



JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

REPUBLIC OF INDONESIA

MINISTRY OF PUBLIC WORKS

DIRECTORATE GENERAL OF HIGHWAYS

**THE STUDY ON ARTERIAL ROAD NETWORK
DEVELOPMENT PLAN FOR SULAWESI ISLAND
AND
FEASIBILITY STUDY ON PRIORITY ARTERIAL
ROADS IN SOUTH SULAWESI PROVINCE**

**FINAL REPORT
VOLUME 2-3: EIA AND STAKEHOLDER
MEETINGS**

MARCH 2008

NIPPON KOEI CO., LTD.
KRI INTERNATIONAL CORP.
ALMEC CORPORATION

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FINAL REPORT

VOLUME 2-3: EIA AND STAKEHOLDER MEETING

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I-1. SUMMARY OF EIA FOR TRANS-SULAWESI MAMMINASATA ROAD

PREFACE

PREFACE

EIA (Environment Impact Analysis) Executive Summary Report of Maros-Takalar Road Development (Trans Sulawesi-Mamminasata Road) in South Sulawesi Province is a summary of Environment Impact Analysis (EIA), Plan of Environment Management (RKL) and Plan of Environment Monitoring (RPL).

This Executive Summary is compiled referring to Regulation of Ministry of Environment No. 08 of 2006 concerning EIA Compilation Guidelines (Annex V)

A great extent of appreciation is going to all the parties that have assisted in the completion of this Executive Summary.

Makassar, August 1st, 2007

Proponent,
Balai Besar Pelaksana Jalan
Nasional VI, Makassar

Ir. H. Nurdin Samaila. M.Si
Head

KATA PENGANTAR

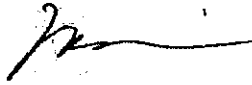
Laporan Ringkasan Eksekutif AMDAL (Analisis Mengenai Dampak Lingkungan) Pembangunan Ruas Jalan Maros – Takalar (Jalan Trans Sulawesi Mamminasata) di Propinsi Sulawesi Selatan merupakan rangkuman dari Analisis Dampak Lingkungan (ANDAL), Rencana Pengelolaan Lingkungan Hidup (RKL) dan Rencana Pemantauan Lingkungan Hidup (RPL).

Ringkasan Eksekutif ini disusun berdasarkan Peraturan Menteri Negara Lingkungan Hidup No. 08 Tahun 2006 tentang Pedoman Penyusunan Analisis Mengenai Dampak Lingkungan Hidup (Lampiran V).

Terima kasih disampaikan kepada semua pihak yang telah memberi bantuan dalam penyusunan laporan Ringkasan Eksekutif AMDAL ini.

Makassar, 01 Agustus 2007

Pemrakarsa Proyek,
Balai Besar Pelaksana Jalan Nasional VI, Makassar



Ir. H. Nurdin Samaila, M.Si
Kepala Balai

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CHAPTER I INTRODUCTION

CHAPTER I INTRODUCTION

1.1. Background

Maros-Takalar Road in province of South Sulawesi are planned to be developed as a part of the Trans Sulawesi Road. This part will represent an interconnection roads systems, improving the connections of the roads to all provinces in Sulawesi island. The development plan of Maros-Takalar Road also represent the effort to fulfill the demand of transportation infrastructure in future. At some roads of this area, the traffic density have exceeded 20.000 LHR, and in future it is estimated to reach 100.000 LHR.

Length of Maros-Takalar Road is 58 km, and according to Regulation of State Minister of Environment No. 11 Year 2006 on Type of Bussines and/or of activity which are obliged to provide with The Environmental Impact Assessment (AMDAL), hence the development of Maros-Takalar Road is included in activity criterion which is obliged to provide AMDAL.

AMDAL stipulated in Article 1 verse 21 of National Law No. 23 Year 1997 regarding Environmental Management is the study on important and big impact of a business and/or an activity plan to the environment which is necessary in decision making process on the implementation of the business and/or the activity.

Further arrangement concerning the activity obliged to the EIA is stipulated by Government Regulation Number : 27 Year 1999 regarding the Environmental Impact Assessment, as the Technical Guidelines which is arrange by institution in change and related institutional. The activities included in AMDAL are the Environmental Impact Analysis (ANDAL), Environmental Management Plan (RPL) and Environmental Monitoring Plan (RKL).

The plan of Maros-Takalar Road (Part of Trans Sulawesi Mamminasata) is described in the following figure:

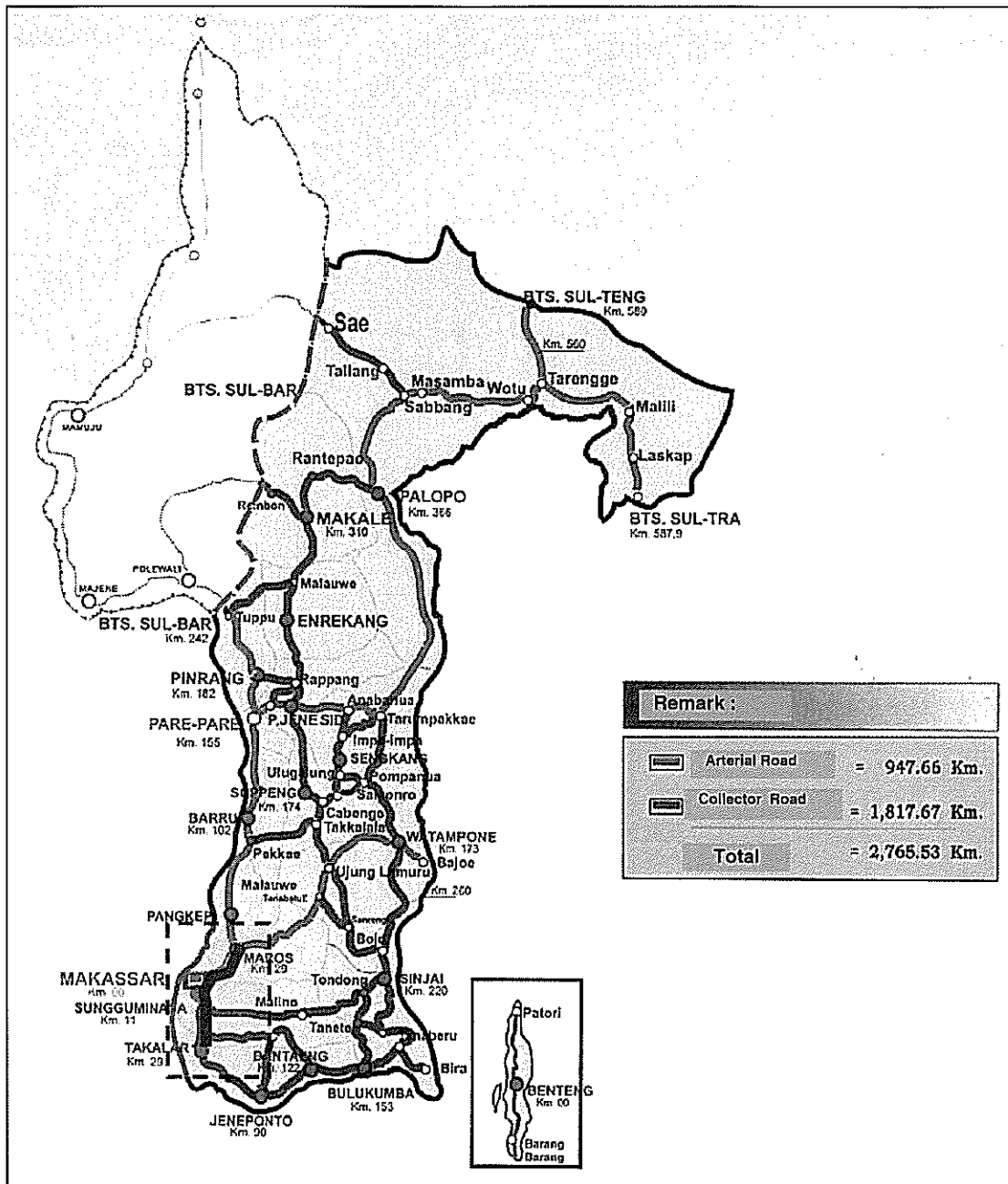
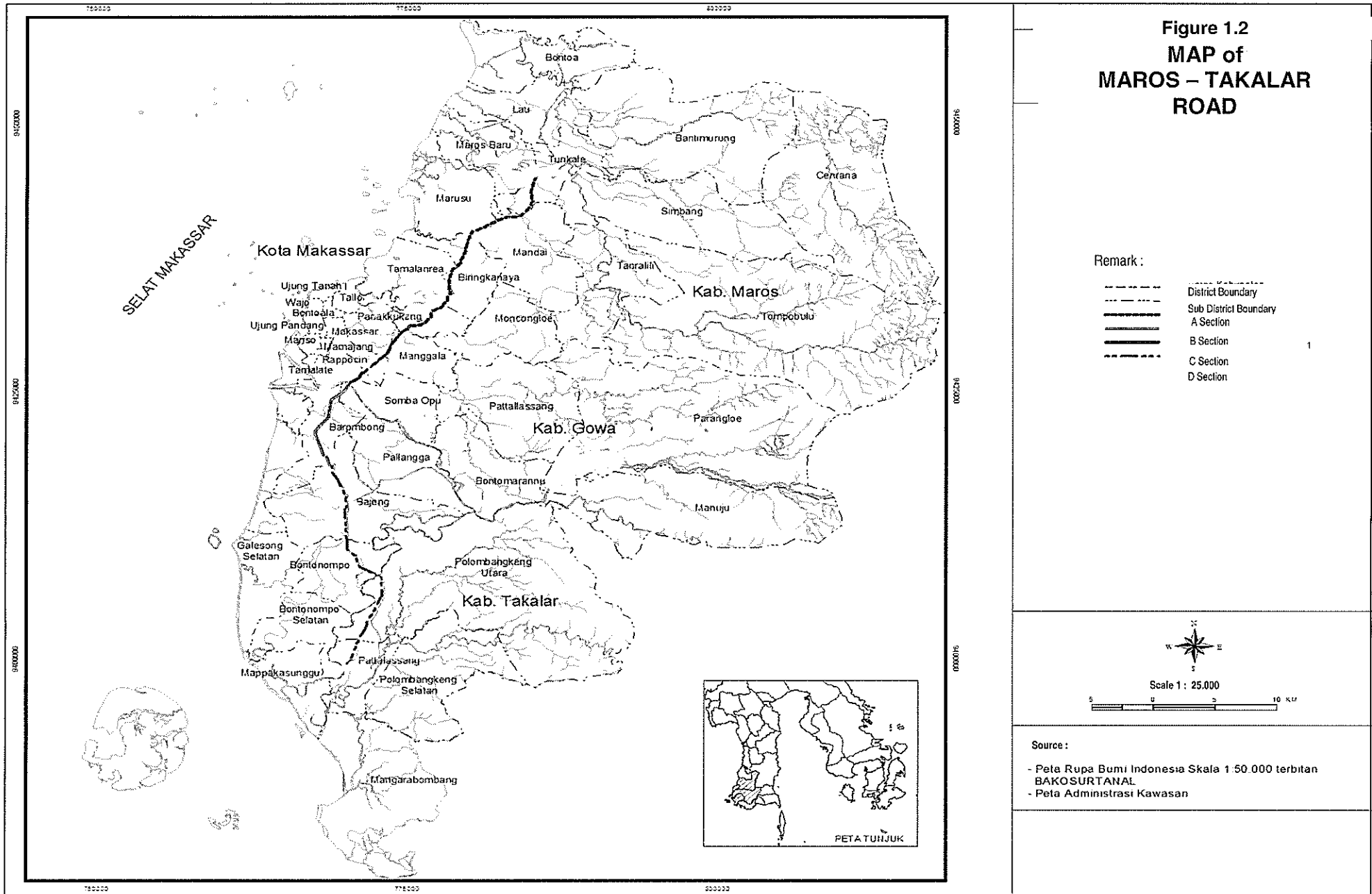


Figure 1.1. Project Location of Maros – Takalar Road in South Sulawesi Province



1.2. Action Plan

1.2.1. Location

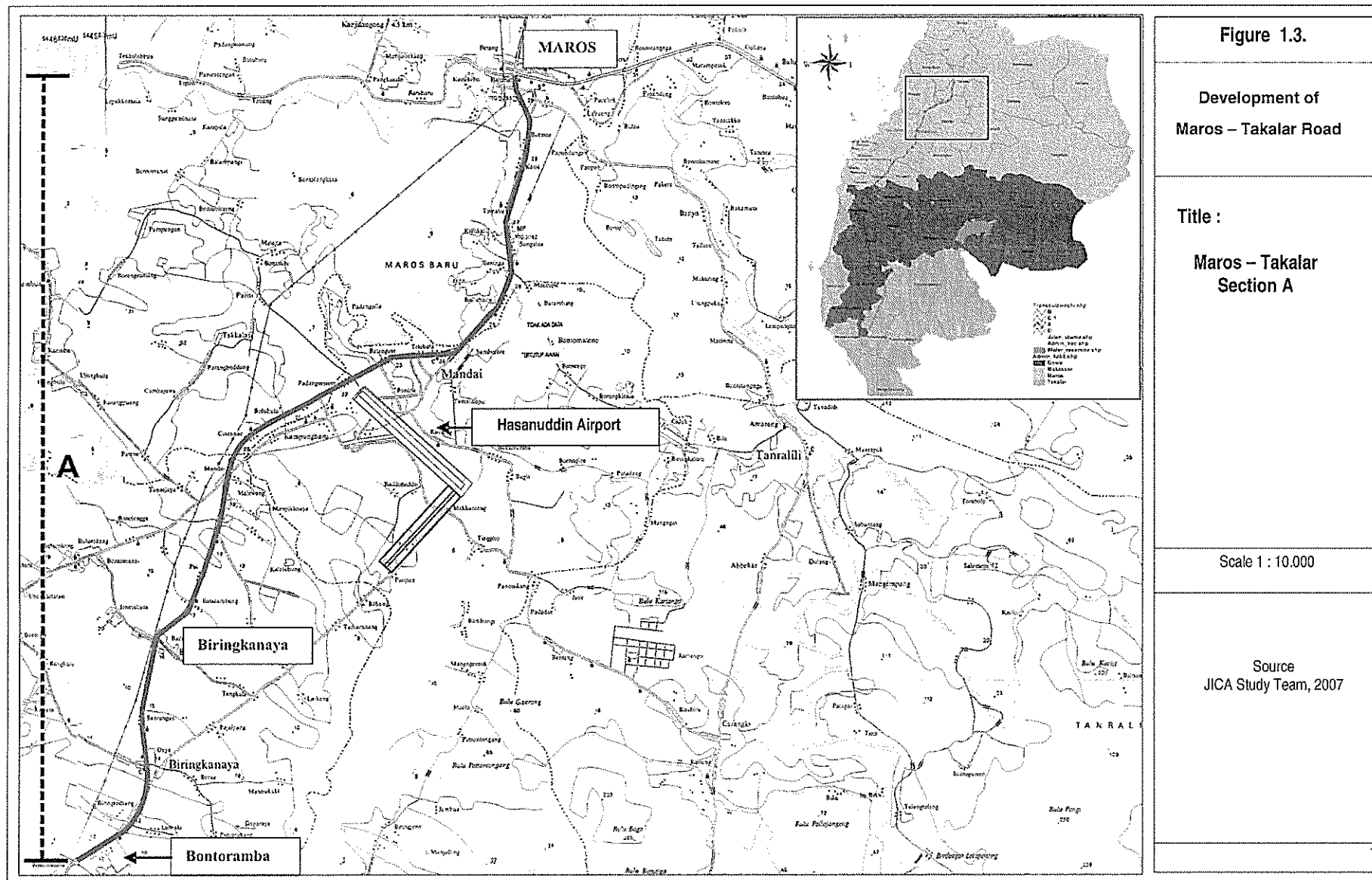
Administratively, Maros – Takalar Road is situated in the region of Maros District (Turikale, Mandai, dan Marusu sub-districts), Makassar City (Biringkanaya, Tamalanrea, Manggala, Panakkukang, Rappocini, dan Tamalate sub-districts), Gowa District (Sombaopu, Palangga, Barombong, Bajeng, dan Bontonompo sub-districts) and Takalar District (North of Polombangkeng and Pattalassang sub-Districts).

1.2.2. Type and magnitude of activity

Type and magnitude of Trans-Sulawesi Maros – Takalar Road Development in Province of South Sulawesi are divided into 4 sections as follows :

- Section A is national road from Maros (km 29.00) to Middle Ring Road through Jl. Perintis Kemerdekaan. See Figure 1.3
- Section B is Middle Ring Road between Jl Perintis Kemerdekaan and Jl Sultan Alauddin (boundary of Makassar City and Gowa District). See Figure 1.4.
- Section C is the end part of Middle Ring Road to Bonto Kaddopepe sub-village (about 5.3 km in the south of Sungguminasa city). See figure 1.4.
- Section D is road from Bonto Kaddopepe sub-village and ended in Takalar. See Figure 1.5.

The details are shown in Figure 1.3, 1.4 and 1.5



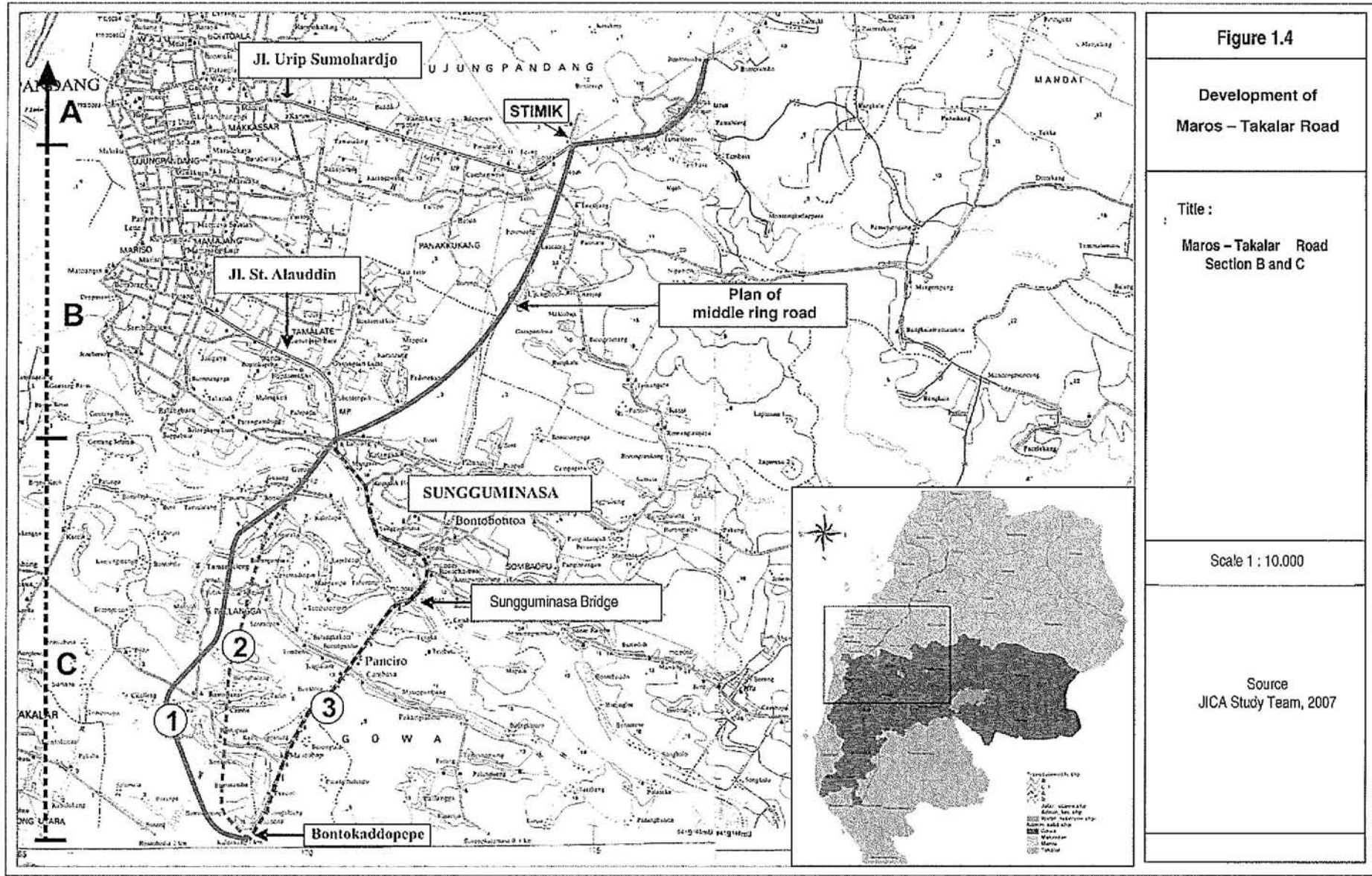


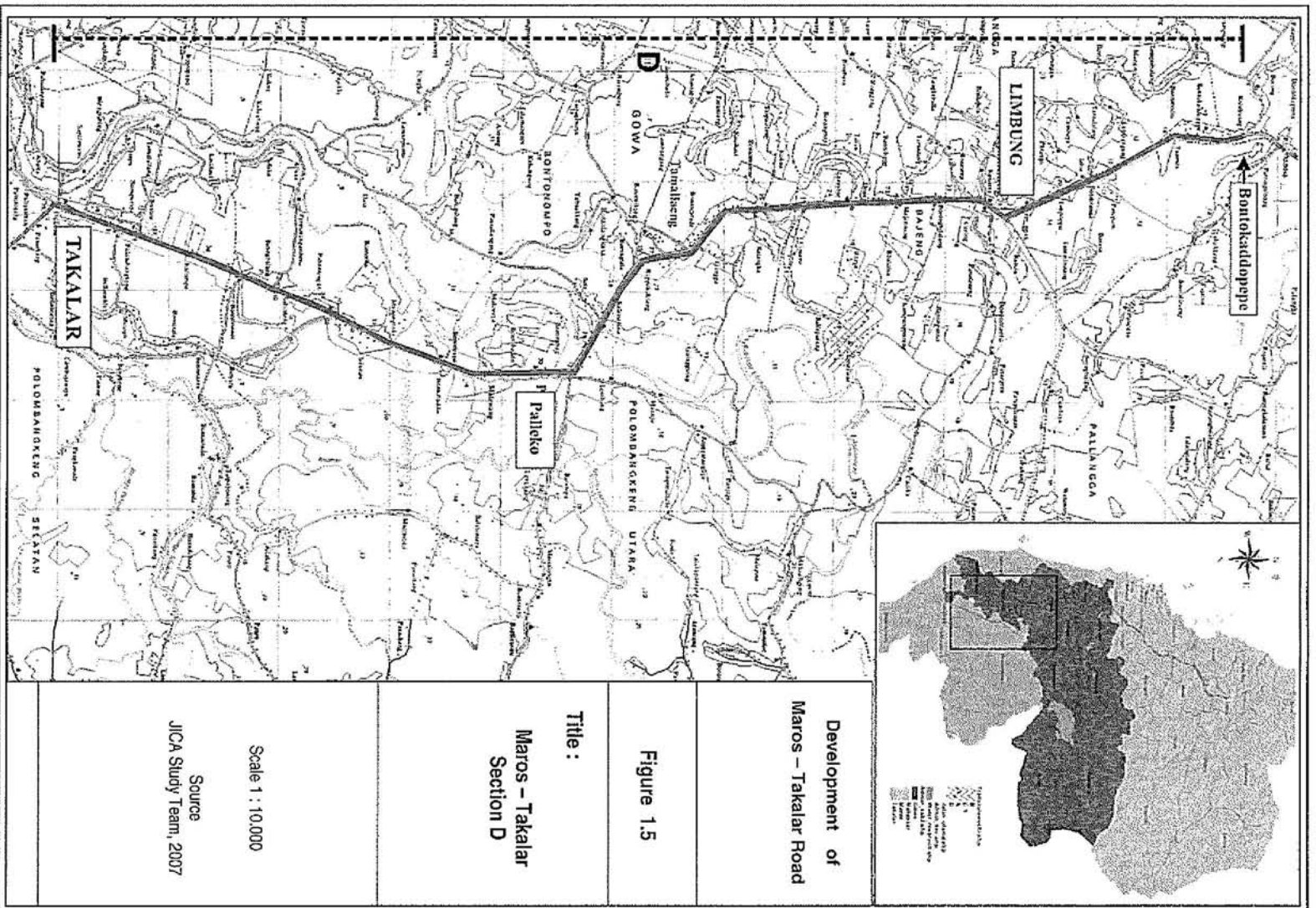
Figure 1.4

Development of Maros – Takalar Road

Title :
Maros – Takalar Road Section B and C

Scale 1 : 10.000

Source
JICA Study Team, 2007



Magnitude of activities based on plan of road classification, is shown in Table 1.1.

