

## **CHAPTER 3 IMPLEMENTATION PLAN**

### **3.1 Implementation Plan**

The Ministry of Works (MOW) of the Government of Tanzania will be responsible for the administrative control of the Project, including administration, collaboration, coordination and preparations for grant and the technical cooperation agreed upon between the two governments and for technical control as well as supervision. Meanwhile, it is planned that the TANROAD will be responsible for road maintenance in the post-project period.

In connection with the implementation of the Project, the MOW will participate in the basic design work conducted by the JICA and will conclude a service agreement with the Japanese Consultant who is fully aware of the required work under the Project. This Consultant will conduct the following work based on full knowledge of the role of a consultant in a grant aid project.

- Preparation of tender documents
- Supportive work regarding pre-qualification, tender and signing of contract
- Work supervision

The actual construction work will be conducted by a Japanese construction company (the Contractor) selected in accordance with the grant aid scheme of the Government of Japan. The Contractor will procure the necessary equipment and materials in an efficient and appropriate manner and will conduct the construction work in accordance with the work schedule.

#### **3.1.1 Implementation Concept**

##### **(1) Project Implementation Principles**

Assuming the Project's implementation within the framework of the grant aid scheme of the Government of Japan, the construction work must take the following principles into proper consideration.

- The maximum utilization of local labor, equipment and materials will be planned in order to contribute to the creation of employment opportunities, facilitation of technology transfer and vitalization of the local economy, as well as to reduce a risk of social conflicts that might arise.
- A close liaisoning system incorporating the MOW of the Government of Tanzania, the Consultant and the Contractor will be established to ensure the smooth implementation of the Project.
- A realistic work plan will be formulated, taking the pattern of rain in the Project Area, required period for the procurement of equipment and materials and the employment of an appropriate construction method, etc. into consideration.
- The Japanese Contractor will be responsible for the construction of facilities and the procurement of equipment, etc. in accordance with the relevant contract.
- The Contractor should establish a camp yard at a site provided by the MOW free of charge to proceed with the construction work.

- The relocation or removal of utility facilities which disrupt the work must be completed by the MOW prior to the commencement of the construction work.
- The MOW will also be responsible for coordinating the work with local people and those responsible for the management of the facilities affected by the Project with the assistance of the Consultant and the Contractor.
- The Contractor will hand over each road section of which the improvement work has been completed to the MOW to allow such section to serve vehicle traffic. The TANROAD will be responsible for the maintenance of the road sections handed over by the Contractor.

## (2) Work Implementation System

There is no local construction company in Tanzania which owns suitable equipment and machinery to conduct large-scale road improvement work by itself. Although local companies do conduct the repair of major roads as subcontractors of the MOW, such problems as slow work progress and inferior quality, partly attributable to insufficient equipment and funding, etc., can be pointed out.

Consequently, the Japanese Contractor will, in principle, be directly responsible for the implementation of the Project, assuming the provision of grant aid cooperation by the Government of Japan, and will use local companies as subcontractors to conduct simple work under the management, technical guidance and work supervision of the Contractor in order to improve the capability of local companies under its management.

## (3) Dispatch of Japanese Engineers

Tanzania has a total population of 31 million (1998 ) and its primary education enrolment rate of 80% is much higher than that of neighbouring countries. However, the enrolment rate for secondary education is as low as 6 - 7%. Higher education is only provided by the University of Dar es Salaam, the Sokoine Agricultural College and three technical colleges and, therefore, there is an absolute shortage of highly qualified engineers.

For the Project, it is planned to procure/produce asphalt mixture and concrete through locally leased plants or local companies and to use local subcontractors for the paving work, earth work, subgrade work and structural work. Accordingly, Japanese engineers will be dispatched to Tanzania to operate and maintain the asphalt plants, to supervise the earth work and paving work and to control the quality of the work results, all of which will have major implications on the successful outcome of the construction work.

### **3.1.2 Implementation Conditions**

The following points must be carefully noted in regard to the construction work under the Project in view of the labour, social, site and material procurement conditions in Tanzania.

