JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

UNITED NATIONS
TRANSITIONAL ADMINISTRATION IN EAST TIMOR

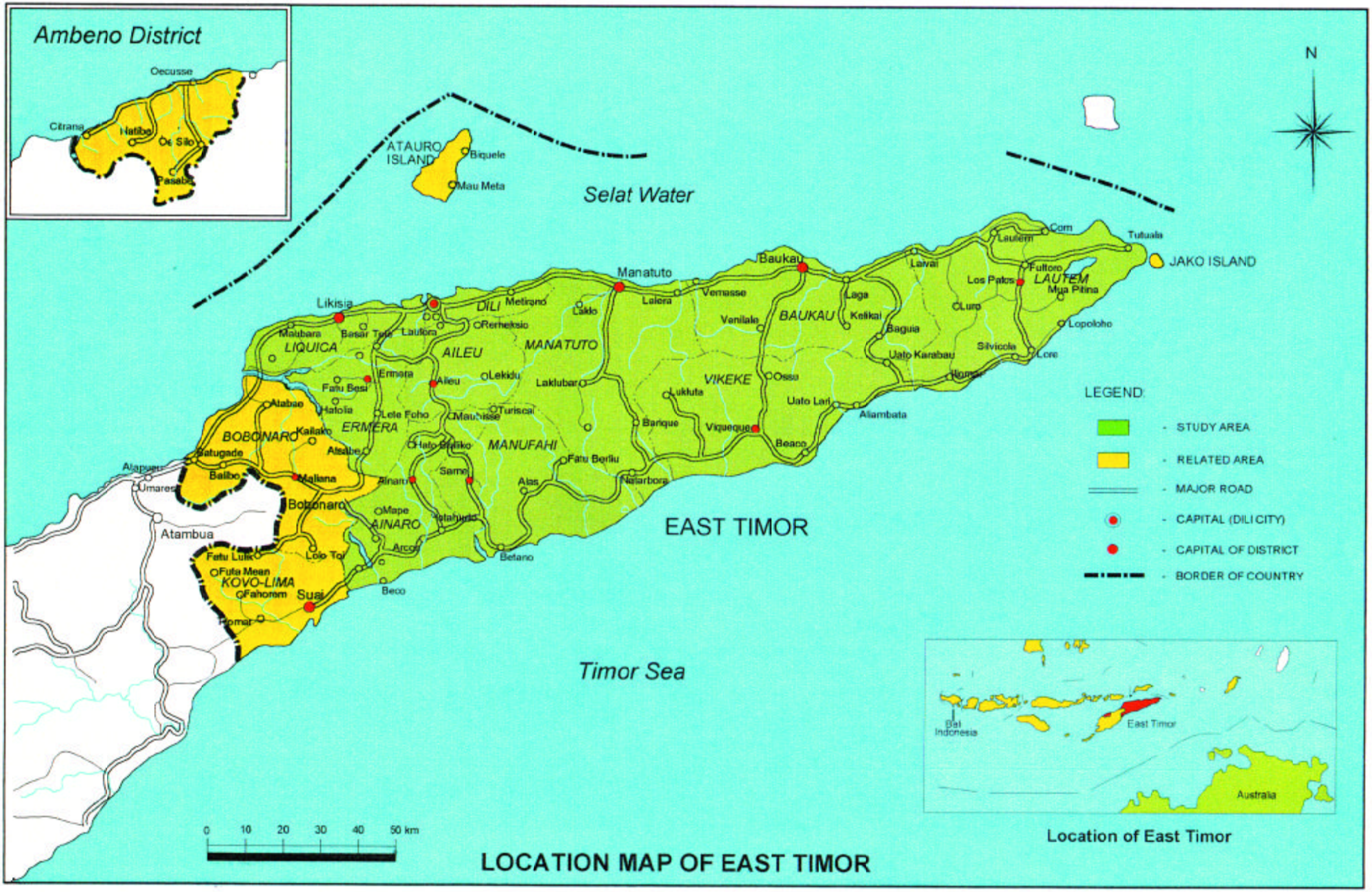
THE STUDY
ON
URGENT REHABILITATION PLAN
IN
EAST TIMOR

FINAL REPORT

VOLUME 4: MANUAL (ANNEX)

August 2000

PACIFIC CONSULTANTS INTERNATIONAL
NIPPON KOEI CO., LTD.
YACHIYO ENGINEERING CO., LTD.



LOCATION MAP OF EAST TIMOR

MANUAL (ANNEX)

TENDER DOCUMENTS
FOR
QUICK PROJECT
FOR
ROAD REHABILITATION
IN
EAST TIMOR

August 2000

PACIFIC CONSULTANTS INTERNATIONAL

IN ASSOCIATION WITH

NIPPON KOEI CO., LTD.

YACHYO ENGINEERING CO., LTD.

TOKYO, JAPAN

List of Acronyms

ADB	Asian Development Bank
AusAID	Australian Agency for International Development
CAP	UN Consolidated Inter Agency Appeal for the East Timor Crisis
CEP	Community Empowerment and Local Governance Project
CFA	Central Fiscal Authority
CNRT	Conselho Nacional da Resistencia Timorese (National Council of the
D/D	Detail Design
DFID	Department for International Development (UK)
DPU	Public Works Department in Indonesia
DSRSG	Deputy Special Representative of Secretary General
DTW	Department of Transport and Works
DWT	Dead Weight Tonnage
ECHO	European Commission Humanitarian Office
EIA	Environmental Impact Assessment
EPU	Environmental Protection Unit
FAO	Food and Agricultural Organization
FY	Fiscal Year
GOJ	Government of Japan
GWT	Gross Weight Tonnage
IDA	International Development Agency
ILO	International Labor Organization
IMF	International Monetary Fund
IOM	International Organization for Migration
JAM	Joint Assessment Mission
JICA	Japan International Cooperation Agency
MOU	Memorandum of Understanding
NCC	National Consultative Council
NGOs	Non-Governmental Organization
NTG	Northern Territory Government
O/M	Operation and maintenance
OCHA	Office of the Coordination of Humanitarian Affairs
PAET	Power Authority of East Timor
PKF	Peace Keeping Force
PQ	Per-Qualification
QIPs	Quick Impact Projects
QP	Quick Project
ROW	Right of Way
S/W	Scope of Work
SRSG	Special Representative of Secretary General
TFET	World Bank-Administered Trust Fund for East Timor
	Timorese Resistance

UNDP	United Nations Development Programmed
UNFPA	United Nations Population Fund
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations International Children's Fund
UNOPS	United Nations Office for Project Services
UNPKF	United Peacekeeping Force
UNTAET	United Nations Transitional Administration in East Timor
USAID	United States Agency for International Development
WFP	World Food Programmed
WHO	World Health Organization
WUA	Water User Association

CHAPTER 1

INTRODUCTION TO TENDERS

1 INTRODUCTION TO TENDERS

1.1 Introduction

1.1.1 Definitions

Terms used in this document are described in Clause 1.1 of Section IV, General Conditions of Contract.

1.1.2 General

This tender is called "Quick Project", for urgent repair and restoration of roads at Dili - Aileu - Ainaro road and Baucau - Laga - Baguia - Junction of Southern coastal road in East Timor as shown on the map in the back of this specification. The contract will be made for two sections of road above. The major work consists of:

(1) Dili – Aileu – Ainaro road

Restoration of embankment failure by gabion including embankment fill (7 locations along the road).

(2) Baucau –Laga – Baguia –Junction of Southern coastal road

construction of four (4) causeways;

restoration of embankment failure by gabion (5 locations along the road);

restoration of road surface of about 7km length, 2,500m^3 of earthwork, placing 13,300m^2 road base, 2,300m^3 of gabion, 35-pipe culvert installation and 6 gabion causeway constructions.

One of the main priorities of this contract, apart from making the roads passable, is to actively promote the extensive use of local manpower through labor intensive work practices. Contractor will be required to recruit local labor in close cooperation with the local authorities in the villages and towns adjacent to the project, and to maintain close liaison with such authorities.

The Works will be carried out under the supervision of the Study Team in coordination with UNTAET, Dili, East Timor.

1.1.3 Acquaintance with Local Conditions

The tenders shall be deemed to have visited the Project site and their environs and to have become thoroughly acquainted with all conditions, which may have influence on the completion of their tenders and the subsequent execution of the Works, including

climatic conditions, access to the Project site, conditions of the existing facilities in the Project site, transport to and from the Project site, the availability of skilled and unskilled labor, availability of locally produced and imported construction materials, living accommodation, rates of pay for labor regulations, insurance, and necessary permits from statutory authorities, if any.

Tenders should be aware that restrictions would be applied limiting the size and number of earthmoving plant on site. This will ensure that a maximum number of people are employed from the area where the work is being undertaken. To further promote the aim of using local manpower, Tenders are advised that they should structure their workforce to achieve a ratio of expatriate staff to local staff of 1:25 or more. Also tenders must have formed an association between a foreign contractor and local East Timorese Contractor in the civil engineering construction field.

Furthermore the tenders are to have an intimate understanding of the cultural and ethical sensitivities involved in working with the East Timorese people and have staff with in the association who can converse fluently with their workforce (Tetum, Portuguese and Bahasa Indonesian).

No claims whatsoever shall be made as a result of ignorance of local conditions on the part of the tenders.

1.1.4 Non-Reimbursement

The Study Team will not be responsible for reimbursing any expenses or losses which may be incurred by any tendered in the preparation and submission of his tender.

The tenders will not be returned to the tenders regardless of the result of tendering.

1.2 TENDER DOCUMENTS

The Tender Documents shall consist of the followings:

TENDER AND CONTRACT DOCUMENTS

Chapter 1 INSTRUCTIONS TO TENDERS

Chapter 2 FORM OF TENDER AND ANNEXES

- Annex A Construction Schedule
- Annex B Manning Schedule
- Annex C Construction Equipment
- Annex D Resumes of Key Personnel

Chapter 3 FORM OF CONTRACT

Chapter 4 GENERAL CONDITIONS OF CONTRACT

Chapter 5 BILL OF QUANTITIES

Chapter 6 SPECIFICATIONS (General)

Chapter 7 SPECIFICATIONS (Technical Specification)

Chapter 8 DRAWINGS

The tenders shall examine carefully the Tender Documents so that they may fully understand the facilities, difficulties and restrictions affecting the execution and completion of the Work.

Any negligence or failure of the tenders to obtain reliable and necessary information for successful execution or completion of the Work shall not relieve or excuse from performing the responsible and obligatory completion of the Work.

Any tendered who may be in doubt as to the true meaning of any part of the Tender Documents shall send written request to the Study Team for explanation, clarification or further information not later than **5** p.m. East Timor standard time on **17th April, 2000**.

Any interpretation or supplemental information related to the Tender Documents shall be valid only if the Study Team provides the addenda in writing as provided in hereof.

Upon receipt of any tender's request for explanation or further information, or in case any clarifications, revisions, deletions or additions to the Tender Documents are deemed

necessary by the Study Team, the Study Team will issue formal addenda to all tenders who has obtained the Tender Documents.

In any case, the addenda, if any, shall be issued not later than **3** p.m. East Timor standard time on **19th April, 2000**. Such addenda shall form an integral part of the Tender Documents and receipt of which shall be acknowledged by respective tendered by returning the duly signed form to the Study Team. Failure of any tendered to acknowledge receipt of any addenda might result in rejection of his tender.

1.3 PREPARATION OF TENDERS

1.3.1 Preparation of Tenders

The tender shall be prepared in the prescribed Form of Tender and annexes A to D provided herewith without any alteration thereto. All forms shall be completely filled in. The completed forms shall not be interlined or erased except the case of correcting errors, in which case the interlineation and erasures shall be initialed by the person or persons signing the tender.

The tendered shall comprise followings;

Form of Tender

Annex A: Construction Schedule

Annex B: Manning Schedule

Annex C: Construction Equipment

Annex D: Resumes of Key Personnel

All entries in the tender and all supplemental information shall be in the English language. All units in the tender shall be in the metric system unless otherwise specified in the specifications or drawings.

1.3.2 Prices

All prices shall be quoted in Japanese Yen unexceptionally. The Tender Price shall be expressed on lump sum basis. No variation in prices for any reason whatsoever shall be considered in tender evaluation and the contract.

The Contractor shall be entitled to exemption from all taxes and duties that are usually imposed on connection with the execution of the Works. Therefore, prices in tenders shall be exclusive of customs duties, internal taxes and other fiscal levies in force in East Timor.

1.4 SUBMISSION OF TENDERS

1.4.1 Submission of Tenders

Tenders so completed as designated in Articles 5, 6 and 7 hereof shall be prepared in duplicate respectively marked as "Original" and "Copy". The tenders shall be separately enclosed in two (2) envelopes, namely Envelop-A and B as defined in Article 6 hereof, and properly sealed and filled out with the tender's name and address and marked as "Quick Project".

Power of Attorney" need to be neither enclosed in an envelope nor sealed.

The tenders shall be submitted to the Tender Box located in the office of the Study Team, former PT PNL building, Dili, East Timor, not later than **10** a.m. East Timor standard time on **20th April, 2000**.

Tenders received after the due date and time prescribed above shall be returned unopened. Tenders shall be responsible for assuring that their Tenders are actually received on time at the place designated.

Each tendered shall submit one tender only for the Project. Tenders once received shall not be returned.

1.4.2 Interpretation of Tenders

In the case where there is a difference between the figures entered in words and in numerals in the tender, the figures entered in words shall take precedence over numerals.

1.5 SUFFICIENCY AND SECURITY OF TENDERS

1.5.1 Sufficiency of Tenders

Each tendered shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his Tender for the Works and of the price quoted in his tender. Tender Price shall cover all his obligations under the contract and all matters necessary for the proper completion of the Works.

1.5.2 Security of Tenders

The tenders shall be irrevocable and shall bind the tenders for a period of thirty (30) calendar days from the Tender Closing Date.

1.6 OPENING AND EVALUATION OF TENDERS

1.6.1 Opening of Tenders

All tenders shall be opened publicly at the office of the Study Team, designated in Article 8 hereof, immediately after the closing time mentioned in Article 8 hereof in the presence of the Study Team and the tenders or their representatives.

All participants in the tender opening shall register their signatures on an attendant list before the tender opening

At first, the Study Team shall confirm the effectiveness of each "Power of Attorney". In case the document is incomplete or inappropriate, the tendered shall forfeit his right to participate in the tender opening any further and the tender shall be returned unopened.

Secondly, Envelope-B shall be opened and availability of the required documents in Envelop-B shall be examined. In case the documents are lacking incomplete or inappropriate, the tendered shall forfeit his right to participate in the tender opening any further and Envelop-A shall be returned unopened. The appropriateness of each document shall be examined carefully afterwards in the stage of tender evaluation.

Finally, Envelop-A shall be opened and the tender price offered by each tendered shall be read aloud and recorded. The tendered that submit the lowest tender price within the estimate set by the Study Team shall be designated as the prioritized negotiator.

In the event that all the tenders exceed the estimates set by the Study Team, re-tender will be called immediately after the tender opening. In this case, the tenders shall be requested to submit the Form of Tender only and handwriting shall be acceptable.

If any of the tenders in three consecutive tendering does not reach the estimates set by the Study Team, the tendered submitting the lowest price will be asked to enter into negotiation for price reduction into the ceiling price.

In the event that such negotiation can not satisfy the Study Team, the Study Team shall invite the next lowest tendered to enter negotiation. This procedure will be followed until the Study Team reaches agreement with a tendered. When no tendered reaches agreement in this procedure, re-tendering may be considered.

In the event that the tender(s) is (are) less than the lowest estimate set by the Study Team, the Tender(s) will be invalid and the lowest price Tendered, but above the lowest

estimate, will be asked to enter into negotiation. The lowest estimate shall be the 75 % of the estimate.

The representative of each tendered who attends the said opening of tenders shall therefore be fully authorized by his firm or company to submit the tenders for these subsequent offers.

In case there are more than one tender offering the same and lowest price within the estimate set by the Study Team, a prioritized negotiator shall be determined by drawing lot. A turn of the lot shall be decided after consultation among the tenders concerned.

1.6.2 Evaluation of Tenders

The Study Team shall ascertain the Tenders that;

(1) computation are free of material errors,

(2) the tenders are substantially responsive to the Tender Documents,

(3) the required certificates and securities have been provided.

(4) documents have been properly signed, and

(5) the tenders are otherwise generally in order.

If a tender does not substantially conform to the Specifications, or contains inadmissible reservations or is otherwise not substantially responsive to the Tender Documents, it shall be rejected.

The tenders which substantially conform to the Specifications, and are responsive to other stipulations of the Tender Documents, shall be judged on the basis of the submitted price, and the tendered with the lowest price within the estimate set by the Study Team shall be designated as the prioritized negotiator.

The prioritized negotiator shall be invited for further confirmation and negotiations In this negotiation, the prioritized negotiator shall be inquired for clarification of his tender in order to assist in the examination and evaluation of the tender by the Study Team, and required to submit a priced bills of quantities for the examination and evaluation to determine prices of works for payment.

If the negotiations should end in a rupture for any reason, the right to negotiation will be ceded to the next lowest price tendered.

1.7 AWARD OF CONTRACT

After decision has been reached on the award of contract in the evaluation of Tenders, the Study Team will issue notification of award to the successful tendered after having received the approval from JICA. The notification of award will be given to the successful tendered within the period of validity of tenders stated in Article 11 hereof.

Upon receipt of the notification of award by the successful tendered, the contract shall be deemed to have been made, and the Study Team and the successful tendered shall become bound by all the terms and conditions of the Form of Contract as attached hereto, unless the successful tendered fails to execute the contract.

The Study Team shall prepare the documents for contract, which shall include the following documents:

a. Contract Agreement
b. Conditions of Contract
c. Specifications
d. Drawings
f. Tender
g. Such other documents those are intended to form the Contract.
h. Performance Security

The successful tendered who receives the notification of award shall furnish a performance security within seven (7) days after the date of receiving the notification of award. The amount of the performance security shall be 10 % of the Contract Price.

If the successful tendered fails to furnish the performance security within the period above, the award of contract to such tender shall be null and void. And then the Study Team will be free to award the contract to the next lowest tendered.

