvimentu Nacional (ADN) and Decree Law No. 40/2012: Programa Eletrificacão 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.

Form A-2 (Verification of Payment Request by the PEN Commission)

REPUBLICA DEMOCRATICA DE TIMOR LESTE
GABINETE DO PRIMEIRO MINISTRO
AGÉNCIA 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: Agéncia Desenvolvimentu Nacional (ADN) and Decree Law No. 40/2012: Programa Eletrificacão 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.

Form-B (Recommendation for Payment by the PEN commission)

Verification for Payment Request by the Commission

Form B

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 Library Period :			
7	Payment conditions	Advance payment (%), Retention (%), Repay of Retention (% at Completion day), etc.			
8	Project site	District & Sub-district			
		Village/Hamlet			
9	Contract Value			$	1,000,000.00
10	Gross Payment until now			$	500,000.00
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)x((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	Release for previous retention			$	-
18	Payment for this month	(14)+(15)		$	80,000.00
19	Balance after this payment	(9)-(10)-(18)		$	420,000.00
20	Progress for previous payment (%)	(10)/(9)			50%
21	Progress for this payment (%)	(12)/(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 Schedule of the work	Yes/No			
e	Testing Result for handover	Yes/No			
f	Inspection Report	Yes/No			
g	Pictures for completed works	Yes/No			
24	Result of inspection by EDTL				
	{ Result of Document Inspection }				
	{ Result of Site Inspection }				
	{Judgment for payment }				
25	Proposed Payment Request from the Contractor				
26	Recommendation for payment				80,000.00
27	Site inspection day	Date:	Month:	Year:	
28	Inspector	Signature:		Date :	
		Signature:		Date :	
29	Verified by :	Signature:		Date :	
30	Approved by :	Signature:		Date :	

Form C (Inspection Report and Recommendation for Payment)

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

Form C

	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 Liblary Peariod :	
7	Payment conditions	Advance payment (%), Retention (%), Repay of Retention (% at Completion day), etc.			
8	Project site — District & Sub-district				
	Project site — Village/Hamlet				
9	Contract Price			$	1,000,000.00
10	Gross Payment until now			$	500,000.00
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)x((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	Release for previous retention			$	-
18	Payment for this month	(14)+(15)		$	80,000.00
19	Balance after this payment	(9)-(10)-(18)		$	420,000.00
20	Progress for previous payment (%)	(10)/(9)			50%
21	Progress for this payment (%)	(12)/(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 Hndover	Yes/No			
d	Program _Schedule of the work	Yes/No			
e	Testing Result for handover	Yes/No			
f	Inspection Report	Yes/No			
g	Pictures for completed works	Yes/No			
21	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)				
	Result of Verification: APPROVES/ APPROVES with NOTE /REDUCTION/PENDING				
22	Proposed payment in the invoice from the Contractor (USD)				
23	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 Guterres			Date :	
	Verified by :	Signature:		Date :	
	Miguel Marques Monteiro de Jesus				
26	Q.C.	Signature:		Date :	
	Esron ST. Henuk				
27	Approved by :	Signature:		Date :	
	Sr. Samuel Marçal				
28	Director General - ADN.				
27	Annex : Employer'				

Form D-1 (Recommendation for Remedy)

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

Form D-1

RECOMMENDATION FOR REMEDY IN INTELIM PAYMENT

Date : _____
Company : _____
Project Name : _____
Project Site : _____

Based on the inspection by ADN, ADN Team submitted the recommendation for remedy of defects as fallows:

1 Medium Voltage

.....
.....
.....

2 Low Voltage

.....
.....
.....

3 Home Connection

.....
.....
.....

The recommendations which are mentioned above based on reality in the field and the Company is ready to collaborate or follow up the recommendation from AND Team.

Ekipa ADN

(_____)

Supervisor of the Committee

(_____)

Supervisor of the Company

(_____)

NOTE:

1. After signing the Original should be returned to AND
2. A Copy should be sent to EDTL and Company respectively

Form D-2 (Recommendation for Remedy)

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

Form D-2

RECOMMENDATION FOR REMEDY IN PROVISIONAL HANDOVER

Date : _____
Company : _____
Project Name : _____
Project Site : _____

Based on the inspection by ADN, ADN Team submitted the recommendation for remedy of defects as fallows:

1 Medium Voltage

.....
.....
.....

2 Low Voltage

.....
.....
.....

3 Home Connection

.....
.....
.....

The recommendations which are mentioned above based on reality in the field and the Company is ready to collaborate or follow up the recommendation from AND Team.

Ekipa ADN

(_____)

Supervisor of the Committee

(_____)

Supervisor the Company

(_____)

NOTE:

1. After signing the Original should be returned to AND
2. A Copy should be sent to EDTL and Company respectively

Form D-3 (Recommendation for Remedy)

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

Form D-3

RECOMMENDATION FOR REMEDY IN PROVISIONAL HANDOVER

Date : _____
Company : _____
Project Name : _____
Project Site : _____

Based on the inspection by ADN, ADN Team submitted the recommendation for remedy of defects as fallows:

1 Medium Voltage

.....
.....
.....

2 Low Voltage

.....
.....
.....

3 Home Connection

.....
.....
.....

The recommendations which are mentioned above based on reality in the field and the Company is ready to collaborate or follow up the recommendation from AND Team.

Ekipa ADN

(_____)

Supervisor of the Committee

(_____)

Supervisor the Company

(_____)

NOTE:

1. After signing the Original should be returned to AND
2. A Copy should be sent to EDTL and Company respectively

AGENCIA DE DESENVOLVIMENTO NAÇIONAL
GABINETE DO PRIMEIRO MINISTRO
REPÚBLICA DEMOCRÁTICA DE TIMOR-LESTE

Checklist A

Checklist A (Document to be submitted)

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	Remedy & 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	
			Summary 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 sourses	Yes/No	
	④	Salient futures 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	
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

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Checklist B-1

Checklist for Necessary Items in Inspection Report of the Committee					Inspected by	Approved by
Project Name						
Stage	Verification for Interim Payment Request (1st and 2nd Payment)			Date of Inspection of ADN		
Fund	Infrastructure Fund	Type of Project	National Electrification Program	Implementing Agency	EDTL	
Project Site	a) District:	b) Sub district:		c) Village/Hamlet :		

	Check Item		Check Point	Checking	Remarks for the lacking items
1	Summary of Verification for Payment Request by the Committee			Yes/No	by usage of "Checklist A"
	1	Outline of the Project and payment request	Category of payment such as interim, provisional and final handover		
	2	Calculation of payment	Payment calculation with payment conditions		
	3	Letter with signature for verification	Signature of the supervisor and head of the Committee		
2	Revision of the Works and detailed investigation according to geographical and geological aspect				
	1	The revision of route of the line, if any	the reason of the revision	Yes/No	
	2	The Length of the 20 kv and 220v lines	the result of the detail investigation	Yes/No	
	3	The number of house connections	the result of the detail investigation	Yes/No	
	4	The number of transformer	the result of the detail investigation	Yes/No	
	5	Approval of the revision by the Committee		Yes/No	
3	Company`s Documents with Overwritten Signs of the Committee on Each Page				with name of inspector
	1	Billing sheets	Payment calculation with payment conditions	Yes/No	
	2	BOQ	Completed quantities which can refer in drawings	Yes/No	
	3	Drawings	Marking red color to the works completed	Yes/No	The completed works in drawing should correspond to the quantities of the BOQ
	4	"Program"	including schedule of S curve of planning and completion	Yes/No	
	5	Photographs	showing the works completed	Yes/No	
4	Result of Supervision by the Committee				
	1	Instruction to the Company	Instruction of remedy for defect of the works by the Committee	Yes/No	
	2	Issuing certification	Certification for completed work by Company upon remedy	Yes/No	
5	Digital data of billing sheets in the payment request			Yes/No	

Checklist B-1 (Inspection for the payment)

AGENCIA DE DESENVOLVIMENTO NAÇIONAL
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Checklist B-2

Checklist for Necessary Items in Inspection Report of the Committee					Inspected by	Approved by
Project Name						
Stage	Verification for Payment Request at Provisional Handover			Date of Inspection of ADN		
Fund	Infrastructure Fund	Type of Project	National Electrification Program	Implementing Agency	EDTL	
Project Site	a) District:	b) Sub district:		c) Village/Hamlet :		

	Check Item		Check Point	Checking	Problems / Defects & Remedy
1	Summary of Verification for Payment Request by the Committee			Yes/No	by usage of "Checklist A"
	1	Outline of the Project and payment request	Category of payment such as interim, provisional and final handover		
	2	Calculation of payment	Payment calculation with payment conditions		
	3	Letter with signature for verification	Signature of the supervisor and head of the Committee		
2	Revision of the Works and detailed investigation according to geographical and geological aspect				
		The revision of route of the line, if any	the reason of the revision	Yes/No	
		The Length of the 20 kv and 220v lines	the result of the detail investigation	Yes/No	
		The number of transformer	the result of the detail investigation	Yes/No	
		The number of house connections	the result of the detail investigation	Yes/No	
		Approval of the revision by the Committee		Yes/No	
3	Company's Documents with Overwritten Signs of the Committee on Each Page				with name of inspector
	1	Billing sheets	Payment calculation	Yes/No	
	2	BOQ	Completed quantities by measuring the result of the works	Yes/No	
	3	As-built Drawings	The works completed	Yes/No	
	4	"Program"	including schedule of S curve of planning and completion	Yes/No	
	5	Photographs	showing the works completed	Yes/No	
4	Result of Supervision by the Committee				
	1	Instruction to the Company	Instruction of remedy for defect of the works by the Committee	Yes/No	
	2	Issuing certification	Certification for completed work by Company upon remedy	Yes/No	
5	Result of Functional Testing and measurement with criteria			Yes/No	Reference of the "Checklist C"
6	Digital data of billing sheets in the payment request			Yes/No	

AGENCIA DE DESENVOLVIMENTO NAÇIONAL
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Checklist B-3

Checklist for Necessary Items in Inspection Report of the Committee				Inspected by	Approved by
Project Name					
Stage	Verification for Payment Request at Final Handover		Date of Inspection of ADN		
Fund	Infrastructure Fund	Type of Project	National Electrification Program	Implementing Agency	EDTL
Project Site	a) District:	b) Sub district		c) Village / Hamlet	

	Check Item		Check Point	Checking	Problems / Defects & Remedy
1	Summary of Verification for Payment Request by the Committee			Yes/No	by usage of "Checklist A"
	1	Outline of the Project and payment request	Category of payment such as interim, provisional and final handover		
	2	Calculation of payment	Payment calculation with payment conditions		
	3	Letter with signature for verification	Signature of the supervisor and head of the Committee		
2	Revision of the Works and detailed investigation according to geographical and geological aspect , if any change				
		The revision of rout of the line, if any	the reason of the revision	Yes/No	
		The Length of the 20 kv and 220v lines	the result of the detail investigation	Yes/No	
		The number of transformer	the result of the detail investigation	Yes/No	
		The number of house connections	the result of the detail investigation	Yes/No	
		Approval of the revision by the Committee		Yes/No	
3	Company's Documents with Overwritten Signs of the Committee, if any changes after Provisional Handover				with name of inspector
	1	Billing sheets, if any changes	Payment calculation	Yes/No	
	2	BOQ, if any changes	Completed quantities by measuring the result of the works	Yes/No	
	3	As-build Drawings, if any changes	The works completed	Yes/No	
	4	"Program", if any changes	including schedule of S curve of planning and completion	Yes/No	
	5	Photographs, if any changes	showing the works completed	Yes/No	
4	Report of operation and maintenance				
	1	Problems for operation and maintenance		Yes/No	
	2	Instruction to the Company	Instruction of remedy during defect liability period by the Committee	Yes/No	
	3	Issuing certification	Certification for completed work by Company upon remedy	Yes/No	
5	Digital data of billing sheets in the payment request			Yes/No	

AGENCIA DE DESENVOLVIMENTO NAÇIONAL
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REPÚBLICA DEMOCRÁTICA DE TIMOR-LESTE

Checklist C

Checklist for Necessary Items for Technical Inspection

Project Name				Inspected by	Approved by
Stage	Verification for Payment		Date of Inspection of ADN		
Fund	Infrastructure Fund	Type of Project: National Electrification Program	Implementing Agency	EDTL	
Project Site	a) District:	b) Sub district:	c) Village/Hamlet:		

		Check Item	Check Point	Checking (Yes/No)	Problems / Dedects & Remedy
1	Checking by External Examination at Site				
	1	Stability of the pole	Type of foundation: for soil or rock		
			Depth in underground		
			Support of critical pole: Guy/Shaft support		
	2	Painting of pole	Layer of painting		
	3	Conductor	Clearance		
			Length of MV/LV Circuits		
	4	Insulator			
	5	Transformer			
	6	Height of Overhead Lines			
	7	Clearance between Overhead Lines and Objects			
	8	Crossing of Overhead Lines	Distance of the lines		
2	Checking Documents from Technical Standard				
	1	Tensile Strength of Conductors and Ground Wires	Safety factor		
			Tensile Strength after Connection		
	2	Conductor	Connection of Conductor		
	3	Insulation	Insulation Capacity depend on voltage		
	4	Power System Grounding	The value of grounding		
	5	Protective Devices	Overcurrent and Ground Fault Circuit Breakers		
			Surge Arresters		
	6	Standard Voltage			
3	Checking Documents and by Measurement at Site				
	1	Earthing Resistance	System Earthing for substations		
			Protective Earthing for transformers		
			Surge Arrester Earthing		
	2	Insulation Resistance	20kV voltage line		
			Transformer		
			Lightning arrester		
4	Others				
	1	Certificate from suppliers/factories	Mill Certificate for materials		
			Performance Certificate for Components		

[Attachment]

Guideline of Technical Inspection for Distribution Line

1. Purpose

This "Technical Guideline for Site Inspection of Distribution Line" was established for the smooth and efficient implementation of technical inspection upon the physical completion of the distribution power line construction. In other words, this guideline is to be used for checking "Checklist C".