Table 1.1. Maros - Takalar Road Plan

| Part | Road Name | Length (km) | Function | Status | Line Number | | Work Type | ROW (m) | Acquisition | |
|------------|---|-------------|---------------------|----------------------------|-------------|----------|-----------|---------|-----------------|-----------|
| | | | | | Existing | Planning | | | Building (unit) | Land (ha) |
| A | Maros – Jl. Sutami IC | 8 | Arteri (Primary) | National Road | 4 | 6 - 8 | Widening | 42 | 487 | 44 |
| | Jl. Sutami IC – Middle Ring (Jl Perintis) | 12 | Arteri (Primary) | National Road | 4 | 8-10 | Widening | 42 | | |
| B | Middle Ring Road | 7 | Arteri (Secondary)* | Mid-Town road (Makassar)** | - | 8 | New | 42 | 241 | 28 |
| C | Access Middle Ring Road | 9 | Arteri (Secondary)* | District Road (Gowa)** | - | 4 | New | 40 | 90 | 33 |
| D | Middle Ring Access - Takalar | 22 | Arteri (Primary)* | National Road | 2 | 4 | Widening | 30 | 665 | 22 |
| Total (km) | | 58 | | | | | | | 1.483 | 127 |

Source : FS 2007

* Proposed function

** Proposed as national road in future (strategical road)

1.2.3. Stage of Activity

Activity Plan is implemented in stages as follows :

1. Preconstruction stage

a. *Re-measuring*

The existing study is Feasibility Study. Hence the result is the design at F/S level based on inputs obtained in several continuation studies, this design will be continued to the Detail Design. Pursuant to this study result, the re-measurement other related activities will be done to support the land acquisition.

b. *Land acquisition.*

Land acquisition is one of the necessary activities both in the new alignment part (section B and C) and also at widening part (section A and D). Predicted quantity of buildings and land acquisition are shown at Table 1.1.

2. Construction Stage

a. *Mobilisation/Demobilisation of Equipment and Material*

There are mobilization and demobilization of equipments and construction material activities for the construction work.

b. *Work of Land Clearing and Preparation.*

The land is cleared from distraction material to prepare a stable condition for the construction work.

c. *Man Power Supplying*

Labours concerned at phase of construction of development of Maros-Takalar Road is as much 24.489 man-days by various specification, implies the working opportunities for local community around project region.

d. *Road/Bridge Development*

Steps of activities in road construction shall be as follows :

- Stone Work.

- Foundation layer carpeting with Class A aggregate
- Foundation layer carpeting with Class B aggregate
- Spraying diffuse layer of binder and glue
- Carpeting with trite layer(AC-WC)

Steps of activities of bridge construction shall be as follows :

- Stock piling in field
- Excavation for structures depth 0 - 3 metres.
- Iron assembling for abutment
- Loading test for ground work
- Piling at locations
- Pillar/abutmen work
- Iron bars assembling for the plate
- Assembling /joint beams
- Pulling out pre-pressure cable at beam
- Installation of Elastomeric
- Locating beam at elastomeric
- Setting of Scaffolds for the plates connecting
- Locating of iron bars
- Plate Moulding
- Installation of expansion joint
- Arm rest Installation
- Moulding of arm rest Pillar

e. Development of utilities and infrastructure

The activity is the installation of road facilities and utilities such as traffic signs or tree planting etc.

3. Post Construction Stage

The activity in this stage consists of

- a. Operation of Maros-Takalar Road;
- b. Maintenance of Maros-Takalar Road.

1.3. Alternative Study in Environmental Impact Analysis

The development plan of Maros-Takalar Road in Province of South Sulawesi consists of four 4 sections. Section A is national road from Maros (Km 29.00) to Middle Ring Road. Section B is the middle ring road part between Perintis Kemerdekaan road and the Sultan Alauddin road (border of Makassar city and Gowa District). Section C is from middle ring road to Bonto Kaddopepe sub-village representing national road of about 5.3 km at south of Sungguminasa. And section

D is national road from Bonto Kaddopepe sub-village to Takalar. For Section C there are some alternatives as shown in Fig. 1.6.

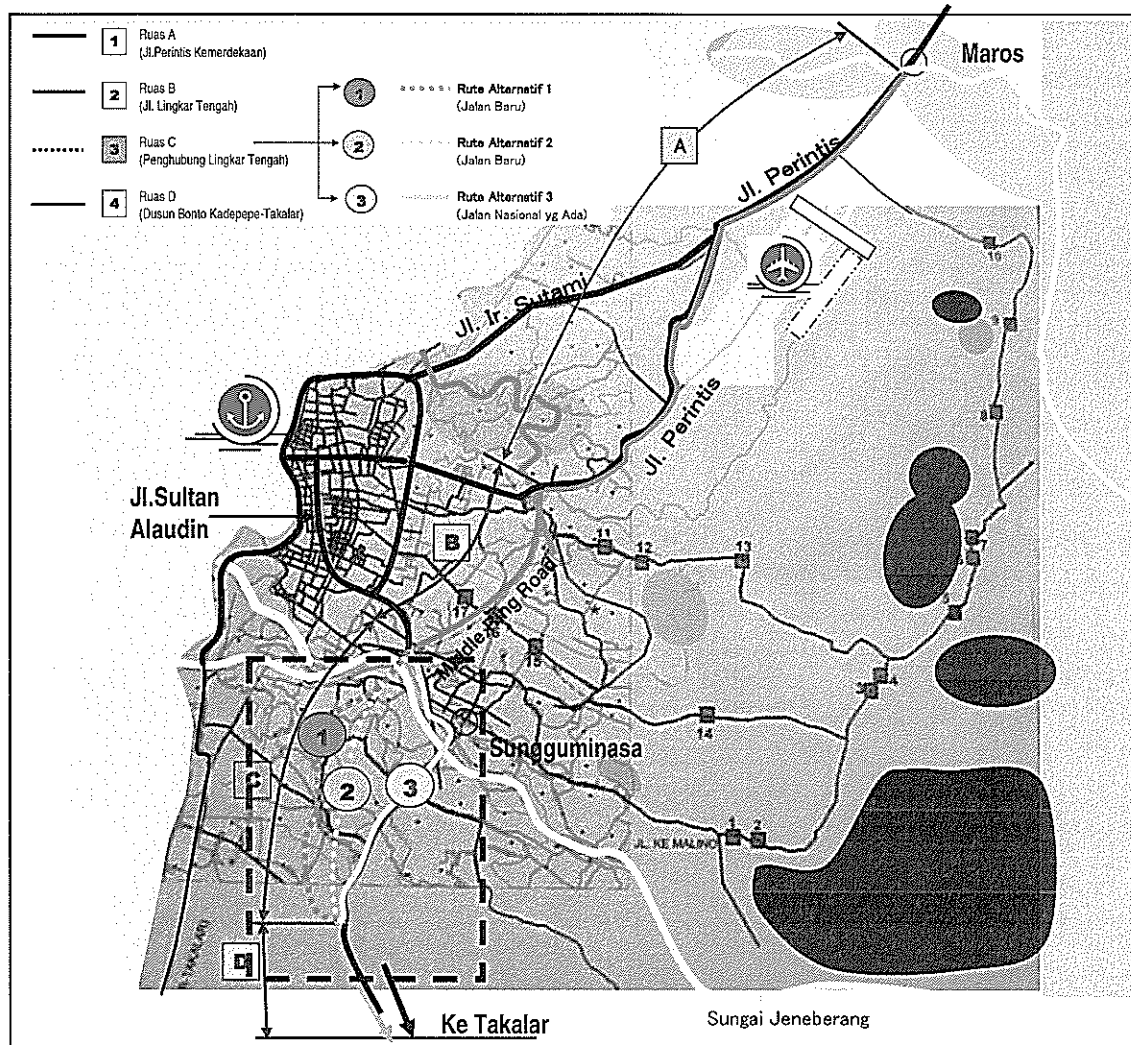


Figure 1.6. Alternatives 1,2 and 3 of Section C of Maros – Takalar Road

Table 1.2. Analyses of alternatives of Section C of Maros – Takalar Road

| Alternatives Studied | Scoring | | | C-Section alternatives | | |
|--|------------|-------------|-------------|---------------------------------------|---------------------------------------|--|
| | Phase 1 | Phase 2 | Total | Alternative 1 (new road 8.6 Km) | Alternative 2 (new road 7.6 Km) | Alternative 3 (existing road 8.7 Km) |
| Total | | | 100% | 85% | 84% | 52% |
| Technical Aspect | 40% | 100% | | 90% | 97% | 33% |
| 1. Road alignment | | 30% | 12% | 97% | 100% | 50% |
| 2. Movement demand | | 30% | 12% | 100% | 100% | 30% |
| 3. Road network | | 30% | 12% | 100% | 90% | 30% |
| 4. Others | | 10% | 4% | 100% | 100% | 0% |
| Economic and Financial Aspect | 30% | 100% | | 83% | 85% | 65% |
| 1. Cost (Construction and maintenance) | | 30% | 9% | 48% | 50% | 100% |
| 2. economic effectivity | | 30% | 9% | 95% | 100% | 50% |
| 3. Impact toward regional economy | | 30% | 9% | 100% | 100% | 50% |
| 4. Others | | 10% | 3% | 100% | 100% | 50% |
| Environmental aspect | 30% | 100% | | 71% | 66% | 63% |
| 1. Social environment | | 50% | 15% | 78% | 68% | 54% |
| 2. Natural environment | | 30% | 9% | 64% | 64% | 73% |
| 3. Pollution rate | | 20% | 6% | 65% | 65% | 69% |

Parameters studied are technical aspect, financial aspect and environmental aspect. Based on environmental aspect especially social environment, the most appropriate alternative is alternative 1 considering that only about 90 units of building are affected. Alternative 2 and 3 exceeded far the amount .

1.4. Recommendation of Environmental Feasibility Assessment

As we know that the EIA activities of Maros – Takalar road development plan is arranged based on the feasibility study, it is suggested that the further studies to be conducted immediately in order to achieve more detail data, especially on land acquisition planning.

Generally, the Maros – Takalar road development plan is environmentally feasible. Natural Protected Area of National Park of Babul and an important and

significant social cultural circumstances in South Sulawesi Province such as historical and cultural heritages in surrounding area of Cemetery Complex of Sultan Hasanuddin both do not in the physical boundary of the project and do not significantly affected by negative impact from the planned project

The Maros – Takalar road development plan is environmentally feasible to be implemented as long there are efforts to avoid, control, manage, and monitor the possible significant environmental impacts. The guideline for these efforts is shown in the suggestion and recommendation for impact management in Table 1.3.

Table 1.3. Suggestions and Recommendations for Significant Impact Management.

| ACTIVITIES | ENVIRONMENTAL Impact COMPONENT | RECOMMENDATION For SIGNIFICANT IMPACT MANAGEMENT |
|--|--|---|
| Pre-Construction Period | | |
| 1. Land Acquisition. | <ul style="list-style-type: none"> • Anxiety of Project affected land owners | <ul style="list-style-type: none"> • For the land acquisition the Committee of Land Acquisition (P₂T) must be formed and involved the representative of local community . |
| Construction Period | | |
| 1. Material mobilization for the construction of Maros – Takalar road development. | <ul style="list-style-type: none"> • Roads which are passed by material transportation vehicles. • Dust in the community settlement along the material transportation routes. • The safeties of road users along the transportation routes. | <p>The recommendations are aimed to:</p> <ul style="list-style-type: none"> • Reduce the risk of damage of the roads • Minimize the dust concentration in the surrounding road areas which are passed by material transportation vehicles. • Avoid the traffic accidents along the material transportation routes. |
| 2. Activities of Maros – Takalar road development. | <ul style="list-style-type: none"> • Formation • Increasing of noise • Decreasing of air quality. | <ul style="list-style-type: none"> • The recommendation is aimed to minimize the physical environment impacts. |
| 3. Road Facility and Infrastructure Construction. | <ul style="list-style-type: none"> • The safeties of road users. | <ul style="list-style-type: none"> • The recommendation is aimed to minimize the traffic accidents. |
| Operational Period | | |
| 1. Operational activities of Maros – Takalar road. | The continuity of transportation system | <ul style="list-style-type: none"> • The recommendation is aimed to make traffic flows become continuity. • Reduce the traffic accidents. |
| 2. Maintenance activities of Maros – Takalar road. | Esthetic and median. | <ul style="list-style-type: none"> • The recommendation is aimed to recover the cut down trees before, so the established median will play as ecological, shelter, and esthetic functions. |

1.4. Execution Time

Outline of Execution Time of Maros-Takalar Road is shown in the following table.

Table 1.3. Plan of Work Execution Schedule of Maros-Takalar Road in Province of South Sulawesi.

| No | Aktifitas | Year | | | | | | | | | | | | | |
|----|--------------------------------------|------------------|---|--|---|----------------------|---|------------|---|--|--|------|---|------|--|
| | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | |
| | | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | | |
| 1 | Studies | ████████████████ | | | | | | | | | | | | | |
| 2 | Construction Preparation | | | ██ | | | | | | | | | | | |
| 3 | Land acquisition | | | | | ████████████████████ | | | | | | | | | |
| 4 | Land Clearing | | | | | | | ██████████ | | | | | | | |
| 5 | Material Mobilisation | | | | | | | | | ██ | | | | | |
| 6 | Road and Bridge Construction | | | | | | | | | ██ | | | | | |
| 7 | Structure/InfraStructure Development | | | | | | | | | | ██ | | | | |

1.5. Proponent Activity

1.5.1. Project Proponent

Project Proponent : Department of Public Work
Directorate General of Highways
Agency of National Road VI, Makassar

Address : Jl. Mesjid Raya No. 72, Makassar

Telp./Faximile : 0411 – 442673

Responsible Person : Ir. H. Nurdin Samaila, M.Si

Title : Head of the Agency

Address : Jl. Mesjid Raya No. 72, Makassar

Telp./Faximile : 0411 – 442673

1.5.2. EIA Arrangement

Institution Name : PT. ANDAL PERSADA UTAMA konsultan

Address : Jl. Adhyaksa Baru Ruko ZAMRUD II H 17
Panakkukang Mas – Makassar

Telp./Faximile : 0411 – 443603

Responsible Person : Ir. Rusly Dhanio

Title : Director

Address : Jl. Adhyaksa Baru Ruko ZAMRUD II H 17
Panakkukang Mas – Makassar

Telp./Faximile : 0411 - 443603

CHAPTER II
IMPORTANT IMPACT TO ENVIRONMENT

CHAPTER II IMPORTANT IMPACT TO THE ENVIRONMENT

This chapter explain briefly execution steps of work for development of Maros-Takalar Road with the Important Impact generated. Important impact elaborated here, important negative impact and also important positive impact represent result of impact evaluation. The summary shall be as follows :

2.1. Important Impact at Pre-construction Stage

- Activity of land acquisition for the development of Maros – Takalar road interests generate important negative impact to resident perception.

2.2. Important Impact at Construction Stage

- Activity of material Mobilization for the development of Maros-Takalar Road generates important negative impact to air quality.
- Activity of material Mobilization for the development of Maros-Takalar Road generates important negative impact to the road structure/building.
- Activity of material Mobilization for the development of Maros-Takalar Road generates important negative impact to society health.
- Activity of material Mobilization for the development of Maros-Takalar Road generates important positive impact to job opportunity
- Activity of farm Sweeping for development of Maros-Takalar Road Activity generates important negative impact to flora and fauna.
- Activity of Construction of Maros-Takalar Road generates the important negative impact to air quality.
- Activity of Development of Maros-Takalar Road generates the important negative impact to hidrology (suffused area/ floods).
- Activity of Development of Maros-Takalar Road generates the important negative impact to traffic current.
- Activity of structure/building/ infrastructure works for tree cultivation in Maros - Takalar road generates important positive impact to flora and fauna

2.3. Important Impact at Post-Construction Stage

- Activity of Operation of Maros-Takalar Road generates the important positive impact to fluency of traffic current.
- Activity of Operation of Maros-Takalar Road generates the important negative impact to resident perception, specially how to across the road
- Maintenance of Maros-Takalar Road is evaluated to generate the important positive impact to other environmental function and esthetics

Evaluation Matrix of the Important Impact for the development of Maros – Takalar road can be found at the following tables :

Table 6.21. The Matrix of Hypothetical Significant Impact of Maros Takalar Road Development in South Sulawesi

| No | Activity Stage Environmental Components | Pre-construction Stage | | Construction Stage | | | | Post-construction Stage | |
|-----|--|------------------------|------------------|------------------------|--------------------|-------------------|--------------------------|-------------------------|-----------|
| | | Re-measurement | Land Acquisition | Materials Mobilization | Labor Availability | Location Cleaning | Road/Bridge Construction | Network/Facility | Operation |
| I | PHYSICAL-CHEMICAL COMPONENTS | | | | | | | | |
| 1. | Air Quality | | | - P | | | - TP | | |
| 2. | Hydrology | | | | | | - P | | |
| 3. | Water Quality | | | | | | - TP | | |
| 4. | Road Facility | | | - P | | | | | |
| 5. | Traffic Flows | | | | | | - P | + P | |
| 6. | Space, Load, and Soil | | - TP | | | | | | |
| II | BIOLOGICAL COMPONENTS | | | | | | | | |
| 1. | Flora | | | | | - P | + P | | |
| 2. | Fauna | | | | | - P | + P | | |
| III | SOCIAL CULTURE-PUBLIC HEALTH COMPONENTS | | | | | | | | |
| 1. | Social perception | - TP | - P | | | | | - P | |
| 2. | Job Opportunity | | | | + P | | | | |
| 3. | Social interaction | | | | - TP | | | | |
| 4. | Historic Heritage | | - TP | | | | | | |
| 5. | Public Health | | | - P | - TP | | | | |
| 6. | Green Area / Aesthetics | | | | | | | | + P |

Catatan : P = Important - = Negative Impact
 TP = Not Important + = Positive Impact

CHAPTER III
MANAGEMENT EFFORT AND
ENVIRONMENT

CHAPTER III MANAGEMENT EFFORT AND ENVIRONMENT MONITORING

This chapter outlines briefly and clearly, the Management and Environment monitoring performed in frame to anticipate the important impacts of environment being generated as referred to chapter II. The Description is presented in the form of tables with the detail on Environment Management and Environment Monitoring, elaborated at following pages.