Upon the furnishing of the performance security by the successful tendered, the Study Team shall promptly notify the other tenders in wiring that their tenders have been unsuccessful.

CHAPTER 2

FORM OF TENDER AND ANNEXES

2. FORM OF TENDER AND ANNEXES

2.1 FORM OF TENDER

Tender for: Quick Project

To: Team Leader of the Study Team
Dili, East Timor

Gentlemen,

Having carefully examined and being familiar with the Tender Documents, we, the undersigned hereby, offer to execute and complete works for the above described project in strict accordance with the Tender Documents and remedy any defects therein in conformity with the Tender Documents, for the following fixed lump sum amount;

Japanese Yen _____only (J¥_____)

We understand that you are not bound to accept the lowest or any tender you may receive.

This offer is valid for the period of thirty (30) calendar days from the date of closing of this tendering, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

Dated this _____th day of April, 2000

(Signature)_____
(Name of Signer)
(Title of Signer)
(Name of Tendered)
(Address of Tendered)

2.2 FORM OF PERFORMANCE BOND

To: Team Leader of the Study Team
Dili, East Timor

Re: Quick Project

By this Security, we, (Name of the Contractor) whose registered office is at (Address of the Contractor) (hereinafter referred to as the Contractor) and (Name of Surety), whose registered office is at (Address of the Surety) (hereinafter referred to as the Surety), are held and firmly bound unto Pacific Consultants International, in association with Nippon Koei Co., Ltd. and YACHIYO Engineering Co., Ltd., (hereinafter referred to as the Study Team) in the amount of Japanese Yen _____ only (J¥_____) for the payment of which sum, we, the Contractor and the Surety, bind ourselves, our successors and assigns, jointly and severally, firmly by these presents.

Whereas the Contractor has entered into a contract with the Study Team on the th day of _____ , 2000 (hereinafter referred to as "the Contract") to execute and complete certain works and remedy any defects therein in conformity with the provisions of the Contract.

Now, therefore, the Condition of this Security is such that, if the Contractor shall promptly and faithfully perform the Contract (including any amendments thereto) then this obligation shall be null and void; otherwise it shall remain in full force and effect. Provided always that the above obligation of the Surety to satisfy and discharge the damages sustained by the Study Team shall arise only upon receipt of a written statement of the Study Team stating following;

(a) Declaration and detailed explanation of the default of the Contractor under the Contract
(b) Description of the method to remedy the default thereof
(c) Amount with detailed cost estimation of the defects to be remedied

The Surety shall not be liable for a greater amount than the specified penalty of this Security.This Security shall be null and void against the certificate of completion of all the works to be rendered by the Contractor under the Contract issued by the Study Team.

(Signature)_____	(Signature)_____
(Name of Signer)	(Name of Signer)
(Title of Signer)	(Title of Signer)
(Name of the Contractor)	(Name of Surety)

FORM OF POWER OF ATTORNEY

Date: (_____, 2000)

To: Team Leader of the Study Team
Dili East Timor

Gentleman,

I, the undersigned, hereby constitute and appoint (Name and Title), whose specimen signature appears at the lower left corner of this document, to sign the tender and all other related documents thereof which are subject of the Invitation to Tender for Quick Project, on behalf of the undersigned.

This Power of Attorney shall remain in force until the completion of aforementioned purposes.

(Signature)
(Name of Signer)
(Name of Tendered)
(Address of Tendered)

Designated Person:

(Signature)
(Name of Signer)
(Title of Signer)

2.3 FORM OF QUESTIONNAIRE

To: Team Leader of the Study Team

Re: Quick Project

No.	Questions

(Signature)
(Name of Signer)
(Title of Signer)
(Name of Tendered)

2.4 FORM OF ACKNOWLEDGEMENT OF ADDENDUM

Tender for: Quick Project

Re: Team Leader of the Study Team

We, the undersigned hereby, acknowledge the receipt of following addendum and understand that this addendum forms an integral part of the Tender Documents.

- Tender Addenda No. _____ Dated this ___th day of ____, 2000

(Signature)_____
(Name of Signer)
(Title of Signer)
(Name of Tendered)

ANNEX A (2/1)

CONSTRUCTION SCHEDULE

Project: Quick Project

→ (Dili-Aileu-Ainaro road)

Description of work	Quantity	1st week	2	3	4	5	6	7	8	9	10	11
Mobilization												
Km 73.1, Gabion box	40 m³											
Km 76.5, Gabion box	40 m³											
Km 79.5, Gabion box	30 m³											
Km 81.5, Gabion box	30 m³											
Km 82.0, Gabion box	30 m³											
Km 83.4, Gabion box	115 m³											
Km 84.0, Gabion box	60 m³											
Repairing road surface (Km82-84)	2 km											
Demobilization and clean up site												

(Signature)

(Name of Signer)

(Title of Signer)

(Name of Tender)

ANNEX A (2/2)

CONSTRUCTION SCHEDULE

Project: Quick Project
(Baucau-Laga-Baguia-J.C. of Southern Coastal road)

Description of work	Quantity	1st week	2	3	4	5	6	7	8	9	10	11
Mobilization												
Km 12.5, Gabion	480 m³											
Km 23.3 Embankment fill	160 m³											
Km 33.2 Causeway	1 No.											
Km 33.3, Gabion	18 m³											
Km 41.9, Gabion	300 m³											
Km 42.5, Causeway	1 No.											
Km 42.55, Causeway	1 No.											
Km 42.6, Causeway	1 No.											
Road restoration, Ossohuna-Afalecai	7.6 km											
Demobilization and clean up site												

(Signature) .....
(Name of Signer)
(Title of Signer)
(Name of Tender)

ANNEX B

MANNING SCHEDULE

Project: Quick Project

Description of work	Man-month	1st. week	2	3	4	5	6	7	8	9	10	11
Expatriate												
Local staff												
Labor/operator												

Signature) .....

(Name of Signer)

(Title of Signer)

(Name of Tender)

ANNEX C

LIST OF MAJOR CONSTRUCTION EQUIPMENT

All major construction equipment shall be listed and described below. Description shall include name, capacity, weight, and the time of mobilization.

Equipment Description	Type and Capacity	**WEIGHT**	Quantity	Present Condition	Time of Mobilization

(Signature)
(Name of Signer)
(Title of Signer)
(Name of Tendered)

ANNEX D

RESUMES OF KEY PERSONNEL - (1)

Resumes of person to be assigned to the Project, containing the following information, shall be submitted.

No. 1 (a) Position : Site Manager

(b) Name :

(c) Age :

(d) Education :

(e) Relevant Experience :

Period	Name of Project	Capacity

(f) Employment History :

(Signature)

(Name of Signer)

(Title of Signer)

(Name of Tendered)

ANNEX D

RESUMES OF KEY PERSONNEL - (2)

Resumes of person to be assigned to the Project, containing the following information, shall be submitted.

No. 2 (a) Position : Civil Engineer

(b) Name :

(c) Age :

(d) Education :

(e) Relevant Experience :

Period	Name of Project	Capacity

(f) Employment History :

(Signature)

(Name of Signer)
(Title of Signer)
(Name of Tendered)

CHAPTER 3

FORM OF CONTRACT

3. CONTRACT AGREEMENT

3.1 AGREEMENT

This Agreement made and entered into this _____th day of April, 2000 by and between Pacific Consultants International, in association with Nippon Koei Co., Ltd. and YACHIYO Engineering Co., Ltd., having its office at 7-5, Sekido 1-Chome, Tama-shi Tokyo, Japan (hereinafter referred to as "the Study Team") and _____, duly organized and existing under the laws of Japan, having its principal office of business at_____,Japan (hereinafter referred to as "the Contractor")

WHEREAS the Study Team is desirous of having the construction work for Quick Project for urgent rehabilitation of road (hereinafter referred to as "the Project") carried out, and the Contractor is willing to execute the work on the terms and conditions as set forth in this Agreement.

NOW THEREFORE, in consideration of the mutual covenants hereinafter contained, the parties agree as follows:

3.2 ARTICLE 1. PERIOD OF EXECUTION OF THE WORK

The Contractor shall commence the Work within seven (7) days from the date of the receipt of the notice to commence issued by the Study Team.

The Contractor shall complete the Work until July 15, 2000. However, when extension of the period of execution of the Work is necessary due to causes beyond the control and responsibility of the Contractor, and the Study Team, the extension of the term of this Contract shall be negotiated between the parties hereto.

3.3 ARTICLE 2. REMUNERATION

The Client shall pay to the Contractor with a sum of_____ Japanese Yen only (J¥) as the Contract Price for the Work in accordance with the payment schedule stated in Article 3 of this Contract.

The Contract Price quoted in the Tender for the Work shall be a fixed lump sum price for the period of this Contract. This shall be held fixed and firm from the award of the Contract until the end of the Contract.

Price escalation of local or imported materials and personnel will not be considered as a claim in the Contract Price.

3.3 ARTICLE 3. PAYMENT

Payment Schedule

(1) Advance Payment

The amount of _____Japanese Yen only (J¥_____), which corresponds to thirty (30) percent of the Contract Price, shall be paid within ten (10) days upon the signing of this Contract.

(2) Final Payment

The remainder of _____Japanese Yen only (J¥_____) shall be paid upon the completion of the Work and approved by the Study Team under this Contract.

IN WITNESS WHEREOF, the parties hereto have caused this Contract to be signed in their respective names in duplicate, each party retaining one (1) copy thereof.

___th day of April, 2000 as of the day and year first herein before written.

For and on behalf of	for and on behalf of
the Study Team	the Contractor
Signed by:	Signed by:
_____	_____
Mr. Haruo SAKASHITA	
Team Leader of the Study Team	
Dili, East Timor	

CHAPTER 4

GENERAL CONDITIONS OF CONTRACT

4. GENERAL CONDITIONS OF CONTRACT

4.1 DEFINITIONS

In interpreting or construing this Contract the following expressions shall have the meanings hereby assigned to them except where the context otherwise requires:

4.1.1 "The Study Team" means Pacific Consultants International, in association with Nippon Koei Co., Ltd. and YACHIYO Engineering Co., Ltd., with his office duly organized and existing under the laws of Japan, having its principal office of business at 7-5, Sekido 1-Chome, Tama-shi Tokyo, Japan.

4.1.2 "The Engineer" means the team leader of the Study Team whose services have been engaged by JICA to provide professional services in designing and supervision for the establishment of the Works.

4.1.3 "Engineer's Representative" means any resident engineer or assistant of the Study Team.

4.1.4 "The Work" means the works to be executed and completed under the Contract.

4.1.5 "The Contractor" means the person whose tender has been accepted and with whom the Contract has been entered into.

4.1.6 "Bill of Quantities" is the document in which the Contractor indicates the cost of the Works, on the basis of the foreseen quantities of items of work and the fixed unit prices applicable to them.

4.1.7 "Drawings" and "Specifications" mean the Drawings and Specifications referred to in the Contract and any modification thereof or addition to thereto as may from time to time be furnished or approved in writing by the Engineer.

4.1.8 "The Contract Price" means the sum agreed in the Contract as payable to the Contractor for the execution and completion of the Works and for remedying of any defects therein in accordance with the Contract.

4.1.9 "Site" means the land and other places on, under, in or through which the Works or Temporary Works are to be constructed.

4.2 ENGINEER AND ENGINEER'S REPRESENTATIVE

4.2.1 Engineer's Duties and Authority

(a) The Engineer shall carry out the duties specified in the Contract.

(b) The Engineer may exercise the authority specified in or necessarily to be implied from the Contract, provided, however, the Engineer is required to obtain the specific approval of the Study Team for the execution of the Engineer's duties under Sub-Clauses 4.7.1and 4.8.1. Notwithstanding the obligation, as set out above, to obtain approval, if in the opinion of the Engineer, an emergency occurs affecting the safety of life or of the Works or of adjoining property, he may, without relieving the Contractor of any of his duties and responsibilities under the Contract, instruct the Contractor to

execute all such works or to do such things, as may, in the opinion of the Engineer, be necessary to abate or reduce the risk. The Contractor shall forthwith, comply, despite the absence of approval of the Study Team, with any such instructions of the Engineer.

(c) Except as expressly stated in the Contract, the Engineer shall have no authority to relieve the Contractor of any of his obligations under the Contract.

(d) The Study Team shall take all necessary steps to ensure that the Engineer shall appoint a Representative and sufficient qualified staff to perform the Engineer's duties under the Contract in a timely manner.

4.2.2 Engineer's Representative

The Engineer's Representative shall be appointed by and be responsible to the Engineer and shall carry out such duties and exercise such authority as may be delegated to him by the Engineer under Sub-Clause 4.2.3.

4.2.3 Engineer's Authority to Delegate

The Engineer may from time to time delegate to the Engineer's Representative any of the duties and authorities vested in the Engineer and he may at any time revoke such delegation. Any such delegation or revocation shall be in writing and shall not take effect until a copy thereof has been delivered to the Study Team and the Contractor.

Any communication given by the Engineer's Representative to the Contractor in accordance with such delegation shall have the same effect as though it had been given by the Engineer. Provided that:

any failure of the Engineer's Representative to disapprove any work, materials or Plant shall not prejudice the authority of the Engineer to disapprove such work, materials or Plant and to give instructions for the rectification thereof;

if the Contractor questions any communication of the Engineer's Representative he may refer the matter to the Engineer who shall confirm, reverse or vary the contents of such communication.

4.2.4 Appointment of Assistants

The Engineer or the Engineer's representative may appoint any number of persons to assist the Engineer' Representative in the carrying out of his duties under Sub-Clause 2.2. He shall notify to the Contractor the names, duties and scope of authority of such persons. Such assistants shall have no authority to issue any instructions to the Contractor save in so far as such instructions may be necessary to enable them to carry out their duties and to secure their acceptance to materials, Plant or workmanship as being in accordance with the Contract, and any instructions given by any of them for those purposes shall be deemed to have been given by the Engineer's Representative.

4.2.5 Instruction in Writing

Instructions given by the Engineer shall be in writing, provided that if for any reason the Engineer considers it necessary to give any such instruction orally, the Contractor shall comply with such instruction. Confirmation in writing of such oral instruction given by the Engineer, whether before or after the carrying out of the instruction, shall be deemed

to be an instruction within the meaning of this Sub-Clause. Provided further that if the Contractor, within 3 days, confirms in writing to the Engineer any oral instruction of the Engineer and such confirmation is not contradicted in writing within 3 days by the Engineer, it shall be deemed to be an instruction of the Engineer.

The provisions of this Sub-Clause shall equally apply to the instructions given by the Engineer's Representative and any assistants of the Engineer or the Engineer's Representative appointed pursuant to Sub-Clause 4.2.4.

4.2.6 Engineer to Act Impartially

Wherever, under the Contract, the Engineer is required to exercise his discretion by:

(a) giving his decision, opinion or consent, or

(b) expressing his satisfaction or approval, or

(c)determining value, or

(d)otherwise taking action which may affect the rights and obligations of the Study Team or the Contractor.

4. 3 CONTRACT DOCUMENTS

4.3.1 Priority of Contract Documents

The several documents forming the Contract are to be taken as mutually explanatory of one another, but in case of ambiguities or discrepancies the same shall be explained and adjusted by the Engineer who shall thereupon issue to the Contractor instructions thereon and in such event, unless otherwise provided in the Contract, the priority of the documents forming the Contract shall be as follows:

(1) The Contract Agreement;

(2) The Letter of Acceptance;

(3) The Tender;

(4) The Specifications;

(5) The Drawings;

(6) Priced Bill of Quantities; and

(7) Any other document forming part of the Contract.

4.3.2 Supply of Drawings and Documents

The Contractor shall supply to the Engineer two copies of all Drawings, Specification and other documents and approved by the Engineer in accordance with Sub-Clause 3.6(3). In addition the Contractor shall supply such further copies of such Drawings, Specification and other documents as the Engineer may request in writing for the use of the Study Team, at the Contractor's cost.

4.3.3 One Copy of Drawings to be Kept on Site

One copy of the Drawings, purchased from the Engineer or supplied by the Contractor as aforesaid, shall be kept by the Contractor on the Site and the same shall at all reasonable times be available for inspection and use by the Engineer and by any other person authorized by the Engineer in writing.

4.3.4 Disruption of Progress

The Contractor shall give notice to the Engineer, with a copy to the Study Team, whenever planning or execution of the Works is likely to be delayed or disrupted unless any further drawing or instruction is issued by the Engineer within a reasonable time. The notice shall include details of the drawing or instruction required and of why and by when it is required and of any delay or disruption likely to be suffered if it is late.

4.3.5 Supplementary Drawings and Instructions

The Engineer shall have authority to issue to the Contractor, from time to time, such supplementary Drawings and instructions as shall be necessary for the purpose of the proper and adequate execution and completion of the Works and the remedying of any defects therein. The Contractor shall carry out and be bounded by the same.

4.3.6 Designs and Drawings

(1) The apparent silence of the Specifications, Drawings and other documents as to any details, or the apparent omission from them of a detailed description concerning any point shall be regarded as meaning that only the best general practice is to be used. All interpretation of the Specification shall be made on this basis.

In the case of any class of work for which there is no specification, such work shall be carried out in accordance with the specification approved by the Engineer. It is the responsibility of the Contractor to submit such specification to the Engineer for approval prior to commencing the works.

(2) The Contractor's drawings submitted to the Engineer for approval shall be prepared in a format to be approved by the Engineer and unless otherwise permitted it shall be A3 size dimensioned in metric (SI) units using diagrammatic scales.

(3) The Contractor shall submit drawings and/or calculations in two copies, where required, to the Engineer at least three (3) days in advance of actual constructional requirements. The Engineer will check and return one copy of the same for the Contractor's use with any amendment, if any, noted therein.

(4) It is expressly understood that approval of the Contractor's drawings by the Engineer shall not be a complete check but will indicate only that the general methods of construction and detailing are satisfactory. Approval shall not be construed as permitting any departure from the Contract requirements.

(5) If the Contractor's drawings show variations from the Contract requirements because of standard shop practice or for other reason, the Contractor shall describe such variations in his letter for the Engineer's approval.