2. Scope

This guideline lists the main items and these criteria to apply to technical aspect for the inspection at the handover.

3. Object of handover inspection

The technical inspection should be carried out so as to check whether the power distribution facilities concerned are constructed properly in accordance with the design contents and technical specification in the contract. Remedy for defects should be instructed on the basis of the inspection.

4. Self-inspection by the Contractor

The Contractor should submit the self-inspection report to the LM by carrying out the self-inspection after the completion of the works. As-built Drawing, BOQ of completed work and photographs for the Project should be attached.

5. Inspection by the LM

The LM should prepare and submit the inspection report to ADN by carrying out the inspection after receipt of the Contractor's inspection report.

6. Handover Inspection

Documentary Examination

The result of the inspection by the Contractor and the LM should be

examined. If the content of these inspections are inadequate, ADN should instruct them to carry out additional inspections or look for possible remedies for defects.

Inspection methods and criterion

Installation conditions at the site should meet the commonly used technical standards such as Indonesia PLN standard.

The measures below should be carried out for all facilities.

a. Checking by External Examination
b. Checking from Technical Standard
c. Checking by Measurement

Check List for Technical Aspect in Site Inspection (From Checklist C)

Checking by External examination at site

Stability of the Pole

a.Depth underground
b. Support of critical pole : Guy/Shaft support

Painting of pole

a. No of paint layers

Conductor

a.Clearance
b.Length of MV/LV Circuits

Insulator

Transformer

Height of Overhead Lines

a.Road or others

Clearance between Overhead Lines and Other Objects

a.Tree; more than 5m for a new overhead line
b.Crossing of Overhead Lines
c. Distance of the lines

Checking from Technical Standard

Tensile Strength of Conductors and Ground Wires

a.Safety factor
b.Tensile Strength after Connection

Conductor

a.Connection of Conductor

Insulation

a.Insulation Capacity depend on voltage

Power System Grounding

a.The value should not be more than 10 ohms.

Protective Devices

a.Over Current Circuit Breakers
b.Ground Fault Circuit Breakers
c. Surge Arresters

Acquisition of certificate from suppliers/factories

a.Mill Certificate for materials
b.Performance Verification Certificate for Components

Standard Voltage

Checking by Measurement

Earthing Resistance

a.System Earthing for substations
b.Protective Earthing for transformers
c. Surge Arrester Earthing

Insulation Resistance

a.20kV voltage line
b.Transformer
c. Lightning arrester

CHECKING by EXTERNAL EXAMINATION at site

Stability and Painting of the Pole

Item	Inspection method	Criterion
Type	Visual inspection of the material, size	Constructed as same as the contract
Setting depth	✧ Check by marking of depth - Check by photograph	- Constructed as same as the contract - 2m depth for 12 m pole at soil foundation - 1m-1,5m depth for 12 m pole at rock foundation - 1m depth for 9 m pole at rock foundation - 1.5m depth for 9 m pole at soil foundation
Incline	Visual inspection	Top of the pole should not go out of line more that 2ft.
Painting	Visual inspection	- At least, two layers should be painted - Base layer of painting should not appear at any parts of structure

[example of incline]

Good case	Bad case
	
Incline is less than 2ft.	Incline is more than 2ft at the top.

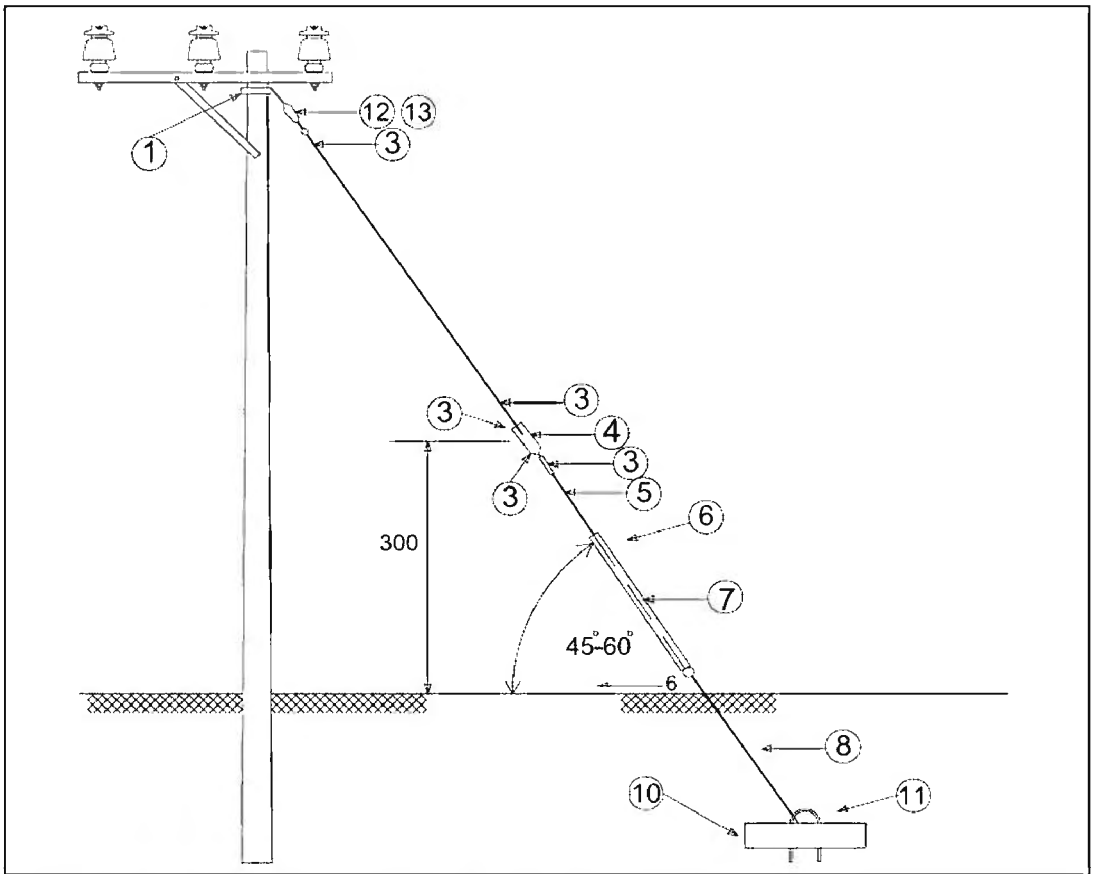
[Guy]

Item	Inspection method	Criterion
Judge for	Visual inspection	the two lines at a pole have more than 5 degrees

adoption		of the angle
Installation	Visual inspection	Installed on the pole correctly
Foundation	Visual inspection	Installed firmly so that it can adequately endure the tensile load
Globe insulator	Visual inspection	Inserted in the upper part of the guy

[Pole Supporting Construction]

Type 1. Guy wire

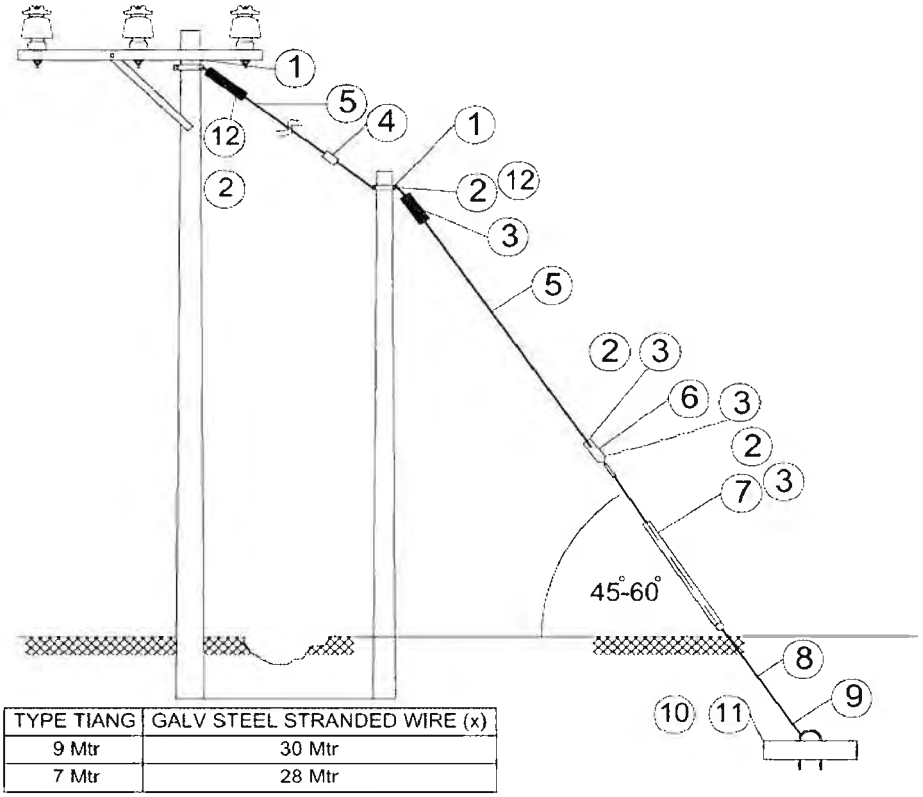


Keterangan : ○ Konstruksi topang tarik (Guy Wire) jika komponen no 3 di pakai, tidak perlu memakai komponen no. 6

NO	NOMOR SAP	NAMA MATERIAL	SATUAN	JUMLAH	
				TM	TR
1		Guy Wire Band + Bolt & Nut M16 X 50	Set	1	1
2		Terminating Thimble	Pcs	1	-
3		Preformed Grit 22/35/70	Pcs	4	2
4		Guy Insulator	Pcs	1	-
5		Galv Steel Stranded Wire 22/35/70 Sqmm	Mtr	X	X
6		Wire Clip	Pcs	1	1
7		Pipa Pelindung 3/4"-2Mtr	Pcs	1	1
		-	Pcs	-	-
8		Guy Rod (2,5 / 1,8) Mtr	Pcs	1	1
9		U Bolt & Nut M16	Pcs	1	1
10		Anchor Block 400 X 400 mm/Epending Anchor	Pcs	1	1
11		Turn Buckle 5/8"	Pcs	-	1
12		Turn Buckle 3/4"	Pcs	1	-

ADN	KONSTRUKSI TOPANG TARIK / GUY WIRE PADA TIANG BETON BULAT	FOTO
DIGAMBAR: PPST UI	STANDAR KONSTRUKSI JARINGAN DISTRIBUSI	No. GAMBAR : JTM/SUTM/68
DISETUJUI : DIV. DISTRIBUSI IT, IB, JB		EDISI 1 2010
		112