Tabel 3.1. Plan of Environment Management (RKL) On Development of Maros-Takalar Road

| No. | RKL | | | | | | | |
|----------------------------------|---|---|--------------------------------------|---|--|--|---|--|
| | IMPACT ENVIRONMENT PARAMETER/ COMPONENT | IMPACT SOURCE | IMPACT CRITERIA | GOAL OF ENVIRONMENT MANAGEMENT | ENVIRONMENT MANAGEMENT | ENVIRONMENT MANAGEMENT LOCATION | ENVIRONMENT MANAGEMENT PERIODE | ENVIRONMENT MANAGEMENT INSTITUTION |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| I. PRE-CONSTRUCTION STAGE | | | | | | | | |
| 1. Land acquisition | | | | | | | | |
| | Anxiety of land owner along the road | Activity of land acquisition for interest of development of Maros-Takalar Road. | Anxiety of land owner along the road | To avoid the Anxiety of land owner along the the road | <ul style="list-style-type: none"> ▪ Doing socialization the development plan of Maros-Takalar Road, so that they know its benefit and in the end support the such activity ▪ Compensatory gift to land owner and building at the right price ▪ Doing socialization in every activity step so that society comprehend better activity target. | Management Location is Maros-Takalar Road. | period of environment Management will be done before construction execution of development of Maros-Takalar Road. | <p>- Environment Management Execution : As Environment Management Institution is Proponent of the project and management of Maros-Takalar road</p> <p>- Environment Management Supervisor : As Environment Management Institution is Ditjen Bina Marga Dep. Pekerjaan Umum dan Bapedalda Propinsi Sulawesi Selatan.</p> <p>- Environment Management Result Report : Result of Environment Management is reported to Ditjen Bina Marga Depertemen Pekerjaan Umum dan Bapedalda propinsi Sulawesi Selatan once in every 6 months.</p> |

| No. | Field Work Plan | | | | | | | |
|-------------------------------------|--|---|---|--|--|------------------------------------|--|---|
| | IMPACT ENVIRONMENT PARAMETER/ COMPONENT | IMPACT SOURCE | IMPACT CRITERIA | GOAL OF ENVIRONMENT MANAGEMENT | ENVIRONMENT MANAGEMENT | ENVIRONMENT MANAGEMENT LOCATION | ENVIRONMENT MANAGEMENT PERIODE | ENVIRONMENT MANAGEMENT INSTITUTION |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| II. CONSTRUCTION STAGE | | | | | | | | |
| 1. Mobilisasi Bahan/Material | | | | | | | | |
| | <ul style="list-style-type: none"> ▪ Transportation Infrastructure passed by [by] the material vehicle ▪ Dust in resident settlement around Maros-Takalar Road. ▪ Safety user, especially alongside Maros-Takalar Road. | Material transportation for the construction requirement of Maros-Takalar Road development. | <ul style="list-style-type: none"> ▪ Generating damage of road infrasturcture ▪ Changing of air quality exceeding the limit criteria value ▪ Generating the traffic accident caused by material transportation | <ul style="list-style-type: none"> ▪ Decreasing risk of damage of road infrastructure passed by the transportation vehicles ▪ Minimizing dust concentration in the region passed by transportation vehicles ▪ Avoiding traffic accident | <ul style="list-style-type: none"> ▪ Accomodating transportation volume with the existing road capacities and also repair the road damage which is resulted by material transportation activity ▪ Closing material transported with the ratch and do sprinkler at road passed by transportation vehicles for the minimization of dust ▪ Decreasing vehicle speed when passing dense settlement area of resident | Regions around Maros-Takalar Road. | done during activity of material transportation. | <ul style="list-style-type: none"> - Environment Management Execution As Environment Management Institution is Proponent of the project, in this case executor project of Maros-Takalar road - Environment Management Supervisor As Environment Management Institution is Bapedalda Propinsi Sulawesi Selatan. - Environment Management Result Report : Result of Environment Management is reported to Bapedalda Propinsi Sulawesi Selatan once in every 6 months. |

| No. | Field Work Plan | | | | | | | |
|---------------------------------------|--|---|--|---|--|---------------------------------|--|--|
| | IMPACT ENVIRONMENT PARAMETER/ COMPONENT | IMPACT SOURCE | IMPACT CRITERIA | GOAL OF ENVIRONMENT MANAGEMENT | ENVIRONMENT MANAGEMENT | ENVIRONMENT MANAGEMENT LOCATION | ENVIRONMENT MANAGEMENT PERIODE | ENVIRONMENT MANAGEMENT INSTITUTION |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 2. Road and Bridge Development | | | | | | | | |
| | <ul style="list-style-type: none"> ▪ Forming of water suffuse ▪ Increasing noise ▪ Decreasing air quality | Development activity of Maros-Takalar Road. | Resident perception, especially living around and bridge Maros-Takalar road. | Impact minimization generated by activity of road-works and bridge of Maros-Takalar Road. | <ul style="list-style-type: none"> ▪ Majoring making of drainage channel ▪ Choose the right time for piling (only office hours). ▪ Doing periodical sprinkler at potential dust area. | Maros-Takalar Road. | period of environment Management will be done before and during construction execution of development of Maros-Takalar Road. | <ul style="list-style-type: none"> - Environment Management Execution : As Environment Management Institution is Proponent of the project and management of Maros-Takalar road - Environment Management Supervisor : As Environment Management Institution is proponent - Environment Management Result Report : Result of Environment Management is reported to proponent and Bapedalda propinsi Sulawesi Selatan once in every 6 months. |

| No. | Field Work Plan | | | | | | | |
|---|--|---|---|---|---|---------------------------------|--|---|
| | IMPACT ENVIRONMENT PARAMETER/ COMPONENT | IMPACT SOURCE | IMPACT CRITERIA | GOAL OF ENVIRONMENT MANAGEMENT | ENVIRONMENT MANAGEMENT | ENVIRONMENT MANAGEMENT LOCATION | ENVIRONMENT MANAGEMENT PERIODE | ENVIRONMENT MANAGEMENT INSTITUTION |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 3. Structure and Infrastructure Work | | | | | | | | |
| | <ul style="list-style-type: none"> ▪ Safety of road users ▪ Maros-Takalar road Esthetic | Execution of across bridge development , traffic equipment installation, tree cultivation etc..at Maros-Takalar Road. | Road user and resident perception around Maros-Takalar road | Preventing incidence of negative impact, and develop the positive impact from activity of supporting structure at Maros-Takalar Road. | <ul style="list-style-type: none"> ▪ Develop overpass at strategic location ▪ Executing every activity of according to standard criteria. ▪ Making better arrangement to settlement area of Maros-Takalar Road . | Region of Maros-Takalar Road. | period of environment Management will be done during construction execution of structure/infra structure | <ul style="list-style-type: none"> - Environment Management Execution : As Environment Management Institution is Proponent of the project, in this case, construction executor of Maros-Takalar road Development - Environment Management Supervisor : As Environment Management Institution is proponent and Bapedalda Propinsi Sulawesi Selatan. - Environment Management Result Report : Result of Environment Management is reported to proponent and Bapedalda propinsi Sulawesi Selatan once in every 6 months. |

| No. | Field Work Plan | | | | | | | |
|---|---|---|---|---|--|---------------------------------|---|---|
| | IMPACT ENVIRONMENT PARAMETER/ COMPONENT | IMPACT SOURCE | IMPACT CRITERIA | GOAL OF ENVIRONMENT MANAGEMENT | ENVIRONMENT MANAGEMENT | ENVIRONMENT MANAGEMENT LOCATION | ENVIRONMENT MANAGEMENT PERIODE | ENVIRONMENT MANAGEMENT INSTITUTION |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| III. Post Construction Stage | | | | | | | | |
| 1. Operation of Maros-Takalar Road | | | | | | | | |
| | Fluency of transportation system | Operation activity of Maros-Takalar Road length of 58 Km. | Road user perception of Maros-Takalar road. | <ul style="list-style-type: none"> ▪ Facilitating traffic current, especially for vehicles which needn't enter the downtown ▪ Decreasing traffic accident. ▪ Placing officer to do the arrangement of vehcile current transfer | Installing traffic equipments which can lead the main road users for entering the downtown centres | Maros-Takalar Road. | done continuously during operational of Maros-Takalar Road. | <p>Environment Management Execution: As institution of environment organizer is organizer of Maros-Takalar Road.</p> <p>Environment Management Supervisor : As institution of environment organizer is proponent</p> <p>Environment Management Result Report : Result of Environment Management is reported to Proponent and Bapedalda of Sulawesi Selatan once in every 6 months.</p> |

| Field Work Plan | | | | | | | | |
|--|---|---|---|--|---|---------------------------------|--|---|
| No. | IMPACT ENVIRONMENT PARAMETER/ COMPONENT | IMPACT SOURCE | IMPACT CRITERIA | GOAL OF ENVIRONMENT MANAGEMENT | ENVIRONMENT MANAGEMENT | ENVIRONMENT MANAGEMENT LOCATION | ENVIRONMENT MANAGEMENT PERIODE | ENVIRONMENT MANAGEMENT INSTITUTION |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 2. Maintenance Maros-Takalar Road | | | | | | | | |
| | Esthetic and green line | Maintenance activity of Maros-Takalar Road. | Road user perception of Maros-Takalar road. | To develop the positive impact from development of Maros-Takalar Road. | Doing maintenance of Area of Maros-Takalar Road and maintain the green Line existence.. | Region of Maros-Takalar Road | done according to requirement, during operational of Maros-Takalar Road. | <p>- Environment Management Execution : As Environment Management Institution is Proponent</p> <p>- Environment Management Supervisor : As Environment Management Institution is Ditjen Bina Marga Dep. Pekerjaan Umum dan Bapedalda Propinsi Sulawesi Selatan.</p> <p>- Environment Management Result Report Result of Environment Management is reported to Ditjen Bina Marga Depertemen Pekerjaan Umum and Bapedalda Propinsi Sulawesi Selatan once in 6 months</p> |

Tabel 3.2. Plan of Environment Monitoring (RPL) of Development of Maros-Takalar Road .

| No. | Field Work Plan | | | | | | | Environment Monitoring Institution |
|-------------------------------|--|---|--|---|--|---------------------|--|---|
| | Important Impact Monitored | Impact Source | Environment Parameter Monitored | Goal of Environment Monitoring Plan | Environment Monitoring Method | | | |
| | | | | | Method of Collecting and Data Analysis | Monitoring Location | Period and frequency of Monitoring | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| Pre-Construction Stage | | | | | | | | |
| 1. Land acquisition | | | | | | | | |
| | anxiety of land Owner along the the road | Activity of land acquisition for the development of Maros-Takalar Road. | Incidence of anxiety of land owner along the location of Maros-Takalar Road. | To know incidence of land owner anxiety residing in location of Maros-Takalar Road. | Doing field observation and interview with the land owner along the road | Maros-Takalar Road | Monitoring executed at the time of compensatory payment, done once during compensatory gift process. | <ul style="list-style-type: none"> • Environment Management Execution : As Environment Management Institution is Project Proponent ini this case proponent and management of Maros-Takalar Road. Environment Management Supervisor : As Environment Management Institution is Ditjen Bina Marga Dep. Ditjen Bina Marga Dept. Pekerjaan Umum and Bapedalda Propinsi Sulawesi Selatan. Environment Management Result : Report Result of Environment Management is reported to Ditjen Bina Marga Departemen Pekerjaan Umum and Bapedalda Propinsi Sulawesi Selatan once in every 6 months. |

| No. | Field Work Plan | | | | | | | Environment Monitoring Method |
|---------------------------------|---|---|--|--|--|--|---|--|
| | Important Impact Monitored | Impact Source | Environment Parameter Monitored | Goal of Environment Monitoring Plan | Environment Monitoring Method | | | |
| | | | | | Method of Collecting and Data Analysis | Method of Collecting and Data Analysis | Method of Collecting and Data Analysis | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| I. CONSTRUCTION STAGE | | | | | | | | |
| 1. Material Mobilization | | | | | | | | |
| | <ul style="list-style-type: none"> • Transportation Infrastructured passed by transportation vehicle • Dust in resident settlement around Maros-Takalar Road . • Safety of road users especially in the along Maros-Takalar Road | Transportation of material for the construction requirement of Development of Maros-Takalar Road. | <ul style="list-style-type: none"> • Incidence of road infrastructure damage • Decreasing air quality exceeding the determined criteria value • Incidence of traffic accident in the road passed by transportation vehicles | <ul style="list-style-type: none"> • Decreasing risk of damage of road infrastructure passed by the transportation vehicles • Minimizing dust concentration in the region passed by transportation vehicles • Preventing incidence of traffic accident. | Doing field observation and interview with the resident of around Maros-Takalar Road and also do the dust measurement and compare its result with Environment Criteria according to Decision of Governor of Sulsel No. 14 Year 2003. | Monitoring location is Maros-Takalar Road. | Monitoring executed at the time of activity of material transportation, conducted once in every 6 months. | <ul style="list-style-type: none"> • Environment Management Execution : <i>As Environment Management Institution is Project Proponent ini this case Construction Executor of Maros-Takalar Road.</i> • Environment Management Supervisor :<i>As Environment Management Institution is proponent and Badan Pengendalian Dampak Lingkungan Daerah Propinsi Sulawesi Selatan.</i> • Environment Management Result : <i>Report Result of Environment Management is reported to Ditjen Bina Marga Depertemen Pekerjaan Umum and Bapedalda Propinsi Sulawesi Selatan once in every 6 months.</i> |

| No. | Field Work Plan | | | | | | | Environment Monitoring Method |
|--|--|---|--|--|---|--|--|--|
| | Important Impact Monitored | Impact Source | Environment Parameter Monitored | Goal of Environment Monitoring Plan | Environment Monitoring Method | | | |
| | | | | | Method of Collecting and Data Analysis | Method of Collecting and Data Analysis | Method of Collecting and Data Analysis | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| 2. Road and Bridge Construction | | | | | | | | |
| | <ul style="list-style-type: none"> ▪ Forming of water suffuse ▪ Increasing noise • Decreasing air quality | Development activity of Maros-Takalar Road. | Resident perception, especially living around and bridge Maros-Takalar road. | Impact minimization caused by activity of road-works and bridge of Maros-Takalar Road. | Doing field observation and interview with the resident of around Maros-Takalar Road and also do the noise and dust measurement and compare its result with Criteria Value of Environment according to Decision of Governor of Sulsel No. 14 Year 2003. | Monitoring location is Maros-Takalar Road. | Monitoring executed at the time of activity of road and bridge construction, conducted once in every 6 months. | <ul style="list-style-type: none"> • Environment Management Execution : As Environment Management Institution is Project Proponent ini this case Construction Executor of Maros-Takalar Road. • Environment Management Supervisor :As Environment Management Institution is proponent • Environment Management Result : Report Result of Environment Management is reported to Proponent and Bapedalda Propinsi Sulawesi Selatan once in every 6 months. |

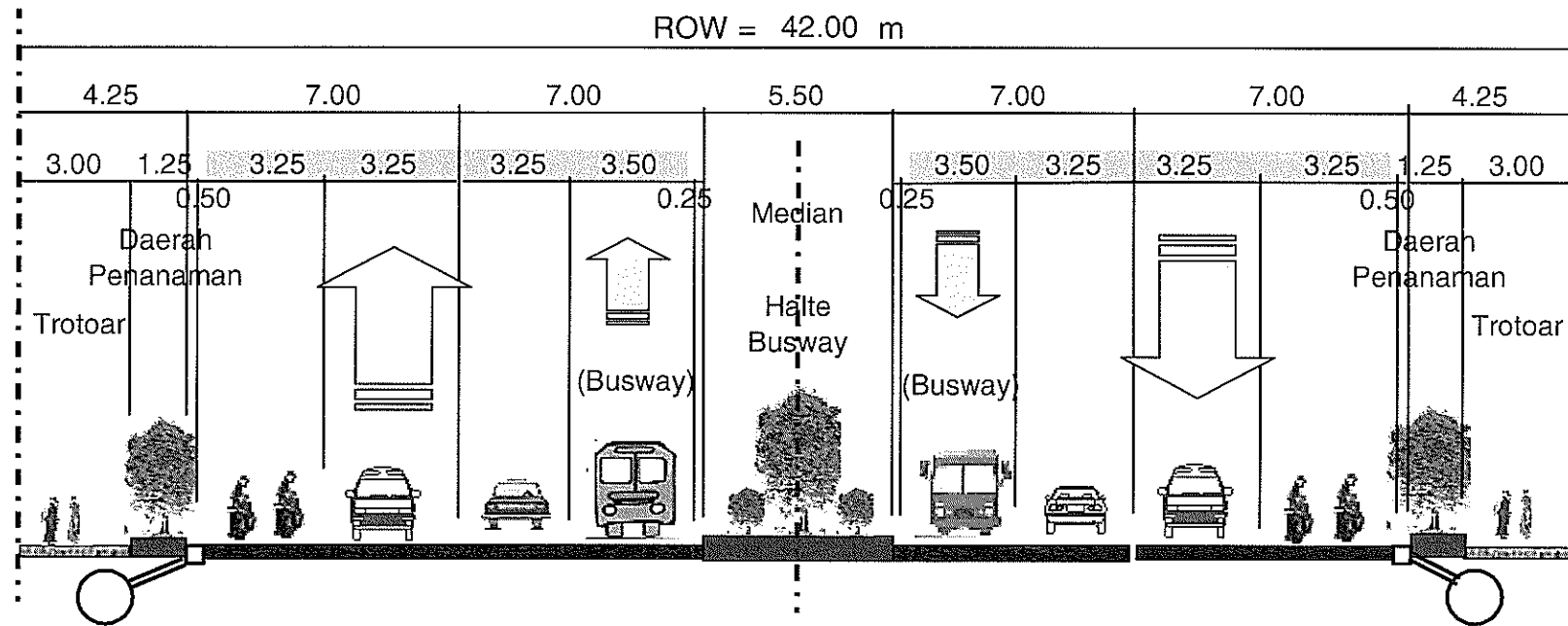
| No. | Field Work Plan | | | | | | | Environment Monitoring Method |
|---|---|--|--|---|---|--|--|---|
| | Important Impact Monitored | Impact Source | Environment Parameter Monitored | Goal of Environment Monitoring Plan | Environment Monitoring Method | | | |
| | | | | | Method of Collecting and Data Analysis | Method of Collecting and Data Analysis | Method of Collecting and Data Analysis | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| 3. Structure/Infrastructure Construction | | | | | | | | |
| | - Safety of road users - Maros-Takalar road Esthetic | Execution of accross bridge development, traffic equipment installation, tree cultivation etc.at Maros-Takalar Road. | Resident perception, especially living around s and bridge Maros-Takalar road. | Preventing incidence of negative impact, and develop the positive impact from activity of supporting structure at Maros-Takalar Road. | Doing field observation and interview with the resident of around Maros-Takalar Road. | Monitoring location is Maros-Takalar Road. | Monitoring executed during activity of structure/ infrastructure construction, conducted once in every 6 months. | <ul style="list-style-type: none"> • Environment Management Execution : As Environment Management Institution is Project Proponent ini this case Construction Executor of Maros-Takalar Road. • Environment Management Supervisor : As Environment Management Institution is proponent and Badan Pengendalian Dampak Lingkungan Daerah Propinsi Sulawesi Selatan • Environment Management Result : Report Result of Environment Management is reported to Proponent and Bapedalda Propinsi Sulawesi Selatan once in every 6 months. |

| No. | Field Work Plan | | | | | | | Environment Monitoring Method |
|--|---|---|---|--|---|--|---|---|
| | Important Impact Monitored | Impact Source | Environment Parameter Monitored | Goal of Environment Monitoring Plan | Environment Monitoring Method | | | |
| | | | | | Method of Collecting and Data Analysis | Method of Collecting and Data Analysis | Method of Collecting and Data Analysis | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| II. POST CONSTRUCTION STAGE | | | | | | | | |
| 1. Operation Maros-Takalar Road | | | | | | | | |
| | Important impact watched from operational activity of Maros-Takalar Road is fluency of transportation system. | Activity of Operation of Maros-Takalar Road as long as 58 km. | Perception of User Society of Maros-Takalar Road. | -To know the fluency of traffic current, especially for vehicles which needn't enter the downtown center in region passed by. -Decreasing traffic accidents | Doing field observation and interview with the resident of around Maros-Takalar Road. | Monitoring location is Maros-Takalar Road. | Monitoring Executed during operational of Maros-Takalar Road, conducted once in 6 months. | <ul style="list-style-type: none"> • Environment Management Execution : As Environment Management Institution is management of Maros-Takalar Road. • Environment Management Supervisor : As Environment Management Institution is proponent. • Environment Management Result : Report Result of Environment Management is reported to Proponent and Bapedalda Propinsi Sulawesi Selatan once in every 6 months. |

