ROAD AND BRIDGE WORKS

THE REPUBLIC OF UGANDA

**MINISTRY OF WORKS AND TRANSPORT**

# ROAD PROJECT IMPLEMENTATION MANUAL

**January 2010**

## List of Reference Documents

- Bidding Document for the Procurement of Works and
- Bidding Document for the Procurement of Consultancy Services
- World Bank publication “The Project Cycle”, dated 2004
- African Development Bank publication “Project Cycle”, dated 2004
- EU publication “Project Cycle Management”, published 1997
- CIDA publication “Overview of Bilateral Project Cycle”, published Feb 1999
- Road Design Manual, new version under preparation
- FIDIC publications Tendering Procedure, Contract Guide, Consultant selection, Red Book, White Book
- Standard Tender Documentation for Road and Bridge Works, new version under preparation



**PREAMBLE**

This **Road Project Implementation Manual** is one of a series of Engineering Specifications, Standards, Manuals and Guidelines issued by Ministry of Works and Transport. It gives guidance and recommendations to the Engineers responsible for the maintenance of roads in Uganda. It complements the Ministry’s efforts in providing guidance to the construction industry by setting uniform standards to be used in the construction and maintenance of infrastructure facilities that meet the needs of the users.

The purpose of this Manual is to serve as nationally recognized document, the application of which is deemed to serve as a standard reference and ready source of good practice for project implementation of roads, and will assist in a cost effective operation and an environmentally sustainable development of the country’s road network.

Further, this Manual is a technical document, which, by its very nature, requires periodic updating from time to time arising from the dynamic technological developments and changes. The Ministry, therefore, welcomes proposals on areas for further development and revision stemming from the actual field experience and practice. It is hoped that the comments will contribute to future revisions of the Manual expected to lead to better and more economical designs.

Ministry of Works and Transport
P.O. Box 10
Entebbe

**January 2010**

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## Project Financing

| Funding Source | Project Approval USD '000 | Expend to June 02 Shs '000 | Budget Past year 2002/03 Shs '000 | Expected Out Turn Past FY 2002/03 Shs '000 | Projected New FY 2003/04 Shs '000 | Projected beyond next FY (1) Shs '000 |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| GoU | 3,380 | 3,435,430,977 | 2,100,000,000 | 988,160,000 | 662,100,000 | 0 |
| Donor | 10,990 | | 2,533,983,400 | | 2,072,590,000 | 0 |
| Taxes | 1,235 | | 474,000,000 | | 464,500,000 | 0 |
| Other | - | | | | | |
| **Total** | **15,605** | **3,434,430,977** | **5,107,983,400** | **988,160,000** | **3,199,190,000** | **0** |

Note: The "projected beyond next Financial Year" covers only the MTEF period of FY 2004/05 and 2005/06.

## 9.2 Appendix 2 , Project Write-up

### UPGRADING OF KYOTERA-MUTUKULA ROAD

Project Code : TR 65(A)
Project Name : Upgrading of Kyotera-Mutukla Road
Start Date : 1999
Completion Date: 2003

### Background

Kyotera-Mutukula Road is located in south Western Uganda. This road is part of the Nothern Corridor and the PTA transportation systems. Internally, it is an interstate road connecting Uganda to Tanzania via Bukoba.

The road traverses a highly populated and fertile area with major crops grown such as coffee, bananas, beans, tea, cocoa, maize, millet, sorghum, and potatoes. Upgrading this road to bitumen is expected to increase household incomes as it will facilitate increase in crop production, help in the establishment of more social services and encourage rural investment.

### Objective

The project aims at upgrading Kyotera-Mutukula road from its present gravel state to bitumen standard.

### Overall achievements since the project started

Kyotera-Mutukula road (45km): A contract for civil works for this road was signed in August 2000 and the Contractor mobilized and started works in January 2001. Civil works were completed in September 2002.

### Current year to date compared with the forecast in the last Ministry Policy Statement

This road is being upgraded from gravel to Class II Bitumen Standard. Civil works were completed in September 2002.

### Expected in the coming Financial Year

The defects liability period started in October 2002 and will be completed in October 2004.

At the end of the loan disbursement period (anywhere from 1-10 years), a completion report identifying accomplishments, problems, and lessons learned is submitted to the Bank Board of Executive Directors for information purposes.

**Useful public document**

*Implementation Completion Reports* review the results and assess an operation on completion of each loan financed by the Bank. Operational staff prepare these self-evaluations for every completed project.

***The Evaluation Phase***

Following the completion of a project, the Bank's Operations Evaluation Department conducts an audit to measure its outcome against the original objectives. The audit entails a review of the project completion report and preparation of a separate report. Both reports are then submitted to the executive directors and the borrower. They are not released to the public.

**Useful public documents**

*Project Performance Assessment Reports* rate project outcomes (taking into account relevance, efficacy, and efficiency), sustainability of results, and the institutional development impact. One in four completed projects (or about 70 a year) is chosen for a Project Performance Assessment Report, which takes Operations and Evaluation Department staff about six weeks to produce and normally includes a visit to the project in the borrowing country.

*Impact Evaluation Reports* assess the economic worth of projects and the long-term effects on people and the environment. These "second looks" at projects are performed five to eight years after the close of loan disbursements.

*Inspection Panel Reports* review claims by affected parties that the Bank failed to follow its operational policies and procedures with respect to the design, appraisal and/or implementation of a Bank-financed operation.

Projects may be dropped at any point in the project cycle from preparation to approval. For these projects, which never achieve active status, Project Information Documents, described above, are effectively the final documents. See also Measuring Results.

**Additional Information**

- The *Monthly Operational Summary* discloses the status of projects in the World Bank's lending pipeline from the point they are identified to the time the loan or credit agreement supporting them is signed.
- The Infoshop provides an explanation of the Project Cycle and related documents.
- The Bank's Latin America and Caribbean section has prepared its own description of the Project Cycle, along with relevant links and check lists associated with different stages
- The Business Opportunities site provides advice on how businesses wishing to bid on Bank-financed projects can interact with the Project Cycle.
- A glossary of project documents.