(6) The cost of preparing all drawings and calculations, and the cost of purchasing contract documents, specifications, and drawings as specified herein shall be deemed to

have been included in the respective rates/prices quoted by the Contractor in the Bill of Quantities and the Contractor will be allowed no extra compensation therefore.

4. 4 GENERAL OBLIGATIONS

4.4.1 Study Team's Responsibilities

(1) The Study Team shall carry out the following works in time for the commencement of the Work or according to the progress of the Work:

a. To secure land necessary for the execution of the Project and provide enough space for such construction as temporary offices, working area, stockyard and other utilities prior to the commencement of construction.

b. To ensure that the river area necessary for the construction of the facilities be freely accessible.

(2) The Study Team shall take necessary measures to exempt the Contractor from customs duties, internal taxes and other fiscal levies which may be imposed in East Timor with respect to the supply of the products, services and equipment necessary for the construction of the Project.

(3) The Study Team shall cooperate with the resident representative of the Contractor in the negotiations and procedures with the various authorities and public and private organizations for the execution of the Work.

4.4.2 Contractor's General Responsibilities

The Contractor shall execute and complete the Works and remedy any defects therein in accordance with the provisions of the Contract. The Contractor shall provide all superintendence, labor, materials, Plant, Contractor's Equipment and all other things, whether of a temporary or permanent nature, required in and for such execution, completion and remedying of any defects, so far as the necessity for providing the same is specified in or is reasonably to be inferred from the Contract.

4.4.3 Site Operations and Methods of Construction

The Contractor shall take full responsibility for the adequacy, stability and safety of all Site operations and methods of construction. Provided that the Contractor shall not be responsible for the design or specification of Permanent Works, or for the design or specification of any Temporary Works not prepared by the Contractor

4.4.4 Contract Agreement

The Contractor shall enter into and execute the Contract Agreement, to be prepared and completed at the cost of the Contractor in the form annexed to these Conditions with such modification as may be necessary.

4.4.5 Errors and Omission

The Contractor shall promptly inform the Engineer of any error, omission, fault, and other defect in the design, drawing or specifications for the works which are discovered

when reviewing the Contract Documents or in the process of execution of the Works.

4.4.6 Local Materials and Services

The Contractor shall make the maximum use of locally available materials, equipment, plant and services subject to compliance with the requirements of the Specifications

4.4.7 Work to be in Accordance with Contract

Unless it is legally or physically impossible, the Contractor shall execute and complete the Works and remedy any defects therein in strict accordance with the Contract to the satisfaction of the Engineer. The Contractor shall comply with and adhere strictly to the Engineer's instructions on any matter, whether mentioned in the Contract or not, touching or concerning the Works. The Contractor shall take instructions only from the Engineer or, subject to the provisions of Clause 2, from the Engineer's Representative.

4.4.8 Program to be Submitted

The Contractor shall, within three (3) days after the date of the Letter of Acceptance, submit to the Engineer for his consent a program, in such form and details as the Engineer shall reasonably prescribe, for the execution of the Works. The Contractor shall, whenever required by the Engineer, also provide in writing for his information a general description of the arrangements and methods which the Contractor proposes to adopt for the execution of the Works.

4.4.9 Revised Program

If at any time it should appear to the Engineer that the actual progress of the Works does not conform to the program to which consent has bee give under Sub-Clause , the Contractor shall produce, at the request of the Engineer, a revised program showing the modifications to such program necessary to ensure completion of the Works within the Time for Completion.

4.4.10 Contractor not Relieve of Duties or Responsibilities

The submission to and consent by the Engineer of such program or the provision of such general descriptions shall not relieve the Contractor of any of his duties or responsibilities under the Contract.

4.4.11 Contractor's Records

The Contractor shall at all times keep complete and accurate records related to the Works in accordance with sound engineering practices and to the satisfaction of the Engineer. All records related to the Works shall be made available to the Engineer and the Engineer's Representative at all times.

4.4.12 Employment of Local Personnel

The Contractor is encouraged, to the extent practicable and reasonable, to employ staff and labor from sources within the Republic Centrafricaine.

4.4.13 Safety, Security and Protection of the Environment

The Contractor shall, throughout the execution and completion of the Works and the remedying of any defects therein:

(1) have full regard for the safety of all persons entitled to be upon the Site and keep the Site (so far as the same is under his control) and the Works (so far as the same are not completed or occupied by the Study Team) in an orderly state appropriate to the avoidance of danger to such persons, and

(2) provide and maintain at his own cost all lights, guards, fencing, warning signs and watching, when and where necessary or required by the Engineer or by any duly constituted authority, for the protection of the Works or for the safety and convenience of the public or others, and

(3) take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of his methods of operation.

4.4.14 Damage to Persons and Property

The Contractor shall indemnify the Study Team against all losses and claims in respect of:

(1) death of or injury to any person, or

(2) loss of or damage to any property (other than the Works), which may arise out of or in consequence of the execution and completion of the Works and the remedying of any defects therein, and against all claims, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto.

4.4.15 Interference with Traffic and Adjoining Properties

All operations necessary for the execution and completion of the Works and the remedying of any defects therein shall, so far as compliance with the requirements of the Contract permits, be carried on so as not to interfere unnecessarily or improperly with:

(1) the convenience of the public, or

(2) the access to, use and occupation of public or private roads and footpaths to or of properties whether in the possession of the Study Team or of any other person.

The Contractor shall save harmless and indemnify the Study Team in respect of all claims, proceedings, damaged, costs, charges and expenses whatsoever arising out of, or in relation to, any such matters insofar as the Contractor is responsible therefore.

4.4.16 Avoidance of Damage to Roads

The Contractor shall use every reasonable means to prevent any of the roads, bridges or causeways communicating with or on the routes to the Site from being damaged or injured by any traffic of the Contractor and, in particular, shall select routes, choose and use vehicles and restrict and distribute loads so that any such extraordinary traffic as will inevitably arise from the moving of materials, Plant, Contractor's Equipment or Temporary Works from and to the Site shall be limited, as far as reasonably possible,

and so that no unnecessary damage or injury may be occasioned to such roads and bridges.

4.4.17 Transport of Contractor's Equipment or Temporary Works

Save insofar as the Contract otherwise provides, the Contractor shall be responsible for and shall pay the cost of strengthening any bridges or altering or improving any road communicating with or on the routes to the Site to facilitate the movement of Contractor's Equipment or Temporary Works and the Contractor shall indemnify and keep indemnified the Study Team against all claims for damage to any such road or bridge caused by such movement, including such claims as may be made directly against the Study Team, and shall negotiate and pay all 8claims arising solely out of such damage.

4.4.18 Opportunities for Other Contractors

The Contractor shall, in accordance with the requirements of the Engineer, afford all reasonable opportunities for carrying out their work to :

(1) any other contractors employed by the Study Team and their workmen,

(2) the workmen of the Study Team, and

(3) the workmen of any duly constituted authorities who may be employed in the execution on or near the Site of any work not included in the Contract or of any contract which the Study Team may enter into in connection with or ancillary to the Works.

4.4.19 Facilities for Other Contractors

If, however, pursuant to Sub-Clause 4.20 the Contractor shall, on the written request of the Engineer:

(1) make available to any such other contractor, or to the Study Team or any such authority, any roads or ways for the maintenance of which the Contractor is responsible, or

(2) permit the use, by any such, of Temporary Works or Contractor's Equipment on the Site, or

(3) provide any other service of whatsoever nature for any such, the Engineer shall determine an addition to the Contract Price in accordance with Clause 6.3 and shall notify the Contractor accordingly, with a copy to the Study Team.

4.4.20 Contractor to keep Site Clear

During the execution of the Works the Contractor shall keep the Site reasonably free from all unnecessary obstruction and shall store or dispose of any Contractor's Equipment and surplus materials and clear away and remove from the Site any wreckage, rubbish or Temporary Works no longer required.

4.4.21 Clearance of Site on Completion

Upon the issue of any Taking-Over Certificate the Contractor shall clear away and remove from that part of the Site to which such Taking-Over Certificate relates all

Contractor's Equipment, surplus material, rubbish and Temporary Works of every kind, and leave such part of the Site and Works clean and in a workmanlike condition to the satisfaction of the Engineer. Provided that the Contractor shall be entitled to retain on Site, until the end of the Defects Liability Period, such materials, Contractor's Equipment and Temporary Works as are required by him for the purpose of fulfilling his obligations during the Defects Liability Period.

4.5 LABOR

4.5.1 Engagement of Staff and Labor

The Contractor shall make his own arrangements for the engagement of all staff and labor, local or other, and for their payment, housing, feeding and transport.

4.5.2 Measures against Insect and Pest Nuisance

The Contractor shall at all times take the necessary precautions to protect all staff and labor employed on the Site from insect nuisance, rats and other pests and reduce the dangers to health and the general nuisance occasioned by the same. The Contractor shall provide his staff and labor with suitable prophylactics for the prevention of malaria and take steps to prevent the formation of stagnant pools of water. He shall comply with all the regulations of the local health authorities in these respects and shall in particular arrange to spray thoroughly with approved insecticide all buildings erected on the Site. Such treatment shall be carried out at least once a year or as instructed by the Engineer. The Contractor shall warn his staff and labor of the dangers of bilharzias and wild animals.

4.5.3 Epidemics

In the event of any outbreak of illness of an epidemic nature, the Contractor shall comply with and carry out such regulations, orders and requirements as may be made by the Government, or the local medical or sanitary authorities, for the purpose of dealing with and overcoming the same.

4.5.4 Burial of the Dead

The Contractor shall make all necessary arrangements for the transport, to any place as required for burial, of any of his expatriate employees. The Contractor shall also be responsible, to the extent required by the local regulations, for making any arrangements with regard to burial of any of his local employees who may die while engaged upon the Works.

4.5.5 Arms and Ammunition

The Contractor shall not give, barter or otherwise dispose of to any person or persons, any arms or ammunition of any kind or permit or suffer the same as aforesaid.

4.5.6 Festivals and Religious Customs

The Contractor shall in all dealings with his staff and labor have due regard to all

recognized festivals, days of rest and religious or other customs.

4.5.7 Disorderly Conduct

The Contractor shall at all times take reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst his staff and labor and for the preservation of peace and protection of persons and property in the neighborhood of the Works against the same.

4.5.8 Records of Safety and Health

The Contractor shall maintain such records and make such reports concerning safety, health and welfare of persons and damage to property as the Engineer may from time to time prescribe.

4.5.9 Reporting of Accidents

The Contractor shall report to the Study Team details of any accident as soon as possible after its occurrence. In the case of any fatality or serious accidents, the Contractor shall notify the Engineer immediately by the quickest available means.

4.5.10 Supply of Water

The Contractor shall, so far as is reasonably practicable, having regard to local conditions, provide on the Site and adequate supply of drinking and other water for the use of his staff and labor.

4.5.11 Health and Safety

Due precautions shall be taken by the Contractor, and at his own cost, to ensure the safety of his staff and labor and, in collaboration with and to the requirements of the local health authorities, to ensure that medical staff, first aid equipment and stores, sick bay and suitable ambulance service are available at the camps, housing and on the Site at all times throughout the period of the Contract and that suitable arrangements are made for the prevention of epidemics and for all necessary welfare and hygiene requirements.

4.5.12 Returns of Labor and Contractor's Equipment

The Contractor shall, if required by the Engineer, deliver to the Engineer a return in detail, in such form and at such intervals as the Engineer may prescribe, showing the staff and the numbers of the several classes of labor from time to time employed by the Contractor on the Site and such information respecting Contractor's Equipment as the Engineer may require.

4. 6 MATERIALS, PLANT AND WORKMANSHIP

4.6.1 Quality of Materials, Plant and Workmanship

All materials, Plant and workmanship shall be:

(1) of the respective kinds described in the Contract and in accordance with the

Engineer's instructions, and

(2) subjected from time to time to such tests as the Engineer may require at the place of manufacture, fabrication or preparation, or on the Site or at such other place or places as may be specified in the Contract, or at all or any of such places.

The Contractor shall provide such assistance, labor, electricity, fuels, stores, apparatus and instruments as are normally required for examining, measuring and testing any materials or Plant and shall supply samples of materials, before incorporation in the Works, for testing as may be selected and required by the Engineer.

4.6.2 Cost of Samples

All samples shall be supplied by the Contractor at his own cost if the supply thereof is clearly intended by or provided for in the Contract.

4.6.3 Cost of Tests

The cost of making any test shall be borne by the Contractor if such test is :

(1) clearly intended by or provided for in the Contract, or

(2) particularized in the Contract (in cases only of a test under load or of a test to ascertain whether the design of any finished or partially finished work is appropriate for the purposes which it was intended to fulfill) in sufficient detail to enable the Contractor to price or allow for he same in his Tender.

4.6.4 Inspection of Operations

The Engineer, and any person authorized by him, shall at all reasonable times have access to the Site and to all workshops and places where materials or Plant are being manufactured, fabricated or prepared for the Corks and the Contractor shall afford every facility for and every assistance in obtaining the right to such access.

4.6.5 Inspection and Testing

The Engineer shall be entitled, during manufacture, fabrication or preparation to inspect and test the materials and Plant to be supplied under the Contract. If materials or Plant are being manufactured, fabricated or prepared in workshops or places other than those of the Contractor, the Contractor shall obtain permission for the Engineer to carry out such inspection and testing in those workshops or places. Such inspection or testing shall not release the Contractor from any obligation under the Contract.

4.6.6 Dates for Inspection and Testing

The Contractor shall agree with the Engineer on the time and place for the inspection or testing of any materials or Plant as provided in the Contract. The Engineer shall give the Contractor not less than 24 hours notice of his intention to carry out the inspection or to attend the tests. If the Engineer, or his duly authorized representative, does not attend on the date agreed, the Contractor may, unless otherwise instructed by the Engineer, proceed with the tests, which shall be deemed to have been made in the presence of the Engineer. The Contractor shall forthwith forward to the Engineer duly certified copies of the test readings. If the Engineer has not attended the tests, he shall accept the said

readings as accurate.

4.6.7 Rejection

If, at the time and place agreed in accordance with Sub-Clause 6.6, the materials or Plant are not ready for inspection or testing or if, as a result of the inspection or testing referred to in this Clause, the Engineer determines that the materials or Plant are defective or otherwise not in accordance with the Contract, he may reject the materials or Plant and shall notify the Contractor thereof immediately. The notice shall state the Engineer's objections with reasons. The Contractor shall then promptly make good the defect or ensure that rejected materials or Plant comply with the Contract. If the Engineer so requests, the test of rejected materials or Plant shall be made or repeated under the same terms and conditions and the cost of such test shall be borne by the Contractor.

4.6.8 Independent Inspection

The Engineer may delegate inspection and testing of materials or Plant to an independent inspector. Any such delegation shall be effected in accordance with Sub-Clause 2.4 and for this purpose such independent inspector shall be considered as an assistant of the Engineer. Notice of such appointment (not being less than 3 days) shall be given by the Engineer to the Contractor

4.6.9 Examination of Work before Covering up

No part of the Works shall be covered up or put out of view without the approval of the Engineer and the Contractor shall afford full opportunity for the Engineer to examine and measure any such part of the Works which is about to be covered up or put out of view and to examine foundations before any part of the Works is placed thereon. The Contractor shall give notice to the Engineer whenever any such part of the Works or foundations is or are ready or about to be ready for examination and the Engineer shall, without unreasonable delay, unless he considers it unnecessary and advises the Contractor accordingly, attend for the purpose of examining and measuring such part of the Works or of examining such foundations.

4.6.10 Removal of Improper Work, Materials or Plan

The Engineer shall have authority to issue instructions from time to time, for:

(1) the removal from the Site, within such time or times as may be specified in the instruction, of any materials or Plant which, in the opinion of the Engineer, are not in accordance with the Contract,

(2) the substitution of proper and suitable materials or Plant, and

(3) the removal and proper re-execution, notwithstanding any previous test thereof or interim payment therefore, of any work which, in respect or

a. materials, Plant or workmanship, or

b. design by the Contractor or for which he is responsible,

is not, in the opinion of the Engineer, in accordance with the Contract

4.7 COMMENCEMENT AND DELAYS

4.7.1 Commencement of Works

The Contractor shall commence the Works on Site within seven (7) days after the receipt of a notice to this effect from the Engineer, which notice shall be issued after the date of the Letter of Acceptance. Thereafter, the Contractor shall proceed with the Works with due expedition and without delay.

4.7.2 Time for Completion

The whole of the Works shall be completed in accordance with the time stated in the

Article 1 of the Contract Agreement for the whole of the Works.

4.7.3 Restriction on Working Hours

Subject to any provision to the contrary contained in the Contract, none of the Works shall, save as hereinafter provided, be carried on during the night or on locally recognized days of rest without the consent of the Engineer, except when work is unavoidable or absolutely necessary for the saving of life or property or for the safety or the Works, in which case the Contractor shall immediately advise the Engineer. Provided that the provisions of this Clause shall not be applicable in the case of any work which it is customary to carry out by multiple shifts.

4.8 ALTERATIONS, ADDITIONS and OMISSIONS

4.8.1 Variations

The Engineer shall make any variation of the form, quality or quantity of the Works or any part thereof that may, in his opinion, be necessary and for that purpose, or if for any other reason it shall, in his opinion, be appropriate, he shall have the authority to instruct the Contractor to do and the Contractor shall do any of the following:

(1) increase or decrease the quantity of any work included in the Contract,

(2) omit any such work (but not if the omitted work is to be carried out by the Study Team

or by another contractor),

(3) change the character or quality or kind of any such work,

(4)change the levels, lines, position and dimensions of any part of the Works,

(5) execute additional work of any kind necessary for the completion of the Works, and

(6) change any specified sequence or timing of construction of any part of the Works.

4.8.2 Instructions for Variations

The Contractor shall not make any such variation without an instruction of the Engineer. Provided that no instruction shall be required for increase or decrease in the quantity of any work where such increase or decrease is not the result of an instruction given under this Clause, but is the result of the quantities exceeding or being less than those stated in

the Bill of Quantities.

4.8.2 Valuation of Variations

All variations referred to in Sub-Clause 8.1 shall be valued by applicable rates and prices provided in the priced Bill of Quantities. If the priced Bill of Quantities does not contain any rates or prices applicable to the varied work then suitable rates or prices shall be agreed upon between the Engineer and the Contractor.