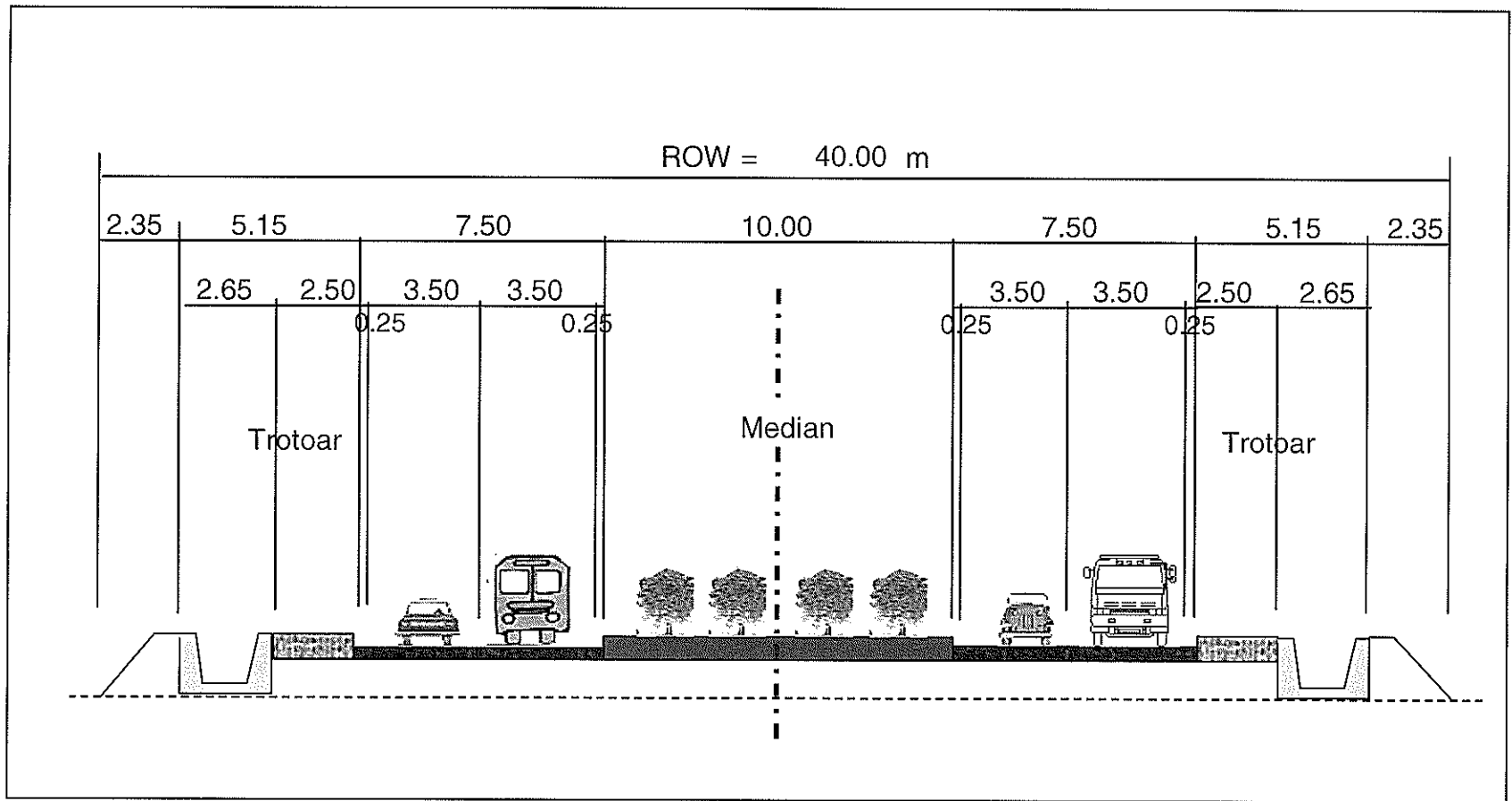
| No. | Field Work Plan | | | | | | | Environment Monitoring Method |
|---|--|--|---|---|---|--|---|---|
| | Important Impact Monitored | Impact Source | Environment Parameter Monitored | Goal of Environment Monitoring Plan | Environment Monitoring Method | | | |
| | | | | | Method of Collecting and Data Analysis | Method of Collecting and Data Analysis | Method of Collecting and Data Analysis | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 2. Maintenance of Maros-Takalar Road | | | | | | | | |
| | Important impact watched from maintenance of Maros-Takalar Road is esthetics and green line existence. | Maintenance Activity of Maros-Takalar Road | Perception of User Society of Maros-Takalar Road. | To know the positive impact from development of Maros-Takalar Road. | Doing field observation and interview with the resident of around Maros-Takalar Road. | Monitoring location is Maros-Takalar Road. | Monitoring executed during maintenance of Maros-Takalar Road, conducted once in 6 months. | <ul style="list-style-type: none"> • Environment Management Execution : As Environment Management Institution is Proponent • Environment Management Supervisor : As Environment Management Institution is Ditjen Bina Marga Departemen Pekerjaan Umum and Bapedalda Propinsi Sulawesi Selatan. • Environment Management Result : Report Result of Environment Management is reported to Ditjen Bina Marga Departemen Pekerjaan Umum and Bapedalda Propinsi Sulawesi Selatan once in every 6 months. |

ATTACHMENT

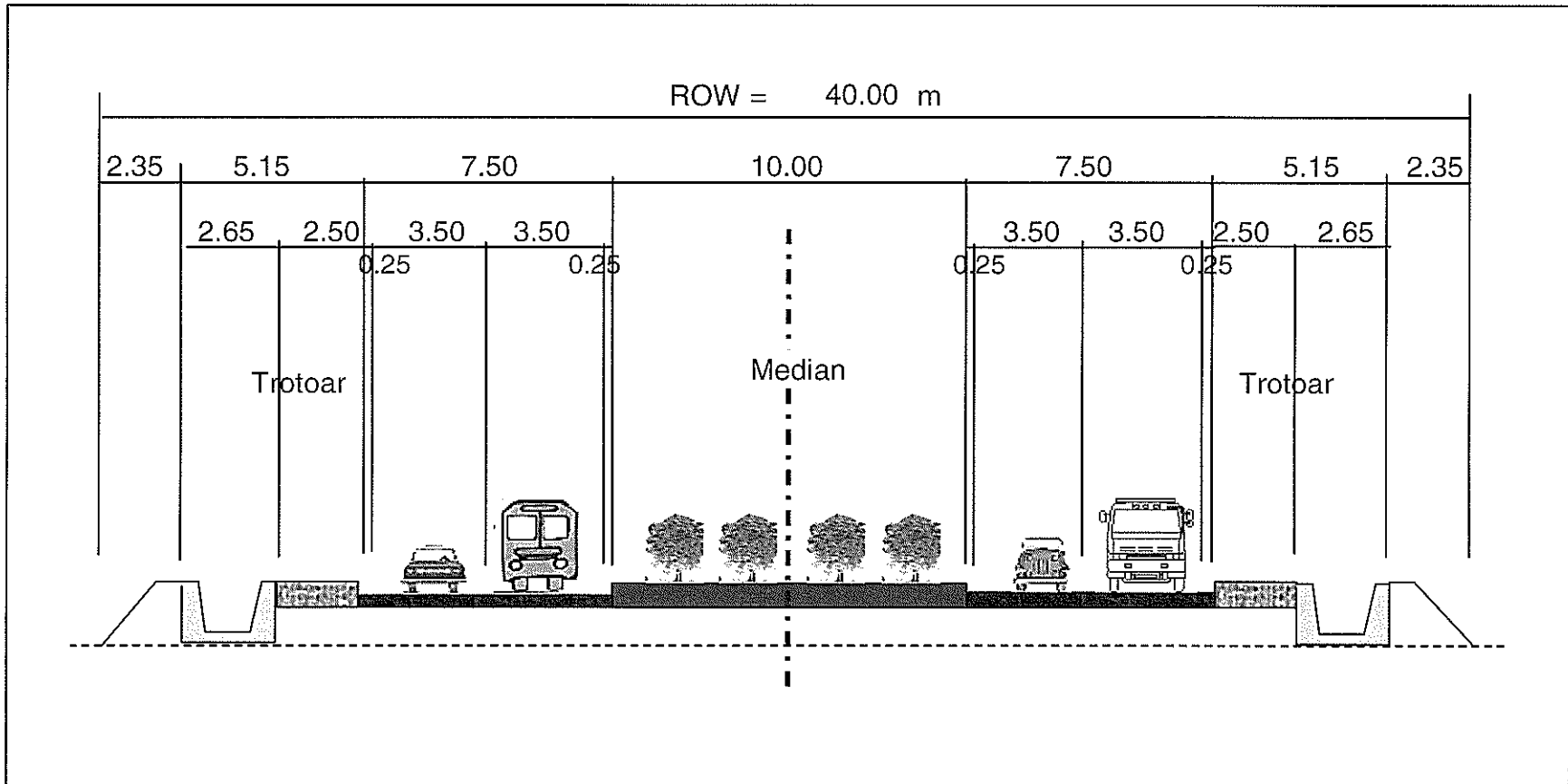
Attachment 1. Development Plan of Section A and B (Maros – Jl. Perintis Kemerdekaan)



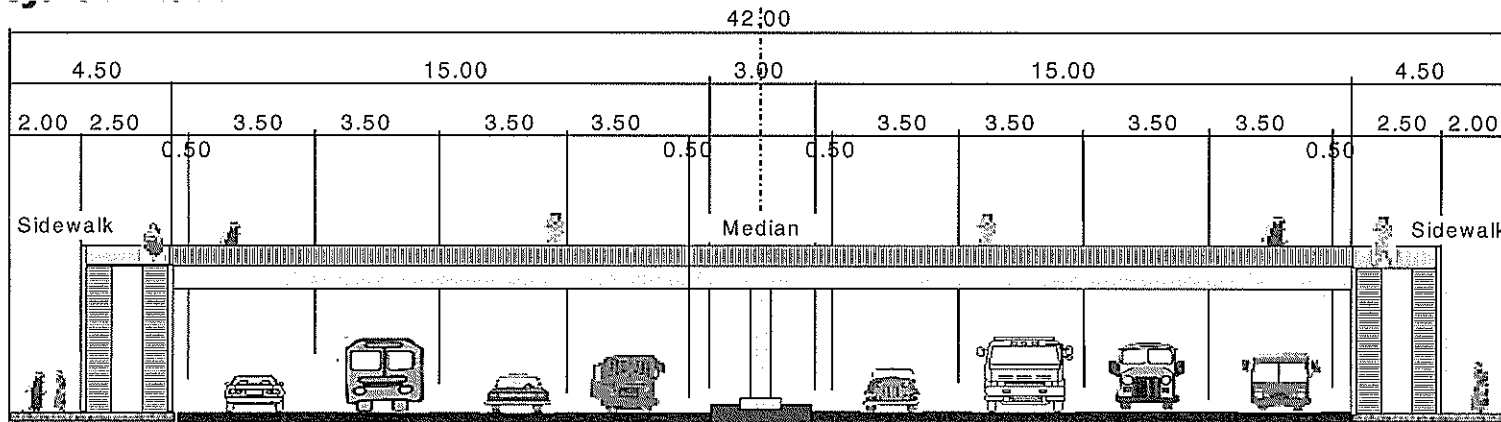
Attachment 2. Development Plan of Section C (Road Plan Jl. Lingkar Tengah)



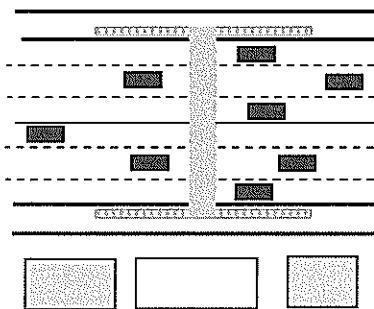
Attachment 3. Development Plan of Section D (Bontokaddopepe/boka – Takalar City)



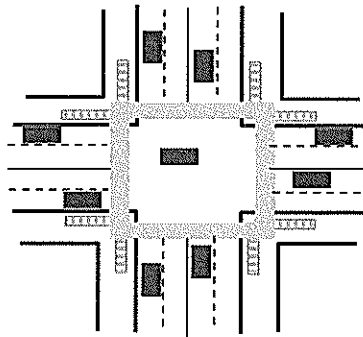
Attachment 4. Design (Typical) of overpass for Pedestrian at the location of regional facility, Market, PUSKESMAS, and other Community facilities along the Maros-Takalar Road



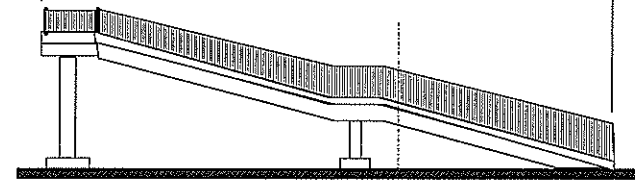
Di Ruas Simping Susun Sibuk
(Sekolah, Masjid, Pasar)



Di Persimpangan Utama



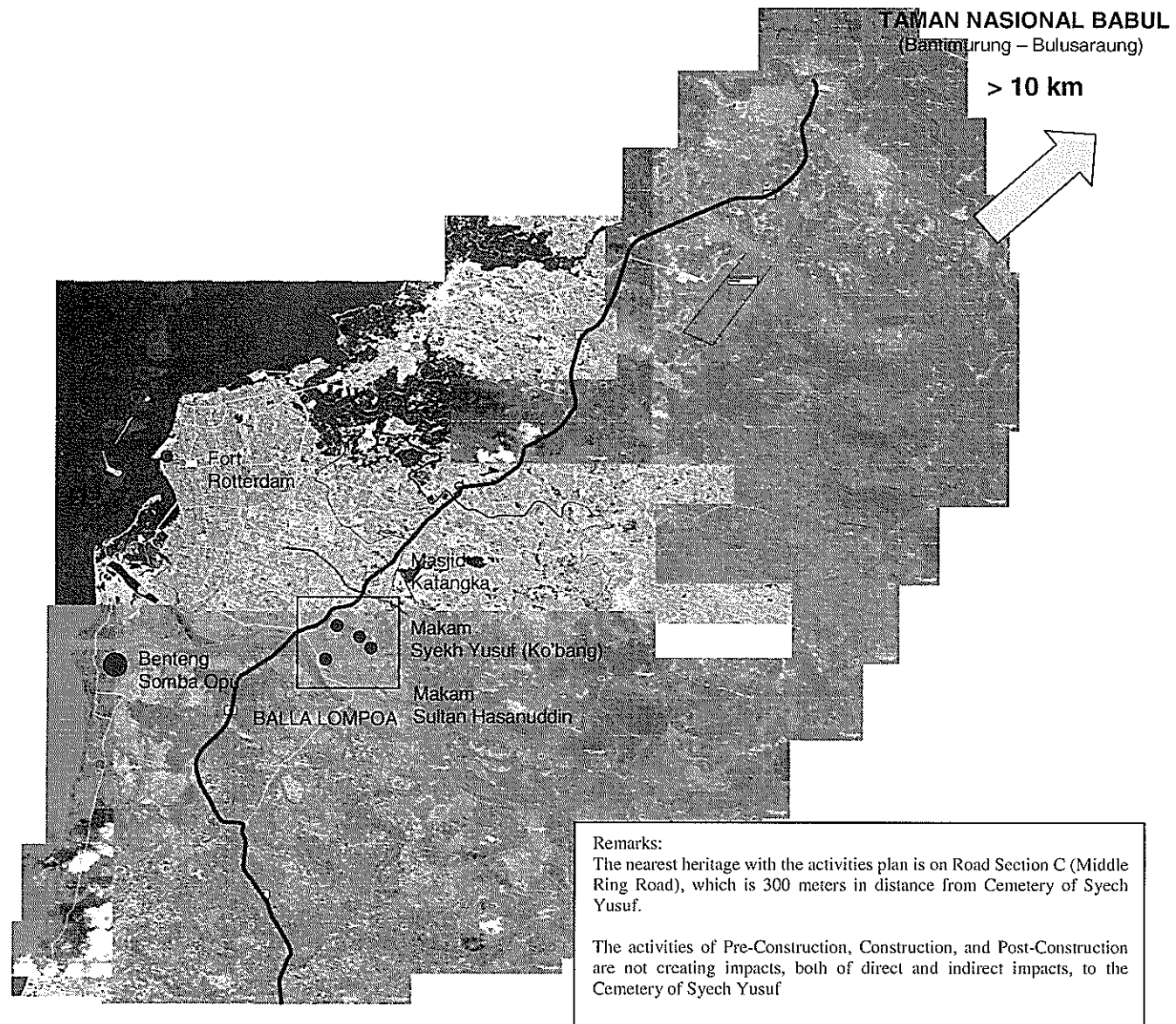
Desain yang Ramah Pengguna



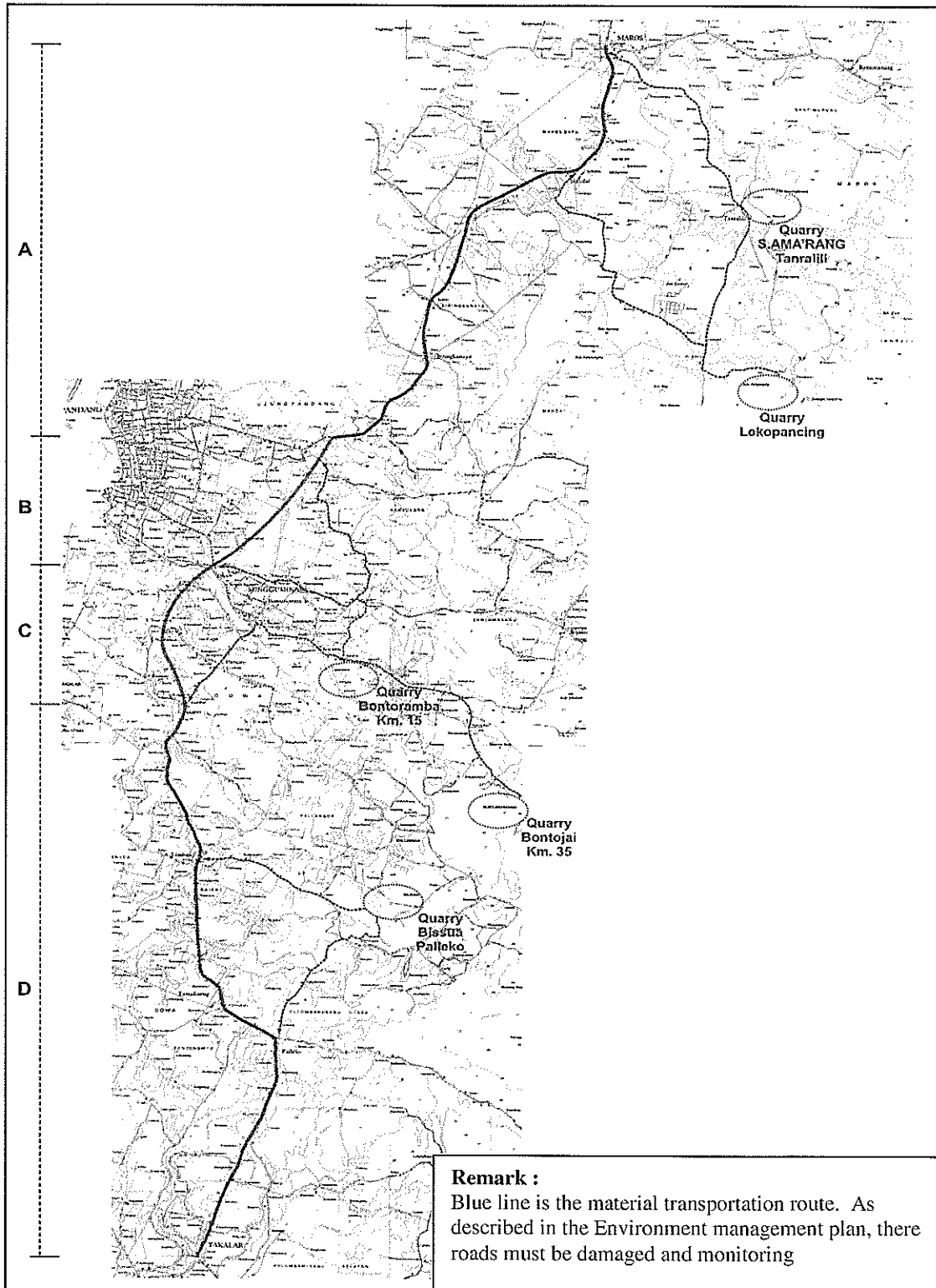
Remark :

The planned overpass is the part of environmental management which is aimed to reduce the traffic accident, and it is expected will not break the community activities in their social-economical and cultural activities

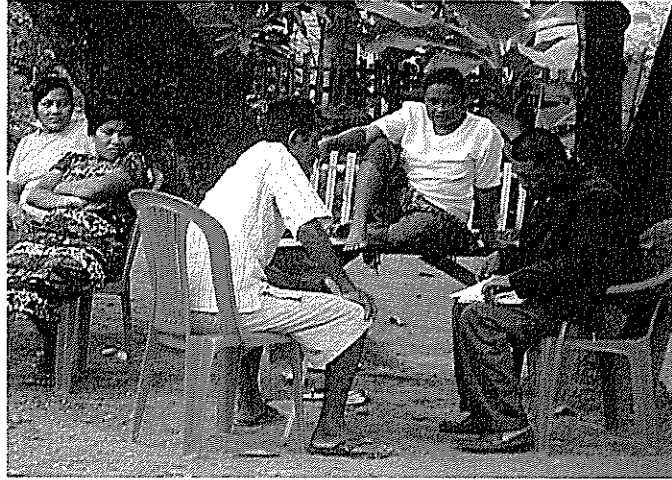
Attachment 5. Cultural Heritage Location of Maros – Takalar Road Development Plan



Attachment 6. Location of Material Source and Material Transportation Routes of Maros – Takalar Road Development



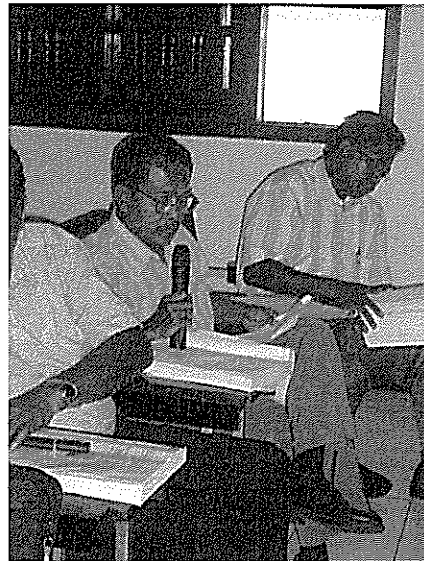
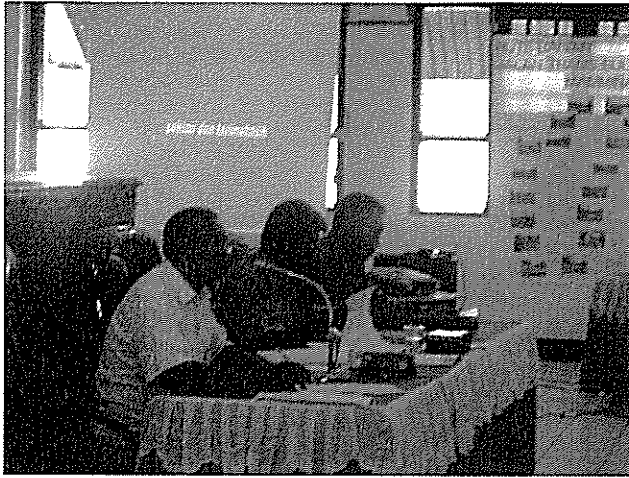
Attachment 7