# DEFINITIONS

The following definitions shall apply to all projects executed by and on behalf of the Ministry of Works and Transport:

a) The Employer is

The "Employer" is the party named in the Agreement, who employs the Contractor to carry out the Works and means Procuring and Disposing Entity as defined in the Public Procurement and Disposal of Public Assets Act, 2003.

b) The Project Manager is

The "Project Manager" is the person named in the SCC (or any other competent person appointed by the Employer and notified to the Contractor, to act in replacement of the Project Manager) who is responsible for supervising the execution of the Works and administering the Contract.

c) The Project Manager's Representative (usually called the Resident Engineer) is

The MOWT employee or Consultant appointed in writing to have overall engineering responsibility for supervision of the construction works.

d) The Contractor is

A person or corporate body whose Bid to carry out the Works has been accepted by the Employer and is named as such in the Agreement, and means Provider as defined in the Public Procurement and Disposal of Public Assets Act, 2003.

e) The Contract is

The agreement between the Employer and the Contractor to execute, complete, and maintain the Works.

f) The Contract Documents are

The documents that define the terms, conditions and specifications governing the Contract. They include the Form of Tender, the Conditions of Contract, the Specification, the Bill of Quantities, the Drawings, the Form of Agreement, the Performance Bond and if requested, the Advance Payments Guarantee.

g) The Tender is

Contractor's offer to undertake the Works in accordance with the terms of the Contract Documents.

h) The Site Agent is

The Contractor's chief representative on the site of the Works.

i) The Works are

All those items which are to be constructed under the terms of the Contract i.e. all Permanent and Temporary Works.

j) The Contractor is the legal entity that is party to and performs a works contract, the other party to the contract being the "Employer." Contractor means "Provider", as defined in the Public Procurement and Disposal of Public Assets Act, 2003.

k) The Consultant is a professional entity or individual who has been engaged to offer professional expertise as defined by the terms of reference agreed between the entity or individual and the Employer.

# ABBREVIATIONS

| | |
|---|---|
| ACE | Assistant Commissioner for Engineering |
| ADB | African Development Bank |
| ADF | African Development Fund |
| CML | Central Materials Laboratory |
| DE | Director of Engineering |
| DP | Direct Purchase |
| EACD | External Aid Co-ordination Department |
| EEC | European Economic Commission |
| EFA | External Funding Agency |
| EIC | Engineer -in- Chief |
| ERA | Ethiopian Roads Authority |
| EIRR | Economic internal rate of return |
| FA | Force Account |
| FIDIC | Federation Internationale des Ingenieurs-Conseils |
| GCC | General Conditions of Contract |
| GOU | Government of Uganda |
| ICB | International Competitive Bidding |
| IDA | International Development Agency |
| ITT | Invitation to Tender |
| LCB | Local Competitive Bidding |
| LICB | Limited International Competitive Bidding |
| LS | Local Shopping |
| MOFPED | Ministry of Finance, Planning and Economic Development |
| MOWT | Ministry of Works and Housing |
| NGO | Nongovernmental Organisation |





The Bank is responsible for this part of the process. Bank staff review the work done during identification and preparation, often spending three to four weeks in the client country. They prepare for bank management either Project Appraisal Documents (investment projects) or Program Documents (for adjustment operations) and the Financial Management team assesses the financial aspects of the project. The PID is updated during this phase. These documents are released to the public after the project is approved (see below).

***The Negotiation and Approval Phase***

After Bank staff members have appraised the proposed project, the Bank and the country that is seeking to borrow the funds, negotiate on its final shape. Both sides come to an agreement on the terms and conditions of the loan. Then the Project Appraisal Document (PAD) or the Program Document (PGD), along with the Memorandum of the President and legal documents are submitted to the Bank's Board of Executive Directors for approval. The appropriate documents are also submitted for final clearance by the borrowing government which may involve ratification by a council of ministers or a country's legislature. Following approval by both parties, the loan agreement is formally signed by their representatives. Once this has occurred, the loan or credit is declared effective, or ready for disbursement, after the relevant conditions are met, and the agreement is made available to the public.

**Useful public documents**

The *Project Appraisal Document* (PAD) presents all the information the Board needs to approve Bank financing of the proposal. Before 1999, this document was called the Staff Appraisal Report. The *Program Document* (PGD) describes adjustment lending operations, and sets out the Bank's appraisal and assessment of the feasibility and justification for the program.

The *Technical Annex* supplements a Memorandum and Recommendation of the President for freestanding technical assistance loans, which do not require Project Appraisal Documents.

***The Implementation and Supervision Phase***

The implementation of the project is the responsibility of the borrowing country, while the Bank is responsible for supervision. Once the loan is approved, the borrowing government, with technical assistance from the Bank, prepares the specifications and evaluates bids for the procurement of goods and services for the project. The Bank reviews this activity to ensure that its procurement guidelines have been followed. If they have, the funds will be disbursed. The Bank's Financial Management Team maintains an oversight of the financial management of the project including periodically requiring audited financial statements.

**Useful public document**

*Report on the Status of Projects in Execution* provides a very brief summary of all projects that were active during the previous fiscal year. Previously an internal communication to the Board of Executive Directors, the SOPE Report now is available to the public. Projects that closed during the fiscal year are no longer included in the SOPE, since their Implementation Completion Reports are also publicly disclosed.

**The Implementation Completion Report**

Bank's lending program and are a useful source of information for interested stakeholders and businesses wishing to identify potential future areas of Bank lending. During the identification phase, Bank teams work with the government to identify projects which can be funded as part of the agreed development objectives. Once a project has been identified, the Bank team creates a Project Concept Note (PCN) which is an internal document of four to five pages that outlines the basic elements of the project, its proposed objective, likely risks, alternative scenarios to conducting the project, and a likely timetable for the project approval process.

**Useful public documents**

The *Project Information Document* (PID) is prepared after an internal review of the PCN and is released publicly through the Bank's InfoShop. It is usually four to five pages long and contains the information mentioned above - the objective, a brief description, etc. It also contains the name of the World Bank Task Manager or Team Lead who is supervising the project, a useful contact for companies interested in bidding for work on the project. The PID is an essential resource for tailoring bidding documents to the project concerned.

The *Integrated Safeguards Data Sheet* (ISDS) is also prepared for the first time after the project's first formal review and made available publicly. It identifies key issues under the World Bank's safeguard policies for environmental and social issues, and provides information about how they will be addressed during project preparation.

***The Preparation Phase***

This part of the process is driven by the country that the Bank is working with and can take anything from a few months to three years, depending on the complexity of the project being proposed. The Bank plays a supporting role, offering analysis and advice where requested. During this period, the technical, institutional, economic, environmental and financial issues facing the project will be studied and addressed - including whether there are alternative methods for achieving the same objectives. An assessment is required of projects proposed for Bank financing to help ensure that they are environmentally sound and sustainable (Environmental Assessment). The scope of the Environmental Assessment depends on the scope, scale and potential impact of the project.

**Useful public documents**

An *Environmental Assessment Report* (EA) analyzes the likely environmental impact of a planned project and steps to mitigate possible harm.

An *Indigenous Peoples Development Plan* identifies potentially adverse effects on the health, productive resources, economies, and cultures of indigenous peoples.

The *Environmental Action Plan* - describes the major environmental concerns of a country, identifies the main causes of problems, and formulates policies and concrete actions to deal with the problems.