If the event of disagreement the Engineer shall fix such rates or prices as shall, in his opinion, be reasonable and proper.

4.9 CONTRACTOR'S EQUIPMENT, TEMPORARY WORKS AND MATERIALS

4.9.1 Exclusive Use for the Works

All Contractor's Equipment, Temporary Works and materials provided by the Contractor shall, when brought on to the Site, be deemed to be exclusively intended for the execution of the Works and the Contractor shall not remove the same or any part thereof, except for the purpose of moving it from one part of the Site to another, without the consent of the Engineer. Provided that consent shall not be required for vehicles engaged in transporting any staff, labor, Contractor's Equipment, Temporary Works, Plant or materials to or from the Site.

4.9.2 Re-export of Contractor's Equipment

In respect of any Contractor's Equipment which the Contractor has imported for the purposes of the Works, the Study Team will use his best endeavors to assist the Contractor, where required, in procuring any necessary Government consent to the re-export of such Contractor's Equipment by the Contractor upon the removal thereof pursuant to the terms of the Contract.

4.9.3 Approval of Materials not Implied

The operation of this Clause shall not be deemed to imply any approval by the Engineer of the materials or other matters referred to therein nor shall it prevent the rejection of any such materials at any time by the Engineer.

4.10 MEASUREMENT

4.10.1 Quantities

The quantities set out in the Bill of Quantities are the estimated quantities for the Works, and they are not to be taken as the actual and correct quantities of the Works to be executed by the Contractor in fulfillment of his obligations under the Contract.

4.10.2 Works to be measured

The Engineer shall, except as otherwise stated, ascertain and determine by measurement the value of the Works in accordance with the Contract and the Contractor shall be paid

that value in accordance with Clause 10. The Engineer shall, when he requires any part of the Works to be measured, give reasonable notice to the Contractor's authorized agent, who shall:

(1) forthwith attend or send a qualified representative to assist the Engineer in making such measurement, and

(2) supply all particulars required by the Engineer.

Should the Contractor not attend, or neglect or omit to send such representative, then the measurement made by the Engineer or approved by him shall be taken to be the correct measurement of such part of the Works. For the purpose of measuring such Permanent Works as are to be measured by records and drawings, the Engineer shall prepare records and drawings as the work proceeds and the Contractor, as and when called upon to do so in writing, shall, within seven (7) days, attend to examine and agree such records and drawings with the Engineer and shall sign the same when so agreed. If the Contractor does not attend to examine and agree such records and drawings, they shall be taken to be correct. If, after examination of such records and drawings, the Contractor does not agree the same or does not sign the same as agreed, they shall nevertheless be taken to be correct, unless the Contractor, within 14 days of such examination, lodges with the Engineer notice of the respects in which such records and drawings are claimed by him to be incorrect. On receipt of such notice, the Engineer shall review the records and drawings and either confirm or vary them.

4.10.3 Method of Measurement

The works shall be measured net, notwithstanding any general or local custom, except where otherwise provided for in the Contract.

4.11 PROVISIONAL SUMS

4.11.1 Definition of "Provisional Sums"

"Provisional Sum" means a sum included in the Contract and so designated in the Bill of Quantities for the execution of work or the supply of goods, materials, or services, or for contingencies, which sum may be used, in whole or in part, or not at all, at the direction and discretion of the Engineer. The Contract Price shall include only such amounts in respect of the work, supply or services to which such Provisional Sums relate as the Engineer shall approve or determine in accordance with this Clause.

4.11.2 Use of Provisional Sums

In respect of every Provisional Sum the Engineer shall have power to order:

(1) Work to be executed, including goods, materials or services to be supplied by the Contractor. The Contract Price shall include the value of such work executed or such goods, materials or services supplied determined in accordance with Sub-Clause 8.3 hereof.

(2) Goods and materials to be purchased by the Contractor. The sum be paid to the Contractor therefore shall be determined and paid in accordance with Sub-Clause 11.4 hereof.

4.11.3 Production of Vouchers, etc.
The Contractor shall, when required by the Engineer, produce all quotations, invoices, vouchers and accounts or receipts in connection with expenditure in respect of Provisional Sums.

4.11.4 Payments to Contractor
For all work executed or goods, materials, or services supplied by the Contractor, there shall be included in the Contract Price:

the actual price paid or due to be paid by the Contractor, on the direction of the Engineer;

the sum, if ordered by the Engineer pursuant to Sub-Clause 11.2 hereof, as may be determined in accordance with Sub-Clause 8.3 hereof;

All other charges and profit shall be 25% of the actual price paid or due to be paid calculated.

4.12 CERTIFICATE AND PAYMENT

12.1 Final Statement
Upon completion of the whole of the Works, the Contractor shall submit to the Engineer a final statement, with supporting documents in the form approved by the Engineer, showing the amounts to which the Contractor considers himself to be entitled under the Contract in respect of:

(1) the value of all work done in accordance with the Contract and

(2) any further sums which the Contractor considers to be due to him under the Contract.

If the Engineer disagrees with or cannot verify any part of the draft final statement, the Contractor shall submit such further information as the Engineer may reasonably require and shall make such changes in the draft as may be agreed between them. The Contractor shall then prepare and submit to the Engineer the final statements as mutually agreed.

4.12.2 Final Certificate
Within three (3) days after receipt of the Final Statement the Engineer shall issue to the Study Team, with a copy to the Contractor, the Certificate of Completion of the Works for final payment pursuant to Article 3 of the Contract Agreement.

4.12.3 Defect Liability Certificate
The period of guarantee against any defects in the Work shall be three (3) months, from the date of the final certificate for payment.

The Contract shall not be considered as completed until a Defects Liability Certificate shall have been signed by the Engineer and delivered to the Study Team, with a copy to the Contractor, stating the date on which the Contractor shall have completed his

obligations to execute and complete the Works and remedy any defects therein to the Engineer's satisfaction.

4.13 BOND

4.13.1 Bond

The Performance Bond is a bond for the proper carrying out of all of the Contractor's obligations during the period from the date of Signing of this Contract to the completion of the Work in accordance with the terms and conditions of this Contract, and the amount of the Performance Bond shall be ten (10) percent of the Contract Price.

The Performance bond shall be released immediately when the Work has passed the final inspection of the Study Team.

4.14 ASSIGNMENT AND SUBLETTING

14.1 Assignment and Subletting

This Contract and the rights and obligations hereunder shall not be transferred by either party except as otherwise allowed in this Contract. The Contractor shall not sublet the whole of the Work to any third party.

4.15 FORCE MAJEURE

4.15.1 Force Majeure

(1) Neither party shall be deemed to be in default or in breach of the Contract if he is unable to perform his obligations under the Contract owing to circumstances beyond his reasonable control. Such circumstances (hereinafter referred to as Force Majeure) include, but shall not be limited to, the following:

a. acts of God, including storm, earthquake, flood or any other such operation of the forces of nature as his reasonable foresight and ability could not foresee or reasonably provide against.

b. war (declared or undeclared), hostilities, invasion, act of any foreign enemy, threat of or preparation for war; riot, insurrection, civil commotion, rebellion, revolution, usurped power, civil war; and labor troubles or other industrial troubles, strikes, embargoes, blockades, sabotage of labor.

(2) Monetary Obligations

Notwithstanding the foregoing, the occurrence of Force Majeure shall not prejudice nor otherwise affect either party's liability to pay remuneration or reimbursement of expenses to which the other party is entitled on or before the date of occurrence.

(3) Notice

The party affected by Force Majeure shall give the other party a written detailed account of the circumstances of the Force Majeure as soon as practicable, but not later than 3 days from the occurrence.

(4) Staff

In the event that Force Majeure is likely to endanger the safety of any expatriate staff of the Contractor, they shall be allowed to leave the site and or office, giving at least 24-hours notice to one of the Study Team's staff responsible for the management of the Project.

(5) Suspension and Termination

Upon the occurrence, the party affected may be allowed to temporarily suspend the performance of his duties under this Contract for so long a period as Force Majeure continues and as his performance is prevented thereby. In such instance, he shall make all reasonable efforts to mitigate the effect of Force Majeure upon his duties. When he cannot resume the performance of his duties, in spite of such efforts, within a cumulative period of 30 days of the suspension, either party may be entitled to terminate the Contract without prejudice.

4.16 APPLICABLE LAW

4.16.1 Applicable Law

This Contract is governed by the rules of the United Nations Transitional Administration in East Timor.

4.17 DISPUTE AND ARBITRATION

4.17.1 Dispute and Arbitration

This Contract shall be executed by the parties hereto in good faith, and in case any doubtful point is raised or any dispute occurs concerning the interpretation or performance of this Contract, such matter shall be settled through the consultation of the parties.

In the event, that an amicable settlement cannot be reached through consultation, the matter shall be referred to arbitration. The arbitration shall be conducted, by three arbitrators, or whom one shall be appointed by the Study Team, another by the Contractor and the last by the said two arbitrators.

In the event that the said two arbitrators cannot reach agreement on the appointment of the third arbitrator, the dispute shall be referred to Head of Infrastructure, UNTAET, Dili, East Timor for arbitration. The parties shall be bound by the arbitration award rendered in accordance with such arbitration as the final adjudication of any such controversy or claim. The place of arbitration shall be Dili, East Timor.

The losing party shall bear the cost for all proceedings of arbitration throughout.

4.18 LANGUAGE AND MEASUREMENT SYSTEM

4.18.1 Language and Measurement

All correspondence between the two parties including notices, requests, consents, offers or demands shall be made in English. All drawings, specifications, reports and other documents shall also be prepared in English.

All documents made under this Contract shall adopt the metric system (IS) and days shall be calendar days.

4.19 EARLY TERMINATION

4.19.1 Early Termination

(1) The Study Team may terminate this Contract upon fourteen (14) days' written notice to the Contractor, should the Contractor not fulfill his obligations as stipulated in Article 8 for more than thirty (30) consecutive days.

(2) The Contractor may terminate this Contract upon thirty (30) days' written notice to the Study Team, should the Study Team delay the payment stipulated in Article 2 of the Contract Agreement for more than thirty (30) consecutive days.

In the event of Early Termination for reasons stated in paragraphs (1) or (2), the Contractor shall be paid by the Study Team a fair and reasonable proportion of the Contract Price calculated on the basis of the Contractor's Work carried out up to the termination date.

4.20 JOINT VENTURES

4.20.1 Joint Ventures

The Contractor shall form a joint venture between a foreign contractor and a local East Timorese Contractor in the civil engineering construction field. All partners of the joint venture shall be jointly and severally liable to the Study Team for the fulfillment of the terms of the Contract and shall designate one of such persons to act as leader with authority to bind the joint venture. The composition or the constitution of the joint venture shall not be altered without the prior consent of the Study Team.

4.21 NOTICE

4.21.1 Notice

All notices pertaining to this Contract between the Study Team and the Contractor shall be sent in writing by registered air mail, facsimile, or be handed to the addresses so stated herein. In case either party hereto changes the address, the party concerned shall give such notice to the other party beforehand. Time of any notice shall start on the day of deposit of such a notice, in the post office of the sender.

For the Study Team:

Name : The Study Team

Address : Dili, East Timor

Telephone :

Facsimile :

For the Contractor

Name :

Address :

Telephone :

Facsimile :

CHAPTER 5

BILL OF QUANTITIES

Summary of Bill of Quantities

SECTION	AMOUNT (¥)
DILI-AILEU-AINARO ROAD	
BAUCAU-LAGA-BAGUIA-J.C. OF SOUTHERN COASTAL ROAD	
TOTAL	

Bill of Quantities (1/3)

Dili-Aileu-Ainaro section

Item No.	Description	Quantity	Unit	Rate (¥)	Amount (¥)
	1.General				
1.1	Mobilization of equipment, labor, materials and camp set up	1	LS		
1.2	Demobilization and site clean up	1	LS		
	Provisional sums				
	2 Causeways and culverts				
2.1	Excavation for structures				
	Excavation	50	m^3		
	Back filling	200	m^3		
2.2	Riprap	100	m^3		
2.4	Concrete	10	m^3		
2.6	Gabion				
	(1) Gabion mattress	40	m^2		
	(2) Gabion box	300	m^3		
2.7	Geotextile filter fabric	150	m^2		
2.9	Grouted stone pitching	50	m^2		
Sub-total					

Bill of Quantities (2/3)

Baucau-Laga-Baguia-J.C. of Southern Coastal section

Item No.	Description	Quantity	Unit	Rate (¥)	Amount (¥)
	1. General				
1.1	Mobilization of equipment, labor, materials and camp set up	1	LS		
1.2	Demobilization and site clean up	1	LS		
1.3	Provisional				
	2. Causeways and culverts				
2.1	Excavation for structures				
	Excavation	300	m^3		
	Back filling	1,140	m^3		
2.2	Riprap	185	m^3		
2.3	Stone base course	2,840	m^2		
2.4	Concrete cut-off wall	30	m^3		
2.5	Concrete pavement for causeway	350	m^2		
2.6	Gabion				
	(1) Gabion mattress	220	m^2		
	(2) Gabion box				
		1,380	m^3		
2.7	Geotextile filter fabric	2,320	m^2		
2.8	Pipe culvert				
	Nestle pipe culvert (ϕ 0.45m)	20	No.		
	Nestle pipe culvert (ϕ 0.90m)	15	No.		
2.9	Grouted stone pitching	420	m^2		
Sub-total					

BILL OF QUANTITIES (3/3)

Baucau-Laga-Baguia-J.C. of Southern Coastal section

Item No.	Description	Quantity	Unit	Rate (¥)	Amount (¥)
	3. Earthworks				
3.1	Removal of top soil	1,060	m^2		
3.2	Embankment				
	Road excavation	1,850	m^3		
	Embankment fill	1,050	m^3		
3.3	Road base	10,500	m^2		
3.5	Paved side ditch	150	m		
3.6	Gabion				
	(1) Gabion mattress	640	m^2		
	(2) Gabion box	1,000	m^3		
3.7	Clearing	12,000	m^2		
3.8	Unlined side ditch	6,000	m		
Sub-total					
Total					

SCHEDULE OF RATE (1/2)

	Pursuant to Clause 11 of General Conditions of Contract, Tendered shall estimate the rate for equipment, materials and, labor as listed below. Equipment Note: Rates must include fuel, oil, service and maintenance, etc. Rates must include operator/driver and assistant's wage Operating hours per day shall be 7hrs.				
No.	Equipment	Quantity	Unit	Operating unit rate(¥/hr)	
1	Excavator, 10t	5	day		
2	Tip truck (3-5m^3)	20	day		
3	Backhoe loader	20	day		
4	Small bulldozer, 10t	10	day		
5	Concrete mixer, 0.1m^3	20	day		
	Material Note: Rate shall include material purchasing and transportation to the work site. Souring and securing gravel from borrow pits is the Contractor's sole responsibility.				
No.	Material	Quantity	unit	Unit rate (¥$)	
1	Gabion box, 1×1×2m	300	No.		
2	Cement, 40kg bag	200	bag		
3	Sand for concrete	50	m^3		
4	Gravel for concrete	50	m^3		
5	Steel mesh fabric,	200	m^2		
6	Stone boulder for gabion	600	m^3		

SCHEDULE OF RATE (2/2)

	Labor Note: Rates should be based on 7hrs per day. Labor transportation to and from job site shall be included.				
No	Personnel	Quantity	Unit	Rate (¥/day)	
1	Engineer-local	10	day		
2	Foreman	10	day		
3	Skilled labor	50	day		
4	Un-skilled labor	50	day		

CHAPTER 6

TECHNICAL SPECIFICATION

6.1 DESCRIPTION OF WORKS

6.1.1 Location

The Site is located along the Maubisse-Aituto section of Dili-Aileu-Ainaro road and Laga-Baguia –Afaloicai section of Laga-Baguia-Junction of Southern coastal road.

6.1.2 Extent of the work

Dili – Aileu – Ainaro road

- Restoration of embankment failure by gabion including embankment fills (7 places along the road).

Baucau –Laga – Baguia –Junction of Southern coastal road

- Construction of four (4) concrete causeways;
- Restoration of embankment failure by gabion (5 places along the road);
- Restoration of about 7km-earth road, 2,500m^3 of earthwork, placing 13,300m^2 road base, 2,300m^3 of gabion, 35-pipe culverts installation and 6-gabion causeway construction.

6.2 Maintenance of existing roads and bridges

The existing roads and bridges for which construction works to be taken up shall be maintained by the Contractor in safe and trafficable condition during the period of the Contract. The maintenance shall include repairing potholes, ruts and other defects of pavement and repairing existing bridges and causeways, if damaged, to the satisfaction of the Engineer. The Contractor shall also maintain the same for passage of traffic. Necessary barricades and traffic signs shall be installed along the existing road for which construction works are carried out, and adequate number of flagmen shall be deputed at the site for the guidance of road user.

6.3 Environmental Condition

The existing environment is considered fragile and it is the responsibility of the Contractor to limit construction operations to the area necessary to undertake the Work and comply with its obligations in the Contract.

The disposal of soil from site, be it from earthworks in cut, desiltation of drains, slip spoils etc. must be to a site accepted and approved by the Engineer. Emphasis should be placed on recycling as much soil, timber, rock, etc. as possible. Certain locations will allow for the disposal of soil on the downhill side of the road, but those locations that do not lend themselves to this method will require disposal to a pre-approved site. Soil disposed to a pre-approved site must be done in a way that does not cause erosion, and/or in a fashion that reduces existing erosion.

Any topsoil, grass, vegetation that can be salvaged should be stockpiled and used to revegitate exposed surfaces to protect against erosion.

The Contractor is responsible for the safe disposal from the site of all fuels, oils, lubricants and consumables. The disposal process must be approved by the Engineer prior to any potential contaminants being brought to the site.

6.4 Contractor to Supply

In order to perform the Work, the Contractor shall supply all vehicles, equipment, tools, fuel, lubricants, consumables, construction material, support facilities, manpower, supervision and management as follows or as required.

6.4.1 Contractors equipment supply

All equipment required to perform the Work, with emphasis on light equipment, shall be provided by the Contractor.