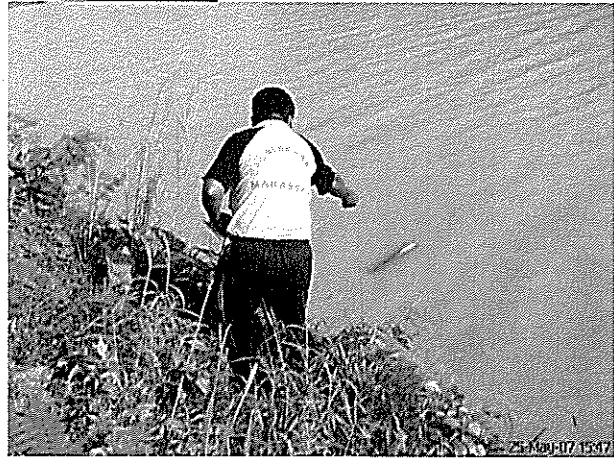
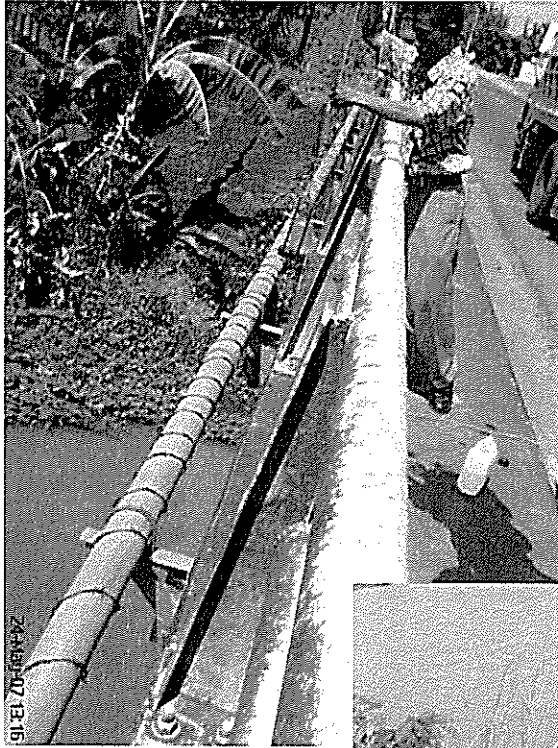
Socialization / public consultancy activity of Maros – Takalar road



Socialization / public consultancy activity of Maros – Takalar road



Presentation of EIA Reference Frame of Maros – Takalar Road (Trans Sulawesi Mamminasata), on May 8 th, 2007 in The Meeting Room of Board of Environment Management South Sulawesi Province



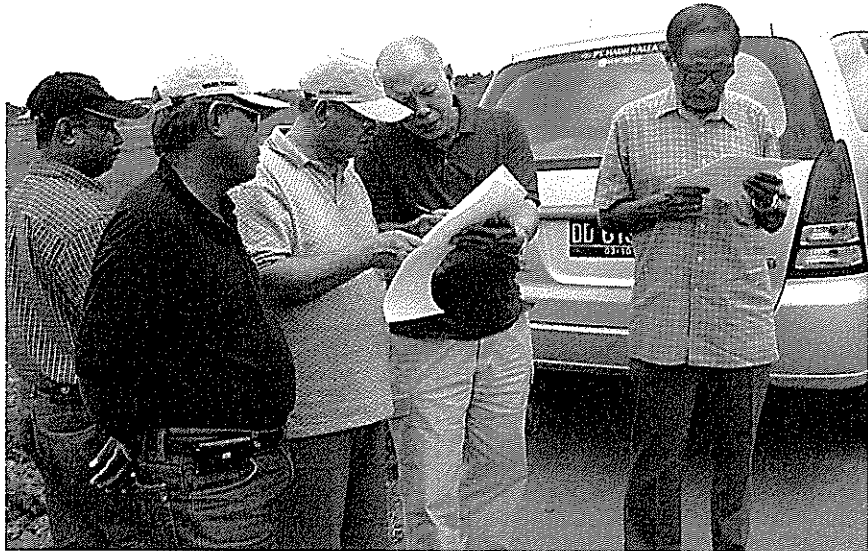
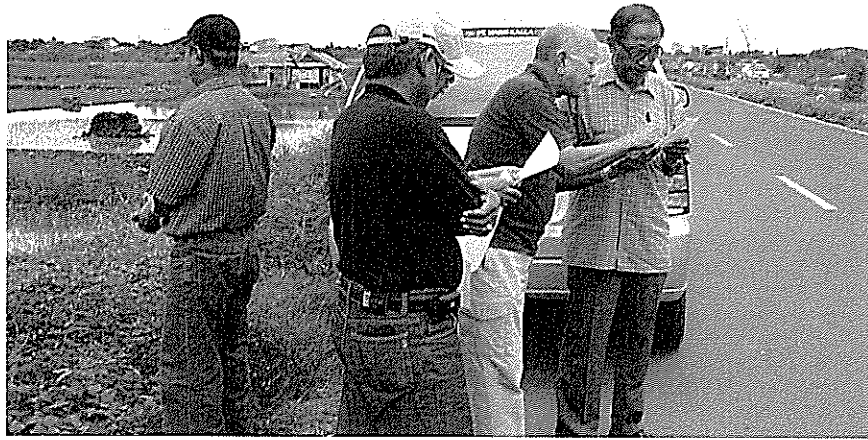
Water Quality Sampling Activities



Vegetation Observation



Air Quality Measurement



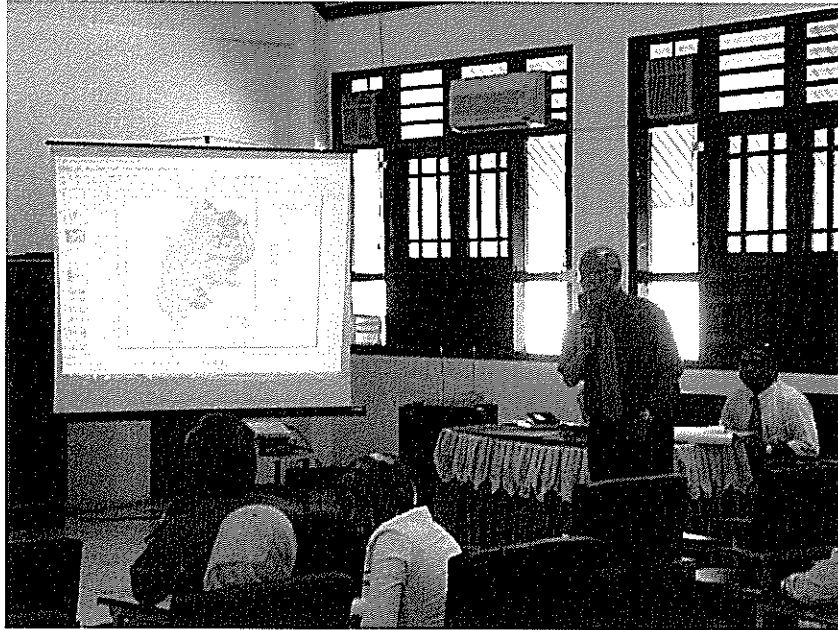
Field Survey with the Technical Team and EIA Commission of South Sulawesi Province



Presentation of Final Report Concept for EIA Maros – Takalar Road (Trans Sulawesi Maninasata), on August 20, 2007 in the meeting room of Board of Environment Management South Sulawesi Province



Visiting of Technical Team Leader for EIA Committed South Sulawesi Province, Head of Balai Besar Pelaksana Jalan Nasional IV Makassar



Presentation of Final Report Concept by Consultant Team



Situation of Final Report Concepts Presentation for EIA Maros – Takalar Road Section (Trans Sulawesi Mamminasata). On August 20, 2007 in the meeting room of Board of Environment South Sulawesi Province

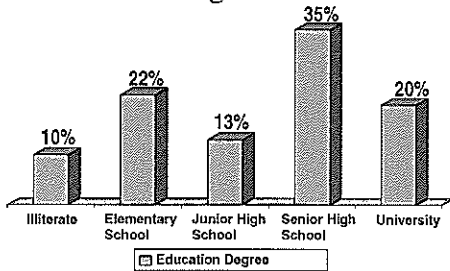


.Response and Idea which are delivered during the presentation of final report

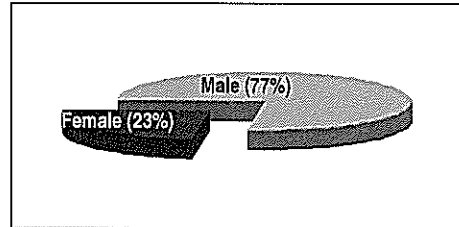
Attachment 8. The Result of Socio-Economic Identification

I. Respondent Identity

- Education Degree

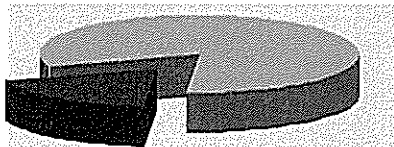


- Sex



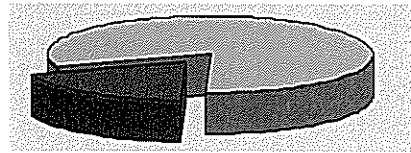
II. Perception on Project

- Already know the project plan?



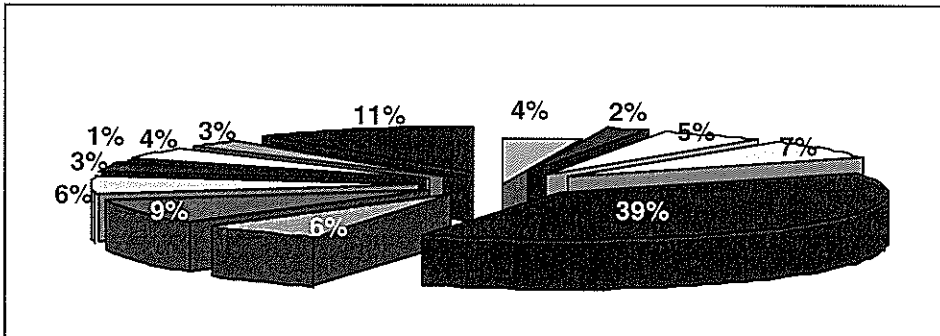
Yes No

- Agree with Project plan?



Yes No

- Suggestion to project ?



Remarks :

- 1 Asking for drainage so no more flood (4%)
- 2 Full Compensation (2%)
- 3 Beside compensation, there is also relocation land (5%)
- 4 Pay more attention to the road quality, not only just to work it (7%)
- 5 Needs transparency in deciding the amount of compensation (39%)
- 6 Perform the works based on the rules (6%)
- 7 Dont oppres the people (9%)
- 8 There is socialization before implementing project (6%)
- 9 Involving local people in the project works (3%)
- 10 Don't disturb road user activities during the project (1%)
- 11 Speed-up the development process (4%)
- 12 Another alternative road (3%)
- 13 No comment (11%)

**1-2. SUMMARY OF EIA FOR MAMMINASA BYPASS, ABDULLAH DAENG
SIRUA ROAD AND HERTASNING ROAD**

PREFACE

PREFACE

EIA (Environment Impact Analysis) Executive Summary Report of Mamminasa bypass, Abd dg Sirua and Hertasning roads Development in South Sulawesi Province as a summary of Environment Impact Analysis (EIA), Plan of Environment Management (RKL) and Plan of Environment Monitoring (RPL).

This Executive Summary is compiled referring to Regulation of Ministry of Environment No. 08 of 2006 concerning EIA Compilation Guidelines (Annex V)

A great extent of appreciation for all the parties that have assisteed in the completion in this Executive Summary.

Makassar, November12th , 2007

Proponent,
Balai Besar Pelaksana Jalan
Nasional VI, Makassar

Ir. H. Nurdin Samaila. M.Si
Head

KATA PENGANTAR

Laporan Ringkasan Eksekutif AMDAL (Analisis Mengenai Dampak Lingkungan) Pembangunan Ruas Jalan Mamminasa Bypass, Jalan Abdullah Daeng Sirua dan Jalan Hertasning di Provinsi Sulawesi Selatan merupakan rangkuman dari Analisis Dampak Lingkungan (ANDAL), Rencana Pengelolaan Lingkungan Hidup (RKL) dan Rencana Pemantauan Lingkungan Hidup (RPL).

Ringkasan Eksekutif ini disusun berdasarkan Peraturan Menteri Negara Lingkungan Hidup No. 08 Tahun 2006 tentang Pedoman Penyusunan Analisis Mengenai Dampak Lingkungan Hidup (Lampiran V).

Terima kasih disampaikan kepada semua pihak yang telah memberi bantuan dalam penyusunan laporan Ringkasan Eksekutif AMDAL ini.

Makassar, 12 November 2007

Pemrakarsa Proyek,
Balai Besar Pelaksana Jalan Nasional VI, Makassar



K. J. Nurhidayah Samaila, M.Si
Kepala Balai

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CHAPTER I
INTRODUCTION

CHAPTER I INTRODUCTION

1.1. Back ground

The increasing number of vehicle movement within this area (demand) must be counterbalanced with the repairing of transportation facilities and infrastructure such as road network (supply). Because if it is not performed with these actions, the urban transportation problems such as congestion will become daily phenomenon within the area. Moreover the road facilities have significant role in encouraging the development of all regional development units and prevalence of development level among these regions.

In order to anticipate the occurrence of urban transportation problems such as congestion and to encourage the regional development, in the Integrated Spatial Planning of Mamminasata Metropolitan Area in 2020 it is suggested the idea of road network development. This road network development within this area consists of 16 road sections. Three of them is the development of 66,5 km road section length, including:

- Road Section Development of Mamminasa Bypass with 47.9 km length
- Road Section Development of Abdullah Daeng Sirua Road with 14.1 km length
- Road Section Development of Hertasning Road with 4.5 km length

The availability of these three road sections in the future will anticipate the occurrence of transportation problems such as congestion, but also they can increase the community mobilization especially in the Eastern Part of Makassar City with nearby cities such as Maros, Gowa, and Takalar. The improvement of these accessibilities will encourage the development of this area.

Based on Ministry of Environment Decree No. 11 (2006) concerning Types of Business and / or activities completed with Environmental Impact Assessment (AMDAL), the Mamminasa Bypass, Abdullah Daeng Sirua Road and Hertasning Road development planning is included in the types of activities obliged to be completed with EIA. Further regulation related with any business and/or activities need to be completed with EIA is stipulated in Government Regulation No. 27 (1999) on Environmental Impact Assessment. As the

technical guidelines in field implementation of EIA, it is regulated by authorized and related institution with these business and/or activities. The EIA activities cover Environmental Impact Analysis, Environmental Management Plan, and Environmental Monitoring Plan.

The location of the project in South Sulawesi Province can be seen in the following figures.

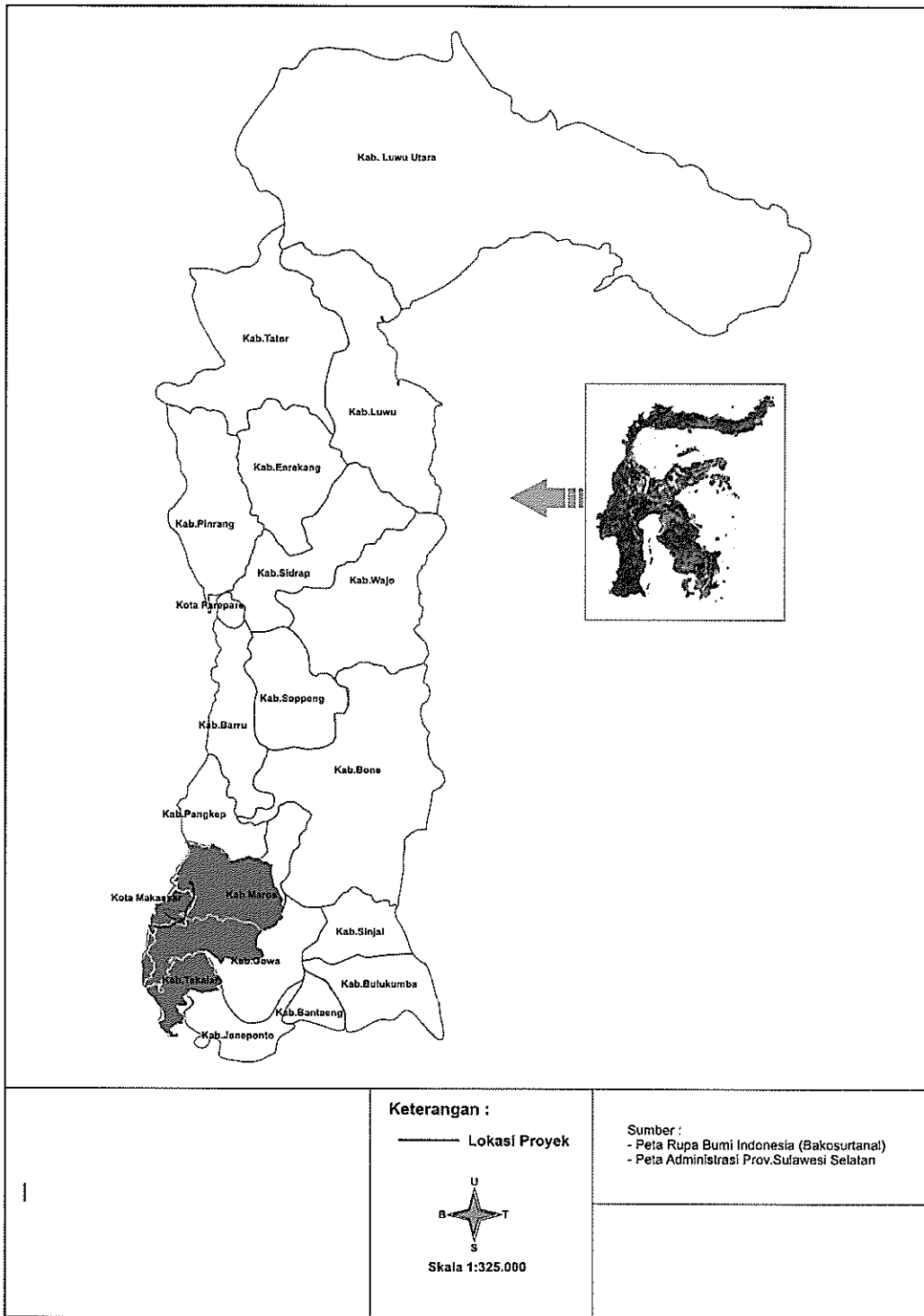


Fig. 1.1. The Location of the Project in South Sulawesi Province

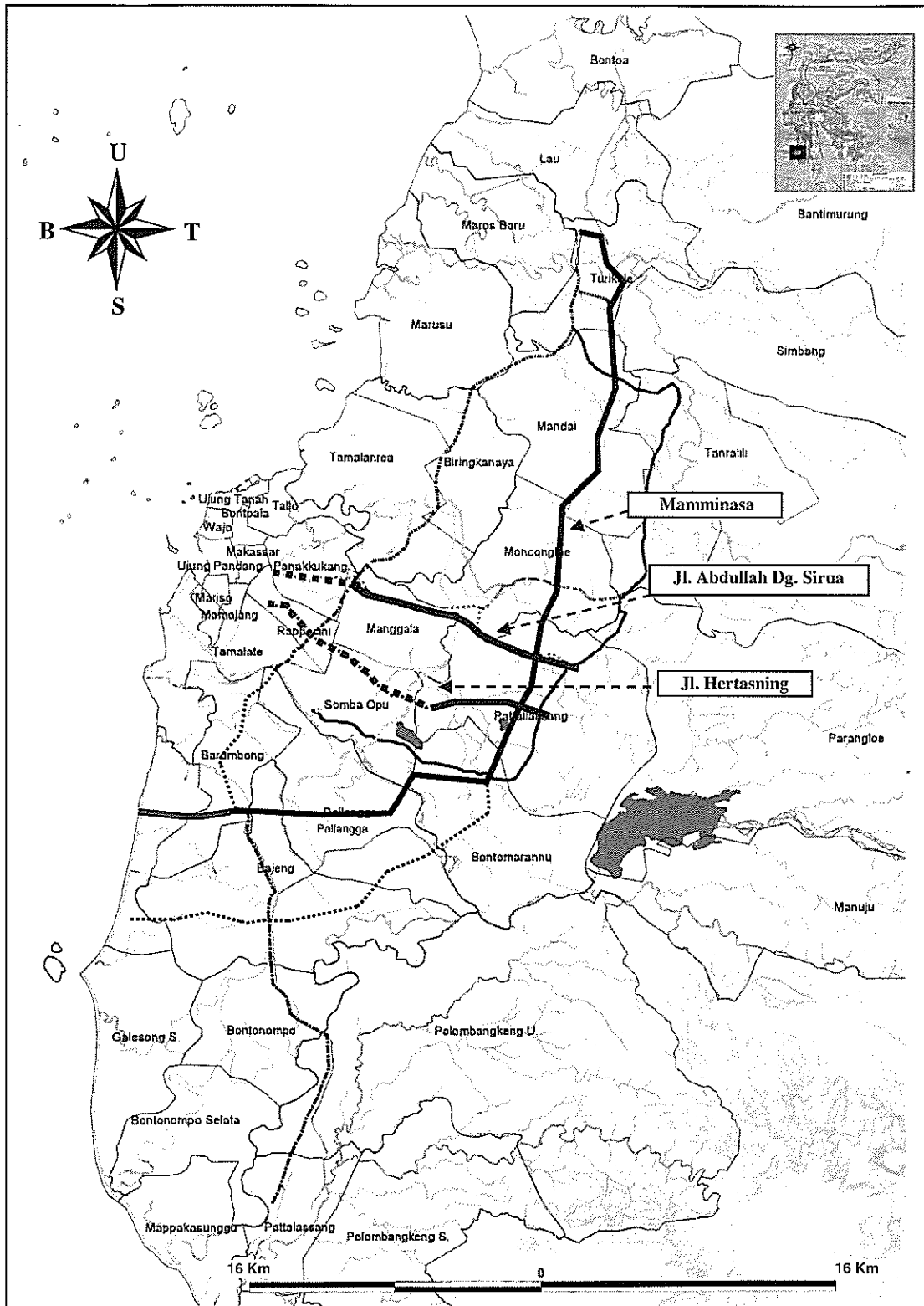


Figure 1.2. Location of Road Section Development Planning of Mamminasa Bypass, Abdullah Daeng Sirua Road, and Hertasning Road.