Type 1. Kontramast



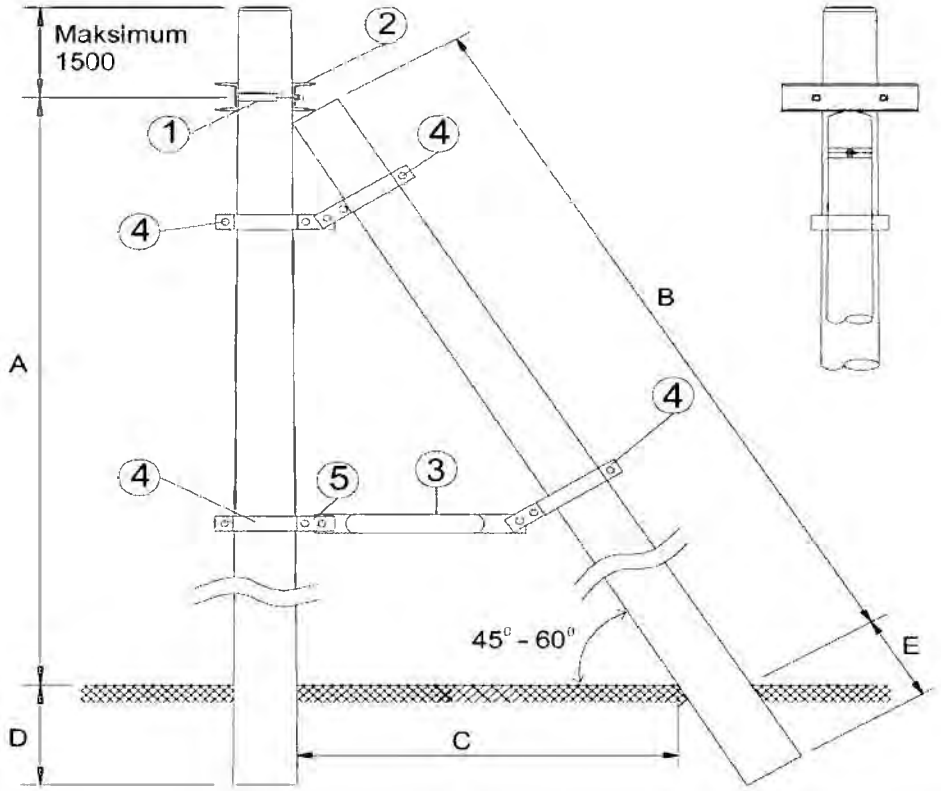
TYPE TIANG	GALV STEEL STRANDED WIRE (x)
9 Mtr	30 Mtr
7 Mtr	28 Mtr

Keterangan ; ◦Konstruksi topang tarik khusus (supported Guy Wire - kontramast)

NO	NOMOR SAP	NAMA MATERIAL	SATUAN	JUMLAH	
				TM	TR
1		Guy Wire Band + Bolt & Nut M16 X 50	Set	1	1
2		Terminating Thimble	Pcs	1	-
3		Preformed Grip 22/35/70	Pcs	4	2
4		Guy Insulator	Pcs	1	-
5		Galv Steel Stranded Wire 22/35 Sqmm	Mtr	X	X
6		Wire Clip	Pcs	1	1
7		Pipa Pelindung 3/4"-2Mtr	Pcs	1	1
8		Guy Rod (2,5 / 1,8) Mtr	Pcs	-	-
9		U Bolt & Nut M16	Pcs	1	1
10		Anchor Block 400 X 400 mm	Pcs	1	1
11		Expanding Anchor	Pcs	1	1
12		Turn Buckle 5/8" atau 3/4"	Pcs	-	1

ADN	KONSTRUKSI TOPANG TARIK KONTRAMAST	FOTO
DIGAMBAR PPST UI	STANDAR KONSTRUKSI JARINGAN DISTRIBUSI	No. GAMBAR : JTM/SUTM/67
DISETUJUI : DIV. DISTRIBUSI IT, IB, JB		EDISI 1 — 2010 — 111

Type 1. Pole support



NO	NOMOR SAP	NAMA MATERIAL	SATUAN	JUMLAH
1		Single Arm Band & Nut M16 + Washer	Set	1
2		Strut Arm UNP, 8 x 300	Pcs	1
3		Strut Tie 1200 s/d 1500	Pcs	1
4		Double Pole Band + Bolt & Nut M 16 X 50	Set	4
5		Bolt & Nut M 16 X 140 + !6 X50	Set	11

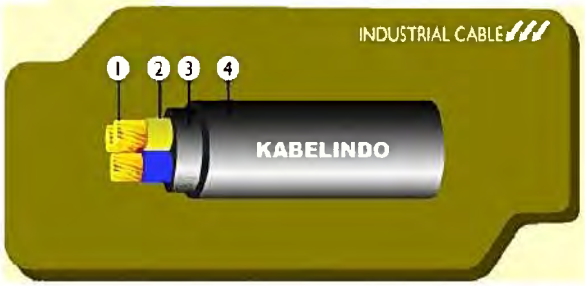
NO	TYPE TIANG BESI		SATUAN DALAM METER				
	UTAMA	STRUT POLE	A	B	C	D	E
1	13	11	8,4	10	5,42	1,83	1
2	11	9	7,7	8,4	3,3	1,83	0,6
3	9	9	6,75	8	4,2	1,5	1
4	7	7	5,3	6,5	3,7	1,16	0,5

ADN	KONSTRUKSI PENOPANG TIANG (STRUT POLE)	FOTO
DIGAMBAR PPST UI	STANDAR KONSTRUKSI JARINGAN DISTRIBUSI	No. GAMBAR : JTM/SUTM/65
DISETUJUI : DIV. DISTRIBUSI IT, IB, JB		EDISI 1 / 2010 / 109

Conductor

NYY 0.6/1 kV

Copper Conductor, PVC Insulated.PVC Sheated



1. Conductor : Annealed Copper wire
2. Insulation : Extruded PVC
3. Filler : Extruded PVC
4. Sheath : Extruded PVC

PVC LOW VOLTAGE CABLE

TECHNICAL DATA

Spec — Specification : SPLN 43 -1 : 1994, IEC 60502 - 1 : 1997

Cu — Conductor Shape : re = Circula rm = Circul

AFL — Used for indoor in ducts installation or for laying in the ground where not sustain mechanical damage

DCV — DC Test Voltage : 8,5 kV for 5

DIMENSIONAL DATA — 5 CORES

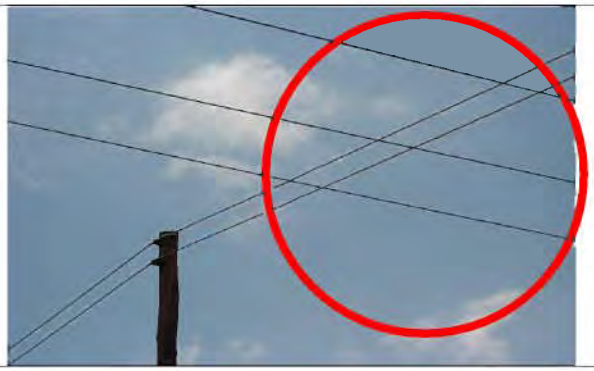
SIZE	No.of wire and Shaped Of Conductor		Nominal Thickness		Approximately		Min. Bending Diameter	Std. Length per reel
			Insulation	Outer Sheath	Overall Diameter	Net. Weight		
mm^2	pcs	shape	mm	mm	mm	kg/km	mm	m
1.5	1	re	0.8	1.8	12.8	255	230	1000
	7	rm			13.3	268	239	
2.5	1	re			14	329	252	
	7	rm			14.6	352	263	
4	1	re	1		16.3	470	293	
	7	rm			17.1	505	308	
6	1	re			17.7	602	319	
	7	rm			18.6	650	335	
10	7	rm			21	912	378	
16	7	rm			23.8	1279	428	
25	7	rm	1.2		28.3	1914	509	
35	7	rm			31.5	2505	567	
50	19	rm	1.4	1.9	36.4	3273	655	

Item	Inspection method	Criterion
Type	Visual inspection at connected point and installation of insulator	Constructed as same as the contract
Connected Point	Visual inspection	No connected points between a pole and next pole
Dip (Sag)	Visual inspection	There has no extraordinary looseness nor tightness
Clearance	Visual inspection and measurement of the clearance	Should be complied with Technical Standards
Length of MV/LV Circuits	Visual inspection Measurement of length by means of car trip meter etc.	Constructed within 500m radius of the substation.

[example of overall installation]

Good case	Bad case
	
Jumper wires are connected by connecter.	Jumper wires are loosely connected, not tightly.

[example of clearance]

Good case	Bad case
	
There is enough clearance between HV and LV.	There is no clearance (only 0.6m) between HV and LV, also there are no guard wires.

Insulator

Type of insulator used in *transmission lines* is parceling/glass type.

Classification of insulator is:

a. cotter pin insulator.

b. pos-transmission isolator.

c. hang isolator.

Cotter pin insulator and post-line isolator are used for transmission relative with low voltage (less than 22-33 kV), and hang insulator can be coupled become suite insulator which is the number can be adjusted to the needs.

There are two types of isolator that can be used in conformity with the function:

1. Line isolator there are various terms: line post insulator, post insulator, insulator pin. This is used to toehold to conduct mechanical force to this insulator is due to heavy load conducted to the pole.
2. Suspension isolator, is 2 type of : isolator paying (Umbrella Insulator) and long rod insulator.

Characteristic of Isolator

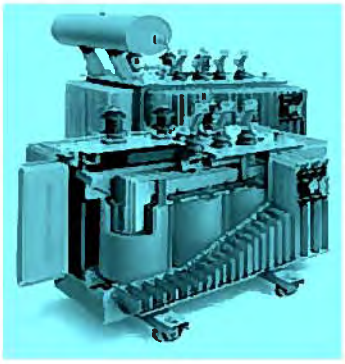
No	characteristics	Type of insulator		
		Line Post	Pin Post	Pin
1	Maximum working voltage	24 kv	24 kv	22 kv
2	Withstand voltage (wet)	65 kv	65 kv	75 kv
3	Impulse withstand Voltage	125 kv	125 kv	125 kv
4	Mechanical Strength	1250 daN	1250 kv	850 daN
5	Creepage distance	480 mm	534 mm	583 mm
6	Heavy	8,34 kg	10 kg	6,4 kg

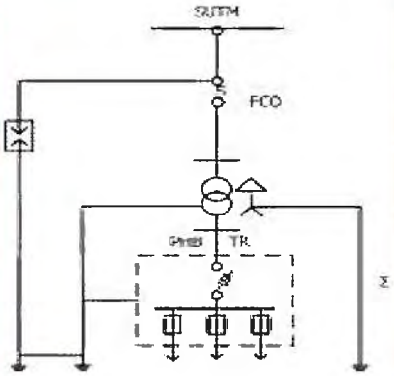
For 1 set as suspension type consists of 2 pieces/2 plates whereas type of long rod 1 piece. This Load mechanical isolator is the mechanism load such as at the peak of pole isolator/beginning.

Item	Inspection method	Criterion
Type, Voltage	Visual inspection of the type	Correspond to line voltage
Overall installation	Visual inspection of the overall installation of the insulators	Nothing unusual such as crack

Transformer

Generally Configuration of pole transformer which powered by SUTM is section T with safety tools Cut-Out (FCO) as a short safety connection for transformer with circuit fuser element (melting security link type expulsion) and Lightning Arrester (LA) as a tool for preventing the increase stress on transformer caused by surges lightning.





NO	Vektor Group	Daya (kVA)	Keterangan
1	Yzn5	50 100 160	Untuk sistem 3 kawat
2	Dyn5	200 250 315 400 500 630	Untuk sistem 3 kawat
3	Ynyn0	50 100 160 200 250 315 400 500 630	Untuk sistem 4 kawat

Height of Overhead Lines

b.Road or others

Clearance between Overhead Lines and Other Objects

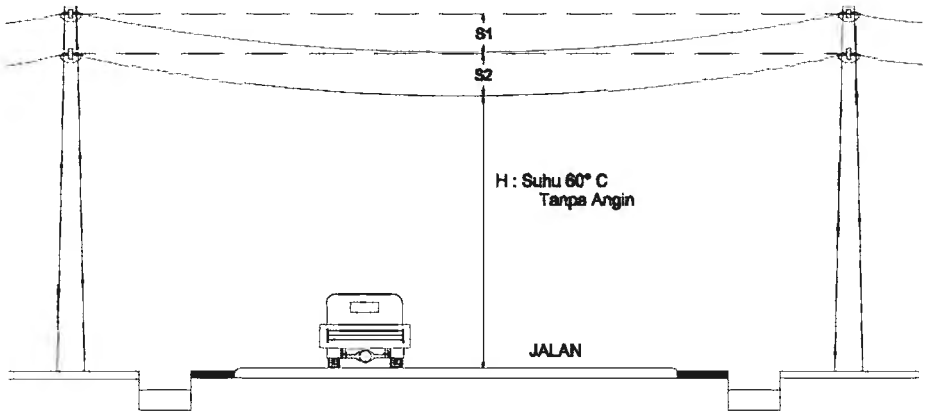
d.Tree; more than 5m for a new overhead line
e. Crossing of Overhead Lines
f. Distance of the lines

Safety Distance of network

Item	Inspection method	Criterion
Type, Capacity	Visual inspection of the type and the capacity of the transformer	Constructed as same as the contract
Connection	Visual inspection of the connection	Connected as required
Substation Wiring	Visual inspection	No connected points on conductors
Transformer installation	Visual inspection of the installation	Nothing unusual
Installation of protective devices	Visual inspection of the installation	Necessary protective devices should be installed at primary side of the transformer
Earthling wire installation	Visual inspection of the overall installation of earthling wire	Nothing unusual