***The Appraisal Phase***





| | |
|---|---|
| PCN | Project Concept Note |
| PIP | Public Investment Plan |
| PPDA | Public Procurement and Disposal Authority |
| SPP | Sectoral Planning Department |
| SCC | Special Conditions of Contract |
| SG | Solicitor General |
| TOR | Terms of Reference |

# 1.0. INTRODUCTION

## 1.1 Background

The Ministry of Works and Transport (MOWT) executes a number of road and bridge projects from the identification stage all through the project cycle among other mandated functions.

While project identification, feasibility and detailed design studies, contract documentation, procurement services and construction supervision are handled by Engineering Development Division, is handled by the Construction Section. The input of the Transport Planning and Materials Section is made as and when required during project implementation. Completed projects are handed over to the Road Maintenance Division for operation and maintenance.

While different stages of the project cycle are handled by different sections of the Ministry, they are also often funded by different donors and contracted to different Consultants and Contractors. Project execution has consequently varied, in the past, from project to project depending on the parties involved in the execution.

This Project Implementation Manual has been written to ensure that MOWT Projects are implemented in a timely, orderly and standard manner. It is hoped that the Manual will be a good reference book for Project Co-ordinators, Consultants and Contractors handling MOWT Projects.

## 1.2 Scope of the Manual

The Manual covers all stages involved in the implementation of road and bridge projects. For every stage of project implementation, the Manual states what has to be done, who does it and how it is done. A number of annexes are provided in the Manual to explain fully how certain tasks are performed and also giving standard formats for reports, certificates, agreements, bonds, etc. The Manual applies to projects that follow all stages of the project cycle and may not be directly applied to projects such as technical assistance, twinning arrangements, etc.

## 1.3 Organization of the Ministry

The MOWT organisation structure consists of two Directorates, one of Engineering and one of Transport. The Engineering Directorate is responsible for management of trunk roads while the Transport Directorate handles the management of other sub-sectors namely rail, air and water. The Ministry also has a Department of Finance and Administration, which is responsible for administration, personnel and finance and Administration, which is responsible for administration, personnel and finance matters.

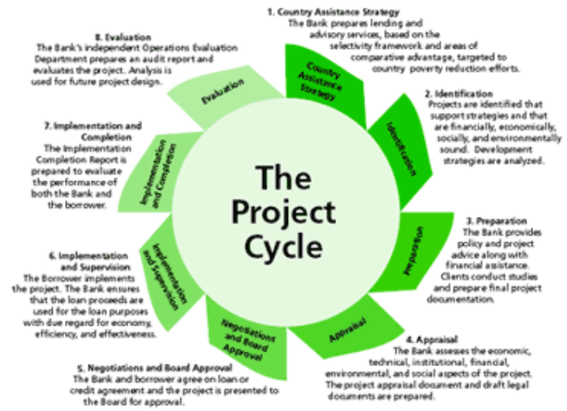
## 1.4 Project Cycle

### 1.4.1. General

Projects are planned and carried out using a sequence of activities commonly referred to as the project cycle. There are many ways of defining the steps in the sequence but the following terminology in road projects is used by MOWT: - identification, feasibility and preliminary engineering study, detailed








***How the Process Begins: Poverty Reduction and Country Assistance Strategies***

The Bank recognizes that many past assistance efforts, including some of its own, failed because the agenda was driven by donors rather than by the governments it was trying to assist. Under its current development policy, the Bank helps governments take the lead in preparing and implementing development strategies in the belief that programs that are owned by the country, with widespread stakeholder support, have a greater chance of success.

In low-income countries, the Bank uses the Poverty Reduction Strategy (PRS) approach which involves widespread consultation and consensus building on how to boost development. Under this process, a national poverty reduction strategy is prepared by the country, creating a framework for donors to better co-ordinate and align their programs behind national priorities. The government consults a wide cross-section of local groups and combines this with an extensive analysis of poverty in the country's society and its economic situation. The government determines its own priorities from this process and produces targets for reducing poverty over a three to five year period. These are outlined in a Poverty Reduction Strategy Paper (PRSP). The Bank and other aid agencies then align their assistance efforts with the country's own strategy - a proven way of improving development effectiveness.

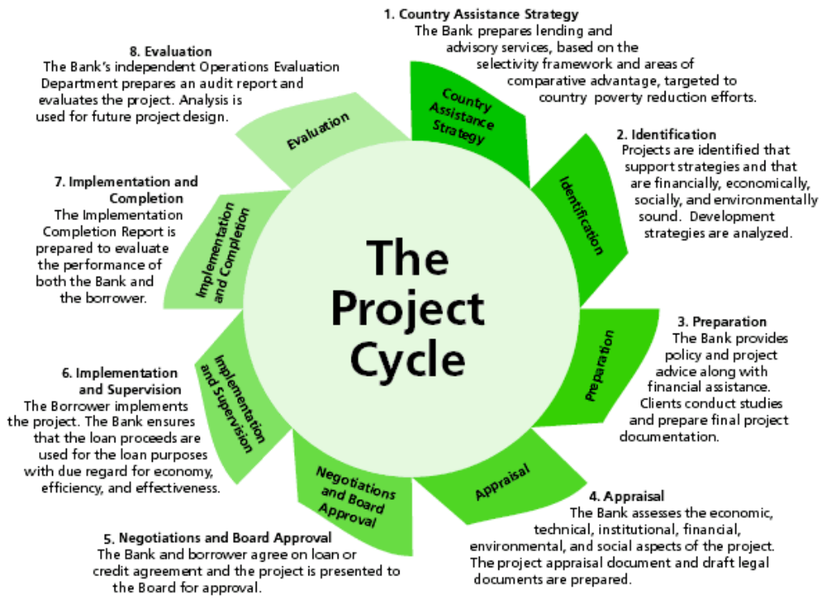
The Bank's blueprint for its work with a country is based on a Country Assistance Strategy (CAS) which, in the case of low income countries, is derived from the priorities contained in the country's Poverty Reduction Strategy Paper. The CAS is produced in co-operation with the government and interested stakeholders. The preparation of the CAS may draw on analytical work conducted by the Bank or other parties on a wide range of economic and social sectors, such as health, education, agriculture, public expenditure and budgeting, fiscal management, or procurement, among others.

***The Identification Phase***

The Bank's Country Assistance Strategy (CAS) forms the blueprint for its assistance to a country. In low-income countries, the CAS is based on the priorities identified in the country's Poverty Reduction Strategy Paper (as outlined above). The goals outlined in the CAS guide the priorities of the

# 9.0 APPENDICES

## 9.1. Appendix 1, World Bank Project Cycle




Project Cycle

**Overview**

Each year the World Bank lends between US$15-$20 billion for projects in the more than 100 countries it works with. Projects range across the economic and social spectrum in these countries from infrastructure, to education, to health, to government financial management. The projects the Bank finances are conceived and supervised according to a well-documented project cycle. Documents produced as part of the project cycle can be valuable sources of information for interested stakeholders wanting to keep abreast of the work the Bank is financing and for businesses wishing to participate in Bank-financed projects. Below is a step-by-step guide to the project cycle, the documents that are produced as part of the process, and how to access them.