A "Contractor's Equipment List" must be a complete list of the equipment required to perform the Work. As Load Limits are to be placed on road networks, emphasis is to be put on light equipment such as, but not limited to: Wackier Packers, 3-5m^3 tip trucks, 10 Ton Excavator (Maximum), Backhoe/Loader etc. All equipment must be able to be transported in the back of rigid-body trucks (i.e. No articulated equipment will be allowed, and rigid load limits will apply). Alternatives will be accepted provided evidence is given that the proposed piece of equipment or method of use can be mobilized, operated and demobilized safely and within the intended limits.

To provide uninterrupted road repair and civil maintenance operation and considering the remote locations, The Contractors may include on site (or be able to source from nearby), free of charge, standby equipment as a replacement for vehicle and equipment out of commission for scheduled or emergency maintenance.

To keep road damaged to an absolute minimum, the Contractors should fully investigate the possibilities of barging their equipment to the nearest boat ramp or port facility and mobilizing to site from there (especially during the rainy season).

6.4.2 Contractor's fuel and miscellaneous vehicle supply

The Contractor shall provide all fuel, lubricants, fluids, additives, and other supplies necessary to support its vehicle equipment, machinery and tools as might be required in performing the Work.

The Contractor is responsible for the safe disposal from the site of all fuels, oils, lubricants, fluids, additives and consumables. The disposal process must be approved by the Engineer prior to any potential contaminants being brought to the site.

6.4.3 Contractor's material

All construction material, consumables, manpower, transport to and from the job site and within the work area, and any other facilities required to perform the Work shall be provided by the Contractor. The material supplied shall include purchasing, transportation to the work site and storage as required. Souring filling material such as earth and stones to repair the roads and sites is the Contractor's sole responsibility.

The Contractor should look at the possibility to employing a crew of workers to break

rocks rather than have Plant undertaking this task. It will employ more people and could potentially cost less than the associated Plant hire cost.

6.4.4 Contractor's labor

The Contractor shall provide all manpower required to perform the Work including but not limited to supervisors, engineers, equipment operators, surveyors, mechanics, warehouseman, labor and administrative persons, and/or any other personnel requirements as may be required to perform the Work.

The Contractor is responsible for ensuring all personnel proposed for the Work have required skills commensurate with the positions. Evidence shall be submitted with the Tender documents.

Emphasis is to be placed on the ratio of Expatriate workers to Local East Timorese workers employed by the Contractor. A preferred ratio is in the order of 1 Expatriate to 25 Local East Timorese.

Further, emphasis should be put on manual labor such as hand digging, cleaning, rock placement, gabion work, culvert installation etc. and compaction by wackier packers or similar small equipment.

The Contractor, on award of the Contract, must seek out local labor from the surrounding area of the Works, and prepare a Brief, detailing the number of workers available, the wage each worker will be paid, logistics in transporting workers to and from the site, etc. District Administrators are located throughout the various Sections and should be contacted to aid in the preparation of this Brief and also to arrange a labor pool.

In determining manpower, the Contractor should bear in mind, the following:

- Workers will most likely be from subsistence backgrounds, and will need to tend to farming needs as well as working for the Contractor (this may means 6 hrs of work per day);

- Workers should not be paid more than what they would be likely to earn if they were farming. Influencing them away from their farms can lead to undesired social consequences at a later date;

- Wages will fluctuate from area to area, hence the Contractor will need to pay the "going rate" for that area. It is expected that the more remote the local village/town, the lower the wage will be. The Contractor must be mindful of this to best obtain value for money;

- If in a site camp arrangement, workers will most likely work 10 hr days, but will require 1 day off per week to tend to their homes and farms.

The possibilities of rotating crews of workers should be investigated by the Contractor (i.e. one crew could work half days then be released for farm work, with their places being taken by other local labor).

6.4.5 Contractor's mobilization and demobilization

All mobilization, demobilization for the Contractors material, equipment and manpower

shall be provided by the Contractor.

The Contractor must ensure that daily mobilization of their employees does not interfere with work hours. Local labor source from the nearest village/town shall reduce time for transporting labor to and from the site.

All site preparation for the Contractor's use such as equipment yard, Vehicle Park, camp, warehouse and utility facilities shall be performed by the Contractor.

All site clean up after demobilization and abandonment shall be performed by the Contractor to the Engineer's satisfaction. Site condition shall be restored to equal or better than the conditions existing prior to the use by the Contractor. No demobilization fee will be paid until site clean up has been completed to the Engineer's written acceptance.

6.4.6 Contractor's communication

The Contractor shall provide, at his own expense, all communication requirements for the Contractor's use, such as telephone, fax and two-way radios. The Contractor must supply their Site Supervisors with a Satellite Phone.

The Contractor is responsible for obtaining all required licenses and operating permits for communication equipment. All phone, fax and satellite phone numbers are to be provided to the Engineer prior to work commencing and kept up to date as equipment, numbers, etc. change.

The Contractor's supervisors must have the ability to communicate with the local workers in Portuguese, Tetum and/or Indonesian.

6.4.7 Contractor's facilities

The Contractor shall provide facilities for the Contractor's use including but not limited to:

Support facilities:

- equipment yard
- vehicle and tools maintenance shop;
- office;
- septic tank (if camp arrangement).

6.4.8 Contractor's utility requirement

The Contractor shall provide all necessary utilities, including but not limited to; potable water supply, power generation and electric distribution system, compressed air for tools, etc. as required to perform the Work.

6.5 Maintenance of Contractor's equipment and machinery

The Contractor must execute necessary emergency maintenance work due to breakdowns, which may adversely affect the Work schedule. The Employer is not liable for equipment charges for equipment classified as being out of service due to a

breakdown. The Contractor shall avoid delays in the Work caused by breakdown and is responsible for taking the required action to remedy such delays. Actions may include but are not limited to:

- Provide on site, free of charge, standby equipment as a replacement for vehicles and equipment out of commission for scheduled or emergency maintenance;

- If an essential piece of equipment does break down the Contractor shall mobilize (at own cost) replacement equipment with the same or equal performance and capacity. Such mobilization shall not interrupt the Work. Immediate notification must be given to the Engineer.

- If interruption of the Work is unavoidable, the Contractor shall immediately propose to reschedule the civil work to the Employer's satisfaction and approval.

6.6 Reporting and Progress

The Contractor shall report all required information using forms approved by the Employer, to the designated the Engineer supervising the Work for review and approval that the Work is complete, quality is acceptable, and that the associated rates and quantities are correct.

The Contractor shall prepare daily time sheets for equipment, machinery and manpower. The reports shall indicate operating, standby time and overtime. Material use shall also be reported.

The Engineer shall review and approved by signing all report forms, copies of which will be attached to the subsequent invoices.

The Contractor shall prepare weekly summary reports containing, but not limited to, a summary of the previous week's activities with the original copies of approved time sheets and usage report forms.

Although overtime shall be reported there is no allowance for overtime or any rate(s) higher than the quoted operating rate, which is applied against the operating time for both equipment and manpower.

6.7 Construction Program and Working Documents

A Construction Program must be submitted to the Engineer for approval 7 days prior to the commencement of the Works.

The Contractor shall keep at their office at all times a complete and current set of all Specifications, drawings, relevant standards and manufacturer's installations and shall make them available to the Engineer or any representative of a Government Authority when required.

6.8 As Constructed Photos

Two sets of As-Constructed Photos detailing Before and After shots of the works shall be submitted in CD format to the Engineer two weeks after Final Completion of the

Works. A report detailing, but not limited to:

- a brief description of each problem;
- the change for each problem/section worked;
- a description of what was done to fix the problem;
- details on how/when the work was done

The report must reference the photos utilizing the before and after shots.

6.9 Increment Weather and Public Holidays

The work will be performed throughout the rainy season. The Contractor shall make suitable allowance in the Construction Program for delays, which may occur due to wet weather and public holidays.

6.10 Site Meeting

Throughout the duration of the Contract, the Contractor's construction supervisor shall be required to attend regular site meetings with the Engineer. The frequency of these site meetings will be determined by the Engineer at the start of the contract.

6.11 Daily Site Diary

A daily site diary must be kept by the Contractor detailing;

- date
- weather conditions;
- equipment on site;
- labor on site;
- section being worked
- any difficulties, incidents, delays that may have occurred;
- signature of person filling out the Daily Site Diary;
- certification of the Daily Site Diary by the Contractor' senior supervisor.

This Diary must be available to the Engineer at all times and is to be signed off by the Engineer after inspection.

6.12 Inspection

If the Specification provides for a Notice of Inspection to be given by the Engineer in respect of any part of the Work under the Agreement, that part of the Work shall not have further work placed thereon, or be covered up, or put out of view, without prior approval of the Engineer.

No claim for delay shall arise from the Contractor for the Engineer giving insufficient or unreasonable Notices for Inspection.

6.13 Determinations

The Contractor shall make request in writing where the determination of the Engineer is required. Requests shall allow sufficient time to avoid delays to the Construction Program.

Oral determinations or directions given by the Engineer will not be valid unless confirmed by the Engineer in writing to the Contractor.

6.14 Emergency Repairs

The Contractor must provide a list of equipment, personnel, materials and rates for use in emergency repair works that may occur during the period of the contract.

The Contractor must be able to mobilize a crew to locations that become deemed an Urgent Priority by the Employer.

If the Contractor becomes aware of dangerous failure on the road and considers it to be deemed requiring "Emergency Repairs", the Contractor should immediately contact the Engineer and discuss treatment. No work is to be done until approval by the Engineer is given.

CHAPTER 7

TECHNICAL SPECIFICATION

7.1 Mobilization of equipment, labor, materials and cam set-up.

7.1.1 Description

The provision of this Clause shall apply to transportation of imported plants, equipment and materials necessary to complete the Works. The Contractor shall quote for transportation of plants, equipment and materials from the place of their origin to the Site including any other incidental expenses in connection with the shipping, and cost for their returning, if required, after completion of the Works. It shall also include transportation of the Contractor's staff and construction of the Contractor's offices, workshops, stores etc.

Within seven (7) days of receiving the Letter of Acceptance, the Contractor shall submit to the Engineer the working drawings showing the:

(a) Architectural drawings for the buildings together with specifications

(b) Service drawings showing layout and details of electricity, water supply and sewerage

Within three (3) days of receipt of the detailed proposal, the Engineer may suggest modification or accord approval.

All buildings shall be properly maintained in good condition during the construction period

7.1.2 Measurement and payment

Upon arrival of the items of the Contractor's plants, equipment and materials described in the Contractor's schedule, the Engineer shall inspect them. If they are found in good condition the mobilization of the plants, equipment and materials shall be deemed to have been completed.

The above prices quoted by the Contractor shall be firm and fixed; no additional payment will be made for any additional mobilization of plants, equipment and materials

Pay Item No. 1.1 Mobilization of equipment, labor, materials and camp set up

7.2 Demobilization and site clean up

7.2.1 Description

This work shall consist of demobilization of the whole temporary works and landscaping of the Site and camp yard to the satisfaction of the Engineer. The Site shall be restored to equal or better than the conditions prior to the use by the Contractor.

7.2.2 Measurement and payment

Measurement for this item shall be in lump sum. The rate of this work shall be the full compensation for removing the whole temporary works and restoring the Site and camp yard.

No payment will be made until site clean up has been completed and accepted by the Engineer

Pay Item No. 1.2 Demobilization and site clean up

7.3 Causeways and Culverts

7.3.1 Excavation for structures

(1) Description

This work shall consist of the removal of all materials, of whatever nature, necessary for the construction of gabion and culverts in accordance with the Drawings or as directed by the Engineer. It shall include the placement of necessary backfill as hereinafter specified. It shall also include the disposing of excavated material, which is not required for backfill, from the site to a location approved by the Engineer.

(2) Construction

a. Setting Out

The Contractor shall clear the site in compliance with the requirements of clearing and removing topsoil laid down herein the Sub-Clause 3.1 to the limits of foundation as specified. After clearing the Contractor shall set out true to lines, grades, slopes and sections as shown on the Drawings or as directed by the Engineer.

The foundation elevation as shown on the Drawings shall be considered as approximate only and the Engineer may order in writing such changes in dimensions or elevation of footings as may be necessary to secure satisfactory foundation.

b. Excavation

Excavation shall be carried out in accordance with the Sub-Clause 3.2 for Earthworks in Cut of these Specifications

c. Backfill

All spaces excavated and not occupied by gabion or other permanent work shall be back filled up to the surface of the surrounding ground, with a sufficient allowance for settlement. Materials used for backfill shall be selected granular of a quality acceptable to the Engineer. All backfill materials shall be placed in horizontal, uniform layers not exceeding 200mm in thickness, before compaction, and shall be brought up uniformly on all sides of the structures. Each layer of backfill shall be compacted to a density of not less than 92% MMDD.

d. Backfill behind gabion

The spaces behind gabion shall be back filled with selected granular materials accepted by the Engineer.

All backfill material shall be placed in horizontal, uniform layers not exceeding 200 mm in thickness before compaction, and shall be brought up uniformly on all sides of the structure. Each layer of backfill shall be compacted to a density of not less than 92% MMDD.

7.3.2 Measurement and payment

Excavation will be measured on cubic meter, in original position of material acceptably excavated in conformity with the Drawings or as directed by the Engineer.

Backfill behind structures will be measured on cubic meter as compacted in place.

Payment for excavation shall include the cost of all labor, material, equipment, and other items that may be necessary or convenient to the successful completion of the excavation to the elevation of the bottom of the structures and back filled to the original ground. It shall also include the cost of removing any surplus material which may have been thrown up during the process of excavation.

Payment for backfill behind structures shall be full compensation for furnishing, placing, compacting and trimming of the material including labor, tools, equipment, and incidentals necessary to complete the work.

Pay Item No. 2.1 Excavation for structures

Excavation for gabion

Backfill behind gabion

7.4 Riprap

7.4.1 Description

This work shall consist of Riprap on the riverbed for protection from scouring. The Riprap for riverbed shall be constructed by hand-placed as shown on the Drawings or directed by the Engineer.

7.4.2 Placement of Riprap

Hand-placed Riprap shall consist of rough unhewn stones boulder approximately rectangular, placed directly on the prepared riverbed. Stones shall weigh between 10 and 30 kg. At least 60% of them shall weigh more than 20kg.

Before any Riprap is placed, the surface to be covered shall be fully compacted and graded to the required slope. Riprap on slopes shall commence in a trench below the toe of the slope and shall progress upward, each stone being laid by hand perpendicular to the slope with the long dimension vertical, firmly bedded against the slope and against the adjoining stone, with ends in contact, and with well-broken joints.

The finished surface of the Riprap shall present an even, tight surface, not less than 5cm. thick, measured perpendicular to the slope.

The stones weighing more than 20kg shall be well dispersed throughout the area with the 10-30 kg. stones laid between them in such a manner that all stones will be in close contact. The remaining voids shall be filled with spalls of suitable size and well tamped to produce a firm and compact revetment.

7.4.3 Measurement and payment

Measurement shall be made by cubic meter for hand-placed Riprap completed and accepted by the Engineer.

The price shall include the cost of furnishing and placing the Riprap, labor, equipment and incidentals necessary to complete the work including excavation of riverbed.

Pay Item No. 2.2 Riprap

7.5 Stone base course

(1) Description

This work shall consist of base course for concrete pavement of causeway to the lines, levels, and grades as shown on the Drawings and directed by the Engineer.

(2) Materials

Reference is made to Sub-clause 3.3 of this Specifications.

(3) Construction

The work shall be carried out in accordance with the Sub-Clause 3.3 of these Specifications

(4) Measurement and payment

Stone base course shall be measured by the square meter completed and accepted by the Engineer. Price of the base course shall include the full compensation for providing, hauling, placing, compacting the material and complying with the requirements of these Specifications.

Pay Item No. 2.3 Stone base course

7.6 Cut-off wall

(1) Description

This work shall consist of the reinforced concrete cut-off wall incorporated in the concrete pavement for causeway. The cut-off wall shall be constructed in conformity with the lines, grades, thickness and typical sections shown on the Drawings or as directed by the Engineer.

(2) Materials

a. Concrete

Reference is made to Sub-Clause 2.5 of these Specifications.

b. Reinforcement

Reference is made to Sub-Clause 2.5 of these Specifications

(3) Construction

The construction shall be carried out in accordance with Sub-Clause 2.5 for Concrete Pavement for Causeway.

(4) Measurement and payment

The quantity to be measured shall be the number of cubic meter of completed and accepted by the Engineer.

Payment for cut-off wall shall be full compensation for furnishing and placing all materials, and for all labor, equipment, tools and other incidentals to complete the work in accordance with the Drawings and Specifications and as directed by the Engineer.

Pay Item No. 2.4 Cut-off wall

7.7 Concrete pavement for causeway

7.7.1 Description

This work shall consist of reinforced concrete pavement for causeway. The concrete pavement shall be constructed on a prepared stone base course in conformity with the lines, grades, and thickness as shown on the Drawings.

7.7.2 Materials

(1) Cement

Type GP or GB (Portland Cement) to AS 3972 (or equivalent Indonesian Standard).

(2) Fine aggregate

Clean, hard, tough, durable, uncrated grains, homogenous in quality, free from clay, dirt and organic material.

(3) Coarse aggregate

Clean, hard durable, crushed stone or gravel, free from clay, dirt and organic material.

(4) Water

Clean and free from oil and injurious amounts of acid, alkali, organic or other deleterious substances.

(5) Reinforcement

All reinforcement shall be free from scale, rust, grease paints or other substances likely to reduce the bond between the steel and the concrete. Reinforcing mesh may be used where possible.

7.7.3 Construction

(1) Mix proportion

The Contractor shall supply concrete with the following properties unless otherwise specified:

Compressive strength:	24N/mm^2 (cylinder strength, 10cm Dai × 20cm height)
Maximum aggregate size:	20 mm
Slump:	80 mm

The Contractor shall present his proposal for mix proportions of cement, aggregates and water for approval by the Engineer. Volume batch will be allowed for batch aggregates.

(2) Testing concrete

Slump test shall be performed and a log kept at regular intervals. The frequency of testing will be performed at intervals determined by the Engineer with respect to the method mixing.

(3) Formworks

Forms shall be true to line and braced in a substantial and non-yielding manner. Don not place concrete until the formwork has been inspected by the Engineer.