Tabel 4.1 Jarak aman SUTM

No.	Uraian	Jarak Aman
1.	Terhadap permukaan jalan raya	≥ 6 meter
2.	Balkon rumah	≥ 2,5 meter
3.	Atap rumah	≥ 2 meter
4.	Dinding Bangunan	≥ 2,5 meter
5.	Antena TV/ radio, menara	≥ 2,5 meter
6.	Pohon	≥ 2,5 meter
7.	Lintasan kereta api	≥ 2 meter dari atap kereta
8.	Underbuilt TM – TM	≥ 1 meter
9.	Underbuilt TM – TR	≥ 1 meter



PENJELASAN

S1 : Panjang andongan (sag) jaringan tegangan rendah tidak kurang dari 60 Cm

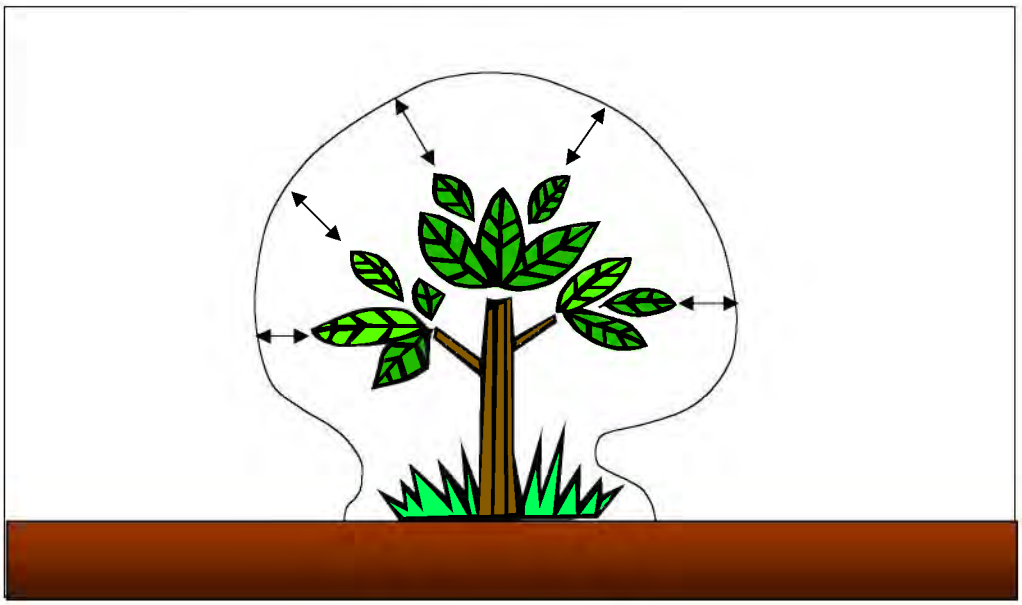
S2 : Jarak saluran udara tegangan rendah dengan kabel optik telekomunikasi tidak kurang dari 1000 Cm

H : Jarak aman kabel optik terhadap permukaan jalan

- Jalan umum tidak kurang dari 6 meter
- Jalan lingkungan tidak kurang dari 5 meter
- Tanah pekarangan pribadi tidak kurang dari 4 meter

ADN	SALURAN UDARA TEGANGAN RENDAH JARAK AMAN		
DIGAMBAR: PPST UI	STANDAR KONSTRUKSI JARINGAN DISTRIBUSI	No. GAMBAR	JTR/SUTR/25
DISETUJUI: DIV. DISTRIBUSI I, II, III		EDISI 1	2010
			64

Title	Clearance between Overhead Line and Tree



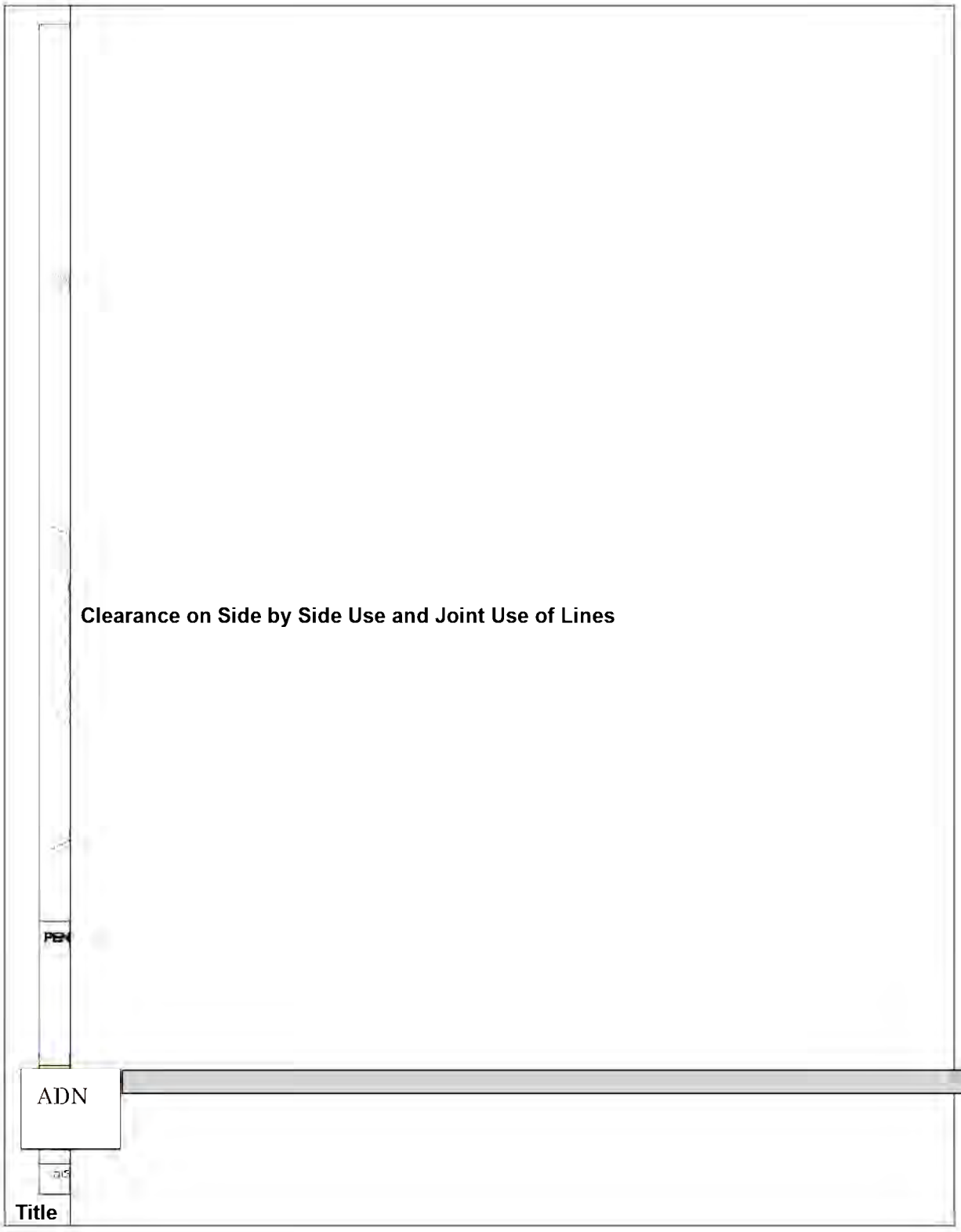
(Unit: m)

Minimum Clearance

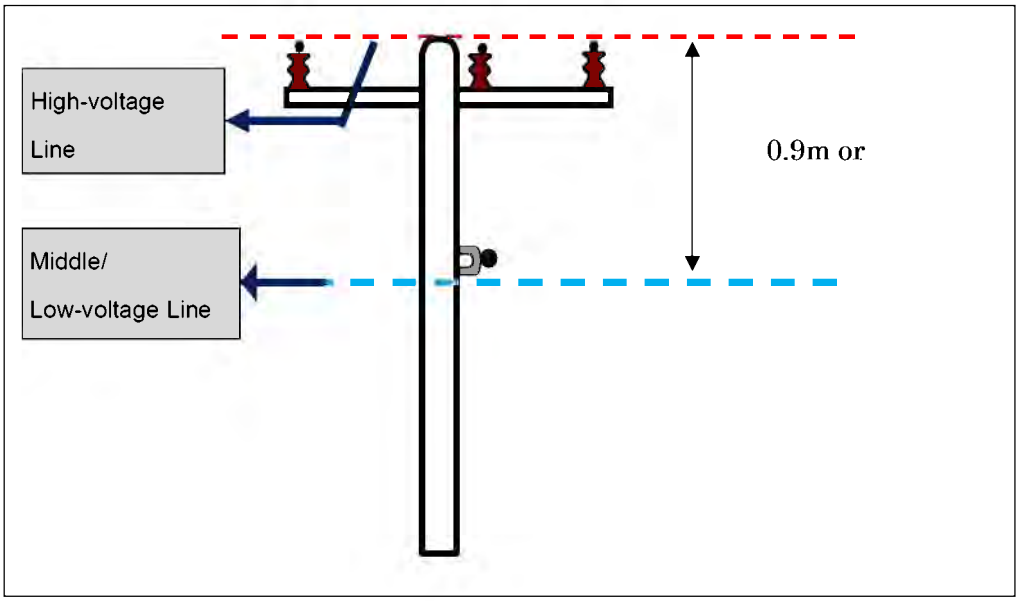
Low/Medium-voltage	***High-voltage***
Shall not contact directly	Less than 0.9m

The clearance should be more than 5m for a new overhead line.

Remarks	Revisions	


Clearance on Side by Side Use and Joint Use of Lines
ADN
Title

The minimum clearance of each lines at a supporting structure is give by the following figure and table. The clearance is dicided taking working space into consideration.



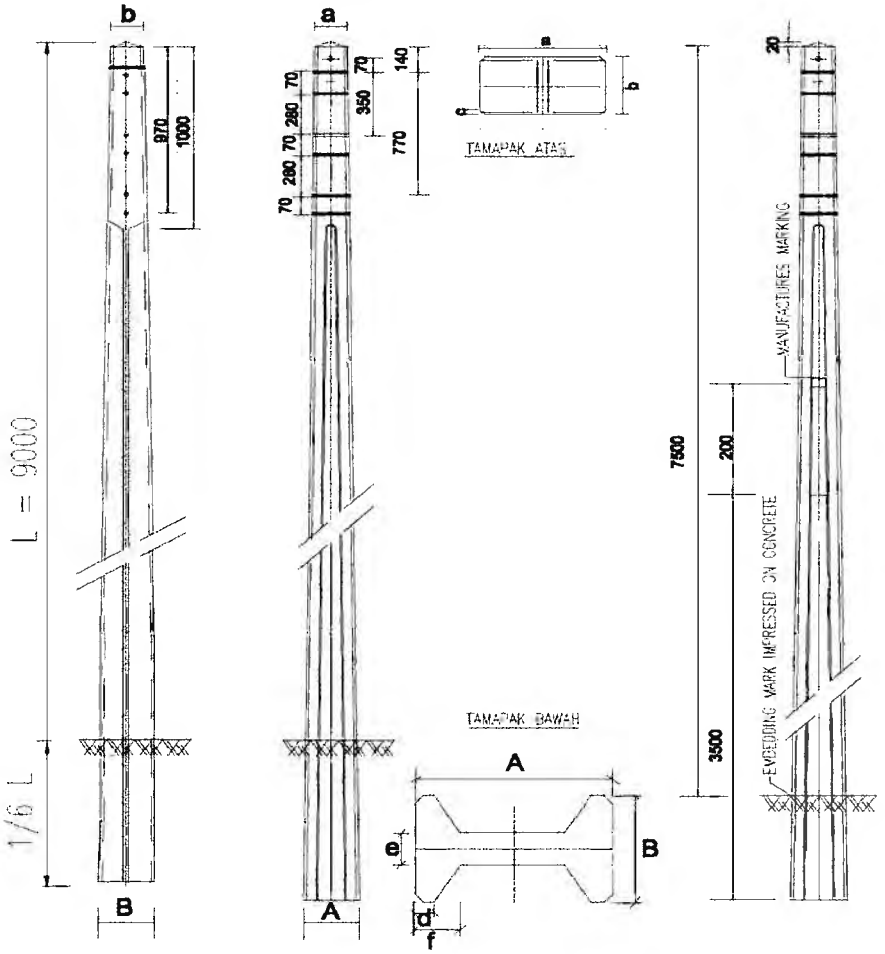
(Unit: m)