Click on image to see larger view





design, procurement and funding, construction supervision and management, operation and project evaluation.

### 1.4.2. Identification

The first stage of the cycle is to find potential projects. This is sometimes known as the pre-feasibility stage. Projects are generally speaking identified by any of the following methods.

i. Suggestions from MOWT technical staff and political leaders
ii. Proposals by MOWT to extend existing programmes or projects.

Projects that are identified to support approved strategies and are financially, economically and environmentally sound will be selected for further development by the and included into PIP. This process usually involves consulting of donor agencies. Once a project has been accepted for further development a Project Concept Note (PCN) will be prepared, often in co-operation with the potential donor agency. The Project Concept Note outlines the basic elements of the project, its proposed objective, likely risks (environmental including), alternative scenarios to conducting the project and likely timeframe for the project approval process.

Identification of projects is done very carefully to distinguish promising projects from dubious ones and also avoid halting of projects at a later stage after arousing the expectations of interested groups.

### 1.4.3 Feasibility and Preliminary Engineering Study

Projects that have been identified and for which Project Concept Note has been prepared will have go through the next phase, the feasibility and preliminary engineering study as well as environmental and social impact assessment.

The study and environmental/social assessment provides enough information for deciding whether to/not to proceed to a more advanced stage of planning. The level of detail of this study depends on the complexity of the project and how much is known already about the proposal. This study defines the objective of the project. It also considers alternative ways of achieving these objectives and eliminating poor alternatives. The study provides the opportunity to mould the project to fit its physical and social environment in such a way as to maximise the return on the investment. Once this study has indicated which project alternative is likely to be most worthwhile, detailed planning and analysis may begin.

Project appraisal, performed by borrowing banks and/or donor agencies concludes this phase of the project implementation.

Note: The study may also indicate that the project is not viable and thus, has to be abandoned.

### 1.4.4 Detailed Design

Detailed design of the project usually is the responsibility of the MOWT and follows government's provisional commitment to the project as a result of the outcome of the feasibility and preliminary engineering study. MOWT usually employs a Consultant to conduct the detailed engineering study and to prepare consequent Tender Documentation. Financiers and/or donor agencies (if any involved) will supervise this process.

Several decisions which affect economic performance are taken throughout the design and economic appraisal often results in redesign.

### 1.4.5 Procurement / Tendering

This stage involves negotiations with potential financiers, invitations to tender and negotiations with Consultants, Contractors and suppliers.

Once financing arrangements have been finalised, the Employer, often in co-operation with the financiers, will prepare the tenders for consulting services, for construction of works and for supplies.

Chosen Consultants will usually assist to review the tender documentation, prepare invitations for Contractors to pre-qualify, invite tenders for construction and analyse the tenders received from Contractors and prepare Contracts to be signed by the Employer.

### 1.4.6 Construction Supervision and Management

At the beginning of this stage the Employer will enter into contracts for the construction and supervision of the works. These contracts usually will have to be reviewed by the financier.

Consultants are recruited to assist the Employer to ensure that procurement guidelines, contract drawings, specifications, schedules and other contract documents are followed in the execution of works.

Contractors are employed to execute the works in accordance with Contract Documents.

### 1.4.7 Operation

Once a certificate of completion has been issued and works have been taken over by the Employer, the constructed road or bridge may be put into use. It is during this phase that benefits of the infrastructure are realised and its maintenance undertaken.

### 1.4.8 Project Evaluation

The final phase of the project cycle is evaluation. This consists of looking back systematically at the successful and unsuccessful elements of the project experienced during implementation and the lessons acquired can help to learn how planning can be improved in the future.

For evaluation to be successful, it is important that data about the project is collected and recorded in a systematic way throughout all the stage of the project cycle. Project evaluation may be carried out using different methods. In the same cases when project evaluation has been carried out by MOWT, but if each stage of the project, that need to be brought to the attention of the project management.

Project evaluation should lead to specific recommendations about improving aspects of the project design which is then used to improve on-going and future planning.





shall be allowed to the Assigned/Attached Staff, during the mobilisation period, to permit the determination of their current experience and abilities. All these are to facilitate the assessment of Training Needs of the Assigned/Attached Staff.

The Consulting Engineer shall be required to include in his proposal details of how this training shall be affected, showing exactly the number of man-months proposed for each staff in the field and in the office. The Consulting Engineer shall in the proposal compute all the costs required for accomplishing this task.

Assigned/Attached Staff shall work under the exclusive direction of the Project Engineer, who shall from time to time submit their training progress reports to the EIC/DE.

## 8.5 The District Engineer

If completion with the Consulting Engineer's work requires co-operation with other Government Departments, the Ministry shall provide liaison and assistance to the Consultant's efforts to gain access to all information that may be necessary for the proper conduct and completion of works. The District Engineer shall from time to time be called upon to provide such assistance at the District level.

The MOWT District Engineer, to whom maintenance of the works will revert after handing over, shall attend all site meetings and shall raise such issues that, to his opinion, might assist in proper conduct and completion of works, and this opinion shall not be unreasonably ignored.

# 8.0 ROLE OF MOWT IN PROJECT IMPLEMENTATION

## 8.1 General

(a) All Government Civil Engineering Contracts are signed on behalf of the MOWT by the EIC/DE. The ACE (Engineering Development) and ACE (Materials) are delegated the powers to control all civil engineering construction works on behalf of the EIC/DE. No changes in the contract documents can therefore be made except with the specific consent and authority of the EIC/DE.

(b) The Project Engineer and his/her staff are appointed by the EIC/DE to direct and supervise the project on his behalf and to ensure compliance with the contract documents can therefore be made except with the specific consent and authority of the EIC/DE.

## 8.2 Project Co-ordination

The Commissioner / Roads shall play the role of Project Co-ordinator in linking the Project Manager with the EIC/DE and other senior staff of the Ministry. The ACE (Engineering Development) may do so by appointing, on behalf of EIC/DE, a Principal Executive Engineer to be project co-ordinator when and where he/she sees fitting.

The Project Co-ordinator shall in liaison with the Project Manager closely monitor progress of works, organise site meetings, recommend to ACE (Engineering Development) all necessary changes to the contract documents for further discussion with and approval by EIC/DE.

## 8.3 Counterpart Staff

The Ministry will in conjunction with the Consulting Engineer arrange for the selection and provision of Counterpart Staff where required. Counterpart Staff will work under the exclusive direction of the Consulting Engineer, in so doing they improve on their performance by gaining additional experience.

In the event that member of the Counterpart Staff fails to perform adequately the work assigned to him/her by the Consulting Engineer, provided such work assignment is consistent with the position occupied by the staff member, the Consulting Engineer, may request that he/she be replaced and such request shall not be unreasonably refused.