#### (1) Safety of Work While Permitting Traffic Flow

As the target road is the only access road to Mto wa Mbu and Karatu as well as to such tourism resources as the Lake Manyara National Park and the Ngorongoro Crater, it will be practically impossible to halt the traffic while the planned work is conducted. It will be essential to conduct the

work while ensuring the traffic flow and safety of workers, pedestrians and wild animals as well as domestic animals. The work will, therefore, be conducted by full-time personnel responsible for traffic safety being appointed at each section.

#### (2) Environmental Conservation During Work Period

- The Project Area is adjacent to a national park and nature reserve and wild animals move around the Project Area. Environmental monitoring will be conducted in accordance with the monitoring plan for such factors as dust and muddy water caused by such activities as the creation of soil pits, disposal of surplus soil, banking work and paving work, etc., presupposing the conservation of the present environment, and the results will be regularly reported to the Tanzanian side. When the monitored data substantially exceeds the pre-work data or relevant environmental standards, remedial measures will be examined in consultation with the Tanzanian side.
- In order to protect wild species from traffic accident, measures mentioned above have been introduced in the plan as well as co-operation of the contractor has been also scheduled in the environmental monitoring program. In addition, environmental monitoring by the Tanzania Team will be conducted with co-operation of the contractor.
- The waste oil and soil of construction shall be managed by Environmental management team, who shall indicate the contractor in regard to waste management and disposal.
- The level of noise during the construction period is managed by Environmental management team. And, after finishing the construction, the level of noise shall be reduced from present circumstance because of asphalt pavement.
  
- Collecting of soil and sand
  
- The borrow pit shall be located in an area where no problem concerns between Makuyuni and Mto-wa-Mbu. The vacant lot of borrow pit is utilized as reservoir, and its structure is designed in considering prior to the safety of residents and wild life.
- Collecting sand is not from river-bed, but from around the river. However, the contractor shall pay its attention to the collapse of riverbank. Moreover, the water quality of Lake Manyara is managed regularly by Environmental management team.

#### (4) Testing of Base Course Material

The use of locally available pozorana is planned under the Project as the base course material to reduce the construction cost. As the ratios of Pozorana constituents vary from one site to another as does the strength, proper quality control will be conducted in regard to pozorana.

#### (5) Safety Measures for Work in Mountain Area

In the sections beyond Mto wa Mbu, the work will mainly consist of the cutting of steep cliffs. This will make the installation of fencing necessary to protect passing vehicles and site workers from falling rocks. In particular, there will be a danger of the inflow of rainwater into cracks at the time of rain which could result in falling rocks or landslides. Watchmen will, therefore, be deployed to check for any slope changes to ensure the safe progress of the work. If any change is observed, the work will be suspended until the safety has been confirmed.

#### (6) Respect for Labour Standards

The Contractor will employ local workers in accordance with the Labour Standards Law in Tanzania which demand that employers abide by the following obligations.

- Basic working hours : 45 hours/week
- Over-time pay : hourly wage x 1.5 for over-time beyond 45 hours/week  
hourly wage x 2 for work on Sundays and national holidays
- Transport expenses and housing allowance : payment of appropriate transport expenses and housing allowance
- Paid holidays : 28 days/year; unused paid holidays are purchased by the employer
- Retirement allowance : (one month's wage) + (wage equivalent to days worked) + (remaining paid holidays unbought)
- Maternity leave : up to 3 months with a doctor's note
- Tax payment : local workers are liable to income tax (PAYE: Pay as You Earn)
- Social insurance : equal contributions by worker and employer

(7) Respect for Local Customs

When calculating the work schedule and total working days, etc., the religious and traditional customs in Tanzania must be taken into proper consideration. The national holidays in Tanzania in the year 2000 are listed in Table 3-1.

**Table 3-1 National Holidays in Tanzania in 2000**

Date		National Holiday
January	1 <sup>st</sup>	New years days
	8 <sup>th</sup> & 9 <sup>th</sup>	Islam days
January	12 <sup>th</sup>	Zanzibar Revolution days
March	17 <sup>th</sup>	Islam days
April	21 <sup>st</sup>	Good Friday
	24 <sup>th</sup>	Easter Monday
	26 <sup>th</sup>	Union days
May	1 <sup>st</sup>	Workers days
June	15 <sup>th</sup>	Islam days
July	7 <sup>th</sup>	National days
August	8 <sup>th</sup>	Farmer's days
December	9 <sup>th</sup>	Independence days
	25 <sup>th</sup>	Christmas days
	26 <sup>th</sup>	Boxing days

**3.1.3 Scope of Work**

The Government of Japan and the Government of Tanzania will be responsible for the work described below for the implementation of the Project.