Recommended Minimum Clearance

A	*High-Voltage Line*	*Medium /Low-Voltage Line*	0.9m

Remarks	Revisions	

Title	Setting Depth of Supporting Structure



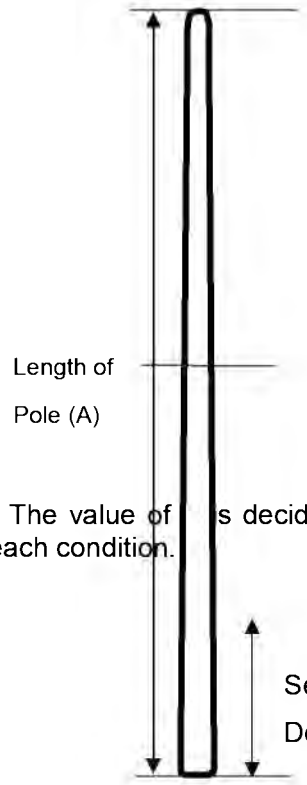
KETERANGAN

L Tinggi Tiang (m) / UKURAN	Beban Rencana (daN)	Top(bag atas) (m m)		Bottom(bag bawah) (m m)		Ukuran (mm)			
		a	b	A	B	c	d	e	f
9	200	166	110	315	235	15	55	62	72
9	500								

ADN	TIANG BETON TYPE - H	
T UI	**STANDAR KONSTRUKSI JARINGAN DISTRIBUSI**	No. GAMBAR : JTR/SUTR-SKUTR/02
DISETUJUI : DIV DISTRIBUSI IT, IB, JB		EDISI 1 — 2010 — 103

Title	**Setting Depth of Supporting Structure**

The setting depth of supporting structures defined in Article No.X-X of Technical Standard are as follows;

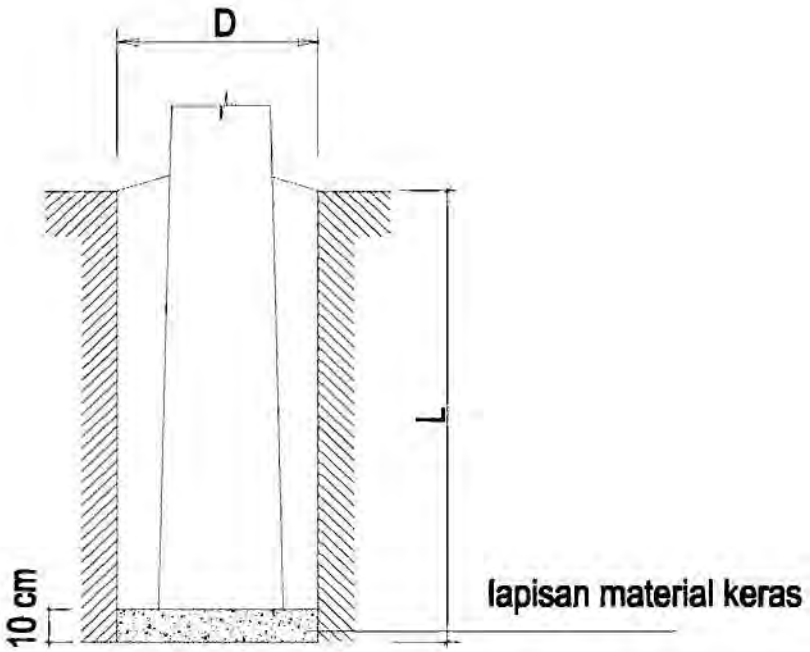


	A (m)	B (m)	
	Length	**In soil**	**In rock**
Wooden pole, Iron pole, Iron-reinforced concrete pole	7.5	1.5	1.0
	9.0	1.7	1.0
	10.8	2.0	1.2
	12.3	2.0	1.2
	13.5	2.0	1.4
	15	2.1	1.4
	16	2.1	1.4

* The value of [illegible]s decided based on the calculation considering the worst situation of each condition.

Remarks	Revisions	

Foundation



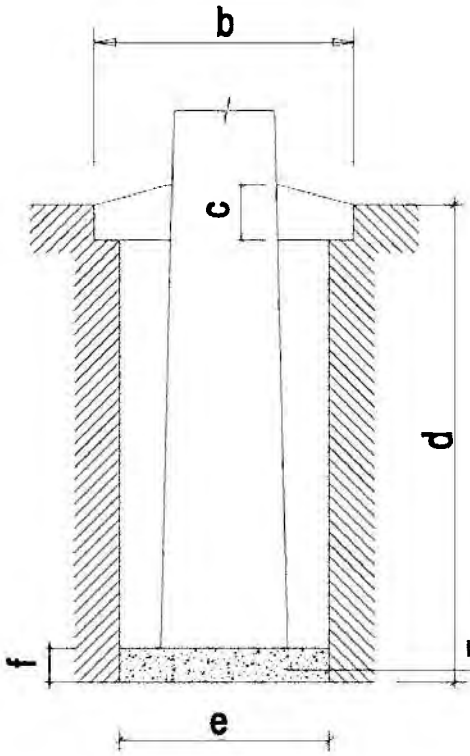
PONDASI TIPE-C

KETERANGAN :

- Pondasi Tipe-C = pemakaian untuk tanah berpasir,tanah liat
- Campuran beton = 1 semen + 3 pasir + 5 koral

ADN	REKOMENDASI PONDASI TIANG TIPE C	
DIGAMBAR : PPST LI	STANDAR KONSTRUKSI JARINGAN DISTRIBUSI	No. GAMBAR : JTR/SUTR/45
DISETUJUI : DIV. DISTRIBUSI I, II, III, JB		EDISI : 2010 / 93

Type foundation In rock



a= 15cm

b= tiang 350 daN = 50cm

tiang 500 daN = 60cm

tiang 200 daN = 40cm

c= 250mm

d= $\frac{1}{6}$ x panjang tiang

e= 2 x diameter tiang bagian bawah

PONDASI TIPE-D

KETERANGAN :

- Pondasi Tipe-d = pemakaian pada tanah lunak, endapan lumpur
- Campuran beton = 1 semen + 3 pasir + 5 koral

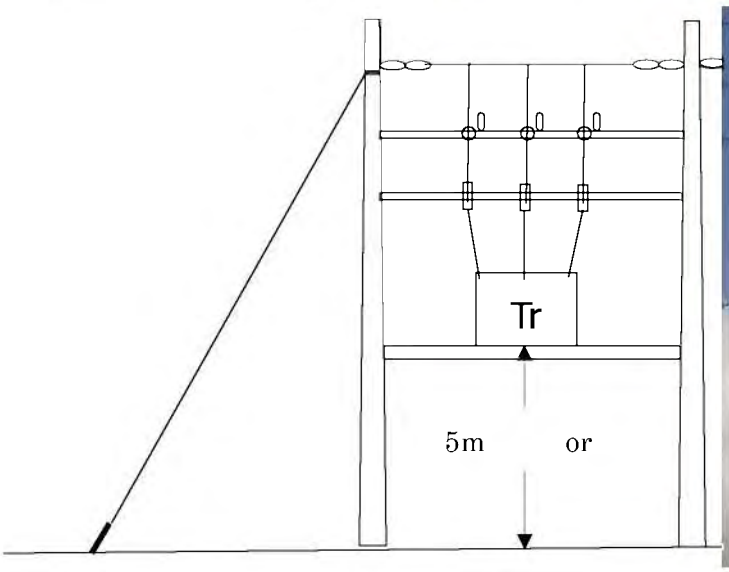
ADN	REKOMENDASI PONDASI TIANG TIPE D	
DIGAMBAR PPST UI	STANDAR KONSTRUKSI JARINGAN DISTRIBUSI	No. GAMBAR JTR/SUTR/45A
DISETUJUI DIV DISTRIBUSI IT, IB, JB		EDISI 1 / 2010 / 94

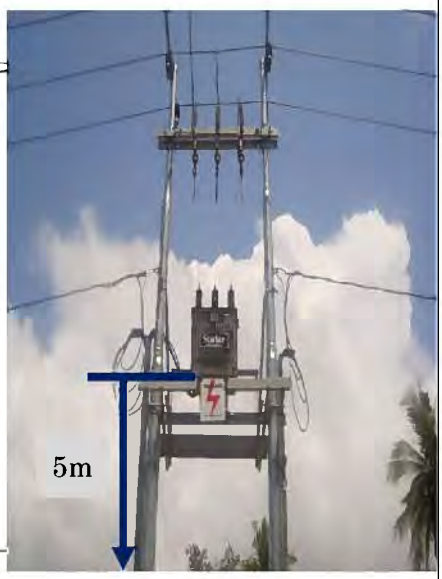
1.4 Transformer

Title	Installation Conditions of HV/MV&LV Transformer

The HV/MV&LV transformers should be installed in either manner of following method if they are not installed in the exclusive cabin with lock.

Installation on a pole at the height of 5.0m or more





Remarks	Revisions	

Checking from Technical Standard

① Tensile Strength of Conductors and Ground Wires

c. Safety factor
d. Tensile Strength after Connection

② Conductor

b. Connection of Conductor

③ Insulation

Insulation Capacity depend on voltage

④ Power System Grounding

b. The value should not be more than 10 ohms.

⑤ Protective Devices

d. Over Current Circuit Breakers
e. Ground Fault Circuit Breakers
f. Surge Arresters

⑥ Acquisition of certificate from suppliers/factories

c. Mill Certificate for materials
d. Performance Verification Certificate for Components

⑦ Standard Voltage

CHECKING from TECHNICAL STANDERD

Height of Overhead Lines

The height of overhead distribution lines should be no less than the values in the following table;

	Medium & Low Voltage	High Voltage
Crossing a Road	5.4m(18ft)	5.7m(19ft)
Crossing a Railway Tracks	7.5m(25ft)	7.5m(25ft)
Others	4.8m(16ft)	5.1m(17ft)

Clearance between Overhead Lines and Other Objects

Overhead lines should pass through over objects with necessary clearance. Minimum clearance between a line and other objects should be the values in the following table;

Unit: m)

				Medium or Low Voltage	High Voltage
Structure of Buildings	Upside Adjacency	With the possibility for persons to climb on	Bare Conductor	2.5m	3m
			Insulated Conductor	2m	2.5m
			Cable	1m	1.2m

		Others	Bare Conductor	2m	3m
			Insulated Conductor	1.2m	1.5m
			Cable	0.4m	0.5m
	Lateral and downside Adjacency		Bare Conductor	2m	3m
			Insulated Conductor	1.2m	1.5m
			Cable	0.4m	0.5m
Plants			Bare Conductor	5m at the new construction	Same as left
			Insulated Conductor	Should not contact directly	
			Cable	Should not contact directly	

Tensile Strength of Conductors and Ground Wires

As for tensile strength of conductors and ground wires for overhead electrical lines except for cables, the safety factor should be not less than 2.5.

Tensile Strength after Connection

(1) Connecting Methods of Overhead Conductors

The tensile strength of the conductors should not be reduced by 20% or more, when electric conductors are connected.

(2) Branching of Overhead Lines

Branching of overhead lines should be made at the supporting point of the lines.

Insulation capacity

Cables and insulated conductors should have sufficient insulation capacity appropriate for the conditions of the applied voltage.

Connection of Conductors

Conductors should be connected as following methods;

1. Conductors should be connected firmly to avoid increasing in the resistance.

2. The insulating capacity of cables and insulated conductors should not decrease.
3. The electrochemical corrosion should not occur by connecting conductors of different kind of materials.

Grounding

1. Grounding or other appropriate measures should be provided for Electrical Equipment to prevent from an electric shock, a danger to human bodies, fire, and so forth.
2. Grounding for electrical equipment should be installed to make current flow to the ground safely and securely.

Power System Grounding

Power system grounding should be applied at a transformer that connects a high voltage distribution line and a medium/low voltage distribution line to prevent an accident, which may occur due to erroneous contact. The value of the grounding should not be more than 10 ohms.

Protection against Over-current

Protection equipment against over-current should be installed at the appropriate places of electrical circuits to prevent electrical equipment from over-heating due to excessive current and not to cause fire.

Protection against Ground Faults

Protection equipment against ground faults or other appropriate measures should be provided to prevent damage of electrical equipment, electrical shock and fire.

Installation of Protective Devices

(1) Over Current Circuit Breakers

1. On a high voltage Lines, an over current circuit breaker should be installed at the outgoing point of a substation or similar location and on the primary side of a transformer.

2. That over current breakers should have the ability to break the short circuit current that pass the breakers.

(2) Ground Fault Circuit Breakers

A ground fault breaker should be installed at an outgoing point of substation or similar locations. That breaks circuit automatically when a ground fault happens in the lines.

(3) Surge Arresters

To prevent electrical equipment from being damaged by lightning, surge arresters should be installed at the critical places of lines as follows.

1. A lead-out of overhead line from substations.
2. The connecting point of overhead high voltage lines to a main transformer.

Distribution Transformers

Distribution transformers should be installed not to be in danger against electrical shock in following methods.