1.2. Activity Plan

The details of road section development of Mamminasa Bypass, Abdullah Daeng Sirua Road, and Hertasning Road in South Sulawesi Province are included the activity planning and during the activity period.

The activity planning of road section development of Mamminasa Bypass, Abdullah Daeng Sirua Road and Hertasning Road a part of the road network development planning on Spatial Plan for the Mamminasata Metropolitan Area

Administratively the location on these three road sections are in area of Maros Regency which consist of four sub-districts, i.e. 1). Turikale Sub-District; 2). Mandai Sub-District; 3). Moncongloe Sub-District, and 4). Tanralili Sub-District; in Makassar City, the locations are 1). Panakkukang Sub-District, and 2). Manggala Sub-District; in Gowa Regency consists of five sub-districts, i.e. 1). Pattallasang Sub-District, 2). Bontomarannu Sub-District, 3). Palangga Sub-District; 4). Bajeng Sub-District, and 5). Barombong Sub-District; as for in Takalar Regency is Galesong Utara Sub-District.

a. Mamminasa Bypass

The basic concept of Mamminasa Bypass development is to direct the new city plan in the southern part of Makassar City in the border of Gowa Regency and Maros Regency. This road is also expected will be the part of outside ring road and outer-outer ring road for the artery road network system within Mamminasata Metropolitan Area.

The length of Mamminasa Bypass Road is 47,9 km which consists of three road sections as follows:

1. The Beginning Road Section (South) with 16,8 km length. This road section is started from Tanjung Bunga – Takalar road (approximately 6,6 km southern of Jeneberang River) and to the southern to the joint access of middle ring road (widening) and national road at Boka Village on the national road approximately 5,3 km southern of Sungguminasa. Then from this place, the road continues to the southern to the joint of Jeneberang River and turns to the northern by passing the river and joins it to the middle road section.

2. The Middle Road Section with 22 km length. This road section is started from the end of beginning road section to the northern and passes sloping and flat topography to Maros.
3. The Final Road Section (North) with 9,1 km length. This road section is started from the end of middle road section to the Maros City. On this route, there are two outlets that will be planned, one is before Maros City, and another is after Maros City.

The image of Mamminasa Bypass will be presented in Figure 1.3.

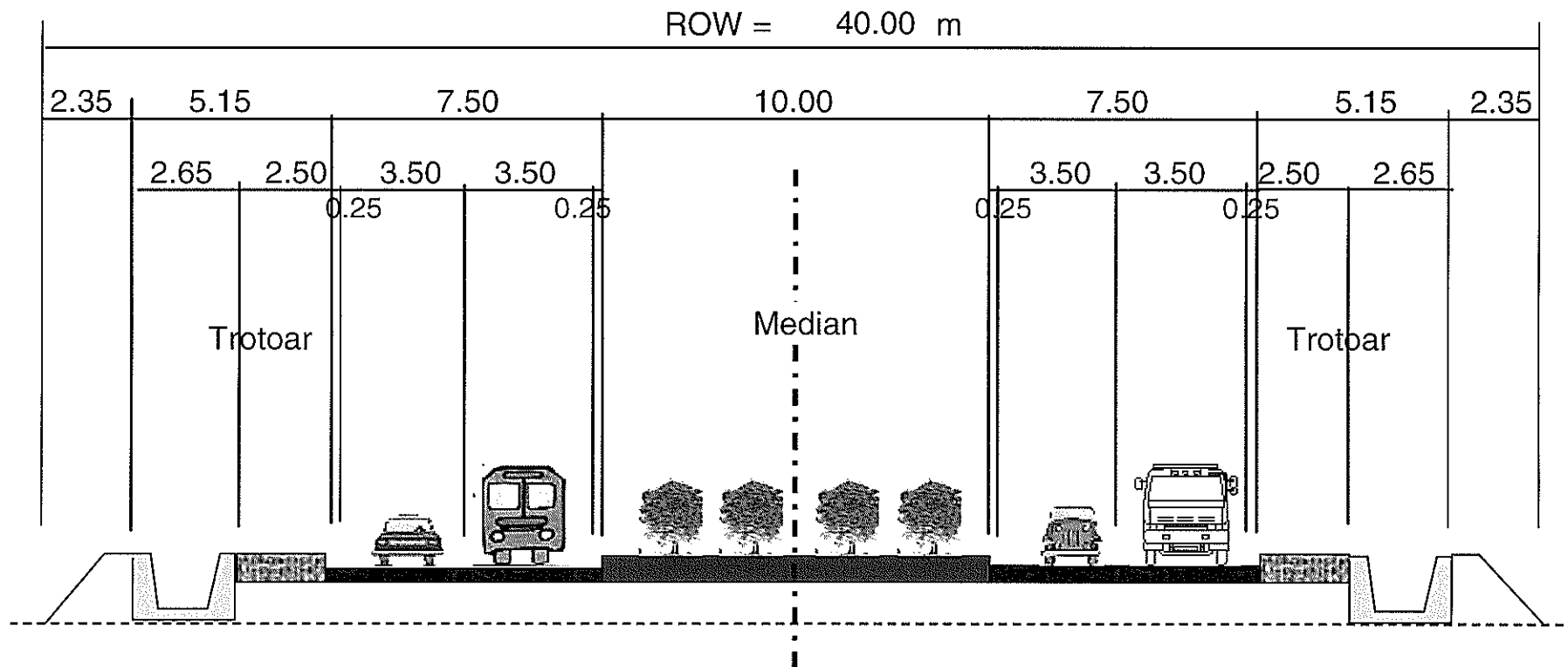


Figure 1.3.
Cross-Section of Mamminasa Bypass Road Development Plan

b. Abdullah Daeng Sirua Road Section

The planned length of Abdullah Daeng Sirua Road that will be developed is 14.1 km. In the progress of development, this road section is divided into four road sections as follows:

- Road Section A with 1.3 km length which is start from A.P. Pettarani road to Pannampu canal.
- Road Section B with 1.5 km length which is start from Pannampu canal to Antang Raya Road.
- Road Section C with 0.8 km length in Antang Raya Road.
- Road Section D with 5.1 km length which is started from Antang Raya Road to the border of Makassar – Maros.
- Road Section E with 1.2 km length which is started from the border of Makassar – Maros to Mangempang.
- Road Section F with 7.0 km length which is started from Mangempang to Moncongloe.

The concept of Abdullah Daeng Sirua Road is a construction of road with four rows as displayed in Figure 1.4. ROW or RUMIJA of this road is planned as wide as 34.30 m, except for Road Section F which is a new road and in other hand, other road section is the improvement of two rows to four rows.

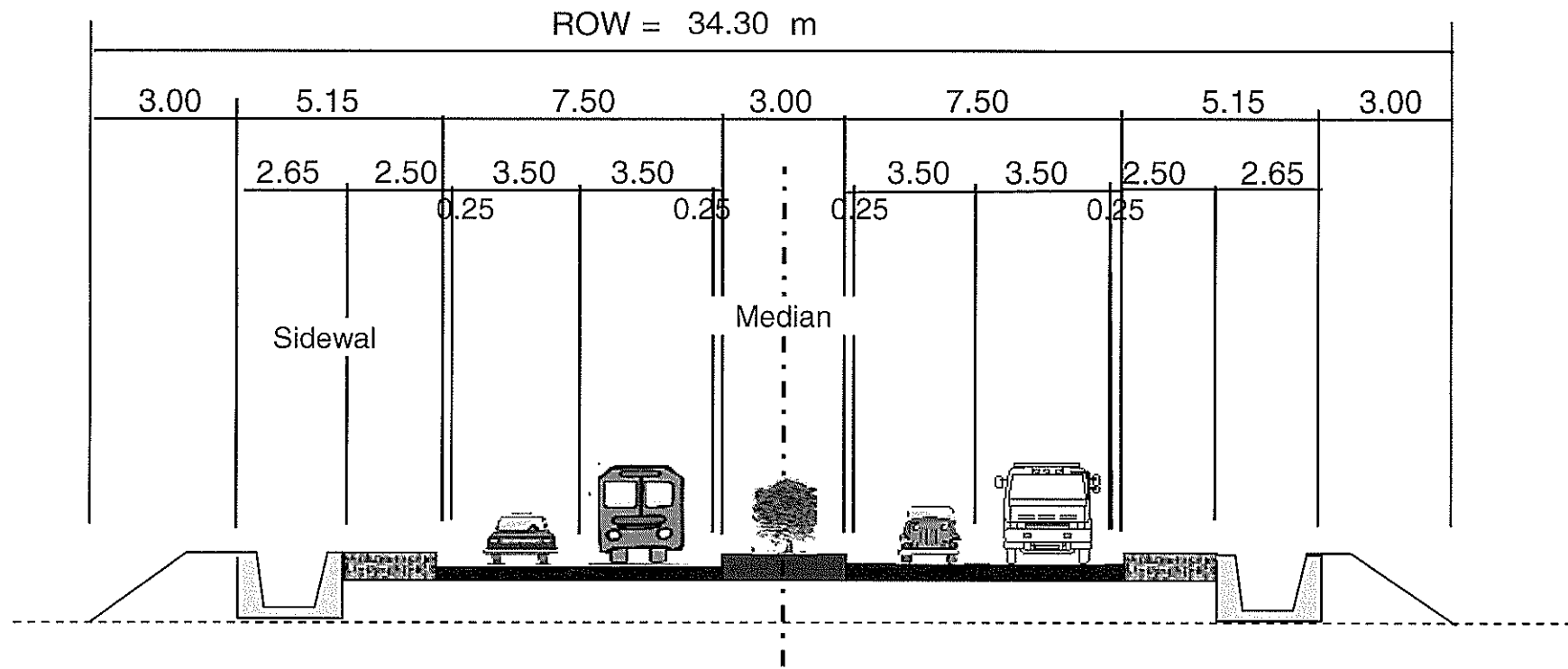


Figure 1.4.
Cross-Section of Development Plan of Abdullah Daeng Sirua Road

c. Hertasning Road

The total length of Hertasning Road that is planned is 15,7 km. In the future, this road section will be consisted of four rows:

- Road Section A (5.2 km), started from the intersection of Pettarani Road to the border of Makassar and Gowa (the end of urban area for nowadays). This road section has been improved to a road with four rows by the government.
- Road Section B (2.3 km), started from border of Makassar City and Gowa until Samata, Gowa Regency (Trans Antang – Sungguminasa). This road section has being developed by Provincial Government.
- Road Section C (3.7 km) in the detail design process.
- Road Section D (4.5 km) in the planning process.

The development concept of Hertasning Road is a construction of road with four rows as presented in Figure 1.5. ROW or RUMIJA of this road is planned as 34.30 m. The planned development road on Road Section D is to create a road which are divided into two carriageway (road for vehicles).

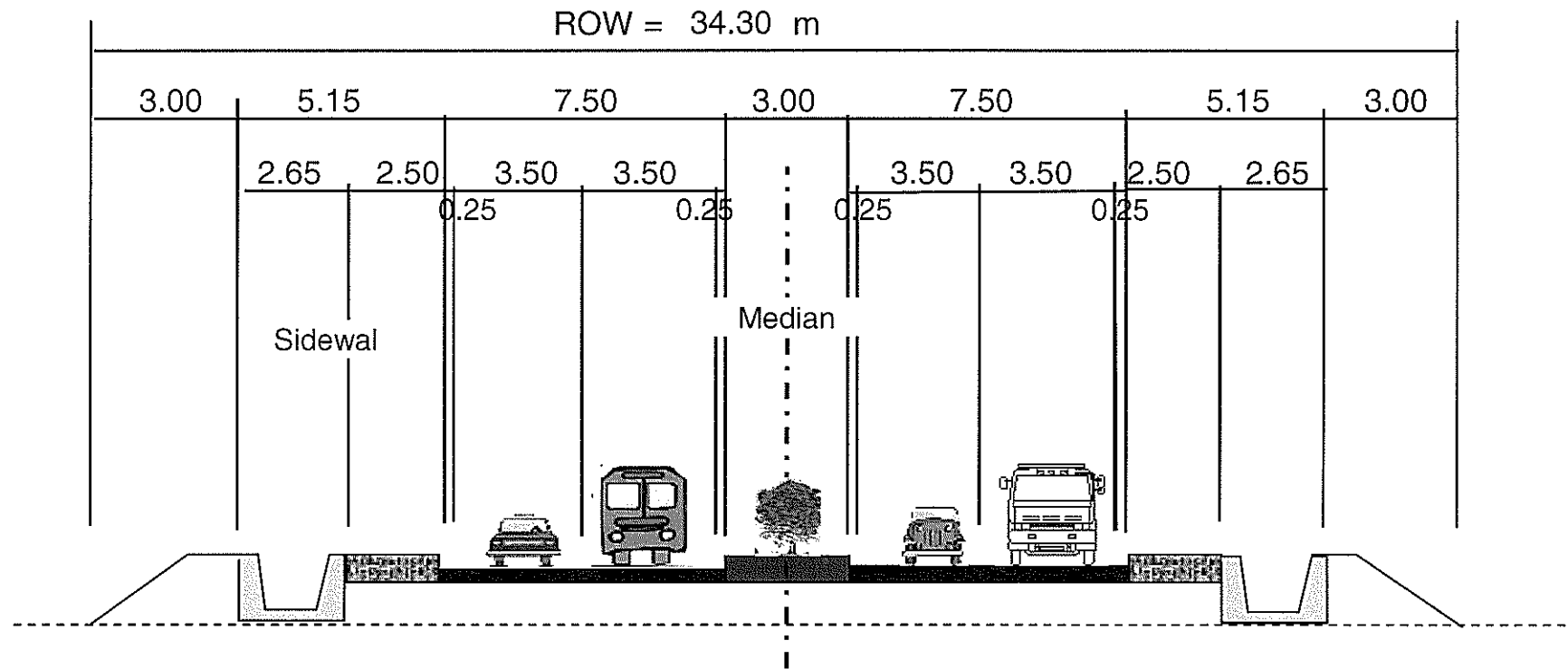


Figure 1.5.
Cross Section of Development Plan of Hertasing Road

1.3 Implementation Phases

The road section development planning within Mamminasata Metropolitan Area on the road section of Mamminasa Bypass, Abdullah Daeng Sirua Road, and Hertasing Road is implemented in three phases, i.e. Pre Construction Period, Construction Period, and Post Construction Period. The details of these activities in each phase are described as follows:

A. Pre Construction Phase

1. *Re-Measurement*

The current design is still in basic design form. Based on the retrieved suggests and ideas during some activities of study of this basic design and it will be continued to detail design form. The activity of re-measurement is one of initial activities during the pre-construction period which is conducted by matching the field facts with the planning. The re-measurement includes the re-check on previous poles in order to ensure the project sites and by knowing or giving boundaries of land needs for the road section development. The measurement is also conducted to know the land owners and width of land that will be acquired.

2. *Land Acquisition*

The land acquisition activity or land procurement for the road route that will be needed during this activity planning, because mainly the planned roads are new roads, especially the road section of Mamminasa Bypass. The total width of land that will be acquired for this activity is approximately 265 ha.

The total land area that will be needed which are the properties of community who inhabit in the area of Maros Regency that consist of four sub-districts, i.e. 1). Turikale Sub-District, 2). Mandai Sub-District, 3). Moncongloe Sub-District, and 4). Tanralili Sub-District; Makassar City in Panakkukang Sub-District and Manggala Sub-District; Gowa Regency are five sib-districts, i.e.: 1). Pattalassang Sub-District, 2). Bontomarannu Sub-District, 3). Palangga Sub-District; 4). Bajeng Sub-District, and 5) Barombong Sub-District; as for Takalar Regency is Galesong Utara Sub-District.

B. Construction Phase

1. *Employment Mobilization*

The number of employees that will be recruited during the road section development of Mamminasa Bypass, Abdullah Daeng Sirua Road, and Hertasing Road are 38.015 man days. The source of employment that will be recruited during these road sections developments will put the priority to the local employees in the surrounding area of project sites, especially the inhabitants in surrounding the project sites.

2. Equipment and Material Mobilization/Demobilization

The types of equipments that will be needed in the road section development planning of Mamminasa Bypass, Abdullah Daeng Sirua Road, and Hertasing Road are Bulldozer, Excavator, Wheel Loader, Motor Grader, Steel Wheel Roller, Slurry Seal Machine, Asphalt Sprayer, Tire Roller, Tandem Roller, Hammer, and Dump truck. These equipments are mainly from nearby regions of Mamminasata Area. During the activity, these equipments will be placed in surrounding of Base Camp, except for dump truck as material transportation. Furthermore, the equipments mobilization during the activity implementation is from the surrounding area of Base Camp to the equipments utilization places (the locations of road section development).

The material that will be mobilized during these activities include the cleaning materials and vegetation cut down, top soil paring, result of digging and piles, stone, sand, iron, bridge materials, asphalt and cement. The vegetation paring results are garbage that will be transported to Final Garbage Throwing Point (TPA). The result of top soil paring will be used as pile and building materials in the nearby road. Some of piles, sands, and stones are transported from nearby quarry sites in the project sites. Asphalts are from nearby AMP in project sites. As for cement and iron, mainly are coming from Makassar. Figure 1.6. shows the quarry locations in the surrounding of project sites.

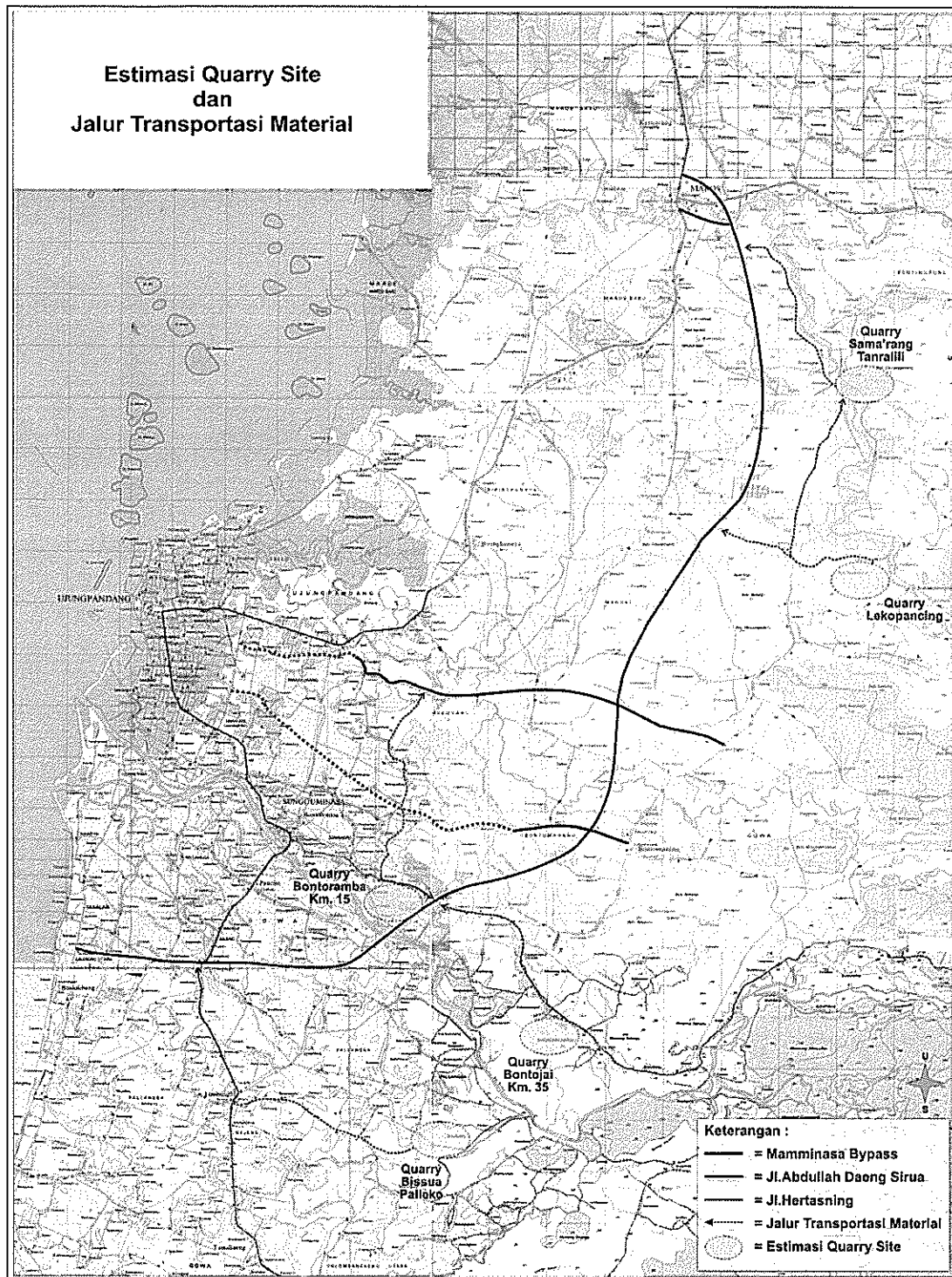


Figure 1.6
Estimation of Quarry Sites and Route of Material Transportation

3. Land Clearing and Preparation

The land clearing and preparation include the procurement activity of kit direction, tree cutting down, bush clearance, building and garbage along the developed routes. This activity includes the top soil paring with the thickness of pared top soil is approximately 50 cm. Thus the volume of top soil paring result is approximately more less than 1.322.000 m³.