(1) Scope of Work for Japanese Side

1) Construction of Facilities

- Construction of those facilities indicated in 2.2 - Basic Concept of the Project and 2.3 - Basic Design
- Improvement of drainage facilities related to the above item up to the connection point with the existing drainage system
- Construction of traffic safety facilities related to the first item
- Construction of temporary facilities (camp yard and office building, etc.)

2) Procurement of Equipment and Materials

- Procurement of road construction equipment and materials and also construction machinery indicated in 2.3 - Basic Design

3) Safety Measures

- Safety control and safety measures required for the work

4) Consultancy Work

- Execution of the detailed design work, preparation of the tender and contract documents and supervision of the work indicated in 2.3 - Basic Design

(2) Scope of Work for Tanzanian Side

1) Expropriation of Land and Compensation

- Expropriation of the land required for the construction of facilities indicated in 2.3 - Basic Design and the removal of and compensation for buildings, etc. which hamper the planned work under the Project

2) Relocation of Facilities and Other Work

- Relocation of water supply pipes, electric poles, transmission/distribution lines and telephone lines, etc. which hamper the planned work under the Project
- Provision of temporary sites (for camp yard and office building, etc.) free of charge
- Provision of a soil pit(s) and quarry for aggregate and stone which are required for the construction of facilities indicated in 2.3 - Basic Design
- Deployment of local supervisors, provision of an office and means of transport for local supervisors and payment of their expenses

3) Safety Measures

- Arrangement of security for temporary facilities and work sites

4) Miscellaneous

- Provision of all conveniences for the entry to and stay in Tanzania of third country nationals (other than Tanzanian nationals)
- Exemption from or payment of customs duty, domestic taxes and levies imposed by the Government of Tanzania

### 3.1.4 Work Supervision Plan

#### (1) Consultancy Work

##### 1) Scope of Consultancy Work

The Project will commence when the Government of Japan and the Government of Tanzania sign the E/N regarding grant aid for the Project. Following the signing of the E/N, the Consultant will conclude a consultancy agreement regarding assistance for the tender process and supervision of the construction work with the MOW which is the project implementation body on the Tanzanian side in accordance with the scope and procedure of the grant aid scheme of the Government of Japan based on the letter of recommendation issued by the JICA. The main types of work involved in this agreement are described next.

##### a. Preparation of Tender Documents Stage

Based on the findings of the Basic Design Study, the Consultant will conduct the detailed design and will prepare the contractual drawings for the construction work for their approval by the MOW.

- Design standards
- Detailed design study report
- Design drawings
- Bill of quantities and cost estimation
- Work implementation plan
- Tender documents

##### b.. Tender Stage

The MOW will conduct the tender with the assistance of the Consultant for the following matters.

- Public announcement of tender
- Pre-qualification
- Briefing on tender procedure and construction sites
- Evaluation of bids
- Contract negotiations

##### c. Work Supervision Stage

Following the certification of the construction agreement by the Government of Japan, the Consultant will issue a notice to proceed with the work to the Contractor to begin its own supervisory work. At the work supervision stage, the Consultant will directly report the work progress situation to the MOW and the Embassy of Japan in Tanzania while conducting the administrative work in regard to work progress, quality, safety and payment for the Contractor and providing technical advice and proposals to improve the work of the Contractor. If necessary, the Consultant will discuss pending issues with the JICA, the Embassy of Japan in Tanzania and the Government of Tanzania.

#### 2) Implementation Regime

a. Implementation Regime for Detailed Design, Tender Document Preparation and Assistance for Tender

The assistance of the Consultant for the tender process will include the preparation of tender documents. The Consultant will pay particular attention to the following matters with full knowledge of the fact that the Project will be implemented under the grant aid scheme of the Government of Japan.