If counterpart staff is not provided in accordance with the agreement, the Ministry and the Consulting Engineer shall agree on how the affected part the works will be carried out and upon a revised compensation thereof.

## 8.4 Assignment/Attached Staff

The Ministry shall if deemed necessary assign/attach to the project junior professional staff herein referred to as Assigned/Attached Staff, and the Consulting Engineer shall provide for the appropriate training and instructions. It is important that the Assignment/Attached Staff are given enough opportunity to gain professionally from and follow closely all the stages of the Consulting Engineer's work.

Access shall be required to and co-operation from such Ministry Senior Staff as may be appropriate to determine the skills required of the Assigned/Attached Staff by the end of the training period. Also, prior access





# 2.0 PROJECT IDENTIFICATION

## 2.1 General

Project Identification is the first among the seven (7) stages involved in the life cycle of a road project.

## 2.2 Project Concept

The Project Identification process involves the development of the concept of the project, definition of its objectives and consideration of possible ways of achieving these objectives. It is considered as the process leading to the acceptance of a project by Ministry of Finance, Planning and Economic Development (MOFPED) and its ultimate inclusion in the Public Investment Plan (PIP).

The Project Identification Stage has three steps: -

a. The development of the Concept of the Project.
b. Preparation of the Project Write-up
c. Preparation of the Project Profile

### 2.2.1 Project Identification of a Road Project

A road construction/rehabilitation project is usually large, complex and donor financed. The road project identification process is accompanied by an economic feasibility, environmental and social impact assessment and preliminary engineering study, often carried out by Consultants appointed/approved by the donor agency. This study considers in detail the alternative technical solutions and administrative arrangements for the road project and analyses its financial and economic as well as environmental ecological and social viability.

### 2.2.2 Procedural Framework for Project Identification

The procedural framework for road project identification is shown in the attached Appendix 1 as part of the overall project planning process.

### 2.2.3 Project Conception

The idea for a project originates either form within MOWT, local community, private sector or NGO and is mainly conceived through the following: -

a) The need to improve on the level of service of a facility or infrastructure, as in the case of a road rehabilitation or construction project.
b) Whether investing in the project is the best solution to the problem rather than a policy change measure.
c) Whether the proposed way of implementing the project is the most feasible way of achieving the project objectives.
d) Whether other investments are required in order to secure the success of the project.
e) Whether the project, is likely to be accommodated within the Ministry's budgetary ceilings for both the recurrent and development budget.

## 2.3 The Project Write up

### 2.3.1 New Projects

This is the second step of the project identification process. The project write-up is prepared by the Implementing Agency (MOWT), having considered all the points in 2.2 above. The project write-up constitutes the formal request to MOFPED to include the project in the PIP. A typical Project write-up consists of summary data about the project, a description of the background, objectives, main features of the project and the proposed financing plan. The format of a project write-up is shown in Appendix 2 in Clause 9.

### 2.3.2 On-going projects

An on-going project requires a project write-up as a part of the annual review of the PIP. A project write-up is also re-written for an on going project when there is a significant change in the project. It is also revised annually as part of the PIP review.

## 2.4 Project Profile

The project write-up is submitted by the implementing agency (MOWT) to MOFPED where it is used as a basis for the preparation of a shorter project profile which is incorporated in the PIP. The profile is prepared by the Sectoral Planning Department (SPD) within the MOFPED. The preparation of all Project Profiles by SPD provides consistency in the style and format and facilitated linkages between different projects to be considered.





## 7.4 Element of Project Evaluation

There are at least three main elements of project evaluation exercise: -

- Reviewing the technical success. Did the technical design work as expected? What were the main strengths and weaknesses in the design? How did the project adjust to them?
- Reviewing the implementation and management. How satisfactory were the management arrangements? How realistic were the assumptions on which implementation schedule was based/ How did the project management perform?
- Reviewing the environmental aspect. To which extent the measures specified in the Environmental Management Plan have been adhered to and how successful and adequate those measures have been.

What was the ex post Economic Internal Rate of Return (EIRR) and how did this compare with that predicted? (Ex post EIRR calculations may be attractive in concept, but in practice they may pose considerable difficulties and are only occasionally attempted).

The person/agency responsible for evaluation may ask this questions and more others during the evaluation process. These guidelines must be adhered to.

## 7.5 Application of Results

The evaluation should result in specific recommendations about improving aspects of the project design which can be used to improve on-going and future planning. Evaluations require a considerable commitment of resources and for this reason should only be undertaken where the results can be expected to contribute to subsequent decision making.

Mid-term evaluations are likely to be particularly useful since there is a direct link with the subsequent implementation of the project. By contrast ex post evaluations can be the most expensive to undertake since they frequently involve a special data collection exercise and should be undertaken more selectively. For example, there might be little point in conducting an ex post evaluation of a project which had failed for reasons which are now obvious and which represented an investment strategy which was no longer government policy, (However, it might still be useful to ask how such an inappropriate decision came to be made).

## 7.6 External Funding Agency Evaluations

External Funding Agencies (EFAs) have their own internal requirements to evaluate the projects they fund and will often offer to undertake an evaluation or to assist the Ministry in undertaking one. Such offers shall generally be welcomed because: -

a) they reflect a legitimate concern on the part of the EFA about the effectiveness of the aid they provide, and
b) they provide additional professional and logistical resources to the Ministry to undertake evaluations.

However, there are no free offers, and an EFA evaluation will inevitably have an opportunity cost in the considerable amount of officials' time taken up.

Procedure for EFA evaluations are available with the Ministry of Planning and Economic Development and shall be adhered to.

# 7.0 PROJECT EVALUATION

## 7.1 General

The final stage of the Project Cycle is evaluation. This consists of looking back systematically at the successful and unsuccessful elements of the project experience to learn how planning can be improved in the future. For evaluation to be successful, it is important that data about the project is collected and recorded in a systematic way throughout all stages of the project cycle. Without this, it is usually impossible to determine detailed events and information that were available during periods leading up to the taking of important decisions.

## 7.2 Types and objectives of Evaluation

Evaluation may take place at one or more of three stages during the project cycle:

- Mid-term evaluation: - During Implementation to assess the likelihood of the project achieving its objectives and suggesting changes in design or otherwise to increase the project's chances of success.

- Terminal evaluation: - Undertaken immediately on completion of the project. Since it is usually still too early to assess the benefits of the project, the evaluation concentrates on reviewing the implementation stage and identifying the main lessons applicable to other projects. There are similarities between terminal evaluation and a project audit.

- Mid-term Evaluation: - Undertaken during completion of the project. It is usually still too early to assess the full benefits of the project, the evaluation concentrates on reviewing the implementation stage and identifying the main lessons applicable to other projects. There are similarities between terminal evaluation and a project audit

- Ex-post evaluation: - undertaken sometime after completion of the project when its impact can be assessed against its original objectives. The results of ex post evaluations feed back into the design of new projects and the development of sector policy.