4. Road and Bridge Works

Some of road section development plans of Mamminasa Bypass, Abdullah Daeng Sirua Road, and Hertasning Road are new road and only few of them are road widening. As for the details of road works activities are as follows:

- a. Embankment
- b. Foundation Layer Overlaying with Aggregate A
- c. Foundation Layer Overlaying with Aggregate B
- d. Spraying Fastener and Adhesive Absorption Layer (Prime Coat)
- e. Surface Layer Overlaying

As for the activities during the bridge construction are as follows:

- a. Pole Procurement in Project Site
- b. Excavation 0 - 3 Meter Depth
- c. Iron Assembling for Abutment
- d. Loading teston the Foundation
- e. Erection of Piles Based on the Location
- f. Abutment/Pile Making
- g. Iron Assembling for Plat
- h. Beam Assembling/Continuation
- i. Pullout the Pre-stressed Wire in the Beams
- j. Elastomeric Installment
- k. Beam Positioning at Elastomeric
- l. Scaffold Making for Plat Adhesion

- m. Iron Positioning
- n. Plat Molding
- o. Expansion Joint Installment

5. Facility/Infrastructure Construction

The facility/infrastructure that will be constructed are: road mark and signs installment including tree planting along the road

C. Post Construction Phase

This phase consists of activities as follows:

1. Operational of the Mamminas by pass, Hertasing and Abd. Dg. Sirua road
2. Maintenance of the Mamminas by pass, Hertasing and Abd. Dg. Sirua road

1.3. Studied Alternatives in Environment Impact Analysis

The location planning of road section development of Mamminasa Bypass, Abdullah Daeng Sirua Road, and Hertasing Road has some alternatives of passing through routes. The alternatives based on technical aspects, economical aspects and environmental aspects. Table 1.1. shows the alternatives.

Tabel 1.1 . Alternative specification for Mamminasa Bypass, Jalan Abdullah Daeng Sirua dan Jalan Hertasing

| Section | Length (km) | Classification | | | Prediction, 2020 (smp) | Number of Row | | Construction | ROW (m) | Bridge (Panjang) | Acquisition | |
|----------------------------------|-------------|--------------------|-------------|------------------|------------------------|---------------|------|--------------|---------|---------------------|-------------|-----------|
| | | Road Function | Road Status | Tipe/ Class | | Present | Plan | | | | Building | Land (ha) |
| Mamminasa Bypass | | | | | | | | | | | | |
| Awal (Selatan) | 16,8 | Arteri (Sekunder)* | Provinsi* | Tipe II / Klas I | 27.000-44.000 | - | 4 | Baru | 40 | Jeneberang (P=230m) | 49 | 67 |
| Tengah | 22 | Arteri (Sekunder)* | Provinsi* | Tipe II / Klas I | 27.000-35.000 | - | 4 | Baru | 40 | - | 18 | 88 |
| Akhir (Utara) | 9,1 | Arteri (Sekunder)* | Provinsi* | Tipe II / Klas I | 30.000-53.000 | - | 4 | Baru | 40 | Maros (P=130m) | 33 | 36 |
| Total | 47,9 | | | | | | | | | | 100 | 191 |
| Abdullah Daeng Sirua Road | | | | | | | | | | | | |
| C | 0,8 | | Provinsi* | Tipe II / Klas I | 38.000 | 2 | 4 | Pelebaran | 15 | | 65 | 1 |
| D | 5,1 | Arteri (Sekunder)* | Provinsi* | Tipe II / Klas I | 35.000 | 2 | 4 | Pelebaran | 15 | | 50 | 7 |
| E | 1,2 | Arteri (Sekunder)* | Provinsi* | Tipe II / Klas I | 35.000 | 2 | 4 | Pelebaran | 34 | | 0 | 4 |
| F | 7,0 | Arteri (Sekunder)* | Provinsi* | Tipe II / Klas I | 37.000 | - | 4 | Baru | 34 | | 10 | 24 |
| Total | 14,1 | | | | | | | | | | 125 | 36 |
| Jalan Hertasing Road | | | | | | | | | | | | |
| D | 4,5 | Arteri (Sekunder)* | Provinsi* | Tipe II / Klas I | 33.000 | 2 | 4 | Pelebaran | 34,30 | | 160 | 11 |
| TOTAL | | | | | | | | | | | | |
| | 66,5 | | | | | | | | | | 385 | 238 |

1.5. Recommendation of Environmental Feasibility Assessment

As we know that the EIA activities of Mamminasa bypass, Abd Dg Sirua and Hertasning roads development plan is arranged based on the feasibility study, it is suggested that the further studies to be conducted immediately in order to achieve more detail data, especially on land acquisition planning.

Generally, the Mamminasa bypass, Abd Dg Sirua and Hertasning roads development plan is environmentally feasible. Natural Protected Area of National Park of Babul and an important and significant social cultural circumstances in South Sulawesi Province such as historical and cultural heritages in surrounding area of Cemetery Complex of Sultan Hasanuddin both do not in the physical boundary of the project and do not significantly affected by negative impact from the planned project

The Mamminasa bypass, Abd Dg Sirua and Hertasning roads development plan is environmentally feasible to be implemented as long there are efforts to avoid, control, manage, and monitor the possible significant environmental impacts. The guideline for these efforts is shown in the suggestion and recommendation for impact management in Table 1.2

Table 1.2. Recommendation Summary of Significant Impact Management.

| Name of Activity | Influenced Component | Recommendation of Impact Management |
|----------------------------------|--|--|
| • PRE=CONSTRUCTION PHASE | | |
| Land Acquisition. | The land and building owners affected by the construction of Mamminasa bypass, Abd Dg Sirua and Hertasning roads development. | <ul style="list-style-type: none"> • Doing socialization on plan of Mamminasa bypass, Abd Dg Sirua and Hertasning roads development. • Giving compensation to the land and building owners with appropriate price. • Every activities period should be initiated with socialization. • In the implementation period, Committee of Land Acquisition P₂T must be formed and attended by community elements. |
| • CONSTRUCTION PHASE | | |
| 1. Workers mobilization | <ul style="list-style-type: none"> • Working age around the Mamminasa bypass, Abd Dg Sirua and Hertasning roads | <ul style="list-style-type: none"> • Priority for the local workers especially for work which do not need special abilities |
| 2. Material Mobilization | <ul style="list-style-type: none"> • Road infrastructure • Air / dust quality • Health disturbance • Safeties of other road users. • Slope of the quarry site • The change of environment at quarry site | <ul style="list-style-type: none"> • Adjusting the transportation volume with the road capacity. • Doing periodical sprinkling and closing the transported material. • Reducing the speed in the community settlement. • Adjust the slope based on the soil condition • Terracing • Reclamation and reutilization of the land |
| 3. Relocation of utilities | <ul style="list-style-type: none"> • PDAM (clean water) users | <ul style="list-style-type: none"> • Temporary channel for the raw water flow • Supply from the mobile tank |
| 4. Land clearing and preparation | <ul style="list-style-type: none"> • Disturbance to flora and fauna • Air quality • Health disturbance • Traffic jam | <ul style="list-style-type: none"> • Reduce the disturbance toward land biotics • Closing of the location • Schedule management • Traffic management and traffic signs |
| 5. Road and bridge | <ul style="list-style-type: none"> • Traffic jam | <ul style="list-style-type: none"> • Traffic management |

| | | |
|--|---|---|
| construction | <ul style="list-style-type: none"> • Creating water pool • Noise • Air / dust quality. • Public health | <ul style="list-style-type: none"> • Installation of traffic signs • Accentuating the drainage channel construction • Arranging the erection schedule (only during the working time) • Doing periodical sprinkling in areas with potentiality of creating dust. |
| 6. Supporting facility / infrastructure construction works (overpass construction, road sign installment, tree and bush planting, etc.). | <ul style="list-style-type: none"> • Green belt | <ul style="list-style-type: none"> • Implementing these activities based on the current applied standard. • Doing better regulation of Mamminasa bypass, Abd Dg Sirua and Hertasning roads areas. • Maintenance of green belts from illegal activities |
| <p>• POST-CONSTRUCTION PHASE</p> | | |
| 1. Operational of Mamminasa bypass, Abd Dg Sirua and Hertasning roads | <ul style="list-style-type: none"> • Transportation system will be continual. • Interconnection of road network in Maminasata area • Uncontrolled land utilization | <ul style="list-style-type: none"> • Monitoring the continuity of transportation system. • Installing the traffic signs in the potential accident areas. • Government policy to support the area development |
| 2. Maintenance of Mamminasa bypass, Abd Dg Sirua and Hertasning roads | <ul style="list-style-type: none"> • Safety of road users • Traffic jam. | <ul style="list-style-type: none"> • Installing the traffic signs in the potential accident areas. • Traffic management and installation of traffic signs • Schedule management of road maintenance (avoid busy hours) |

1.5. Implementation Schedule

The schedule (tentative) for the road development plan within the Mamminasata Metropolitan Area, especially on road sections of Mamminasa Bypass, Abdullah Daeng Sirua Road, and Hertasing Road are presented in Table 1.2.

Table 1.3. Implementation Schedule for Road Section Development Plan within Mamminasata Metropolitan Area of Mamminasa Bypass, Hertasing, and Abdullah Daeng Sirua

| No | Activity | Year | | | | | | | | | | | | | |
|----|---|------|---|------|---|------|---|------|---|------|---|------|---|------|--|
| | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | |
| | | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | | |
| 1 | Study | ■ | | | | | | | | | | | | | |
| 2 | Construction Preparation | | | ■ | | | | | | | | | | | |
| 3 | Land Acquisition | | | | | ■ | | | | | | | | | |
| 4 | Land Clearing | | | | | | | ■ | | | | | | | |
| 5 | Material Mobilization | | | | | | | | | ■ | | | | | |
| 6 | Bridge Construction | | | | | | | | | ■ | | | | | |
| 7 | Road Construction | | | | | | | | | ■ | | ■ | | | |
| 8 | Road Facility (Supported Facility) Construction | | | | | | | | | | ■ | | ■ | | |

1.6. Identity of Initiator and Arrangement Team of Environment Impact Analysis

a. Project Proponent : Department of Public Works
General Directorate of High Way
Balai Besar Pelaksana Jalan Nasional VI,
Makassar

Address : Jl. Mesjid Raya No. 72, Makassar
Telephone/Facsimile : 0411 – 442673

Responsible Person for Activity: Ir. H. Nurdin Samaila, M.Si
Position : Head of Office
Address : Jl. Mesjid Raya No. 72, Makassar
Telephone/Facsimile : 0411 – 442673

b. AMDAL Study Team

Institution/ organization : PT. ANDAL PERSADA UTAMA konsultan
Address : Jl. Adhyaksa Baru Ruko ZAMRUD II H 17
Panakkukang Mas – Makassar

Telephone/Facsimile : 0411 - 443603
Responsible Person for Activity: Ir. Rusly Dhanio
Position : Director of PT. ANDAL PERSADA UTAMA
Address : Jl. Adhyaksa Baru Ruko ZAMRUD II H 17
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CHAPTER II
IMPORTANT IMPACT TO ENVIRONMENT

CHAPTER II IMPORTANT IMPACT TO THE ENVIRONMENT

This chapter explain briefly the steps of work for development of Mamminasa by-pass, Abd, dg Sirua and Hertasning roads Road with the Important Impact generated. Important impact elaborated here, important negative impact and also important positive impact represent result of impact evaluation. The summary shall be as follows :

2.1. Important Impact at Pre-construction Phase

- Land acquisition activity for the development of Mamminasa by-pass, Abd, dg Sirua and Hertasning roads interests generate important negative impact to resident perception.

2.2. Important Impact at Construction Phase

- Activity of material Mobilization for the development of Mamminasa by-pass, Abd, dg Sirua and Hertasning roads generates important positive impact to job opportunity
- Activity of material Mobilization for the development of Mamminasa by-pass, Abd, dg Sirua and Hertasning roads generates important negative impact to air quality.
- Activity of material Mobilization for the development of Mamminasa by-pass, Abd, dg Sirua and Hertasning roads generates important negative impact to the road structure/building.
- Activity of land clearing and land preparation for development of Mamminasa by-pass, Abd, dg Sirua and Hertasning roads Activity generates important negative impact to flora and fauna.
- Activity of Construction of Mamminasa by-pass, Abd, dg Sirua and Hertasning roads generates the important negative impact to air quality. And suffused area/ floods, traffic current.and distraction of utilities (piping water services)
- Activity of structure/building/ infrastructure works for treeplanting along Mamminasa by-pass, Abd, dg Sirua and Hertasning roads generates important positive impact to flora and fauna

2.3. Important Impact at Post-Construction Phase

- Activity of Operation of Mamminasa by-pass, Abd, dg Sirua and Hertasning roads generates the important positive impact to fluency of traffic current.. However in the other side also generates the important negative impact to resident perception, specially how to across the road
- Maintenance of Mamminasa by-pass, Abd, dg Sirua and Hertasning roads is predicted to generate the important positive impact to other environmental function and esthetics

Evaluation Matrix of the Important Impact for the development of Mamminasa by-pass, Abd, dg Sirua and Hertasning roads can be found at the following tables :

Table 2.1. Matrix of Hypothetical Significant Impact of Mamminasa by-pass, Abd, dg Sirua and Hertasing roads.

| No | Activity Phase Environmental Components | Pre-construction Phase | | Construction Phase | | | | | Post-construction Phase | | |
|------------|--|------------------------|------------------|--------------------|------------------------|---------------------|-------------------------------|--------------------------|---|-----------|-------------|
| | | Re-measurement | Land Acquisition | Labor Availability | Materials Mobilization | Utility replacement | Land clearing and preparation | Road/Bridge Construction | Construction of Infrastructure and Facility | Operation | Maintenance |
| I | PHYSICAL-CHEMICAL COMPONENTS | | | | | | | | | | |
| 1. | Air Quality | | | | - P | | -P | - P | | | |
| 2. | Hydrology | | | | | | | - P | | | |
| 3. | Water Quality | | | | | | | | | | |
| 4. | Road Facility | | | | - P | | | | | | |
| 5. | Traffic Flows | | | | -P | | -P | - P | | + P | -TP |
| 6. | Spatial Plan | | -TP | | | | | | | | |
| 7. | Land and soil | | -P | | | | | | | -P | |
| 6. | Slope | | | | -P | | | | | | |
| II | BIOLOGICAL COMPONENTS | | | | | | | | | | |
| | Flora and Fauna | | | | | | - P | + P | | | |
| III | SOCIAL CULTURE-PUBLIC HEALTH COMPONENTS | | | | | | | | | | |
| 1. | Social perception | - TP | - P | | | -P | | | | | + P |
| 2. | Job Opportunity | | | + P | | | | | | | |
| 3. | Historic Heritage | | - TP | | | | | | | | |
| 4. | Public Health | | | | - P | | -P | -P | | | |
| 5. | Green Area / Aesthetics | | | | | | | + P | | | + P |

Note : P = Important - = Negative Impact
 TP = Not Important += Positive Impact

CHAPTER III
MANAGEMENT EFFORT AND
ENVIRONMENT

CHAPTER III MANAGEMENT EFFORT AND ENVIRONMENT MONITORING

This chapter outlines briefly and clearly, the Management and Environment monitoring performed in frame to anticipate the important impacts of environment being generated as referred to chapter II. The description is presented in the form of tables with the detail on Environment Management and Environment Monitoring, elaborated at following pages.

Tabel 3.1. Plan of Environment Management (RKL) On Development of Mamminasa bypass, Abd dg Sirua and Hertasning roads

| No. | Environment Management Plan (RKL) | | | | | | | |
|----------------------------------|--|--|--------------------------------------|--|---|---|--|---|
| | IMPACT ENVIRONMENT PARAMETER/ COMPONENT | IMPACT SOURCE | IMPACT CRITERIA | GOAL OF ENVIRONMENT MANAGEMENT | ENVIRONMENT MANAGEMENT | ENVIRONMENT MANAGEMENT LOCATION | ENVIRONMENT MANAGEMENT PERIODE | ENVIRONMENT MANAGEMENT INSTITUTION |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| I. PRE-CONSTRUCTION PHASE | | | | | | | | |
| Land acquisition | | | | | | | | |
| | Anxiety of land owner along the the road | Activity of land acquisition for interest of development of Mamminasa bypass, Abd dg Sirua and Hertasning roads. | Anxiety of land owner along the road | To avoid the Anxiety of land owners along the the road | <ul style="list-style-type: none"> ▪ Doing socialization the development plan of Mamminasa bypass, Abd dg Sirua and Hertasning roads, so that they know its benefit and in the end support the such activity ▪ Compensatory gift to land owner and building at the right price ▪ Doing socialization in every activity step so that society comprehend better activity target. | Management Location is Mamminasa bypass, Abd dg Sirua and Hertasning roads. | period of environment Management will be done before construction execution of development of Mamminasa bypass, Abd dg Sirua and Hertasning roads. | <p>- Environment Management Execution : As Environment Management Institution is Proponent of the project and management of Mamminasa bypass, Abd dg Sirua and Hertasning roads</p> <p>- Environment Management Supervisor : As Environment Management Institution is Ditjen Bina Marga Dep. Pekerjaan Umum dan Bapedalda Propinsi Sulawesi Selatan.</p> <p>- Environment Management Result Report : Result of Environment Management is reported to Ditjen Bina Marga Depertemen Pekerjaan Umum dan Bapedalda propinsi Sulawesi Selatan once in every 6 months.</p> |

| RKL Environment Management Plan | | | | | | | | |
|------------------------------------|--|---|---|---|--|---|--|---|
| No. | IMPACT ENVIRONMENT PARAMETER/ COMPONENT | IMPACT SOURCE | IMPACT CRITERIA | GOAL OF ENVIRONMENT MANAGEMENT | ENVIRONMENT MANAGEMENT | ENVIRONMENT MANAGEMENT LOCATION | ENVIRONMENT MANAGEMENT PERIODE | ENVIRONMENT MANAGEMENT INSTITUTION |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| II. CONSTRUCTION PHASE | | | | | | | | |
| 1. Mobilization of Labor | | | | | | | | |
| | <ul style="list-style-type: none"> Job and work opportunity for local people | Labor demand for the road construction work | <ul style="list-style-type: none"> The quantity of labor accept for the road construction work | Provide opportunity to the local inhabitants | Provide thge opportunity especially for the suitable ability demanded | Area surrounding the Mamminasa bypass, Abd dg Sirua and Hertasnin g roads | At the period of labor recruitment phase | <ul style="list-style-type: none"> Environment Management Execution As Environment Management Institution is Proponent of the project, in this case executor project of Mamminasa bypass, Abd dg Sirua and Hertasnin g roads Environment Management Supervisor As Environment Management Institution is Bapedalda Propinsi Sulawesi Selatan. Environment Management Result Report : Result of Environment Management is reported to Bapedalda Propinsi Sulawesi Selatan once in every 6 months. |
| 2. Mobilization of Material | | | | | | | | |
| | <ul style="list-style-type: none"> Transportation Infrastructure passed by [by] the material vehicle Dust in resident settlement around Mamminasa bypass, Abd dg Sirua and Hertasnin g roads. Safety user, especially alongside Mamminasa bypass, Abd dg Sirua and Hertasnin g roads. | Material transportation for the construction requirement of Mamminasa bypass, Abd dg Sirua and Hertasnin g roads development. | <ul style="list-style-type: none"> Generating damage of road infrasturcture Changing of air quality exceeding the limit criteria value Generating the traffic accident caused by material transportation | <ul style="list-style-type: none"> Decreasing risk of damage of road infrastructure passed by the transportation vehicles Minimizing dust concentration in the region passed by transportation vehicles Avoiding traffic acciden | <ul style="list-style-type: none"> Accomodating transportation volume with the existing road capacities and also repair the road damage which is resulted by material transportation activity Closing material transported with the ratch and do sprinkler at road passed by transportation vehicles for the minimization of dust Decreasing vehicle speed when passing dense settlement area of resident | Regions around Mamminasa bypass, Abd dg Sirua and Hertasnin g roads. | done during activity of material transportation. | <ul style="list-style-type: none"> Environment Management Execution As Environment Management Institution is Proponent of the project, in this case executor project of Mamminasa bypass, Abd dg Sirua and Hertasnin g roads Environment Management Supervisor As Environment Management Institution is Bapedalda Propinsi Sulawesi Selatan. Environment Management Result Report : Result of Environment Management is reported to Bapedalda Propinsi Sulawesi Selatan once in every 6 months. |