- The rules in the agreement should conform to the relevant international standards.
- The work specifications used by the Government of Tanzania should be taken into proper consideration.
- The engineers responsible for the detailed design and tender should be selected from among those involved in the Basic Design Study.

The personnel plan for the preparation of the tender documents and assistance for the tender should feature those people who are familiar with the situation of the site of the Project and the grant aid scheme of the Government of Japan.

- Chief engineer : coordination to ensure the smooth progress of all of the work; supervision of the preparation of the tender documents; assistance for the tender
- Road engineer (1) : detailed design; preparation of the technical specifications and tender documents, including the agreement for the construction work based on the basic design; assistance for the tender
- Road engineer (2) : preparation of the detailed design and work order documents; assistance for road engineer (1); assistance for the tender
- Structural and drainage engineers : detailed design of structures and drainage facilities
- Material engineer : survey on and testing of aggregate and banking and other materials
- Work plan/cost estimation : preparation of the work order documents; preparation of the pre-qualification documents; assistance for the tender
- Environmental assessment/monitoring : determination of environmental standards during and after the work; preparation of the monitoring plan



b. Work Supervision Regime

A road engineer with experience of grant aid projects will be dispatched as a full-time supervisor on-site. This chief supervisor will be dispatched at critical stages of the construction work for work coordination and other purposes. The roles of those engineers whose services are deemed to be required at different stages of the construction work are described below.

- Chief supervisor : work coordination and technical control to ensure the smooth implementation of the work
- Full-time engineer : daily management and process control
- Materials engineer : supervision and guidance regarding the road paving work, including the testing of banking materials, aggregate for paving and aggregate for concrete and control of the quality, mixing and strength of asphalt concrete and plain concrete
- Facility design engineer : dealing with discrepancies regarding the drainage facilities and auxiliary facilities which may occur during the site work vis-a-vis the relevant basic design specifications
- Environmental survey engineer : control of environmental assessment and monitoring work during the work period

(2) Construction Supervision

1) Basic Framework for Work Implementation

As the construction of facilities under the Project assumes the implementation of the Project with Japanese grant aid, the construction work should be directly conducted by the Japanese Contractor. However, it is planned that the Contractor will use local construction companies as subcontractors to conduct simple work under its management, technical guidance and work supervision so that local companies can develop their technical capability as well as maintenance capability for the new facilities constructed under the Project. (Fig. 3-1)

2) Temporary Facilities Construction Work

a. Temporary Yard

On receiving the notice to proceed, the Contractor will immediately start to arrange the required construction machinery, construction materials and manpower. The camp yard will be established at a site which will be provided by the Tanzanian side free of charge and such temporary facilities as an office building and stock yard, etc. will be constructed (see Fig. 3-2).

**Fig. 3-1 Layout of Camp Yard**

b. Temporary Power and Water Supply

Since little water is available from existing wells, the water source for construction shall be taken from new wells, which will be developed by the contractor at Makuyuni, Mto-wa-Mbu and Karatu. The power for the construction work will mainly rely on the public power supply.

3) Principal Work

The Project aims at improving a local trunk road which functions as a main transportation route for agricultural products as well as an access road to the Lake Manyara National park and other tourism resources. Accordingly, the utmost priority must be given to maintaining a safe traffic flow and total road closure to traffic during the work period must be avoided. In other words, the work must proceed while ensuring the sufficient functioning of the road while accepting a resulting decline of the work efficiency. In principle, the work will be conducted in the daytime and night work will be conducted when such work is absolutely necessary.

The work on the subject road will be conducted taking the requirements described below into full consideration.

- a) When a bypass is planned as part of the improvement plan, the existing road will be used as a detour.
- b) At those sections where widening of the present road width is planned, a single carriageway will be kept open to allow vehicle flow while the improvement work is conducted on the other carriageway.

4) Work Control

Because of the use of local subcontractors, it will be necessary for the Japanese Contractor to conduct proper quality control as well as schedule control. The project implementation plan, therefore, provides for frequent interim inspections and schedule control for the work to be conducted by local subcontractors to ensure high work quality. A Japanese engineer specially responsible for such inspection and quality control will be posted on-site.