(4) Placing of concrete

The Contractor shall give the Engineer sufficient notice so that inspection may be made before and during pouring concrete. The Contractor shall show verification that all constituent materials, formwork, falsework, reinforcement, and environmental conditions comply with all requirements.

Concrete placement must conform to the following

- Use concrete within one hour of mixing;
- Place continuously in a section until that section is complete;
- Ensure no separation of aggregate occurs during placement;
- Provide a construction joint when unforeseen circumstances prevent continuous pouring:
- Do not place concrete when the ambient air temperature exceeds 40℃
- Don not over vibrates the concrete.

(5) Finishing and curing

Concrete must be finished and cured to the following:

- Finish surfaces to a smooth and even colour;
- Round off exposed edges and corners
- Protect exposed surfaces from rain until final set has occurred;
- Cure at least 2 days by keeping damp and covering with polyphone sheeting;
- Protect the work from traffic for at least 7 days after placing concrete.

7.7.4 Measurement and payment

The measurement for concrete pavement shall be square meter completed and accepted by the Engineer.

Payment shall be the full compensation for furnishing all materials, labor, equipment and tools, and other items necessary to complete the work in accordance with the Drawings and directed by the Engineer.

Pay item No 2.5 Concrete pavement for causeway

7.8 Gabion

7.8.1 Description

This work shall consist of furnishing and placing gabion filled with packed stone for restoring embankment failure as slope, or riverbed protection or bank protection. The work shall be done in reasonably close conformity to the Drawings and Specifications.

7.8.2 Material

Gabion shall be a flexible, hexagonal woven steel wire mesh and the requirements for steel wire mesh shall be as follows:

Minimum tensile strength of wire – 40kg/mm^2

Mesh openings to be 80×100mm maximum, hexagonal in shape with flexible joints consisting of not less than 2 full turns,

- Conform to the following wire sizes and galvanizing weights.

Table 2.1 Wire properties

Wire type	Minimum diameter (mm)	Minimum weight of zinc coating (g/m^2)
Body wire	2.7	260
Binding and lacing wire	2.2	240
Selvedge wire	3.4	275

Diaphragms to be at 1,000mm spacing.

Stone shall be hard, durable, angular stone for better interlocking. Maximum stone dimension shall be 250mm and minimum stone dimensions, 100mm.

7.8.3 Construction Method

Gabion shall be assembled by binding the edges together at the selvages with binding wire of thickness shown in Table 2.1. The binding shall be in the form of continuous lacing so that the interval between laces is approximately 50 mm. The diaphragms shall be laced into position at the time of assembly leaving the "lids" of the crates open. Except in the case of sack gabion, the crates shall be placed in their final position before filling starts. They shall be stretched to their full dimension and securely pegged to the ground or wired to adjacent gabion before filling.

The vertical corners shall be kept square and to full dimension by inserting a steel bar of at least 20 mm diameter at each vertical corner, maintaining it in the correct final position throughout the filling process, the selvages of the crate will be bound to the selvages of adjacent crates with binding wire. Where crates are being assembled in position in a wall, the binding of the edges of each crate in the assembly process and the binding together of adjacent crates may be carried out in the same operation.

The filling will be carried out by placing individual stones into the gabion by hand. In this case, the stones shall be bedded on each other and bonded as in dry random rubble masonry. No loose stones shall be tipped into the crate and the practice of coursing and bonding the outer layer and filling the interior with unlaid stones will not be permitted. When the crates are filled, the lids will be closed and the selvages bound with binding wire as in the assembly process. On completion the crates shall be completely tight and square, true to dimensions, line and level as shown on the Drawings.

7.8.4 Measurement and payment

Measurement for this item shall be made on the basis of number of square meter of gabion mattress and cubic meter of gabion box completed in place. Payment shall be the full compensation for furnishing all materials, labor, equipment and tools, and other items necessary to complete the work in accordance with the Drawings and directed by the Engineer.

Pay Item No. 2.6 Gabion

Gabion mattress

Gabion box

7.9 Geotextile Filter Fabric

7.9.1 Description

This work shall consist of furnishing and placing geotextile filter fabric in the back side of the Gabion, in order to prevent movement of backfill soil particles in dynamic water flow. The geotextile fabric shall be laid at the place shown on the Drawings or a directed by the Engineer

7.9.2 Materials

The geotextile filter fabric shall be nonwoven polyester or polypropylene materials conforming to Table 2.2.

Table 2.2 Filter Fabric

Property	Test Method	Requirement
Grab Tensile Strength (MD/CD) in N	AS 3706.3	700 min
Thickness (mm)	AS 3706.1	1.7 min
Flow Rate ($L/m^2/sec$)	AS 3706.7	220 min
Permiability (S^{-1})	AS 3706.9	2.5 min

The filter fabric shall be accompanied with a test certificate from an approved testing laboratory with actual identification test results.

The fabric shall be protected from exposure to ultraviolet rays and stored on clean dry surfaces free of foreign substances such as grease, oil, cement, etc.

7.9.3 Measurement and payment

Measurement for this item shall be made for the completed area in square meter installed and accepted of the geotextile filter fabric. Payment for geotextile filter fabric shall be full compensation for furnishing and placing all materials, and for all labor, equipment, tools and other incidentals to complete the work in accordance with the Drawings and Specifications and as directed by the Engineer.

Pay Item No. 2.7 Geotextile Filter Fabric

7.10 Pipe culverts

7.10.1 Description

This work shall consist of furnishing, placing corrugated steel pipe under road embankment as shown on the Drawings or as directed by the Engineer.

7.10.2 Materials

Corrugated steel pipe shall be of flanged type and galvanized. The minimum sheet thickness shall be as following:

Table 2.3 Sheet thickness of pipe

Pipe (mm)	Sheet thickness (mm)
ϕ 450	2.0
ϕ 900	2.5

Bedding material shall be clean granular material free from sticks, stones and other deleterious material.

7.10.3 Construction

(1) Excavation

Before construction the Contractor shall obtain the Engineer's approval for the setting out. Excavation shall be performed in accordance with the following:

- Excavate in whatever material encountered;
- Pump, shore and brace as necessary;
- Rectify foundations which are affected by rain or surface water entering the excavation:
- Backfill with select fill up to the specified level if the trench is excavated too deep. Any such backfilling shall be at the Contractor's expenses;
- Replace unsuitable material with the select material below specified level if

directed by the Engineer and compact to a density not less than the surrounding material.

(2) Bedding

The Contractor shall place and compact bedding material to a depth 100mm thickness for the full width of the trench or 0.6m greater than the width of the culvert for non-trench conditions.

The bedding material shall compact to a 90% relative compaction and shape the bedding to hold pipes in position during compaction of additional fill. The Contractor shall place and compact a further (haunching) layer of bedding of 150mm compacted thickness over the full width of the previous layer after the pipe is in position.

(3) Laying pipes

The Contractor shall assemble steel pipe in accordance with the manufacture's instructions.

(4) Backfilling

Backfill material shall be placed around the culvert for the full width of the trench, and for a minimum 300mm above the top of the culvert in layers not exceeding 150mm compacted thickness as shown on the Drawings. The remainder of the trench shall be back filled with standard fill.

(5) Inlet and outlet structures

Stone pitched apron shall be provided at the end of the culvert to prevent scouring under the apron.

7.10.4 Measurement and payment

Pipe culvert will be measured in number of culvert completed and accepted by the Engineer. Payment shall be the full compensation for furnishing and placing all materials, including excavation and compaction of backfilling, construction of inlet and outlet and for all costs including labor, tools and incidentals necessary to complete the work..

Pay Item No. 2.8 Pipe Culvert

(1) Nestle pipe culvert (ϕ 0.45)

(2) Nestle pipe culvert (ϕ 0.90)

7.11 Grouted stone pitching

7.11.1 Description

Grouted stone pitching shall consist of stone boulder laid in cement mortar for pavement of approach road to causeways and for slope protection.

7.11.2 Materials

(1) Stone

The stone shall be sound and durable stone with no dimension less than 200mm. and shall be subject to the Engineer's approval. Each stone shall be free from depressions

and projections that might weaken it or prevent it from being properly bedded. The stone shall be dressed to remove any thin or weak portions.

(2) Mortar

Cement mortar shall consist of 1 part cement to 3 parts of clean sand mixed with potable water to form a workable mixture. They shall conform to the requirements of Sub-Clause 2.4 of these Specifications.

7.11.3 Construction

(1) Placing stone

The surface of the bank slope to receive the pitching shall be compacted and trimmed to exact slope, and placing gravel layer where required. Stone shall be hand-placed, interlocked and rammed into the bed to give an even finished surface so that they are firmly bedded in layers. All openings and interstices shall be filled with mortar to a depth of at least 100mm from the surface.

(2) Weep holes

All grouted stone pitching shall be provided with 75mm diameter weep holes unless other wise shown on the Drawings or directed by the Engineer. The weep holes shall be placed at the rate of 1 every 4 square meters.

(3) Cleaning exposed faces

Immediately after being laid, and while the mortar is fresh, all face stone shall be thoroughly cleaned of mortar stains and shall be kept clean until the work is completed.

7.11.4 Measurement and payment

Grouted stone pitching shall be measured by the area completed and accepted by the Engineer. Payment shall be the full compensation for furnishing and placing all materials, including compaction and trimming of bank slope, and for all costs including labor, tools and incidentals necessary to complete the work.

Pay Item No. 2.9 Grouted stone pitching

7.12 Approach Road

7.12.1 Removal of Topsoil

(1) Description

This work shall consist of removing topsoil in the cuttings and embankments of the approach roads as shown on the Drawings or directed by the Engineer, including clearing and stripping of all trees, vegetation, rubbish and objectionable material. It shall also include the demolition, removal and disposal of structures that obstruct the work except where otherwise provided.

(2) Construction

The depth of the stripping shall generally be 200 mm within the limits of the road but deeper if required by the Engineer. Where the Engineer orders that additional material shall be stripped, this shall be treated as cutting to spoil and shall be measured under

item "Road Excavation " of Sub-Clause3.2 of these Specifications.

The material obtained from the topsoil stripping operations shall be hauled any distance, spread and leveled as directed by the Engineer.

When topsoil, which is deemed by the Engineer to be suitable and fertile for agricultural purposes, shall be carefully removed to the specified depth and used on slopes which require planted slope protection or stockpiled in areas designated by the Engineer. Excavation of fertile topsoil shall be carefully done so as to exclude undesirable materials, and it shall be reasonably free from roots, sticks, stumps, stones and other unsuitable debris.

(4) Measurement and payment

The measurement for removal of topsoil to be paid for will be the number of square meters, measured in horizontal plane of removal of topsoil completed and accepted in accordance with the Drawings, Specifications and as directed by the Engineer.

This price shall be full compensation for furnishing all tools, equipment, materials, and labor necessary to complete the work including excavating, hauling to stock pile or waste area in accordance with the Drawings, Specifications and as directed by the Engineer.

Pay Item No. 3.1 Removal of topsoil

7.12.2 Earthwork

(1) Description

This work shall consist of restoring existing road by filling or cutting road formation which affected by embankment slip, deposition of loose material, settlement, etc.

(2) Material

Fill material will be obtained locally, either from river beds, slip spoils, or borrow pits, but it must be able to achieve a compaction of 92% MMDD. The Engineer will require an inspection of the fill material prior to filling and compacting.

(3) Construction

Due to the potential hazards relating to slope stability caused by the unstable nature of the surface geology in most of East Timor, care must be observed to ensure that drainage and embankment construction is undertaken so as to limit potential damage resulting from any slope failure that may occur during construction.

Following clearing, the horizontal and vertical alignment shall be inspected by the Engineer and the Contractor to identify all natural drainage paths, springs, potentially unstable slopes and regions of poor quality material. The chainages of these areas shall be recorded and appropriate remedial works will be designed in accordance with the Employers specifications.

The Contractor shall be responsible for finalizing the horizontal and vertical alignment along the nominated routes. The alignment shall be positioned with due regard to existing features including topography drainage, soil condition, slope stability, vegetation and existing tracks.

a.Embankment

Fill material shall be placed and compacted in layers not exceeding 200mm solid. The fill shall be free from all vegetation and other deleterious material. The Engineer shall give sufficient notification to inspect the natural base prior to any fill placement.

Embankment formation shall be constructed at appropriate slopes to ensure stability. The slope will be dependent upon the nature of the material but shall not be steeper than 1 vertical to 2 horizontal. Where the nature of the site does not allow sufficient room to ensure a stable

embankment, the toe of the embankment may be constructed with the written approval of the Employer to near vertical, using rock gabion. Where the slope of the embankment foundation exceeds 1 vertical in 1/2 horizontal, the natural surface shall be benched to provide a key for embankment construction. The maximum vertical height between benches shall be 2.0m

Fill material shall be placed and compacted in layers, The level of compaction shall be suitable for the purpose of construction as follows:

- General fill	92% (Standard dry density)
- Subgrade (top 150mm)	95% (Standard dry density)
- Embankment fill (below top 200mm)	92% (Standard dry density)
- Select backfill to structures	95% (Standard dry density)

Due to limited availability of testing facilities, these specifications may be substituted with equivalent method specifications subject to the Employer's approval (ie, proof rolling). The method specifications should be developed at the commencement of the project and checked at regular intervals during construction.

Full details of these methods must be supplied at the Tender interview.

b. Cut

All earthworks in cut shall be controlled to ensure that the possibility of mixing of suitable and unsuitable material is minimized. Where over excavation occurs, the backfilling shall be in accordance with the specification for earthworks in fill.

Where areas of cut have the potential to destabilize batters or where embankments greater than 1.8m high are to be constructed, slope stability measures are to be provided.

c. Unstable material

Where unstable material is located beneath areas requiring road repairs, material shall be replaced with approved material. The Contractor shall notify the Engineer when such replacement is to take place and the Engineer may issue a Notice of inspection as provided for in Section 1.14 of the Specification Part A. The base shall be inspected and approved by the Engineer prior to any fill placement, which shall be a suitable material compacted to the density of the surrounding suitable material.

d. Slope stability

Cut batters shall be constructed at a maximum slope of 2 vertical to 1 horizontal in clay and 3 vertical to 1 horizontal on rock, or at slopes agreed to by the Engineer and the

Contractor. No additional payment will be made for the work regardless of the amount of cut required.

Cut off drains and bunds shall be constructed above the batters to limit surface runoff on the face of the batter.

7.12.3 Measurement and payment

Existing ground level of cross-sections shall be taken by the Contractor and agreed with the Engineer before construction of earthworks and these measured ground levels shall be used to determine earthworks volumes.

Where benching of slopes to receive fill is required, the total volume of material to be excavated to form benches below existing ground level shall be measured and payment will be made under items "Road Excavation".

Drainage cutting and removal of unstable material shall be measured in net from the design cross-sections and the payment will be made under items "Road Excavation".

The rate for "Road excavation" shall include for the excavation of material in the cutting to any depth, loading transporting any distance and depositing it on a spoil area as well as trimming the cut to the required profile. Where the material is taken to spoil, the work will also include trimming the spoil area on completion.

The rate for "Embankment fill" shall include for the excavation of material in borrow pit, cutting, loading and hauling any distance, placing and compaction of the material in the embankment. It shall also include trimming of embankment slope as shown on the Drawings or as directed by the Engineer.

Pay Item No. 3.2 Earthwork

Road excavation

Embankment fill

7.12.4 Road base

(1) Description

This work shall consist of base course of graded stone to the lines, levels, and grades as shown on the Drawings and directed by the Engineer.

The Contractor shall be responsible for locating and developing suitable sources of material for graded stone.

(2) Materials

The material shall be free from organic and other deleterious material. Stone shall generally conform to the following specifications:

Table 2.4 Grading limits

A.S sieve size (mm)	Percent passing by weight
75	100
37.5	80 - 100
19.0	50 - 80
9.0	35 - 65
4.75	25 - 50
2.36	15 - 40
0.425	7 - 20
0.075	8 - 18

The material shall comply with the following physical requirements:

- Plasticity Index Non-plastic

The four (4) days soaked CBR value of the material shall be minimum 50% at 95 % M.M.D.D.

The Engineer will be informed of the location of stone sources for inspection and approval prior to use. The Engineer may stipulate conditions of use for the stone sources by which the Contractor must abide.

(3) Construction

Any ruts, holes, defects or soft, yielding places that occur in the sub-base by reason of any improper drainage condition, traffic or hauling over the same or for any other course, shall be corrected and compacted to the required density and stability and complying with the smoothness requirement of these Specifications before the materials are placed thereon.

The road base shall be placed and compacted in layers to achieve the final specified minimum compacted thickness of 300mm. The finished surface shall be true and free from pot holes and weak spots . To ensure adequate drainage the surface shall have minimum crossfall of 2%.

The shoulders of the pavement are to match in neatly with the top of the existing grouted stone pitched ditch to ensure stormwater flows into the ditch and does not scour the shoulders.

(4) Compaction

The compacted thickness of any layer laid, processed and compacted at one time shall not exceed 150mm, and where a greater thickness is required, the graded crushed stone

shall be laid in two or more layers.

As soon as possible after laying, compaction shall be carried out. The moisture content shall be adjusted as necessary and, during compaction, care shall be taken to maintain the moisture content evenly at the required value.

All rolling shall be longitudinal and shall commence at the outer edges of the pavement and progress towards the center, except that on superelevated curves, rollng shall progress from the lower to the higher edge. The base course shall be compacted to at least 98 % of the maximum dry density

Due to limited availability of testing facilities, these specifications may be substituted with equivalent method of specifications subject to the Employers approval (ie. Proof rolling). The method of specifications should be developed at the commencement of the project and checked at regular intervals during construction.

Full details of these methods must be supplied at the Tender interview.

(5) Measurement and payment

Base course shall be measured by the square meter. Price of the base course shall include the full compensation for providing, hauling, placing, compacting the material and complying with the requirements of these Specifications.

Pay Item No. 3.3 Road base

7.12.5 Concrete pavement

(1) Description

This work shall consist of furnishing, mixing, delivering and placing concrete for pavement of approach road to causeway. The work shall be carried out in accordance with these Specifications and conforming to the lines, grades and dimensions shown on the Drawings

(2) Material

a. Concrete

Reference is made to Sub-clause 2.2 for Concrete pavement for Causeway of these Specifications.

