INTRODUCTION

OBJECTIVE:
The Government of Timor Leste wishes to engage a Consultant to carry out the Preliminary, Detailed Engineering Design and Environmental Social Economic Assessment for Highway Road from Sual to Beaco for Southern Coast Infrastructure Development. Highway Road Classification Project according TOR: Expressway

The Consultant using the AASTHO (Association of American State Highway and Transportation Officials) specification:

- Design speed: 100 km/hour
- Distance from Sual to Beaco:
  - Existing road 180 km
  - Design result: 151.66 km (reduce 28.34 km)
- Traveling time from Sual to Beaco:
  - At present: more than 10 hours, when rainy season Delor River cannot pass
  - Design target: less than 2 hours
- Design life:
  - Pavement: 20 years; Bridges: 100 years
  - Vehicle axle load:
    - Existing road: 6 tone (under condition of maintained)
    - Design load: 10 tone

The Detailed Engineering Design Result already to be implemented.

The Detailed Engineering Design work completed 20 September 2011

Summary work result:
1. Compiling primary and secondary data’s
2. Reconnaissance field survey and Book Report – 1 book
3. Inception Report and Route examining and presentation-1 book
4. Geotechnical field survey, analysis, drawing, and Book Report Volume 1 to 5
8. Structure Design calculation, analysis, and Report - 31 books
10. Summary Report - 1 book
11. Drawing & Report is 75 books x 6 copies totally, 1 cargo box vehicle approx. > 2 ton weight

Therefore require a new route expressway

Based on the Expressway technical requirements and environmental considerations, the existing road are not eligible cause of:

- Too many horizontal and vertical to be realignment
- The entire existing bridges are not eligible
- Construction costs for the reconstruction of existing roads to expressway qualified will be greater than when new expressway construction
- Many social problems that will arise because existing road too many through residential areas
- Design speed 100 km / hr will not be achieved because a lot of past settlements that will be harmful to road users and residents in the settlements along the existing road.
Concrete Bridge Elements:
1. Superstructure: Composite Prestressed Concrete I-Girder
2. Substructure: Concrete Pier and Wall Abutment
3. Foundation: Bored Pile D-80cm, D-120cm

Type of Substructures:
a. Type-1 Bridge: Cantilevered Pier for more than 4 spans bridges
b. Type-2 Bridge: Portal Pier for 4 spans bridges or less
c. Type-3 Bridge: Hollow Column Pier for tall piers
Maximum effective span 50 m

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**List of Structures**

<table>
<thead>
<tr>
<th>NO.</th>
<th>NO. OF STRUCTURE</th>
<th>MATERIAL</th>
<th>WIDTH (M)</th>
<th>LENGTH (M)</th>
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<tr>
<td>1</td>
<td>RIVER BRIDGE TYPE 1</td>
<td>PPCGIRDER</td>
<td>2X10.75</td>
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<tr>
<td>2</td>
<td>RIVER BRIDGE TYPE 2</td>
<td>PPCGIRDER</td>
<td>2X10.75</td>
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<tr>
<td>3</td>
<td>RIVER BRIDGE TYPE 3</td>
<td>PPCGIRDER</td>
<td>2X10.75</td>
<td>2X20.28</td>
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<td>4</td>
<td>BOX TUNNEL, NATIONAL ROAD CROSSING</td>
<td>CONCRETE</td>
<td>6.50</td>
<td>30</td>
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<tr>
<td>5</td>
<td>BOX TUNNEL, REGIONAL ROAD CROSSING</td>
<td>CONCRETE</td>
<td>6.50</td>
<td>30</td>
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<tr>
<td>6</td>
<td>BOX TUNNEL, LOCAL ROAD CROSSING</td>
<td>CONCRETE</td>
<td>6.50</td>
<td>30</td>
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<tr>
<td>7</td>
<td>BOX CULVERT, DRAINAGE &amp; PEDESTRIAN CROSSING</td>
<td>CONCRETE</td>
<td>2 TO 4</td>
<td>30</td>
</tr>
</tbody>
</table>

**ENVIRONMENT IMPACT ASSESSMENT**

**Background and Rationale for EIA:**

1. Socio-economic development dependent on efficient road transport infrastructure;
2. Development a new road and/or improvement of existing facilities have potential impacts → positive and negative;
3. Positive impacts can be managed to increase its benefit and negative impacts can be mitigated to decrease its effects.

**INTRODUCTION**

1. The main objective of the study is to provide the government of RDTL with sufficient information on how the service level of highway roads can be enhanced to obtain a sustainable safe roads which facilitates economic growth and improves living standards in the region traversed by the highway roads and the country in large context.
2. The need of the proposed highway roads is evident as it is bring positive changes to the communities living along it.

**PROJECT DESCRIPTION**

**Description of the Project's Pre-construction Activities:**

1. Survey and field measurements;
2. Project socialization and public consultation;
3. Land ownership.

**Description of the Project's Construction Activities:**

1. Pre-construction investigations;
2. Sourcing and transportation of site base camp;
3. Sourcing and transportation of building materials;
4. Storage of materials;
5. Excavation for drainage works;
6. Earth works clearing, excavation and embankment;
7. Processing raw material for aggregate and concrete;
8. Pavement, concrete work and related activities;
9. Drilling of borehole structure works;
10. Sodding, landscaping.
PROJECT DESCRIPTION

DESCRIPTION OF THE PROJECT’S OPERATIONAL ACTIVITIES:
1) OCCUPANCY;
2) SOLID WASTE AND WASTE WATER MANAGEMENT;
3) CLEANING;
4) GENERAL REPAIRS AND MAINTENANCE.