## 7.3 Responsibility for Project Evaluation

Evaluation may be carried out by three different parties: -

- The sponsoring organisation or external funding agency (EFA) may undertake evaluation.
- In large projects, a separate unit within the implementing organisation, in this case the MOWT, may be set up to monitor each stage of the project by collecting data for identifying problems that need to be brought to the attention of the project management.
- In other cases, outside agencies will be used to provide independent audits.

The Ministry of Works and Transport will specify the responsibility of evaluation for particular projects depending on its scope and when and where the said evaluations applicable.





# 3.0 FEASIBILITY AND PRELIMINARY ENGINEERING STUDIES

## 3.1 General

Economic feasibility, environmental impact of the project including social aspects are analysed and a preliminary engineering study is performed at this stage of the project life. The Bidding Document for the Procurement of Consultancy Services, issued by the PPDA gives detailed instructions as how to perform such studies. General description of these studies is given here below.

## 3.2 Feasibility Study

### 3.2.1. Need for the Feasibility Study

A feasibility study (economic and preliminary engineering) is always a requirement for a road project after the project identification process. There are usually a number of alternative technical solutions to be considered from which the most economically viable alternative is determined. During the feasibility study it is always established whether for the best alternative solution chosen:-

a) the project confirms with the country's development objectives and priorities;

b) the relevant policy framework is compatible with the achievement of the projects' objectives;

c) the project is technically sound and that it is the best of the available technical alternatives;

d) the project is administratively workable;

e) there is adequate demand for the projects output;

f) the project is economically justified and financially viable;

g) the project is compatible with the customs and traditions of the beneficiaries; and that

h) the project is environmentally (ecologically and socially) sound.

### 3.2.2. Responsibility for the feasibility study

Donor Agency procedures often require that a feasibility study be carried out by Consultants engaged through international competitive biding and the agency usually provides the financing. Consultants engaged on a feasibility study would normally be responsible to the Engineering Development Division of MOWT, the sector Ministry under which the road project falls. However since the study involves commitment of resources, the MOFPED is involved in the approval of the need for the consultancy, of the Terms of Reference and of the final report. The MOFPED through the External Aid Co-ordination Department (EACD) is also the formal channel of communication between the Government and the Donor Agency.

### 3.2.3. Traffic Studies

Traffic Studies are one of the major elements of the economic feasibility study. The type and volume of traffic forecast to use the proposed road is estimated by collecting and analysing traffic counts and Origin-Destination Survey of the present volume of freight and passenger vehicle on the road under study. Traffic studies involve the following activities: -

a) examination of statistical data on the current and historic traffic counts disaggregated into vehicle categories or classes;

b) Carrying out additional traffic counts and other field investigations to supplement existing data;

c) identifying, describing and quantifying existing and potential traffic generating factors in the area served by the road, based on the economic development of the region and the future needs of highway transport that would result from growth in other sectors;

d) making annual traffic forecast and general projections of future traffic for the economic life of the proposed road.

### 3.2.4. Sectoral Studies

These studies are part of the economic feasibility study. They are always carried out to determine the future needs for highway transport that will result from developments in other sectors; i.e.: -

e) population growth and changes in rural and urban population distribution;

f) national and regional economic growth;

g) development of industry, agriculture, tourism and commerce within the project area;

h) development of animal industry;

i) traffic growth in neighbouring countries;

j) development of social services, medical facilities and schools caused by the new project facility.

### 3.2.5. Cost Benefit Analyses

Available information on vehicle operating and road maintenance costs should be examined and valid current estimates of such costs for both "without" and "with" situations should be produced. Attention should be given in the analyses to conditions affecting costs, which are specific to Uganda and to the area of the studies.

Since the greater element of measurable and quantifiable user benefits will be derived from the improvement of existing roads, in practice, from savings in vehicles operating costs, particular attention should be given to the development of valid current estimates of such costs. In particular, all individual factor unit costs (such as vehicle prices, interest rates, tyres, fuel, crew wages, insurance, etc) input into the economic model should be derived from direct investigation of present costs.

The individual parameters, such as roughness, which are input into the model to determine the different component costs of vehicle operations shall be those that apply to the individual design standard being evaluated. In particular, the analyses shall ensure that the base case (without) is well justified and in accordance with the existing and expected future road





The defects liability period is a period during which the Contractor must complete any outstanding work and also make good any defects. The period begins when the Contractor is issued with a Certificate of Practical Completion, stating when the works were completed and maintained to the Project Manager's satisfaction.

In the event that some items maintenance for which the Contractor is responsible remain unattended to after the stipulated defects liability period, MOWT shall be entitled to withhold the estimated cost of such work from the balance of the retention money, until the Contractor has completed it. Failing this, MOWT may complete the work items at the Contractor's expense.

## 6.30 Retention Money

Retention Money is a percentage of the value of work completed and any other items as measured monthly for payment to the Contractor that is retained by MOWT during the period of construction.

Generally MOWT contracts stipulate a percentage of retention as 5% of each payment and also 5% of the contract price as the limit of the Retention Money. Half of this retention money is paid back to the Contractor when the Certificate of Practical Completion is issued, and the balance at the expiration of the defects liability period.

## 6.31 Final Account

The Project Manager's representative shall assess the final payment due to the Contractor under the terms of the contract before the end of the defects liability period. The assessment of the outstanding payments takes into account both the measured items of work and claims, if any.

The Project Manager's representative prepares a Final Account and issues the Final Certificate on MOWT Form 760. The Final Certificate must be signed by both the Project Manager's representative and the Contractor's Agent and shall be supported by a full submission of measurements and computation of quantities.

## 6.32 Arbitration

If on account of failure to settle a claim, or for any other reason a dispute still remains between the parties in connection with the works it may be referred to arbitration under the conditions prescribed in the contract.

Arbitration should be resorted to only after ultimate failure of the parties to agree by negotiation. Arbitration shall take place in Uganda and be in accordance with the Ugandan rules of Conciliation and Arbitration by one or more Arbitrators appointed in accordance with the rules.

A decision to recompense a Contractor in respect of extra-contractual claims may be taken by the Employer on what he/she may consider to be a moral obligation in order to avoid an admission of liability. Claims of this nature are often examined in this light and, where possible, ex-gratia payments are granted to settle such claims.

## 6.26 Certificate of Practical Completion

When a Project (or a section of road) has been substantially completed, the Project Manager's representative may inspect the work in conjunction with the Contractor and the responsible District Engineer and take over the project from the Contractor by the issue of a Certificate of Practical Completion issued on MOWT Form 761.

## 6.27 As-built Drawings

The Consultant shall produce as-built drawings showing any deviations from the working drawings, occurring during construction. As-built drawings should also include data additional to the pre-contract soil survey on strata encountered, foundation levels and the condition and position of services diverted during the contract.