(3) Construction

Reference is made to Sub-clause 2.2 for Concrete pavement for Causeway of these Specifications

(4) Measurement and payment

The measurement for the concrete pavement shall be in square meter as completed and accepted by the Engineer.

Payment shall be the full compensation for furnishing all materials, labor, equipment and tools, and other items necessary to complete the work in accordance with the Drawings and directed by the Engineer.

7.12.6 Paved side ditch

(1) Description

This work shall construct of side ditch along the shoulders. The ditch shall be of grouted stone pitching. The work shall be done in accordance with the Drawings, and as directed by the Engineer.

(2) Materials

The stone used for the ditch shall be hard angular rocks roughly cubical in shape, and approved by the Engineer. Mortar shall be of one part cement and two parts sand.

(3) Construction

Excavation shall be performed in accordance with the requirement of Sub-clause 2.1 of these Specifications

Each stone shall be cleaned and thoroughly saturated with water before being set and the bed which is to receive it shall be compacted and trimmed and well moistured. All stone shall be well bedded in freshly made mortar. The joints shall be filled with mortar and the stone carefully settled in place before the mortar has set.

(4) Measurement and payment

The ditch shall be measured by meter of the completed ditches. The price shall be the full compensation for furnishing all materials, labor, equipment, tools, and other items necessary for the completion of the work.

Pay Item 3.5 Paved side ditch

7.12.7 Gabion

(1) Definition

This work shall consist of gabion wall to restore embankment failure due to slip and gabion mattress placed on soft ground, riverbeds etc. to restore road pavement. The work shall include removal of slip material and excavation of gabion foundations as shown on the Drawings or directed by the Engineer.

(2) Material

Gabion

Reference is made to Sub-clause 2.6 for Gabion of these Specifications.

Geotextile filter

Reference is made to Sub-clause 2.7 for Geotextile Filter Fabric of these Specifications

(3) Construction

a. Site clearing

The Contractor is responsible for ensuring that all Works are undertaken in a manner that will minimize the effect on the environment and that all work sites are left in a stable, well drained condition. Failure of cut or fill embankments adjacent to the Work site, as a result of inadequate drainage provided by the Contractor as part of the Works, shall be corrected to the Engineer's satisfaction at the expense of the Contractor.

b. Initial slip clean up

All loose material associated with the slip must be removed from the slip site to expose the slip plane surface (ie. Solid founding material).

The material obtained from this clean up can be handled in the following manner but is not limited to:

Remove from the site to a location approved by the Engineer

Kept on site and re-worked as appropriate for use as fill material or backfill.

c. Gabion

Key in anchor gabion shall be placed at least 300mm deep into solid founding material. The anchor gabion imbedded is sloping back towards the hill and has sufficient lateral drainage (min. 3%). For assembling and erection of gabion, refer to the Sub-clause 2.6 of these Specifications.

(4) Measurement and payment

Measurement for this item shall be made on the basis of number of cubic meter for gabion box completed in place and number of square meter for gabion mattress.

Pay Item No. 3.6 Gabion

a. Gabion mattress

b. Gabion box

7.12.8 Clearing

(1) Description

This work shall consist of clearing on the existing road for maintenance. It shall include clearing of all grasses, trees, vegetation, rubbish and objectionable material within the road area. It shall also include the demolition, removal and disposal of structures that obstruct the work except where otherwise provided. The Contractor shall receive the instruction of the area to be cleared by the Engineer before starting work.

The material obtained from the clearing operations shall be hauled to stock yard and disposed off as directed by the Engineer.

Measurement and payment

The measurement for clearing to be paid for will be the number of square meters, measured in horizontal plane cleared, completed and accepted by the Engineer.

This price shall be full compensation for furnishing all tools, and labor necessary to complete the work including hauling grasses, vegetation, and other materials obtained from clearing to stock pile or waste area as directed by the Engineer.

Pay Item No. 3.7 Clearing

7.12.9 Unlined side ditch

(1) Description

This work shall consist of removing deposition in side ditch or/and constructing new side ditch where shown on the Drawings or as directed by the Engineer. Spoil from the side ditch shall be deposited on the outside unless otherwise directed by the Engineer.

Measurement and payment

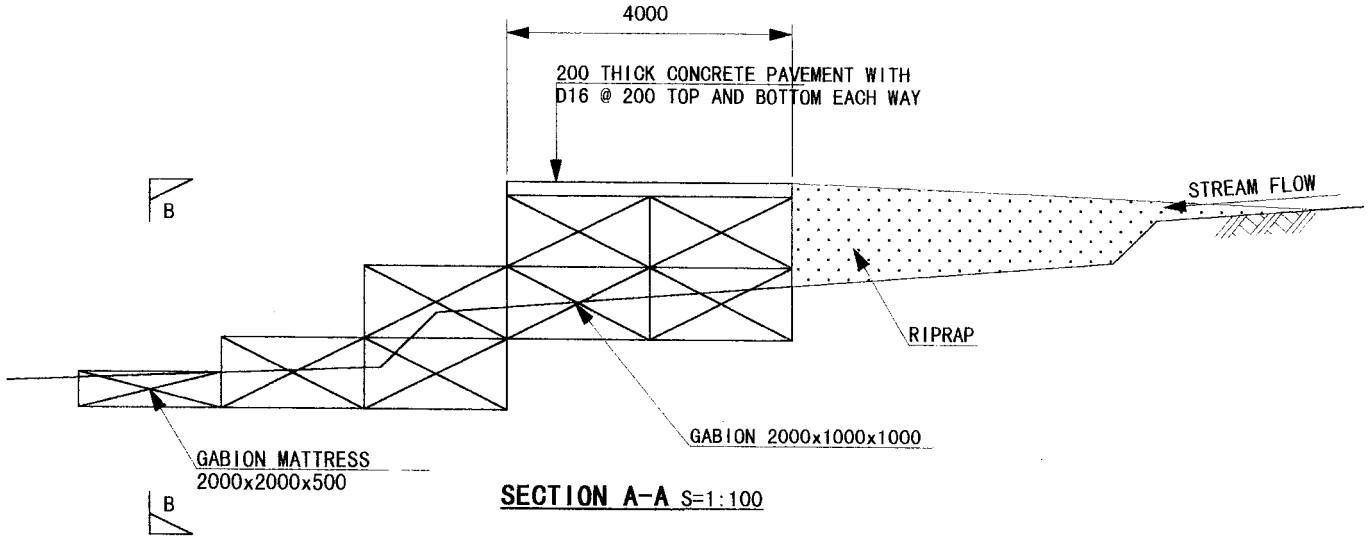
The measurement for unlined side ditch to be paid for will be the length of meters measured along the side ditch completed and accepted by the Engineer.

This price shall be full compensation for furnishing all tools, and labor necessary to complete the work including hauling spoil from the side ditch and disposed off as directed by the Engineer.

Pay Item No. 3.8 Unlined side ditch

CHAPTER 8

DRAWINGS



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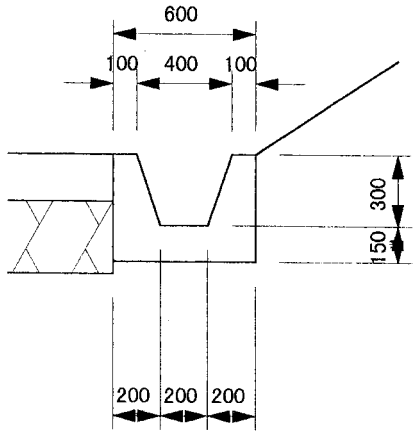
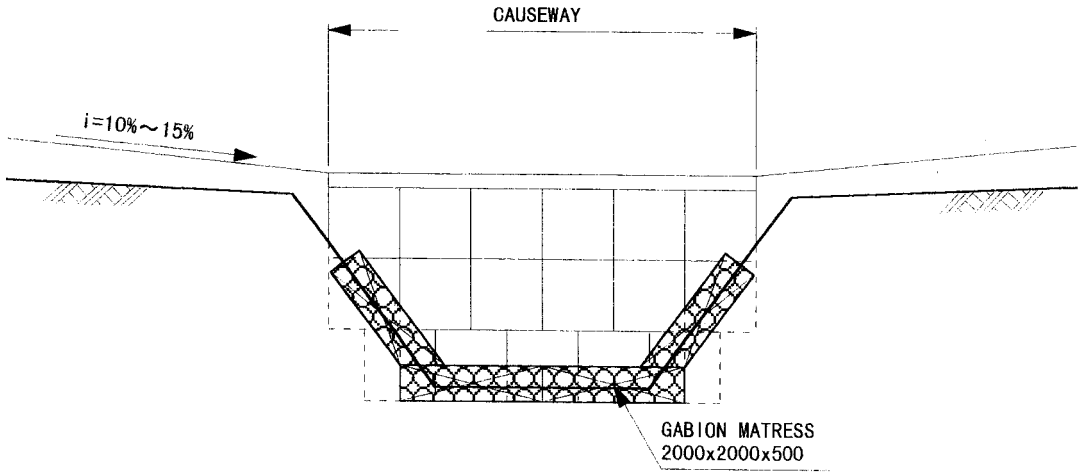
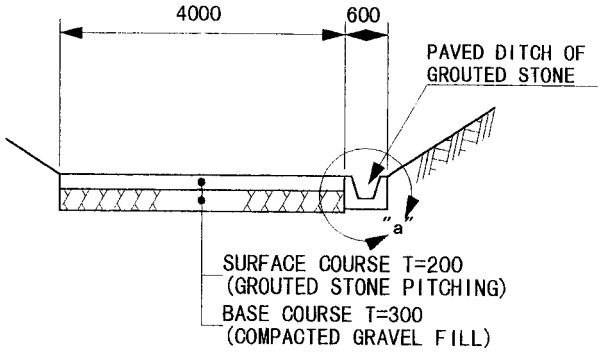


DETAIL "a" S = 1:30

NOTES: ALL THE DIMENSIONS SHOWN IN THE DRAWING ARE ONLY APPROXIMATE. ADJUSTMENT SHALL BE MADE BY THE ENGINEER TO MEET THE FIELD CONDITION.



VIEW B-B



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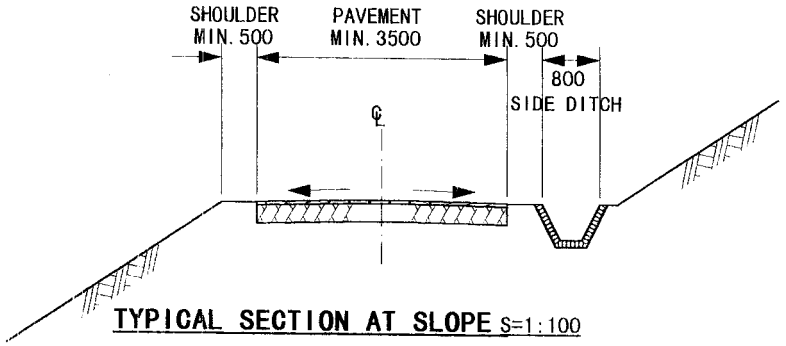
		MAY, 2000	DRAWING NO. : LS 007	



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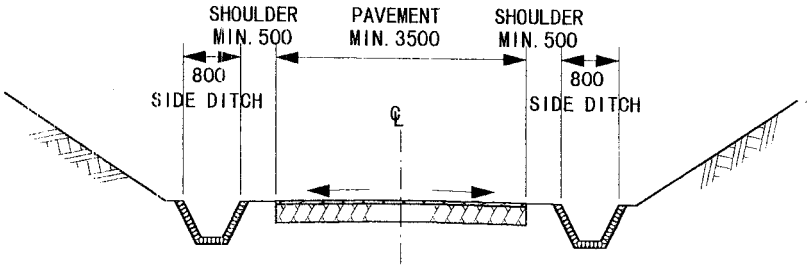

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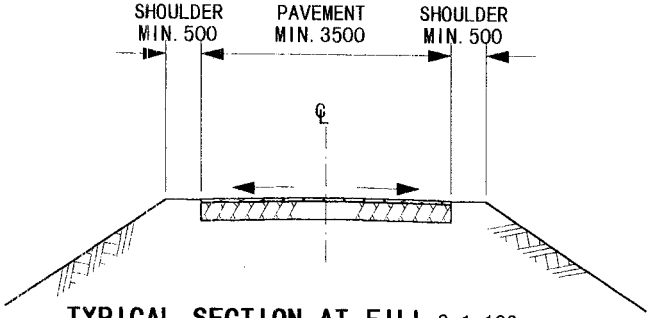

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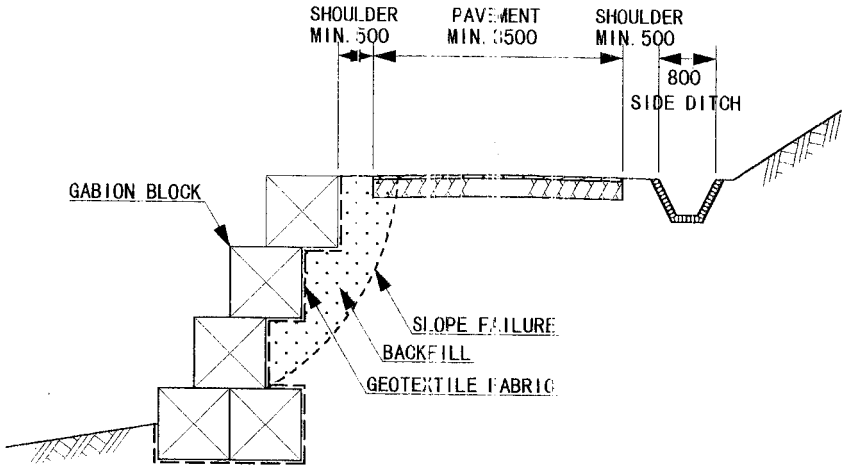
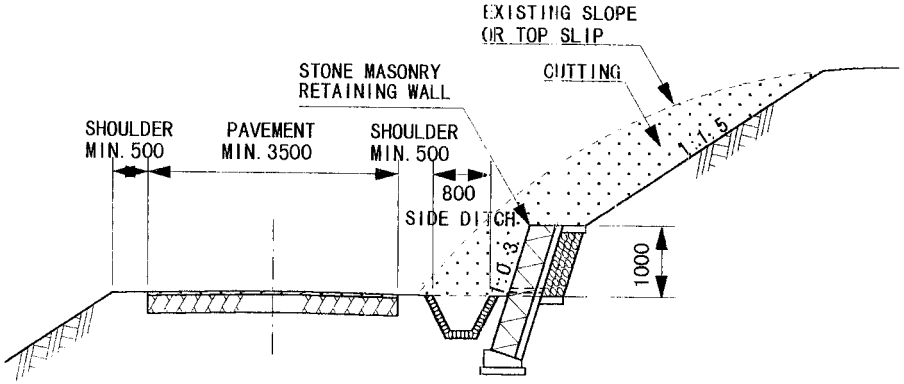
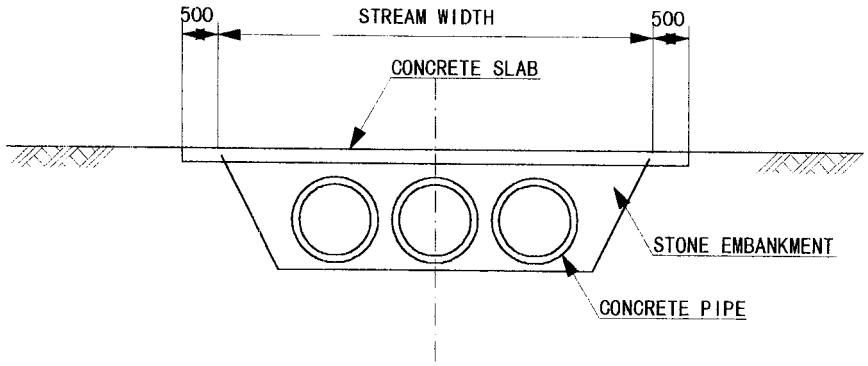


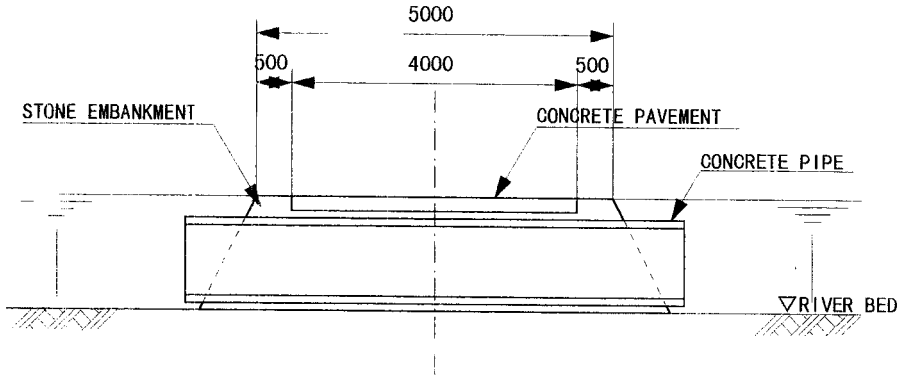
TYPICAL SECTION FOR SLOPE FAILURE S=1:100



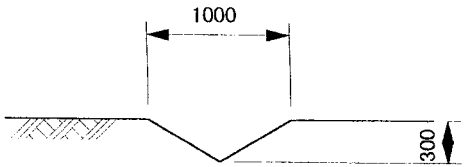
TYPICAL SECTION FOR SLOPE CUTTING S=1:100

UNITED NATIONS TRANSITIONAL ADMINISTRATION IN EAST TIMOR (UNTAET)	URGENT REHABILTAION PLAN FOR ROAD IN EAST TIMOR (DILI - AILEU - MAUBISSE - AITUTO - AINARO - CASSA)	TITLE : TYPICAL SECTIONS	JAPAN INTERNATIONAL COOPERATION AGENCY PACIFIC CONSULTANTS INTERNATIONAL NIPPON KOEI CO., LTD. YACHIYO ENGINEERING CO., LTD.
		MAY, 2000 / DRAWING NO. :	