1. Distribution transformers should be installed at the height of 5.0m or more above the ground in order that persons do not touch them easily.
2. Appropriate fences should be installed around the distribution transformers. Otherwise, charged parts of distribution transformers are not exposed for prevent from touching.

Standard Voltage

The standard voltage should be kept between minimum 94% and maximum 106% of nominal voltage.

150kV line should be kept between 141kV and 159kV.

20kV line should be kept between 18.8kV to 21.2kV.

220V line should be kept between 216.2V to 243.8V.

CHECKING by MEASUREMENT

Earthing Resistance

Basic concept of Earthing Resistance

The purpose of earthing a power system in general is:

1. Provide protection against electrical hazards for users of electricity and the environment
2. increase the reliability of the distribution system in terms of quality, reliability or continuity of electrical power supply
3. Limiting the voltage rise of the values of operating voltage in phase unconnected to the ground is minimum

In the power distribution network there are a number of good earthing points on medium voltage side and low voltage side, ie:

1. earthing points of distribution network construction
   a. earthing neutral point of transformer at main substation
   b. earthing neutral point of low voltage (secondary) side of transformer at distribution substation
   c. earthing neutral conductor of medium voltage and low voltage side
   d. earthing Ground Conductor (*shield wire*) at low voltage side
   e. earthing protective layer of copper, steel of underground cable
2. Earthing protection equipment and measurement instrument
   a. Earthing Lightning Arrester
   b. Earthing CT/PT
3. Earthing 'Bagian Konduktif Terbuka and Ekstra' (BKT and BKE)
   a. Earthing the body (panel) of PHB-TM, PHB-TR, cable Tray/cable rack
   b. Earthing cross (cross arm/travers)
   c. Earthing metal parts that are not part of the installation such as substation doors, iron fences.

EARTHING NEUTRAL POINT of SECONDARY SIDE of POWER TRANSFORMER AT MAIN SUBSTATION OR PLANT

Winding of the secondary side (20kV) of power transformer at the substation or plant has the form of star circuit. The star point is earthed by means:

1. Through resistance :
   a. Low resistance of 12 Ohm, 40 Ohm
   b. resistance is very low (direct earthing / solid grounded)
   c. High resistance of 500 Ohm

2. Ungrounded (floating earthing), for example, on the medium voltage network in small diesel power plant

Among others, these earthing values provide variety kinds of network construction, protection system and range of service of distribution networks.

(a) Earthing/grounding with low resistance value of 12 Ohm and 40 Ohm

Earthing with low resistance is used in the substation on the system :

1. resistance of 12 Ohm for transformer serving ground cable line. Maximum current value of ground circuit is 1000 Amperes.
2. Resistance of 40 Ohm for transformer serving particularly overhead medium voltage line. Maximum current value of ground circuit in system voltage of 20 kV is 300 Ampere.

Current value of ground circuit facilitates the work of protection relays and allows use relays with a relative cheap price. Current value of ground circuit is not small enough to break fuse cut out if in the event of a short circuit to ground in the protected section. Earthing with resistance value of 12 Ohm is used especially for power transformer which supplies electrical power for ground cable network in the area of PLN/EDTL.

Earthing/grounding with too Low resistance value (solid grounded)

This part system of earthing value 20 kV of main transformer connects directly to ground. The system provides benefit to the distribution network is:

1. Very large fault current, so that easy to coordinate relay. *Fuse cut-out* (FCO) is used for ground fuse security network can be effectively run.
2. Extensive distribution network coverage.
3. With system of multigrounded common neutral at MV network possibility for fasa-1 at MV to energize the remote areas with the cheaper cost of investment.

This earthing system is used at PT. PLN Persero distribution area at central Java and Jogjakarta. In order to use this system *multi-grounded common neutral,* inside part of several constructions system is quite different in other special place for air line network of medium voltage, specification transformer and air line system of low

voltage. Ground fault currents are so great, according to the small side of impedance disorder. All poles and conductive are opened at connected network with together neutral conductor at each poles connected to the ground. The value of maximum grounding is at least 5 Ohm.

Earthing/Grounding high resistance Value

In this system the value of earthing resistance at part of 20 kV power transformer in main transformer or generator maximum 500 Ohm.
With the Earthing high resistance value so that impedance disorder into ground is relatively small, maximum 25 Ampere. Value current like this will be provided maximum stress 125 Volt if happened broken air line network at medium voltage and hit to LV network so that general security is more secured .

Grounding/Earthing Floating

Grounding Floating currently in PLN only on the electrical system to power a small village as a source of power, and there is no grounding on the 20 kV transformer, therefore there is existing for *lightning arrester* (LA) part of secondary transformer and a part of opened conductor network.
Grounding at low voltage network uses the system of TN-C, therefore there is only for 1(one) pole before the main feeder pole or bigger conductor.

EARTHING/GROUNDING NEUTRAL POINTS OF DISTRIBUTION TRANSFORMER

- Neutral points of transformer at part of low voltage earthed with copper conductor which similar measure with neutral conductor of cable transformer onto PHB-TR (low voltage). If happened only one fuse network so don't increase stress for other fuse.
- Grounding electrode resistance value does not exceed 1 Ohm

Neutral grounding points at concrete distribution transformer can be used through 2 ways:

a. Neutral points conductor of transformer earthed at outside of transformer grounding installation it is at the first pole of low voltage airways or at first

PHB of grounding cable for low voltage in the neutral conductor.

Massa transformer and cubicle PHB separately earthed.

b. Neutral point's conductor of transformer earthed at circuit equipments for low voltage. Grounding is used copper conductors with a cross section at least 50 mm2 and connected together with a opened conductive earthing (mass transformers, cubicles, etc.)

EARTING/GROUNDING of DISTRIBUTION of LOW VOLTAGE

1. Grounding protection at low voltage network is used guideline TN-C. Neutral conductor network earthed to each 5 poles (+/- 200 meter) with first grounding point at second pole from initial pole and 1 (one) pole before final pole.
2. Great value for one grounding electrode maximum 10 Ohm. Resistance total to transformer and JTR maximal 5 Ohm
3. At the system *multi-grounded common neutral* at neutral conductor system of medium voltage also become the system of neutral conductor for medium voltage. Provision of standard construction at PLN distributor central Java of each poles, the conductor is connected with terminal of grounding pole, therefore connection with grounding electrode constructed at each 5(five) poles.

EARTHING/GROUNDING on DISTRIBUTION of TRANSFORMER

Such parts which earthed at distribution transformers are:

1. All part of opened/naked conductor (BKT) and part of extra conductor (BKE) for examples door of transformer, panel cubicle.
2. Neutral Terminal at part of distribution transformer of low voltage
3. The protective layer electrical cables of medium voltage in the part of cubicles
4. *Lightning Arrester* at at the Portal of transformer

Don't earthed separately for each parts, except grounding of lightning arrester. Parts of grounding conductor will be connected at Earthing conductor sections are linked on an equipotential bonding, next linked equipotential earthed, so that the voltage gradient increases towards the earth due to soil disturbance in all parts of the installation of the same magnitude.

Grounding resistance value does not exceed 1 Ohm (1,7 Ohm at the book of construction standard DJBB).

EARTHING / GROUNDING LAND CONDUCTOR (*SHIELD WIRE/EARTH WIRE*)

Generally land conductor or *earth wire/shield wire is* not used.
This conductor is set upside of SUTM(airways medium voltage) network at area of frequently happened the lighting which opened area and directly connected and earthed to the poles. The use of land conductor should be well in the review such as the level of existing. Setting at area of building/trees which more tall from high of less effectiveness network.

LIGHTNING ARRESTER of EARTHING

Lightning Arrester (LA) is earthed with separate electrode. In the portal type of distribution transformer, neutral point grounding of transformer is separately with the grounding electrode of *Lightning Arrester*.
So to get the similar with voltage gradient on Earth, grounding conductor of *Lightning arrester* with the part of neutral point at low voltage distribution transformer is mechanically connected (in bonding) underground.
To the Transformer (portal) and Transformer (hook) grounding conductor of *lightning arrester* to be united with body of transformer and then earthed.

Earthing resistance should be measured by the inspection method which is shown below according to earthing system (Stipulated in IEC 60364-5-54). It is not necessary to measure all earthing, but sample measurement should be performed.

Item	Inspection method	Criterion
System Earthing at the secondary side of substations _ B class Earthing	Measurement by earth resistance meter	10Ω or less
Protective Earthing for HV equipment including transformers _ A class Earthing	Ditto	10Ω or less
Surge Arrester Earthing	Ditto	10Ω or less

Insulation Resistance

OVERHEAD TRANSMISSION LINE
ALUMINIUM ALLOY CONDUCTOR AND XLPE SHEATHED

Type of Cable : AAAC-S

SPECIFICATION : SPLN 41-10
SPLN 41-8

CONSTRUCTION

Size of Cable	Number / Diameter of Wire	Nominal Thickness of Sheath	Approx. Overall Diameter	Approx. Weight of Cable	Standard Length per Drum
mm²	n / mm	mm	mm	kg/km	m
35	7 / 2.50	3.0	13.9	204	2,000
50	19 / 1.75	3.0	15.2	244	2,000
70	19 / 2.25	3.0	17.7	353	2,000
95	19 / 2.50	3.0	18.9	415	2,000
120	19 / 2.75	3.0	20.2	483	2,000
150	19 / 3.23	3.0	22.6	628	1,000
150	37 / 2.25	3.0	22.2	594	1,000
185	37 / 2.50	3.0	23.9	707	1,000
240	61 / 2.25	3.0	26.7	900	1,000

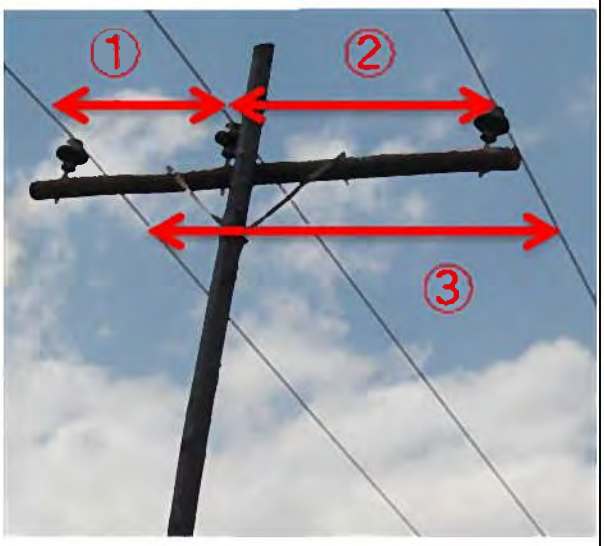
CHARACTERISTICS

Size of Cable	Maximum DC Conductor Resistance at 20 °C	Maximum Current Carying Capacity		Calculated Breaking Load of Conductor	AC Voltage Test
		at 30°C	at 40°C		
mm²	ohm/km	A		N	kV / 5 min.
35	0.958	167	150	9,615	13
50	0.724	200	180	12,750	13
70	0.438	275	246	21,090	13
95	0.355	315	282	26,095	13
120	0.293	356	319	31,590	13
150	0.210	423	378	44,045	13
150	0.225	423	378	41,105	13
185	0.183	484	432	50,765	13
240	0.139	586	523	67;785	13

Insulation resistance measurements confirm the adequacy of the distribution line.

Item	Inspection method	Criterion
20kV Voltage Line	Insulation resistance is measured by 1,000V insulation resistance tester. The measured value should be adopted at 1-min value. If the indication is not stable because of big charging capacity of measured circuit, the measured value should be adopted after the value becomes stable. (It is not necessary to keep measuring more than 3min.)	Insulation of phases-ground and phase-phase should be adequate (2,000MΩ or more)
20kV Voltage Equipment	Ditto	Ditto
Substation	Ditto	Ditto

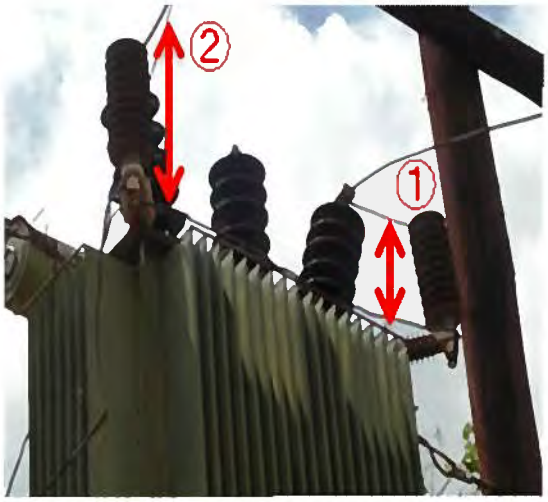
[example of measuring 20kV voltage line]

	Measuring spot	
Wire to Earth	Measure the insulation resistance between wire to earth which is connected to a transformer, a lightning arrester, or a switch.	(There is no picture now.)
Wire to another phase wire	Measure the insulation resistance between a wire and another phase wire before transformers are connected to the lines.	