Work on the as-built drawings should begin on the first day of the contract and deviations from the contract details should be marked as work proceeds, attention being given to change which will subsequently be hidden below ground. As-built drawings are of immense value in clarifying certain aspects of the final account.

## 6.28 Project Completion Report

At the end of the project, the Project Manager and/or Consultant shall prepare a Project Completion Report detailing factual information about the project regarding the following:

i) Actual contract data;

ii) Construction details adopted and reasons for deviation from original designs

iii) Materials incorporated in the permanent works;

iv) Cost of the works;

v) Special problems encountered and how they were tackled;

vi) Recommendations for operation and maintenance; and

v) Any other recommendations that may be relevant in the planning and implementation of future projects.

Six copies of the Project Completion Report shall be submitted to MOWT not later than 30 days after completion of the project. Two copies of the report shall be sent to the Donor Agency by the Consultant on approval by MOWT. This report provides feedback, both to MOWT and the Donor Agency, for future contracts of the same type.

## 6.29 Defects Liability Period

A defect liability period (maintenance period) of twelve months has been adopted by MOWT on most road projects completed in the past.





maintenance policies and capabilities. It is expected that where design standards evaluated in the study have significantly different parameters they will be reflected in vehicle operating costs.

For road maintenance costs for different identified options the analyses shall ensure that such costs are strictly related to current and forecast traffic volumes.

In determining the economic costs for all factors in the study, the analyses shall ensure that costs are net of all taxes and duties, or any other transfer payments to Government, and shadow priced where appropriate to reflect the true scarcity value of the resources being used.

Economic benefits for each identified option shall be expressed primarily in terms of:

a) Saving in vehicle operating cost;

b) Savings in road maintenance expenditure;

c) Residual value of the road's structures at the end of the evaluation period; and

d) Any other factor(s) that shall be considered relevant for the analyses, e.g. employment generation, accident reduction, time savings, etc.

The last factor(s), if included, must be of demonstrable value added within the Ugandan economy.

In view of the fact that some indirect economic and social benefits arising from the improvement in road conditions are intangible or difficult to quantify accurately, detailed qualitative analysis of these benefits shall be performed. Only when such benefits can be firmly demonstrated, can they be included in the economic analyses. In all other cases these benefits will not be included in the economic evaluation of the project but may be used as secondary justification for project implementation.

### 3.2.6. Sensitivity Analysis

This is the second stage of the economic feasibility study. Since the economic analysis is based on assumptions made about the outcome of a project, sensitivity analysis is carried out to determine the changes in the Cost-Benefit Ratio and the Economic Internal Rate of Return (EIRR) in case there is a change in the assumptions. The viability of a project can be affected if the following changes occur: -

a) Design modifications due to unforeseen difficulties.

b) Unexpected cost increases.

c) Actual traffic levels on a new road differ significantly from those predicted.

While carrying out sensitivity analysis of a road project the following steps are followed:

a) Identify the most important variable in the economic analysis.

b) Consider the realistic range of outcomes for each variable

c) Repeat the Cost-Benefit Analysis and EIRR calculations for different outcomes or combination of outcomes.

A robust road project design is the one where even under adverse assumptions the outcome of the project is favourable, so the project is less sensitive to uncertainty.

### 3.2.7. Economic Evaluation

The evaluation of the economic viability of each option for the twenty years following the completion of the construction of the road shall be assessed. For this, the economic costs of the options being evaluated shall be compared with the relevant level of economic user benefits arising from implementation of the project.

The economic viability for each option shall be expressed in terms of:

a) The Economic Internal Rate of Return;

b) The Net Present Value in relation to the Uganda Government's current opportunity costs of capital; and

c) The Benefit – Cost ratio.

The results of the analysis should be expressed in terms of the first year Rate of Return to indicate the optimum year of construction and opening of the road.

### 3.2.8. Risk Analysis

Uncertainty is where the likelihood of a particular project outcome is unknown. Risk is where probabilities are attached to different outcomes of the project economic assumptions, e.g. traffic increase levels. Risk analysis is used on a road project with historical data and is taken into account during the calculation of the projects' Costs and Benefits.

## 3.3 Preliminary Engineering Studies

Having carried out the economic feasibility of a road project and determined the most sound road improvement/construction alternative a technical study (preliminary engineering study) is then carried out. The purpose of preliminary engineering study is to determine what is going to be done and what it requires to do it to attain the project objectives. Preliminary engineering of a road project involves the following: -

### 3.3.1 Topographic Surveys

Topographic and aerial surveys are carried out to determine the following: -

a) Location of the existing road centre-line and the proposed route.

b) Cross-sections related to the centre-line of the proposed route alternative.





3. All amounts due in respect of materials prepayment.
4. All amounts due in respect of any provisional sums in the Bill of Quantities.
5. All amounts due in respect of any approved day works.
6. All monies due to the Employer in respect of recovery of mobilisation advance and liquidated damages, if any.
7. All other sums to which the Contractor considers himself entitled to under the contract, including cost claims.

The Contractor's monthly progress statement shall be presented in the form approved by the Project Manager.

The Project Manager examines the Contractors Monthly Progress Statement, approves it, prepares a certificate and issues it to the Employer within a specified period after receiving the Contractor's Monthly Progress Statement.

But no Payment shall be made to the Contractor if the sum due is less than the minimum stated in the contract.

The Interim Certificate shall contain the following elements, as appropriate:

1. The value of the work items which are included in the Bill of Quantities.
2. Variations, if any,
3. Day works, if any
4. Price-Adjustment
5. Materials prepayment
6. Retention money
7. Mobilisation advance
8. Liquidated damages if any
9. Currencies of payment

## 6.25 Complaints and Third Party Claims

Complaints in the case of road works usually arise from the public for compensation for their land, crops, building, etc which may be used or destroyed during construction, care must always be taken to ascertain ownership, follow the right procedures for valuation, ascertain that the complaint is not within the road reserve and that no compensation has been made for the property before.

Third party claims which are either not made under the conditions of contract or those allegedly made under them but considered legally unenforceable by the employer on the basis that they do not fall within their provisions.

Consequently payment in respect of such claims is considered to be outside the framework of the contract.

Claims which fall into this category often arise because a Contractor has suffered a loss which cannot be attributed to a fault of either party within the terms of the contract.

The advance notice requirement is usually included in the contract because it enables the Project Manager to investigate claims at the material time and make cost records and take steps to avoid or minimise claims.

To be able to deal with claims the Project Manager must have access to all relevant facts and estimates.

The Project Manager must always check that claimed losses do not arise from Contractors own inefficiency. The Project Manager must have adequate record in order to be able to check claims properly.

Several GCC clauses deal with Contractual claim which may be for extension of time or extension of time with costs or costs alone.

## 6.23 Measurement of Works and Procedure for Payment

The measurement and payment clauses of each section of the specification and preamble to the Bill of Quantities lay down provisions of methods for measurement of completed works and for payment.