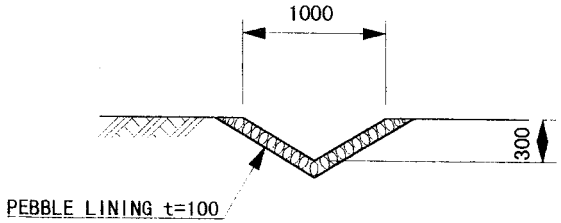




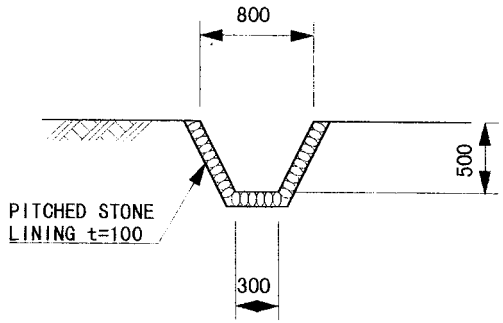
UNITED NATIONS TRANSITIONAL ADMINISTRATION IN EAST TIMOR (UNTAET)	QUICK PROJECT OF ROAD REHABILITATION IN EAST TIMOR (BAUCAU-LAGA-SAMALART -J.C. OF SOURTHERN COASTA SECTION)	TITLE :	JAPAN INTERNATIONAL COOPERATION AGENCY PACIFIC CONSULTANTS INTERNATIONAL NIPPON KOEI CO., LTD. YACHIYO ENGINEERING CO., LTD.
		MAY, 2000 / DRAWING NO. :	



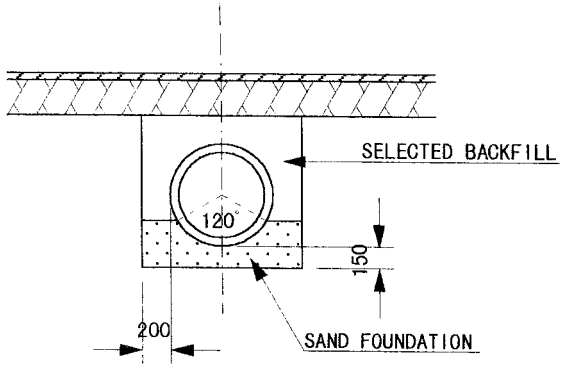
EXCAVATED SIDE DITCH S=1:50



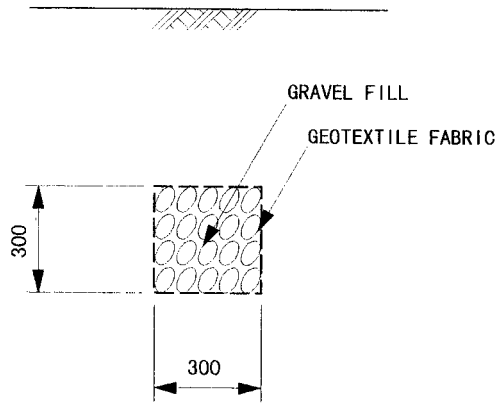
PEBBLE LINED SIDE DITCH S=1:50



PITCHING STONE SIDE DITCH S=1:50

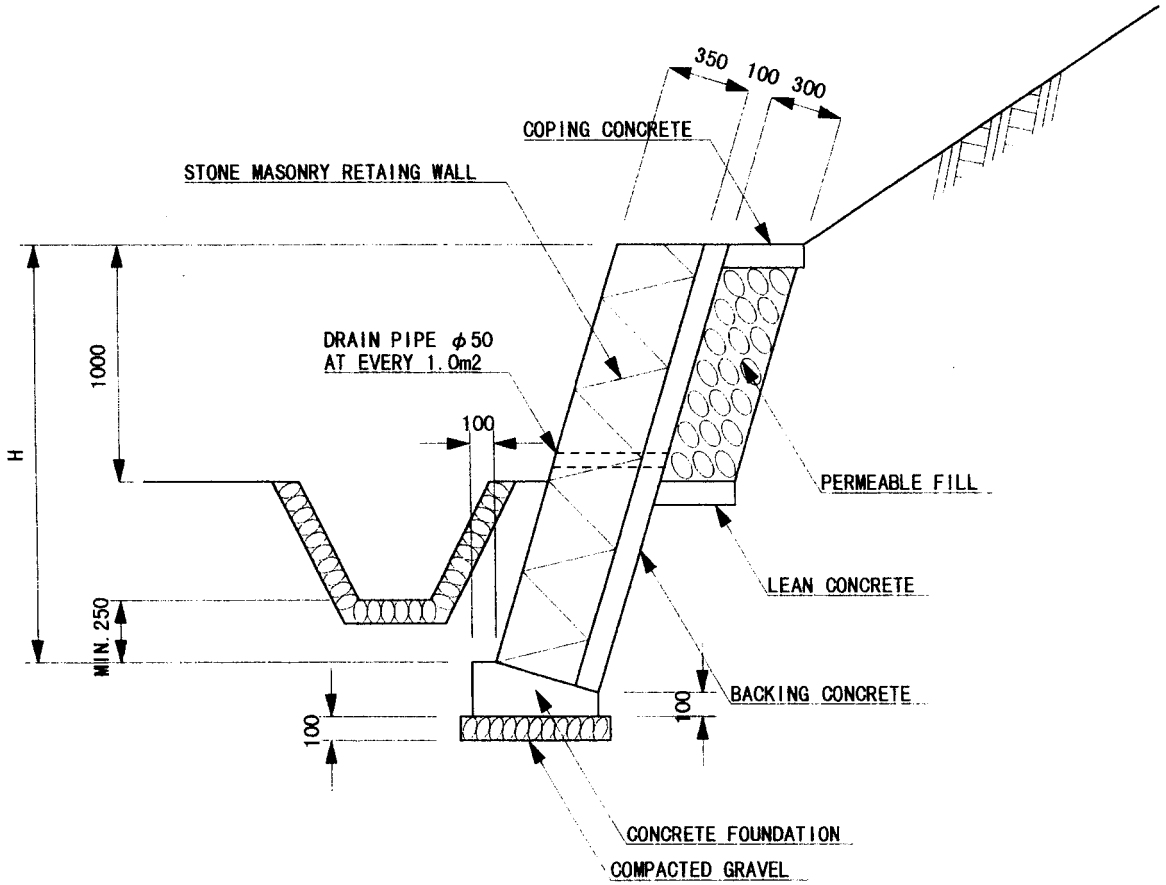


TYPICAL SECTION OF PIPE CULVERT S=1:50



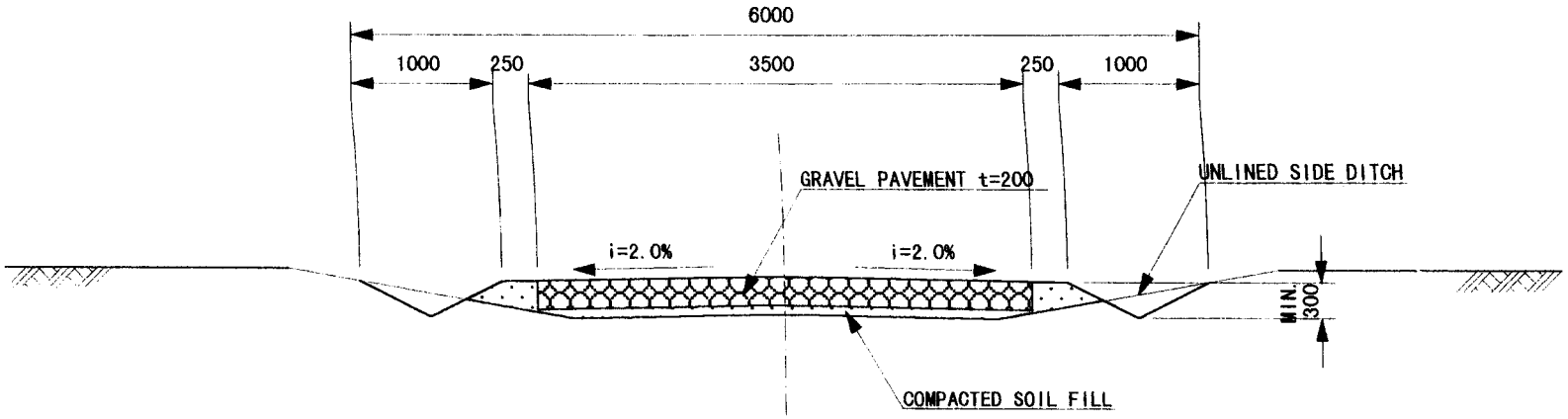
TYPICAL SECTION OF GRAVEL DRAIN S=1:20

UNITED NATIONS TRANSITIONAL ADMINISTRATION IN EAST TIMOR (UNTAET)	URGENT REHABILTAION PLAN FOR ROAD IN EAST TIMOR (DILI - AILEU - MAUBISSE - AITUTO - AINARO - CASSA)	TITLE : STNADARD SECTIONS FOR DRAINAGE	JAPAN INTERNATIONAL COOPERATION AGENCY PACIFIC CONSULTANTS INTERNATIONAL NIPPON KOEI CO., LTD. YACHIYO ENGINEERING CO., LTD.
		MAY, 2000 / DRAWING NO. :	

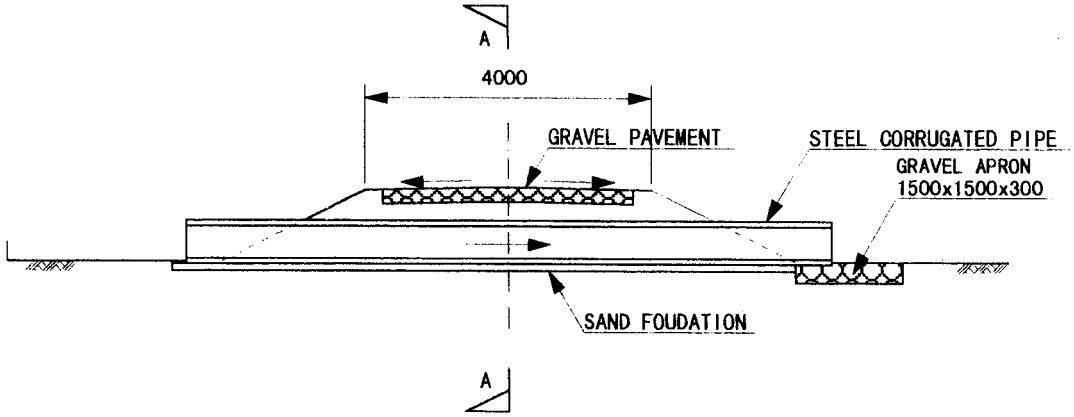


TYPICAL DETAIN OF STONE MASONRY RETAINING WALL S=1:30

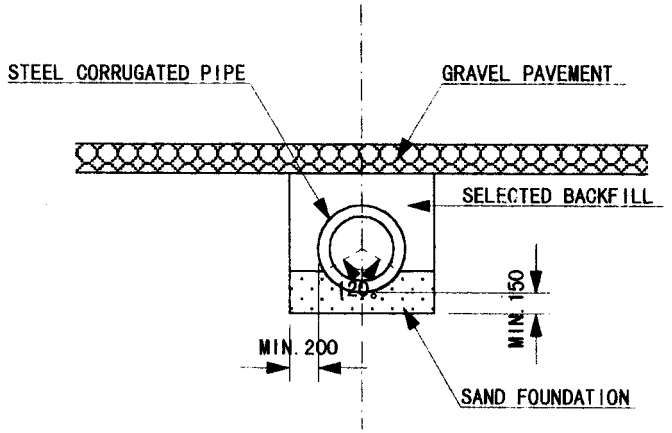
UNITED NATIONS TRANSITIONAL ADMINISTRATION IN EAST TIMOR (UNTAET)	URGENT REHABILTAION PLAN FOR ROAD IN EAST TIMOR (DILI - AILEU - MAUBISSE - AITUTO - AINARO - CASSA)	TITLE : TYPICAL DETAIL OF STONE MASONRY RETAINING WALL		JAPAN INTERNATIONAL COOPERATION AGENCY PACIFIC CONSULTANTS INTERNATIONAL NIPPON KOEI CO., LTD. YACHIYO ENGINEERING CO., LTD.
		MAY, 2000	DRAWING NO. :	



TYPICAL ROAD SECTION S=1:50



TYPICAL CROSS SECTION AT PIPE CROSSING S=1:100

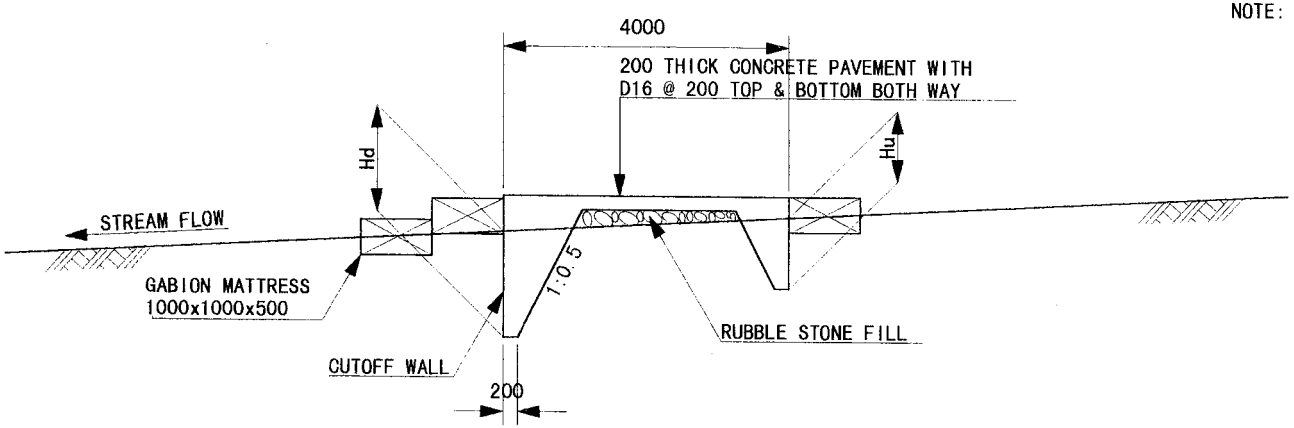


SECTION A-A S=1:50

NOTES: ALL THE DIMENSIONS SHOWN IN THE DRAWING ARE ONLY APPROXIMATE. ADJUSTMENT SHALL BE MADE BY THE ENGINEER TO MEET THE FIELD CONDITIONS.

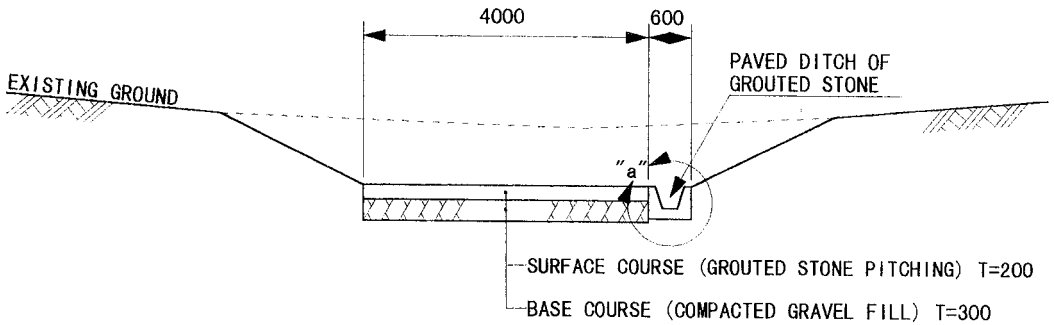
UNITED NATIONS TRANSITIONAL ADMINISTRATION IN EAST TIMOR (UNTAET)	QUICK PROJECT OF ROAD REHABILITATION IN EAST TIMOR (BAUCAU-LAGA-SAMALART -J.C. OF SOURTHERN COASTA SECTION)	TITLE: TYPICAL SECTIONS FOR OSSOHUNA - AFALOICAI		JAPAN INTERNATIONAL COOPERATION AGENCY PACIFIC CONSULTANTS INTERNATIONAL NIPPON KOEI CO., LTD. YACHIYO ENGINEERING CO., LTD.
		MAY, 2000	DRAWING NO.: LS 010	

NOTE: 1) ALL THE DIMENSIONS SHOWN IN THE DRAWING ARE ONLY APPROXIMATE. ADJUSTMENT SHALL BE MADE BY THE ENGINEER TO MEET THE FIELD CONDITIONS.

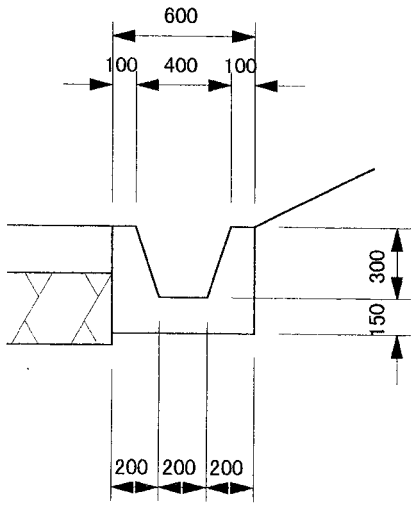


SECTION A-A S=1:100
(CAUSEWAY)

NOTE: MINIMUM EMBEDDED DEPTHS OF CUT-OFF WALL ARE
UPSTREAM SIDE : Hu = 1.0m MIN.
DOWN STREAM SIDE : Hd = 1.5m MIN.



SECTION B-B S=1:100
(APPROACH RAMP)



DETAIL "a" S = 1:30

UNITED NATIONS TRANSITIONAL ADMINISTRATION IN EAST TIMOR (UNTAET)	QUICK PROJECT OF ROAD REHABILITATION IN EAST TIMOR (BAUCAU-LAGA-SAMALART -J.C. OF SOURTHERN COASTA SECTION)	TITLE :	CAUSEWAY AT 0+33.2 SECTIONS & DETAIL	JAPAN INTERNATIONAL COOPERATION AGENCY PACIFIC CONSULTANTS INTERNATIONAL NIPPON KOEI CO., LTD. YACHIYO ENGINEERING CO., LTD.
		MAY, 2000	DRAWING NO. : LS 004	