5) Traffic Control During Construction Work

In principle, total road closure will not be demanded under the Project. However, the implementation of the planned work while allowing vehicle flow will require the Contractor to prepare an implementation plan which deploys personnel responsible for traffic safety at those sections where the work is in progress.

The Project intends the improvement of an existing road and one problem is how to secure vehicle flow on the road while the work is in progress. It will, therefore, be necessary to conduct the work on one side at a time, if possible, while accepting a reduction of the work efficiency.

### **3.1.5 Procurement Plan**

#### **(1) Procurement of Construction Equipment and Materials**

The main construction materials to be procured under the Project are cement, asphalt, reinforcing bars, steel sheets and secondary concrete products. Most construction equipment/machinery can be procured in Dar es Salaam.

##### **Portland Cement**

There are several manufacturers of Portland cement, including Tanga Cement and Twinga cement. Procurement from Tanga Cement is desirable in view of the shorter transportation distance. No problems are currently anticipated in regard to the supply as well as quality of the cement produced by these manufacturers.

##### **Concrete**

There is no local producer of fresh concrete. A local company usually sets up an on-site batcher plant to produce concrete with an appropriate mixing ratio. In the case of small quantities, manual mixing may be conducted.

##### **Reinforcing Bars**

The reinforcing bars are produced in Tanga, Dar-es-Salaam. The local procurement of aggregate should, therefore, not pose any problems. Moreover, be possible to use reinforcing bars from South Africa, Russia and East Europe.

##### **Secondary Concrete Products**

Kerb stones, U-shaped ditches and concrete pipes, etc. are manufactured in Dar es Salaam from which they can be supplied to the Project Area. However, the long transportation distance poses a problem. While there are some local traders who manufacture and market these products near Arusha, their activities are best described as a home industry. The quality, quantity and punctual delivery of their products are, therefore, questionable. In short, it is desirable that the Contractor make his own secondary concrete products.

##### **Asphalt Emulsion**

The use of locally produced asphalt emulsion is best avoided because of problems of quality and stable supply. It will, therefore, be necessary to import asphalt emulsion from South Africa via a local agent in Dar es Salaam.

##### **Aggregate**

Three local companies near Arusha produce and market aggregate. A company in Dar es Salaam has a plant which can be transferred to near Arusha for local production and marketing. The local procurement of aggregate should, therefore, not pose any problems.

##### **Asphalt**

Several local companies in Dar es Salaam market asphalt. A production plant can be transferred near to Arusha for local production. The local procurement of asphalt should, therefore, not pose any problems.

#### Construction Equipment and Machinery

Several local companies in Dar es Salaam have construction equipment and machinery to conduct large-scale road work which can be leased for the Project.

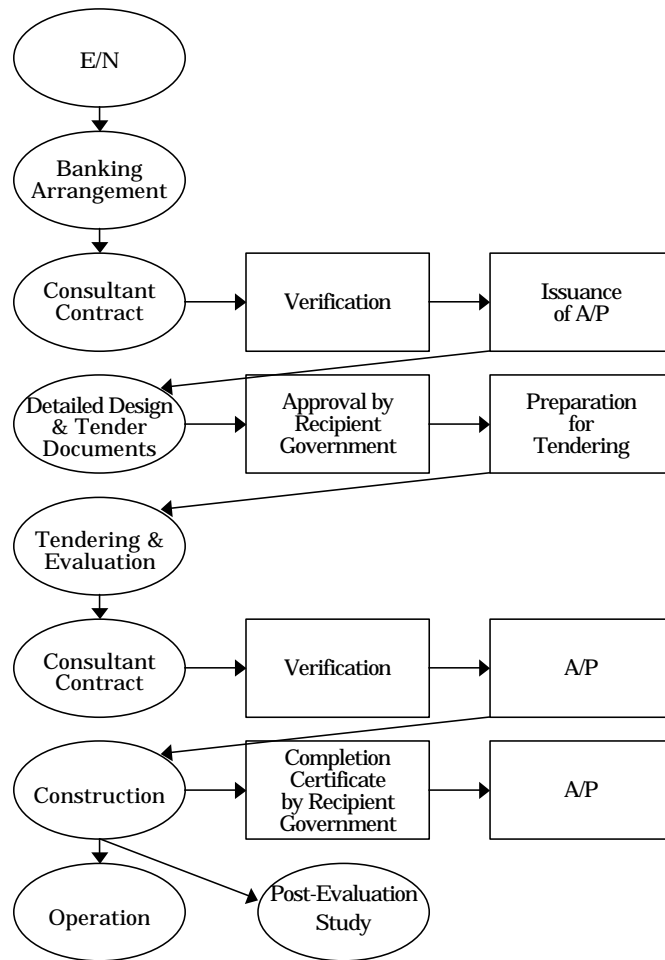
**Table 3-1 Procurement Sources of Construction Materials and Equipment, etc.**