DESCRIPTION OF THE PROJECT’S DECOMMISSIONING ACTIVITIES:
1) DEMOLITION WORKS;
2) DISMANTLING OF EQUIPMENT AND FIXTURES;
3) SITE RESTORATION;
4) CONSTRUCTION MATERIALS AND ENERGY USED;
5) SOLID WASTE GENERATED;
6) LIQUID EFFLUENTS GENERATED.

ANALYSIS OF PROJECT ALTERNATIVES
1) NO PROJECT ALTERNATIVES;
2) ANALYSIS OF ALTERNATIVE CONST MATERIALS AND TECHNOLOGY;
3) SOLID WASTE MANAGEMENT ALTERNATIVES.

PUBLIC PARTICIPATION

OBJECTIVES OF PUBLIC PARTICIPATION

METHODOLOGY AND DATA COLLECTION

DEDUCTION ON INFORMATION GATHERED DURING PUBLIC PARTICIPATION

POTENTIAL ENVIRONMENTAL IMPACTS

ANALYSIS OF ANTICIPATED NEGATIVE ENVIRONMENTAL IMPACT OF PRE-CONSTRUCTION

THE IMPORTANT CASE IS ABOUT LAND OWNERSHIP. Generally, the community supported to the project implementation and need a fair substitute to their lands, farms, crops, paddy lands, houses, etc from the contractors or government.

ANALYSIS OF ANTICIPATED NEGATIVE ENVIRONMENTAL IMPACT OF CONSTRUCTION

EXTRACTION AND USE OF MATERIALS; DUST EMISSIONS; EXHAUST EMISSIONS; NOISE AND VIBRATION; RISKS OF ACCIDENTS AND INJURIES TO WORKERS; CLEARANCE OF VEGETATION; INCREASED SOIL EROSION; WASTE GENERATION; ENERGY CONSUMPTION; CONTAMINATION OF ENVIRONMENT; INCREASED DEMAND OF SANITARY FACILITIES; REPAIRS AND MAINTENANCE OF VEHICLES AND MACHINERY; WATER USE; INTERFERENCE WITH BUSINESS AND DAILY ACTIVITIES DURING DEMOLITION; AND INTERFERENCE WITH WILDLIFE.

POTENTIAL ENVIRONMENTAL IMPACTS

POSITIVE ENVIRONMENTAL IMPACT OF CONSTRUCTION ACTIVITIES
- Increased Security in the Area
- Creation of Employment Opportunities
- Provision of Market for Supply of Materials
- Reduce Costs of Inland Transportation
- Improved Drainage and Road Safety
- Increased Business Opportunities

NEGATIVE ENVIRONMENTAL IMPACT OF CONSTRUCTION, OPERATIONAL AND MAINTENANCE ACTIVITIES
- Immigration of Workers
- Solid Waste Generation
- Increased Storm Water Flow
- Increased Demand for Sanitation
- Energy Consumption
- Water Use
- Increased Informal Settlement
- Increased pressure in the area
- Interference with Traffic Flow during construction
**POTENTIAL ENVIRONMENTAL IMPACTS**

**POSITIVE ENVIRONMENTAL IMPACT OF OPERATIONAL AND MAINTENANCE ACTIVITIES**
- Provision of markets to local goods
- Revenue to National and Local Governments
- Reduction in Poverty
- Improved Security

**NEGATIVE ENVIRONMENTAL IMPACTS OF DECOMMISSIONING ACTIVITIES**
- Solid Waste
- Dust
- Interference with Road Users
- Noise and Vibration
- Increased Waste Water

Positive Environmental Impacts of Decommissioning Activities
- Rehabilitation
- Employment Opportunities → Several employment opportunities will be created for demolition staff.

**IMPACT MITIGATION AND MONITORING**

**MITIGATION OF CONSTRUCTION PHASE IMPACTS**
- Efficient Sourcing and Use of Raw Materials
- Minimization of Vegetation Disturbance
- Minimization of Run-off and Soil Erosion
- Minimization of Construction Waste
- Reduction of Dust Generation and Emission
- Minimization of Exhaust Emissions
- Minimization of Noise and Vibration
- Occupational Health and Safety
- Reduction of Energy Consumption

**ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN**

- Appendix 5 for Air Quality,
- Appendix 6 for Soils,
- Appendix 7 for Water Quality,
- Appendix 8 for Flora
- Appendix 9 for Fauna
Capacity Building and Training

- Programs to train the project engineers and proponent in the process of the EIA to enable them participate fully in the implementation of the EMMP;
- Programs to enhance transport management;
- Organizational practices;
- Project management;
- Public awareness and community education especially on HIV/AIDS and other related social impacts;
- Financial management;
- Operation and maintenance of road infrastructure.

CAPACITY BUILDING

CONSTRUCTION COST AND SCHEDULE

Construction cost: US $ 1.39 Billion (Main road)
Average per kilometer: US $ 9.2 million, the comparison similar condition construction in Indonesia is:
1. Cileunyi-Sumedang-Dasuahan Toll Road, total length 60.42 km, total cost US $ 693,567,250 average cost per km US $ 11,479,100
2. Ciawi-Sukabumi Toll Road, total length 7.70, total cost US$ 83,960,923 average cost per km US $ 10,904,000

Project execution Period:
- Preparation (Land acquisition, Consultant and Contractor procurement), 1 year
- Construction stage:
  - Suai-Betano-Beaco (151.66 km) 5 years
- Total execution period 6 years

THANKS TO ALL PARTICIPANTS

Monitoring Guidelines

- Continuous observation;
- Monitoring parameters or indicators;
- Frequency of monitoring;
- Methods of record keeping;
- Availability of calibrated and maintained equipment;
- Existence of baseline information;
- Data analysis and review.

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