[example of measuring transformer]

	Measuring spot	
Primary wire to transformer's earth	Measure the insulation resistance from primary wire to transformer's earth, from secondary wire to transformer's wire, and from primary wire to secondary wire.	(There is no picture now.)
Secondary wire to transformer's wire		
Primary wire to secondary wire		

[example of measuring lightning arrester]

	Measuring spot	
Primary wire to lightning arrester's earth	Measure the insulation resistance between primary wire to equipment's earth which is connected a transformer, a lightning arrester, or a switch.	There are two lightning arresters in this picture. If there are three lightning arresters, you should measure all of them. 

4. Line Ministries Project

4.1. Project Evaluation before contract Award

4.1.1 Flow Chart

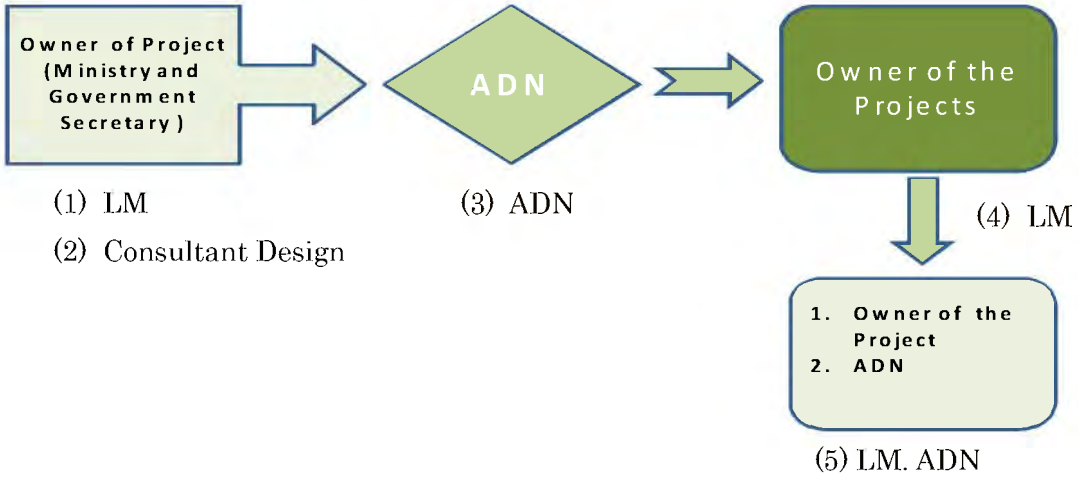


Figure 1. Line Ministries Flow Chart

(1) LM (Line Ministries)

LM prepares the contract for any selected consultant to carry out the detailing of project design. LM is fundamental as the owner of project.

(2) Consultant Design

The Consultant carries out the job based on approval of theTOR. After completed drawing of project, referred Consultant would deliver it to LM then resubmits again into ADN.

(3) ADN (National Development Agency)

In this case, ADN will verify tender documents which submitted by LM if the delivery documents have been completed. After completion of verification, ADN would return verified documents to LM toopen the tender process in the Ministry or Secretary of State.

(4) LM (Line Ministries)

LM is responsible for the project.

(5) LM, ADN

LM will resubmit, if the delivered document is not completed yet. After that, ADN would verify it.

4.1.2 Schedule of the Work

(1) Required time for verification at ADN

ADN shall complete the verification of tender documenta within ten (10) days (calendar days) after receiving officially the documents required by LM. Therefore if the delivery documents have yet to be completed, ADN must make an effort to contact LM for completion of all necessary documents.

(2) Time of additional submission, resubmission or answer to ADN questions

LM shall submit, resubmit or answer to ADN what was required by ADN within two (2) weeks after receiving notice of requiring further information based on types of the project.

(3) In case of the sub-clause (2) above, the time for ADN to complete the verification shall be delayed by the same time as the LM takes for the additional submission, resubmission or answer.

4.1.3 Confirmation of Documents submitted: ADN will check if all the required documents have been delivered. In the case that some are missing, ADN will inform the LM of it and instruct the LM to submit within the specified time.

(1) Request Letter of verification for tender document: Form-A

(2) Project Outline prepared by LM: Form-B

(3) Tender Documents: ADN will confirm the required documents are submitted, using Checklist-A

1) Invitation for Bids
2) Instruction to Bidders
3) Forms of Bid and Qualification Data
4) Conditions of Contract
5) Contract Data
6) Bill of Quantity
7) Forms of Securities
8) Specifications
9) Drawings
10) Others, if necessary

4.1.4 Verification of Payment Conditions: ADN will verify the payment conditions are adequate, using Checklist-B.

(1) Time for Completion / Construction Period

ADN will verify the Time for Completion or Construction Period in such a manner,

1) Verify the detailed construction schedule provided by LM,
2) Ask for an explanation from LM on how they decided the time or period
3) Compare with time for completion of other similar works.

(2) Maintenance Period/ Defect Notification Period/Defect Liability Period

1) Have explanation from LM on how they decided the time or period,
2) Compare with time for completion of other similar works.

(3) Governing Law

Governing Law is the law of the Democratic Republic of Timor Leste.

(4) Ruling Language

Ruling Language is English.

(5) Performance Security/ Performance Bond

Minimum amount of performance bond is such percentage of the Contract Amount as the past data show 10 % to 20 % based on total advance payment.

(6) Delay Damages for the Work/Liquidated Damages

The Liquidated Damages for the whole works are 0.1% of the final Contract Price per day.

(7) Maximum Amount of Delay Damages

The Maximum amount of delay damages/liquidated damages for the past projects are 10% of the Contract Amount.

(8) Provisional Sum

The Provisional Sum for the past projects is 5% up to 15%.

(9) Total Advance Payment

The Total Advance Payment for the past projects is 10% to 20%.

(10) Percentage of Retention

The Percentage of Retention for the past projects is 10%.

(11) Limit of Retention Money

The Limit of Retention Money for the past projects is 10% of the Accepted Contract Amount.

(12) Minimum Amount of Interim Payment Certificates

The Minimum Amount of Interim Payment Certificates is around 25%, 50%, 75%, or 100% of contract amount based on original contract.

4.1.5 Technical check using checklist: ADN will technically verify those documents as BoQ, Drawings and Specifications, using Checklist-C.

Checklist-C is used for building projects.

Building Project (Checklist C)

(1) Background

Check background of project and the feasibility plan. Confirm the adequateness between project and background.

(2) Objectives

Confirm suitability of project, considering effectiveness, economic potential and efficiency.

(3) Scope of the services

Confirm all scope of the services on tender document.

(4) Reports and Time Schedule

Confirm the reasonability on Time Schedule, considering mobilization time, flood season, etc

(5) Specification

Technical specification should follow standard/code, being "equivalent or higher

quality" than common specification?
(6) Standards or code
There are no building law, code & standard in Timor-Leste. Confirm building code "Australian (AS) and Australian/New Zealand (AS/NXS)" or "Indonesia Building Standard (SNI 2002)".
(7) Quality
Follow the technical specification/ code etc.
Sample of Material Specifications
1) Concrete Specification (according to NP EN 206-1, 2007; Inspection class 2 ; 50 years lifetime)
2) Rebar Steel (NP ENV 13670-1)
(8) BoQ
Check quantities, unit prices and amounts of several major items, avoiding easily made mistakes. Confirm the fit among drawings in architecture drawings, structural drawings, and establishment drawing on Mechanical, Electrical, and Hydraulic drawings
(9) Drawings
Check detail of specification and code in drawings.
(10) Scope of construction
Check scope of construction as indicated in drawings and specifications.

4.1.6 **Hearing from LM**: ADN will hear from LM how they reached their final decision, in other words, whether they compared with other alternatives.
It is very tough to verify bulky Tender Documents received on short notice within a few days. So it is recommended thatADN's junior engineers study tender documents and prepare questions in accordance with this manual using the Check list attached heretobefore any inspection or verification process and to call LM engineers and design consultants to ADN, and ask questions that will assist in the evaluation of the project.
This will help ADN engineers to savetime on the verification at a later date and also assist in raising their capacity.

4.1.7 **Verification Schedule**: ADN will prepare a schedule, where it enables the ADN staff to complete their verification work within the allotted time.
Verification schedule for the Tender Documents is very tight, only 10 calendar days after receiving the documents will be given.
It is recommended to prepare schedule for the verification, and follow the schedule, proceed one by one, day by day.
An example of a verification schedule is shown below for a 3-day period.
[1st to 3rd day]
(5) Check whether all the required documents are delivered using Checklist A.
If not, inform LM that the documents are not enough, and verification will start

from the day proceeding the receipt of all necessary documents.

(6) When all the required documents are delivered, start verifying Payment Conditions/Appendix to Tender/Particular Conditions, in accordance with this Manual using Checklist B.

(7) Prepare questions in accordance with this Manual using Checklist C, for building projects.

(8) Arrange interview with LM and his consultant for technical questioning on the Second day.

[4th to 6th day]

(9) Ask any questions on technical matters that you have pre-prepared.

(10) If their answers are not satisfactory or the answer is not clear enough due to lack of data, ask them to prepare enough data to explain, then arrange the next interview. The next day of the next interview is the second day of the verification.

(11) Tell LM to complete all the corrections, and resubmit them.

[7th to 10th day]

(8) Verify only the corrected portion, and send them to LM, when the corrected documents are delivered.

(12) In case that the correction is not satisfactory, do as same as (3) above.

4.1.8 **Remedy**: In case that some problems are found as a result of verifying the Tender Documents, ADN will inform the LM of the problem and how to improve it.

Verification work will be delayed by the time lost for resubmission.

4.1.9 **FAQ (frequently asked questions)**

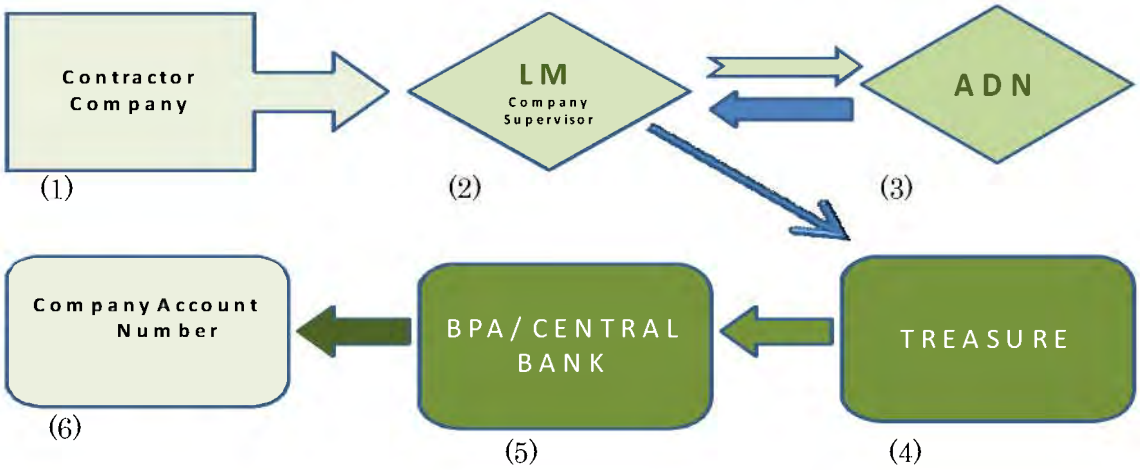
In the course of verifying tender documents, ADN engineers will have various questions and problems, and should try to solve these problems with the help of their senior engineers until they are very much accustomed to complete the work.

It is recommended for the engineers who will have solved these problems to keep records in a "FAQ Book".

The FAQ Book may help other engineers who have encountered similar problems.

4.2 Project Inspection & Recommendation for Payment

4.2.1 Flow Chart



(1) Contractor Company

Submitting Invoice into LM regarding the physical progress of works on the site. Obtain the progress report from the project engineers and cross check and approval of this report by the company supervisor.

(2) LM (Line Ministries) and Company Supervisor

LM receives Invoice from the Contractor Company based on the progress report which has been received and cross checked with the Company Supervisor and approved by SOS or Minister/s to prepare the Payment Certificates and Certificates referred havebeen obtained authorization by Secretary of Estate or Minister/s. Afterward LM would submit the Request Letter to ADN, attached also the completed of relevant documents.

(3) ADN

Receives the Request Letter of Inspection which attached the documents of Payment to realize inspection. After the Inspection, ADN will prepare an Inspection Report and Recommendation for Payment to LM, in order for LM to be able to submit to the Treasury for the TPO (Treasury Payment Order).

(4) Treasure

Treasure will prepare TPO (Treasury Payment Order) then delivers the TPO to the Central Bank (BPA).