Item	Tanzania	Third Country	Japan
Cement	O		
Concrete	O		
Secondary Concrete Products	O		
Asphalt	O		
Aggregate Plant	O		
Asphalt Plant	O		
Construction Machinery	O		
Reinforcing Bars	O		
Equipment	O		

#### 3.1.6 Implementation Schedule

Following the signing of the E/N in regard to the consultancy work (assistance for the tender and supervision of the construction work) and the main work, the Consultant will immediately conclude a consultancy contract with the MOW and will officially commence the Project as a grant aid project of the Government of Japan. To assist the tender to be held by the Government of Tanzania, the Consultant will provide assistance for a series of tender-related work, i.e. pre-qualification, tender, selection of the Contractor and signing of the agreement for the construction work, etc. The Contractor will then conclude the construction contract with the Government of Tanzania. Following approval of the contents of the construction work by the Government of Japan, the Contractor will commence the work on receiving the relevant notice to proceed by the Consultant.

Assuming the implementation of the Project under the grant aid scheme of the Government of Japan, the Project will be implemented in accordance with the processes described in Fig. 3-2.



Note (1)E/N : Exchange of Note  
 (2)A/P : Authorization to pay

**Fig. 3-2 Project Implementation Processes Under Grant Aid Scheme**

The Project is divided into the following four stages for its actual implementation in line with the principles described in 2.3 - Basic Design and in consideration of the urgency, size, contents and cost of the Project and the anticipated grant aid for the Project.

Stage 1: Detailed design Stage

- Detailed design : 5.0 months

Stage 2-1: From 0.0km to 9.0km ( up to construction of Base Course )

- Construction period : 10.5 months

Stage 2-2: From 9.0km to 40.0km ( up to construction of Base Course )

- Construction period : 12.0 months

Stage 2-3: From 40.0km to 71.0km ( up to construction of Base Course )  
 From 0.0km to 46.2km ( construction of Surface Course )

- Construction period : 12.0months

Stage 2-4: From 71.0km to 76.5km (End point) ( up to construction of Base Course )  
 From 46.2km to 76.5km ( construction of Surface Course )

- Construction period : 4.5 months

The resulting implementation schedule for the Project is shown in Table 3-3. The total implementation period is estimated to be approximately 44 months, including 5.0 months for the detailed design Stage, 10.5 months for the Stage 2-1 construction work, 12.0 months for the Stage 2-2 construction work, 12.0 months for the Stage 2-3 construction work and 4.5 months for the Stage 2-4 construction work.