| RKL Environment Management Plan | | | | | | | | |
|--|---|---|---|--|---|--|---|--|
| No. | IMPACT ENVIRONMENT PARAMETER/ COMPONENT | IMPACT SOURCE | IMPACT CRITERIA | GOAL OF ENVIRONMENT MANAGEMENT | ENVIRONMENT MANAGEMENT | ENVIRONMENT MANAGEMENT LOCATION | ENVIRONMENT MANAGEMENT PERIODE | ENVIRONMENT MANAGEMENT INSTITUTION |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 3.Land clearing and preparation | | | | | | | | |
| | <ul style="list-style-type: none"> ▪ Traffic jam ▪ Increasing amount of dust and noise | Land clearing and preparation of the location of onstruction work of Abd. Dg Sirua Road | <ul style="list-style-type: none"> ▪ Traffic jam at the nearby location of the road construction ▪ Decreasing of air quality ▪ Complaints by the local inhabitants | <ul style="list-style-type: none"> ▪ Decreasing of traffic jam possibilities ▪ residential area comfortability | <ul style="list-style-type: none"> -Redirect the traffic flows to the alternative roads -Watering and sprinkling the dusty possibly places -Schedule management of the land clearing and preparation | Regions around Abd dg Sirua | done during the land clearing and preparation work | <ul style="list-style-type: none"> - Environment Management Execution As Environment Management Institution is Proponent of the project, in this case executor project of Mamminasa bypass, Abd dg Sirua and Hertasning roads - Environment Management Supervisor As Environment Management Institution is Bapedalda Propinsi Sulawesi Selatan. - Environment Management Result Report : Result of Environment Management is reported to Bapedalda Propinsi Sulawesi Selatan once in every 6 months. |
| 4. Road and Bridge Development | | | | | | | | |
| | <ul style="list-style-type: none"> ▪ Forming of water pool ▪ Increasing noise ▪ Decreasing air quality | Development activity of Mamminasa bypass, Abd dg Sirua and Hertasning roads. | Resident perception, especially living around and bridge Mamminasa bypass, Abd dg Sirua and Hertasning roads. | Impact minimization generated by activity of road-works and bridge of Mamminasa bypass, Abd dg Sirua and Hertasning roads. | <ul style="list-style-type: none"> ▪ Prioritization of the construction of drainage channel ▪ Choose the right time for piling (only office hours). ▪ Doing periodical sprinkler at potential dust area. | Mamminasa bypass, Abd dg Sirua and Hertasning roads. | period of environment Management will be done before and during construction execution of development of Mamminasa bypass, Abd dg Sirua and Hertasning roads. | <ul style="list-style-type: none"> - Environment Management Execution : As Environment Management Institution is Proponent of the project and management of Mamminasa bypass, Abd dg Sirua and Hertasning roads - Environment Management Supervisor : As Environment Management Institution is proponent - Environment Management Result Report : Result of Environment Management is reported to proponent and Bapedalda propinsi Sulawesi Selatan once in every 6 months. |

| No. | Environment Management Plan (RKL) | | | | | | | |
|---|--|--|--|--|--|--|--|---|
| | IMPACT ENVIRONMENT PARAMETER/ COMPONENT | IMPACT SOURCE | IMPACT CRITERIA | GOAL OF ENVIRONMENT MANAGEMENT | ENVIRONMENT MANAGEMENT | ENVIRONMENT MANAGEMENT LOCATION | ENVIRONMENT MANAGEMENT PERIODE | ENVIRONMENT MANAGEMENT INSTITUTION |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 5. Structure and Infrastructure Work | | | | | | | | |
| | <ul style="list-style-type: none"> ▪ Safety of road users ▪ Mamminasa bypass, Abd dg Sirua and Hertasning roads Esthetic | Execution of across bridge development , traffic equipment installation, tree cultivation etc..at Mamminasa bypass, Abd dg Sirua and Hertasning roads. | Road user and resident perception around Mamminasa bypass, Abd dg Sirua and Hertasning roads | Preventing incidence of negative impact, and develop the positive impact from activity of supporting structure at Mamminasa bypass, Abd dg Sirua and Hertasning roads. | <ul style="list-style-type: none"> ▪ Develop overpass at strategic location ▪ Executing every activity of according to standard criteria. ▪ Making better arrangement to settlement area of Mamminasa bypass, Abd dg Sirua and Hertasning roads . | Region of Mamminasa bypass, Abd dg Sirua and Hertasning roads. | period of environment Management will be done during construction execution of structure/infra structure | <p>- Environment Management Execution : As Environment Management Institution is Proponent of the project, in this case, construction executor of Mamminasa bypass, Abd dg Sirua and Hertasning roads Development</p> <p>- Environment Management Supervisor : As Environment Management Institution is proponent and Bapedalda Propinsi Sulawesi Selatan.</p> <p>- Environment Management Result Report : Result of Environment Management is reported to proponent and Bapedalda propinsi Sulawesi Selatan once in every 6 months.</p> |

| No. | Environment Management Plan (RKL) | | | | | | | |
|--|---|---|--|---|--|--|--|--|
| | IMPACT ENVIRONMENT PARAMETER/ COMPONENT | IMPACT SOURCE | IMPACT CRITERIA | GOAL OF ENVIRONMENT MANAGEMENT | ENVIRONMENT MANAGEMENT | ENVIRONMENT MANAGEMENT LOCATION | ENVIRONMENT MANAGEMENT PERIODE | ENVIRONMENT MANAGEMENT INSTITUTION |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| III. Post Construction Phase | | | | | | | | |
| 1. Operation of Mamminasa bypass, Abd dg Sirua and Hertasning roads | | | | | | | | |
| | Smoothness of transportation system | Operation activity of Mamminasa bypass, Abd dg Sirua and Hertasning roads Along the 66.5 km. | Road user perception of Mamminasa bypass, Abd dg Sirua and Hertasning roads. | <ul style="list-style-type: none"> ▪ Facilitating traffic current, especially for vehicles which needn't enter the downtown ▪ Decreasing traffic accident. ▪ Placing officer to do the arrangement of vehoile current transfer | Installing traffic equipments which can lead the main road users for entering the downtown centres | Mamminasa bypass, Abd dg Sirua and Hertasning roads. | done continuously during operational of Mamminasa bypass, Abd dg Sirua and Hertasning roads. | <p>Environment Management Execution: As institution of environment organizer is organizer of Mamminasa bypass, Abd dg Sirua and Hertasning roads.</p> <p>Environment Management Supervisor : As institution of environment organizer is proponent</p> <p>Environment Management Result Report : Result of Environment Management is reported to Proponent and Bapedalda of Sulawesi Selatan once in every 6 months.</p> |

| Environment Management Plan (RKL) | | | | | | | | |
|---|---|--|--|---|--|---|---|--|
| No. | IMPACT ENVIRONMENT PARAMETER/ COMPONENT | IMPACT SOURCE | IMPACT CRITERIA | GOAL OF ENVIRONMENT MANAGEMENT | ENVIRONMENT MANAGEMENT | ENVIRONMENT MANAGEMENT LOCATION | ENVIRONMENT MANAGEMENT PERIODE | ENVIRONMENT MANAGEMENT INSTITUTION |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 2. Maintenance Mamminasa bypass, Abd dg Sirua and Hertasning roads | | | | | | | | |
| | <ul style="list-style-type: none"> ➤ Esthetic angreen line ➤ Positive perception of local residents on the proper maintenance of the road | Maintenance activity of Mamminasa bypass, Abd dg Sirua and Hertasning roads. | Road user perception of Mamminasa bypass, Abd dg Sirua and Hertasning roads. | To develop the positive impact from development of Mamminasa bypass, Abd dg Sirua and Hertasning roads. | Doing maintenance of Area of Mamminasa bypass, Abd dg Sirua and Hertasning roads and maintain the green Line existence.. | Region of Mamminasa bypass, Abd dg Sirua and Hertasning roads | done according to requirement, during operational of Mamminasa bypass, Abd dg Sirua and Hertasning roads. | <ul style="list-style-type: none"> - Environment Management Execution : As Environment Management Institution is Proponent - Environment Management Supervisor : As Environment Management Institution is Ditjen Bina Marga Dep. Pekerjaan Umum dan Bapedalda Propinsi Sulawesi Selatan. - Environment Management Result Report Result of Environment Management is reported to Ditjen Bina Marga Depertemen Pekerjaan Umum and Bapedalda Propinsi Sulawesi Selatan once in 6 months |

Table 3.2. Plan of Environment Monitoring (RPL) of Development of Mamminasa bypass, Abd dg Sirua and Hertasning roads .

| No. | Monitoring Plan | | | | | | | Environment Monitoring Institution |
|-------------------------------|--|--|---|--|--|---|--|--|
| | Important Impact Monitored | Impact Source | Environment Parameter Monitored | Goal of Environment Monitoring Plan | Environment Monitoring Method | | | |
| | | | | | Method of Collecting and Data Analysis | Monitoring Location | Period and frequency of Monitoring | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| Pre-Construction Phase | | | | | | | | |
| 1. Land acquisition | | | | | | | | |
| | anxiety of land Owner along the the road | Activity of land acquisition for the development of Mamminasa bypass, Abd dg Sirua and Hertasning roads. | Incidence of anxiety of land owner along the location of Mamminasa bypass, Abd dg Sirua and Hertasning roads. | To know incidence of land owner anxiety residing in location of Mamminasa bypass, Abd dg Sirua and Hertasning roads. | Doing field observation and interview with the land owner along the road | Mamminasa bypass, Abd dg Sirua and Hertasning roads | Monitoring executed at the time of compensatory payment, done once during compensatory gift process. | <ul style="list-style-type: none"> • Environment Management Execution : As Environment Management Institution is Project Proponent in this case proponent and management of Mamminasa bypass, Abd dg Sirua and Hertasning roads. • Environment Management Supervisor : As Environment Management Institution is Ditjen Bina Marga Dep. Ditjen Bina Marga Dept. Pekerjaan Umum and BapedaldaPropinsi Sulawesi Selatan. • Environment Management Result : Report Result of Environment Management is reported to Ditjen Bina Marga Depertemen Pekerjaan Umum and Bapedalda Propinsi Sulawesi Selatan once in every 6 months. |

| No. | Monitoring Plan | | | | | | | Environment Monitoring Method |
|---|---|--|--|--|---|--|---|--|
| | Important Impact Monitored | Impact Source | Environment Parameter Monitored | Goal of Environment Monitoring Plan | Environment Monitoring Method | | | |
| | | | | | Method of Collecting and Data Analysis | Method of Collecting and Data Analysis | Method of Collecting and Data Analysis | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| II. CONSTRUCTION PHASE | | | | | | | | |
| 1. Labor Mobilization | | | | | | | | |
| | <ul style="list-style-type: none"> Job and work opportunity for local people | Construction work activities | <ul style="list-style-type: none"> The quantity of labor accept for the road constructi on work | To measure and monitor the efforts of proponent in developing the positive impacts | Field observation and interview with the local people around the Mamminasa bypass, Abd dg Sirua and Hertasning roads | Area surrounding the Mamminasa bypass, Abd dg Sirua and Hertasning roads | Once at the period of labor recruitment phase | <ul style="list-style-type: none"> Environment Management Execution : As Environment Management Institution is Project Proponent ini this case Construction Executor of Mamminasa bypass, Abd dg Sirua and Hertasning roads. Environment Management Supervisor :As Environment Management Institution is proponent and Badan Pengendalian Dampak Lingkungan Daerah Propinsi Sulawesi Selatan. Environment Management Result : Report Result of Environment Management is reported to Ditjen Bina Marga Depertemen Pekerjaan Umum and Bapedalda Propinsi Sulawesi Selatan once in every 6 months. |
| 2. Mobilization of Material and equipments | | | | | | | | |
| | <ul style="list-style-type: none"> Transportation Infrastructure passed by the material vehicle Air quality in residential area along Mamminasa bypass, Abd dg Sirua and Hertasning | Material transportation for the construction requirement of Mamminasa bypass, Abd dg Sirua and Hertasning roads development. | <ul style="list-style-type: none"> Damage of road infrastuct ure Traffic flows Public health Condition of quarry sites | <ul style="list-style-type: none"> Monitoring level of damage of road infrastructure passed by the transportation vehicles Monitoring gas and dust concentration in the region passed by transportation vehicles | Field observation and interview with the local people around the Mamminasa bypass, Abd dg Sirua and Hertasning roads Measurement of SO ₂ ,NO ₂ ,CO, O ₃ , Particles (TSP), PB, and noise based on | Area surrounding the Mamminasa bypass, Abd dg Sirua and Hertasning roads | During the material transportation and reporting every 6 months | <ul style="list-style-type: none"> Environment Management Execution As Environment Management Institution is Proponent of the project, in this case executor project of Mamminasa bypass, Abd dg Sirua and Hertasning roads Environment Management Supervisor As Environment Management Institution is Bapedalda Propinsi Sulawesi Selatan. Environment Management Result Report : Result of Environment Management is reported to Bapedalda Propinsi Sulawesi Selatan once in every 6 months. |

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|--|--|--|--|--|--|---|--|--|
| | <ul style="list-style-type: none"> ▪ roads. ▪ Traffic jam along the routes of vehicles ▪ Disturbance of the health of inhabitants at the neighbourhood. | | | <ul style="list-style-type: none"> ▪ Monitoring the traffic jam incidents ▪ Monitoring the health condition of neighbourhood ▪ Monitoring the condition of quarry sites | <p>the environment standard derived in the South Sulawesi Governors decree No 14/2003 .</p> <p>Monitoring the traffic accident incidents</p> | | | |
| 3. Relocation of utilities | | | | | | | | |
| | <ul style="list-style-type: none"> ▪ Perception of clean water users | <p>Interruption of raw water flows during the road construction phase</p> | <ul style="list-style-type: none"> ▪ Negative perception of water users | <ul style="list-style-type: none"> ▪ Monitoring the construction of temporary or divert channel | <p>Field observation and interview with the local people around the Mamminasa bypass, Abd dg Sirua and Hertasning roads</p> | <p>Area surrounding the Mamminasa bypass, Abd dg Sirua and Hertasning roads</p> | <p>During the material transportation and reporting every 6 months</p> | <ul style="list-style-type: none"> - Environment Management Execution As Environment Management Institution is Proponent of the project, in this case executor project of Mamminasa bypass, Abd dg Sirua and Hertasning roads - Environment Management Supervisor As Environment Management Institution is Bapedalda Propinsi Sulawesi Selatan. - Environment Management Result Report : Result of Environment Management is reported to Bapedalda Propinsi Sulawesi Selatan once in every 6 months. |
| 4.Land clearing and preparation | | | | | | | | |
| | <ul style="list-style-type: none"> ▪ Air quality around the location ▪ Traffic jam ▪ Disruption of the flora and faune ▪ Health problem of the | <p>Land clearing and lost of kind of vegetations in the location of onstruction work of Bypass, Abd. Dg Sirua and Hertasning Roads</p> | <ul style="list-style-type: none"> ▪ The air quality exceeding the standard ▪ Incidents of traffic jam ▪ Variety of flora and | <ul style="list-style-type: none"> ▪ Monitoring the air quality ▪ Monitoring the incidents of traffic jam ▪ Monitoring hte variety of flora and fauna ▪ Monitoring the | <p>Field observation and interview with the local people around the Mamminasa bypass, Abd dg Sirua and Hertasning roads</p> <p>Measurement of SO₂, NO₂, CO, O₃,</p> | <p>Area surrounding the Mamminasa bypass, Abd dg Sirua and Hertasning roads</p> | <p>done during the land clearing and preparation work and reporting every 6 months</p> | <ul style="list-style-type: none"> - Environment Management Execution As Environment Management Institution is Proponent of the project, in this case executor project of Mamminasa bypass, Abd dg Sirua and Hertasning roads - Environment Management Supervisor As Environment Management Institution is Bapedalda Propinsi Sulawesi Selatan. - Environment Management Result Report : |

| | | | | | | | | |
|--|--------------|--|---|----------------------------------|---|--|--|---|
| | local people | | fauna ■ Health condition of the local people | health condition of local people | Particles (TSP), PB, and noise based on the environment standard derived in the South Sulawesi Governors decree No 14/2003 . Monitoring the traffic accident incidents | | | Result of Environment Management is reported to Bapedalda Propinsi Sulawesi Selatan once in every 6 months. |
|--|--------------|--|---|----------------------------------|---|--|--|---|

| No. | Monitoring Plan | | | | | | | |
|--|--|--|--|--|---|--|---|---|
| | Important Impact Monitored | Impact Source | Environment Parameter Monitored | Goal of Environment Monitoring Plan | Environment Monitoring Method | | | Environment Monitoring Method |
| | | | | | Method of Collecting and Data Analysis | Method of Collecting and Data Analysis | Method of Collecting and Data Analysis | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| 5. Road and Bridge Construction | | | | | | | | |
| | <ul style="list-style-type: none"> ▪ Traffic jam ▪ Decreasing of water quality around the location ▪ Formation of water pool ▪ Decreasing of air quality • Health problem of the local people | Development activity of Mamminasa bypass, Abd dg Sirua and Hertasning roads. | Incidence of Traffic jam Air quality exceeding the standard level Flood prone area Health condition of Local people | Monitoring the impacts caused by activity of road-works and bridge of Mamminasa bypass, Abd dg Sirua and Hertasning roads. | Field observation and interview with the local people around the Mamminasa bypass, Abd dg Sirua and Hertasning roads Measurement of SO ₂ , NO ₂ , CO, O ₃ , Particles (TSP), PB, and noise based on the environment standard derived in the South Sulawesi Governors decree No 14/2003 . Monitoring the traffic accident incidents | Area surrounding the Mamminasa bypass, Abd dg Sirua and Hertasning roads | Monitoring executed during of activity of road and bridge construction, reporting every 6 months. | <ul style="list-style-type: none"> • Environment Management Execution : As Environment Management Institution is Project Proponent ini this case Construction Executor of Mamminasa bypass, Abd dg Sirua and Hertasning roads. • Environment Management Supervisor :As Environment Management Institution is proponent • Environment Management Result : Report Result of Environment Management is reported to Proponent and Bapedalda Propinsi Sulawesi Selatan once in every 6 months. |

| No. | Monitoring Plan | | | | | | | Environment Monitoring Method |
|---|---|---|---|--|--|---|--|--|
| | Important Impact Monitored | Impact Source | Environment Parameter Monitored | Goal of Environment Monitoring Plan | Environment Monitoring Method | | | |
| | | | | | Method of Collecting and Data Analysis | Method of Collecting and Data Analysis | Method of Collecting and Data Analysis | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| 6. Structure/Infrastructure Construction | | | | | | | | |
| | - Safety of road users - Mamminasa bypass, Abd dg Sirua and Hertasning roads Esthetic | Execution of accross bridge development, traffic equipment installation, tree cultivation etc.at Mamminasa bypass, Abd dg Sirua and Hertasning roads. | Resident perception, especially living around s and bridge Mamminasa bypass, Abd dg Sirua and Hertasning roads. | Preventing incidence of negative impact, and develop the positive impact from activity of supporting structure at Mamminasa bypass, Abd dg Sirua and Hertasning roads. | Doing field observation and interview with the resident of around Mamminasa bypass, Abd dg Sirua and Hertasning roads. | Monitoring location is Mamminasa bypass, Abd dg Sirua and Hertasning roads. | Monitoring executed during activity of structure/ infrastructure construction, conducted once in every 6 months. | <ul style="list-style-type: none"> • Environment Management Execution : As Environment Management Institution is Project Proponent ini this case Construction Executor of Mamminasa bypass, Abd dg Sirua and Hertasning roads. • Environment Management Supervisor : As Environment Management Institution is proponent and Badan Pengendalian Dampak Lingkungan Daerah Propinsi Sulawesi Selatan • Environment Management Result : Report Result of Environment Management is reported to Proponent and Bapedalda Propinsi Sulawesi Selatan once in every 6 months. |

| No. | Monitoring Plan | | | | | | | Environment Monitoring Method |
|---|--|--|---|---|--|---|--|--|
| | Important Impact Monitored | Impact Source | Environment Parameter Monitored | Goal of Environment Monitoring Plan | Environment Monitoring Method | | | |
| | | | | | Method of Collecting and Data Analysis | Method of Collecting and Data Analysis | Method of Collecting and Data Analysis | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| I. POST CONSTRUCTION PHASE | | | | | | | | |
| 1. Operation Mamminasa bypass, Abd dg Sirua and Hertasning roads | | | | | | | | |
| | Important impact monitored during the operational activity of Mamminasa bypass, Abd dg Sirua and Hertasning roads is fluency of transportation system. | Activity of Operation of Mamminasa bypass, Abd dg Sirua and Hertasning roads as long as 58 km. | Perception of Users of Mamminasa bypass, Abd dg Sirua and Hertasning roads. | -To know the smoothness of traffic current, especially for vehicles which needn't enter the downtown center in region passed by. -Decreasing traffic accidents | Doing field observation and interview with the resident of around Mamminasa bypass, Abd dg Sirua and Hertasning roads. | Monitoring location is Mamminasa bypass, Abd dg Sirua and Hertasning roads. | Monitoring Executed during operational of Mamminasa bypass, Abd dg Sirua and Hertasning roads, conducted once in 6 months. | <ul style="list-style-type: none"> • Environment Management Execution : As Environment Management Institution is management of Mamminasa bypass, Abd dg Sirua and Hertasning roads. • Environment Management Supervisor : As Environment Management Institution is proponent. • Environment Management Result : Report Result of Environment Management is reported to Proponent and Bapedalda Propinsi Sulawesi Selatan once in every 6 months. |

| No. | Monitoring Plan | | | | | | | Environment Monitoring Method |
|--|--|---|--|---|--|---|--|---|
| | Important Impact Monitored | Impact Source | Environment Parameter Monitored | Goal of Environment Monitoring Plan | Environment Monitoring Method | | | |
| | | | | | Method of Collecting and Data Analysis | Method of Collecting and Data Analysis | Method of Collecting and Data Analysis | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 2. Maintenance of Mamminasa bypass, Abd dg Sirua and Hertasning roads | | | | | | | | |
| | Esthetics and the formation of green belts Positive perception of local residents on the proper maintenance of the road | Maintenance Activity of Mamminasa bypass, Abd dg Sirua and Hertasning roads | Perception of User Society of Mamminasa bypass, Abd dg Sirua and Hertasning roads. | To evaluate the positive impacts of the development of Mamminasa bypass, Abd dg Sirua and Hertasning roads. | Doing field observation and interview with the resident of around Mamminasa bypass, Abd dg Sirua and Hertasning roads. | Monitoring location is Mamminasa bypass, Abd dg Sirua and Hertasning roads. | Monitoring executed during maintenance of Mamminasa bypass, Abd dg Sirua and Hertasning roads, conducted once in 6 months. | <ul style="list-style-type: none"> • Environment Management Execution : As Environment Management Institution is Proponent • Environment Management Supervisor : As Environment Management Institution is Ditjen Bina Marga Departemen Pekerjaan Umum and Bapedalda Propinsi Sulawesi Selatan. • Environment Management Result : Report Result of Environment Management is reported to Ditjen Bina Marga Departemen Pekerjaan Umum and Bapedalda Propinsi Sulawesi Selatan once in every 6 months. |