(5) BPA/Central Bank

Making payment to the Company Account Number.

(6) Company Account Number

The company will receive the money through transfer into their Bank Account.

4.2.2 Schedule of the Work

(1) Required time for verification at ADN

ADN shall complete the inspection of payment request within Two (2) Weeks after receiving officially the documents required by ADN.

(2) Time of additional submission, resubmission or answer to ADN questions

Time of additional submission, resubmission or answer to ADN questions

LM shall submit, resubmit or answer to ADN what was required by ADN within two (2) weeks after receiving notice of requiring further information.

(3) In case of the sub-clause (2) above, the time for ADN to complete the verification shall be delayed by the same time as the LM takes for the additional submission, resubmission or answer.2. Document Inspection

4.2.3 Document Inspection

(1) Confirmation of Documents submitted: ADN will check if all the required documents shown below have been delivered using **Checklist-D**. In case something is missing, ADN will inform the LM of it and instruct the LM to submit it within the specified time.

1) Request Letter of Inspection from LM to ADN: **Form-C**
2) Parts of Contract Document, showing the contract amount and payment conditions
3) Bill of Quantities showing unit prices and quantities
4) Description of changes, alteration or variations, if any
5) Site Inspection Report by LM
6) Digital data of BoQ

(2) Confirmation of Payment conditions such as advanced payment and retention:

ADN shall make sure these payment conditions are true to the description of the contract document.

(3) Calculation in billing sheets

(4) Confirmation of completed works in BoQ, drawings and photos

(5) Confirmation of work schedule

(6) Confirmation of inspection result by LM

(7) Issuing Inspection Report and Recommendation for Payment: **Form D**

4.2.4 Site Inspection

(1) Preparation

ADN sends Request of Preparation for Site Inspection to ADN using **Form E** seven days before the Inspection.

1) Attendants

LM shall invite at the following to attend the site inspection.

- Inspector from ADN
- Engineer from Line Ministry
- Supervising Consultant
- Contractor

2) Preparation

LM shall arrange the following material for the site inspection.

- Records on Quality Control
- Drawings
- Details of Bill of Quantities
- Measuring Devices
- Assistants for Measurement

(2) Quality Control

Records of quality control are reviewed by ADN using **Checklist-E.**

The check items in the Checklist are only samples, thus appropriate items must be added depending on the situation.

(3) Measurement of the Work Completed

Works completed shall be accurately measured. The purpose of the measurement is to confirm that the actual quantity of each item completed is the same as the quantity demanded in the invoice.

(4) Hearing from LM engineer

ADN shall hear from LM, if any question.

(5) Remedy

When ADN finds some non-conformant or unsatisfactory works, ADN shall instruct on a suitable remedy for the issue.

4.2.5 Notice of Judgment on Payment

Finally, ADN judges that the adequacy of the payment amount, notice the result and recommend the payment to LM, using **Form C.**

ADN sends one original and two copies of payment documents to LM, and keep one copy at ADN Office.

4.2.6 FAQ (frequently asked questions)

It is strongly recommended to collect and record questions and answer that have risen frequently in ADN regarding the inspection of Payment Request.

Annex - 4. (Line Ministries)

..... Form-A (Request Letter of verification for tender documents)

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 Verification
Project of Line Ministries Fund (Type of project)
Localization (place of project)

In response to the request of verification which regulated at legal regulation on tender process, We (LM) inform that will be done tender process for the project of.....(name of project) with the contract number: RDTL_____.
In this case, we also submitted the bidders companies and their company profile which attached below in order to ADN could verify and select these companies whose going to be a winner.

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. Lists and profile of bidders companies
7. Others, if required

Form-B (Project Outline prepared by LM)

Letter head of LM									
Project Outline of LM									
No	District	Sub District	Type of Project	Cost Estimated	Technical Cost Estimated	Implementation 2012 Percentage...%	Implementation 2013 Percentage...%	Total Implementation	Remarks
....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Total Budget								

Dili, date.....

Prepared by

Project Coordinator of LM

Approved by

Minister/SOS

Form-C (Request Letter of inspection from LM to ADN

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

Form-D (Inspection Report and Recommendation for Payment)

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 .

Existing Sheet

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,PDL,FI,Emergency,MDG Suco,etc)				
D	Contractor				
E	PO number (Purchase Order)				
F	Project site :	B.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 retantion 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	Commends	No
a	Based on Desingn ?				
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. Henuk				
X	Approved by:	Signature:			Date :
	Sr. Samuel Marçal				
	Director Geral - ADN.				
Y	Annex :	Site Picture			

Proposed New Sheet

No	INSPECTION REPORT AND RECOMMENDATION FOR PAYMENT		
1	Name of Project		
2	Ministry/Project Owner		
3	Sources of funds (PDD I, PDD II ,MP, Emergencia, etc)		
4	Contractor		
5	PO Number (Purchase Order)		
6	Project site :	a) District :	
		b) Sub district :	
		c) Village/Hamlet :	
7	Contract Value		
8	Gross Payment until now		
9	Billing in this invoice from the Contractor		
10	Billing verified by the Inspector		
11	Advance payment: (10%) of Contract Value	(7)*10%	
12	Reduction for advance payment	(11)*((10)/(7))	
13	Reduction for retention (10%)	(10)*10%	
14	Payment after reduction	(10)-(12)-(13)	
15	Release for (50%) previous retention		
16	Payment for this month	(14)+(15)	
17	Balance after this payment	(7)-(8)-(16)	
18	Progress for previous payment (%)	(8)/(7)	
19	Progress for this payment (%)	(10)/(7)	
20	Inspection of Documents	Documents	Any Problems & Comments
a	Payment conditions in the contract	Yes/No	
b	BOQ	Yes/No	
c	Technical specification	Yes/No	
d	Drawings	Yes/No	
e	Schedule of S shape curve (for MP)	Yes/No	
f	Employer's (EDTL or district) inspection report	Yes/No	
g	Testing Result for handover	Yes/No	
h	Pictures for this billing	Yes/No	
21	Result of inspection		
	{ Result of Document Inspection } Check items as reference: * Documents for invoice are prepared correctly ? * This invoice meets payment conditions such as advance payment and retention ? * Calculation of billing is correct ? * Completion day will be kept ? * Testing result (Performance Test) for handover meets the criteria ? * If no site inspection, the reason should be mentioned, eg. small amount interim payment, implementation of the previous site visit, enough photograph for verifying qualities, etc.		
	{ Result of Site Inspection } Check items as reference: * The employer (EDTL or the other) is attended at the site or gives explanation in the office? * The important components for function and big volume components in the BoQ are checked ? * Any problems in qualities (Poor quality of material and installation, test result beyond the criteria, etc.)? * Any problems in quantities (Difference between actual figures and 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 repair against defect ?		
22	Proposed payment in the invoice from the Contractor		
23	Recommendation for payment to MPS-MoF/Treasurer-MoF (USD)		-
24	Site inspection day	Date: Month:	Year:
25	Inspector	Signature:	Date :
	1. Maximos dos Santos		
	2. Ana Maria Guterres	Signature:	Date :
	Verified by :	Signature:	Date :
	Miguel Marques Monteiro de Jesus		
26	Q.C.	Signature:	Date :
	Esron ST. Henuk		
27	Approved by :	Signature:	Date :
	Sr. Samuel Marçal		
28	Director General - ADN.		
27	Annex : Employer's certificate & additional documents		

.Form-E (Request of Preparation for Site Inspection)

LETTER HEAD

DATE

(TO WHOM)
LM

(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

By ADN

CC.
to Relevant Organizations if any

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 :

8. The Letter of Inclusion ..... ☐
9. Design should be completed and obtained the signature by Public Works Engineers..... ☐
10. BOQ and Estimation Cost should be gotten the signature by Public Works..... ☐
11. Unit Price Analysis..... ☐
12. Soft copy of documents which mentioned above..... ☐
13. Technical Specification..... ..... ☐
14. If the construction is more than 2 stairs, it should also have the Structure Calculation Analysis..... ..... ☐

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

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

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

8. The Drawings should be approved by Public Works _____ ☐

9. Bill of Quantity (BoQ) should be approved by Public Works___ ☐

10. Cost Estimation should be approved by Public Works _____ ☐

11. Technical Specification should be ascertainable by Public Works_ ☐

12. Submit the Electronic files which saved inside CD _____ ☐

13. If the buildings is more than 2 stairs, it should be attached the feasibility study of Soil or soil investigation results_____ ☐

14. 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 Verifiction Document of Infrastructure Fund project of Building.

Line Ministries	CHECKLIST-B			Verified by	Approved by
Type of Project	Building	Objective	Payment Conditions		

Delay damanges for the Work/Liquidated Damages		Submit Date	
Project Name		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?				
1	Time for completeion/Construction Period	Is there Detailed Time Schedule? Is it OK comparing it with Past Data?			If not, do hearing from LM.
2	Maintenance Period/Defect Notification Period	Is it OK comparing it with Past Data?			
3	Governing Law	Is it the Law of Democratic Republic of Timor Leste?			
4	Ruling Language	Is it English?			ICB uses English in Timor-Leste.
5	Performance Security/Perfirmance Bond	Is it OK comparing it with Past Data?			
6	Delay damanges for the Work/Liquidated Damages	Is it OK comparing it with Past Data?			
7	Maximum amount of delay damages	Is it OK comparing it with Past Data?			
8	Provisional Sum	Is it OK comparing it with Past Data?			
9	Total Advance Payment	Is it OK comparing it with Past Data?			
10	Percentage of Retention	Is it OK comparing it with Past Data?			
11	Limit of Retention Money	Is it OK comparing it with Past Data?			
12	Minimum Amount of Interim Payment Certificates	Is it OK comparing it with Past Data?			

Checklist-B (Payment Condition)

Checklist-C (Technical Verification)

Line Ministries	CHECKLIST-C			Verified by	Approved by
Type of Project	Building	Objective	Technical verification		

Contract No.			Submit Date		
Project Name			Stage	Verification of Tender Documents	
Implementing Agency					

	Check Item	Check Point	Check Date	Check Mark	Remarks
					Referred Data
1	Background	Is it clear between project and background?			
2	Objectives	Is it suitable project, considering effectiveness, economic potential and efficiency?			
3	Scope of the services	It is clear on tender document?			
4	Reports and Time Schedule	Is it clear on Reports? Is it reasonable on Time Schedule?			Consider mobilization time, flood season, etc
5	Specification	Is it clear on Building Code & standard?			
6	Standards or code	Is building code "Australian (AS) and Australian/New Zealand (AS/NXS)" or "Indonesia Building Standard (SNI 2002"?			There are no building law, code & standard in Timor-Leste.
7	Quality	Is it follow standard/code? Is it use "equivalent or higher quality" than specification?			
8	BoQ	Is it correct?			
9	Drawings	Does it show detail of specification and code?			
10	Scope of construction	Does scope od construction indicate in drawings and specifications?			

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 :

12) The Invoice in Original submitted by Consultant _____ ☐

13) The Payment Certificates in Original which obtained approval by Minister or Secretary of State _____ _____ ☐

14) Submit the completed Copy of the valid Contract with attachment_____ ☐

15) Submit the Monthly Report which obtained approval by Project Owner ____ ☐

16) No.TIN (Identification of the Taxpayer contributions Number)_____ ☐

17) Number of Bank Account _____ ☐

18) Submit the valid of the Company Birth Certificate and should be legalized ____ ☐

19) Submit the Valid Economic Activity License and should be legalized ☐

20) Submit the Valid of Company Ownership License_____ ☐

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

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 Court 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 attached the certificates from International Standard Organization (ISO)			

Line Ministries	CHECKLIST-E			Verified by	Approved by
Type of Project	Building	Objective	Quality Control		

Contract No.			Submit Date	
Project Name			Stage	Verification of Tender Documents
Implementing Agency				

	Check Item	Check Point	Check Date	Check Mark	Remarks
1	Purpose and Use	Does the Construction Specification conform to the requirements of the Contract?			If not, do hearing from LM.
2	Codes and Standards	Are all Standards and Codes of Practice used in this Construction Specification latest one as of the Tender Due Date?			same as above
3	Inspection, Sampling and Testing	Do inspection, sampling and testing execute so as to comply with the quality assurance and control requirements specified in General Requirement?			same as above
4	Safety	Do all work execute so as to comply with the safety requirements set out in the Contract and any specific safety requirements?			same as above
5	Access	Is the Contractor responsible for providing temporary access roads to and from the Site?			same as above
6	Signboards	Are signboards provided and erected by the Contractor? Are these signboards in addition to any safety and warning signs?			same as above
7	Environmental Requirements	Is all work executed so as to comply with the environmental requirements set out in any specific environmental requirements?			same as above
8	Demolition	Is it suitable plan?			same as above