**Table 3-3 Makuyuni-Ngoro Ngoro Road Improvement Project Implementation Schedule**

			1	2	3	4	5	6	7	8	9	10	11	12
	Detail Design	Field survey Work in Japan	[Gantt bar from month 1 to 5.5]										5.0 month	
Team 1	Tender preparation		[Gantt bar from month 1 to 10.5]										10.5 month	
	Construction	Preparation of Work	[Gantt bar from month 1 to 10.5]										10.5 month	
		Earth Work	[Gantt bar from month 1 to 10.5]										10.5 month	
		Pavement Work	[Gantt bar from month 1 to 10.5]										10.5 month	
		Drainage Work	[Gantt bar from month 1 to 10.5]										10.5 month	
		Structure Work	[Gantt bar from month 1 to 10.5]										10.5 month	
		Miscellaneous Work	[Gantt bar from month 1 to 10.5]										10.5 month	
Finishing Work	[Gantt bar from month 1 to 10.5]										10.5 month			
Team 2	Construction	Preparation of Work	[Gantt bar from month 1 to 12.0]										12.0 month	
		Earth Work	[Gantt bar from month 1 to 12.0]										12.0 month	
		Pavement Work	[Gantt bar from month 1 to 12.0]										12.0 month	
		Drainage Work	[Gantt bar from month 1 to 12.0]										12.0 month	
		Structure Work	[Gantt bar from month 1 to 12.0]										12.0 month	
		Miscellaneous Work	[Gantt bar from month 1 to 12.0]										12.0 month	
		Finishing Work	[Gantt bar from month 1 to 12.0]										12.0 month	
Team 3	Construction	Preparation of Work	[Gantt bar from month 1 to 12.0]										12.0 month	
		Earth Work	[Gantt bar from month 1 to 12.0]										12.0 month	
		Pavement Work	[Gantt bar from month 1 to 12.0]										12.0 month	
		Drainage Work	[Gantt bar from month 1 to 12.0]										12.0 month	
		Structure Work	[Gantt bar from month 1 to 12.0]										12.0 month	
		Miscellaneous Work	[Gantt bar from month 1 to 12.0]										12.0 month	
		Finishing Work	[Gantt bar from month 1 to 12.0]										12.0 month	
Team 4	Construction	Preparation of Work	[Gantt bar from month 1 to 4.5]										4.5 month	
		Earth Work	[Gantt bar from month 1 to 4.5]										4.5 month	
		Pavement Work	[Gantt bar from month 1 to 4.5]										4.5 month	
		Drainage Work	[Gantt bar from month 1 to 4.5]										4.5 month	
		Structure Work	[Gantt bar from month 1 to 4.5]										4.5 month	
		Miscellaneous Work	[Gantt bar from month 1 to 4.5]										4.5 month	
		Finishing Work	[Gantt bar from month 1 to 4.5]										4.5 month	
Total			44 month											

### 3.1.7 Obligations of the Government of Tanzania

The Government of Tanzania will undertake the following work for the implementation of the Project.

- To provide data and information required for the implementation of the Project.
- To secure the necessary road sites
- To relocate or remove utility facilities which hamper the road work
- To ensure the speedy customs clearance of the equipment procured in South Africa
- To exempt the equipment, etc. procured in accordance with certified contracts and Japanese nationals working for the Project from customs duty, inland taxes and levies
- To provide all conveniences for persons providing services in accordance with certified contracts for their entry to and stay in Tanzania to perform their assigned duties
- To open a project account at a foreign exchange bank in Japan
- To issue the authorisation for payment
- To bear the costs of that work which is not included in the scope of work for the Japanese side
- To secure the necessary personnel and budget for the effective and efficient operation of the equipment provided under the Project
- To provide soil for the road banking work free of charge
- To provide a quarry where the aggregate for concrete and asphalt can be collected free of charge
- To provide a site to house the temporary facilities (camp yard and office building, etc.)

**Table 3-2 Estimation of Rerouting/Relocation Costs**

Item	Unit	Quantity	Cost (Unit: '000 Tshs)
Rerouting of Water Supply Lines	m	16,500	618,750
Rerouting of Power Lines	m	2,900	108,750
Rerouting of Telephone Lines	m	7,110	231,075
Relocation of Buildings (D Rank)	m <sup>2</sup>	2,400	194,400
Relocation of Buildings (E Rank)	m <sup>2</sup>	2,100	100,800



### 3.2 Operation and Maintenance Plan

The maintenance work required after the completion of the Project will consist of cleaning of the road and drainage facilities and water supply to public toilets, etc. The annual quantity and cost required for road maintenance is estimated below.

Type of Maintenance Work	Quantity	Cost
Routine Work (Side Ditch Cleaning @etc)	76.5 km	15,500,000T,shs

The maintenance of cleaning and other tools/equipment will be essential for continual maintenance work and the budgetary appropriation for the systematic procurement of spare parts for the maintenance tools/equipment should be firmly established.