Measurements are done in order to ascertain and determine the value of the works done in accordance with the contract as the quantities set out in the Bill of Quantities are estimated quantities of the works, but they are not to be taken as actual and current quantities of the works to be executed by the Contractor in fulfilment of his obligations under the contract.

Normally measurement of work is the Resident Engineer's obligation.

When he/she requires work to be measured, he/she gives notice to the Contractor's Agent who will assist the Resident Engineer in making such measurement, and shall furnish all particulars required by them.

Should the Contractor's representative not attend, the measurement made or approved by the Resident Engineer shall be taken as correct measurement of the work.

The Resident Engineer shall prepare measurement records month by month, and the Contractor shall examine and sign these when agreed.

The Contractor may raise a dispute over the correctness of named records in writing within 14 days after his examination of the records.

## 6.24 Interim Payments

These are payments made to the Contractor for works carried out on monthly basis.

The Contractor shall present Monthly Progress statement to the Project Manager as soon as possible at the end of each calendar month.

The monthly progress statement shall include the following elements, as appropriate:

1. The estimated value of permanent works up to end of the month
2. All amounts due under the price adjustment provisions.





Drawings showing the vertical and horizontal alignment and cross sections of the proposed route alternative are made and presented in a format prescribed in the Terms of Reference (TOR).

### 3.3.2 Soils and Materials Investigations

Preliminary soils and materials investigations and tests are carried out to identify sources of locally available construction materials and the necessity for imported materials which are necessary to carry out the economic/technical feasibility, final design and construction of the road project. The Consultants always ensure that such materials exist in sufficient quantities in the required area and if they do not, the implications of having to import such materials are assessed.

### 3.3.3 Hydrological Surveys

During the preliminary engineering studies, rainfall, drainage and other hydrological factors are investigated to a sufficient extent to see how they affect the design of the road. These studies are particularly carried out to enable preliminary design on bridge structures and culverts to be undertaken.

### 3.3.4 Design Standards

The geometric and loading standards to be used in the road design are always given in the TOR and the Consultant is responsible for the design details within that framework. The methodologies employed for the design of pavements, earthworks, drainage and other structures all conform with the prevailing proven international techniques and always ensure use of available materials.

The metric system is used throughout the design and the standards for design of different types of roads and bridges as adopted by the Ugandan Government are always adhered to where possible and adequate explanations are always given where different standards are recommended and subsequently adopted by the Consultant.

### 3.3.5 Preliminary Design and Drawings

Based on the traffic studies, economic analysis and geophysical tests, the Consultant recommends what he/she considers to be the most suitable design and standards giving reasons for these recommendations.

The Consultant is required to carry out a preliminary engineering design of the road at the suggested road standards and to prepare preliminary design drawings using the format and title sheets as required by the Government or as laid out in the TOR.

The Consultant shall prepare the preliminary design/drawings for the different options using the format and title sheets as required by the Employer, as follows:

a) Location plans, Scale 1:50,000;

b) Road plans, Scale 1:5,000 showing road centre-line, with chainages of horizontal curves; location description and references to all drainage and bridge works; right-of-way demarcation indicating land utilization; and other relevant natural and cadastral information; and

c) Typical road cross-sections providing all geometric and pavement features. Original plans shall become the property of the Employer.

### 3.3.6 Cost Estimates

Based on the findings and analysis of the various investigations carried out the following information is furnished by the Consultant:

a) Quantities

Preliminary quantities estimated to an accuracy of +/- 20% are submitted for the proposed construction. These quantities should include all the elements described in detail in the Road Design Manual.

b) Costs

Preliminary design cost estimates for the different options including costs of environmental mitigation measures and social costs, shall be net of taxes. The preliminary cost estimate should give justification for details of foreign and local costs as well as duties and taxes to be paid. The foreign exchange component should include equipment depreciation; imported materials; wages of foreign personnel; overhead and profit of foreign firms that may undertake the construction of the road. The local currency component should include the cost of right-of-way acquisition, local materials, salaries and wages of local employees and taxes. The estimates shall include price escalation, contingencies.

Detailed analysis of the taxes and duties element of the cost estimates shall be presented separately.

## 3.4 Other Studies

It is a requirement of every road project to include the following study components: -

### 3.4.1 Environmental Impact Assessment Study

This study is always carried out to analyse the effect of the road project investment on the environment and recommend appropriate solutions to forestall any disagreeable effects resulting from the improvement of the road. The study assesses the positive and negative impacts of the road project. The study shall describe and assess the environmental impacts in the development plans at local and national level, from construction, maintenance, and traffic use of the proposed road, for example loss of vegetative cover, foreclosure of other land uses, modification of natural drainage patterns, changes in ground water table, landslides, erosion, stream and lake sedimentation, degradation of vistas or cultural sites, and interference with movements of wildlife, livestock and local residents. The study shall also contain Environmental Management Plan to mitigate adverse environmental effects that that project may have.





plant used to carry out the extra work are observed and checked by his inspectors.

The Contractor's time and material sheets shall be checked and signed by the Resident Engineers staff for each varied works authorised.

## 6.20 Deviation Orders (Variation Orders)

The contract binds the Contractor to construct the project as defined in the Contract Documents. It might, however, be necessary or desirable to change some part of the original project during construction, due to for example:

1. Unforeseen conditions encountered on site.
2. Changed circumstances
3. Possible cost savings

GCC allows such changes or 'Variations' to be made within the frame work of the contract through Variation Orders.

Under the contract it is only the Project Manager who is empowered to order variations after due consultations with the Employer.

The Project Manager shall have a right and duty to order a variation when he/she is of the opinion that such variation is either necessary or desirable.

Varied works shall be authorised in writing. All verbal orders on variation must later be confirmed in writing either by the Project Manager sending some authorisation to the Contractor or by the Contractor sending a letter of confirmation to the Project Manager.

## 6.21 Cost variations (Contract Price Adjustment)

In case adjustment of Contract Price becomes inevitable, the GCC shall be applied to determine the effects of such an event.

## 6.22 Claims

A claim is a formal demand for additional payment due under some provision of the Conditions of Contract.

Claims by a Contractor for extra payment usually arise from: -

1) Encountering adverse physical conditions or obstructions which he/she could not reasonably have foreseen, or
2) Dissatisfaction with rates fixed by the Project Manager for altered or additional works, or
3) Delays caused to him which have affected the progress of works.

The Contractor must always give notice of his/her intention to claim.

The advance notice must be given as a matter of urgency

### 6.18.1 Welfare Officer

On large contracts, especially those where a construction camp is provided, the Contractor shall employ a welfare officer to see that living conditions conform with the requirements of the local health authorities. He/she must listen patiently to all complaints and do everything reasonable to remedy them. He/she must also arrange recreational facilities and entertainment. The Contractor shall also employ a camp superintendent to look after the day to day running of the camps and their services.

### 6.18.2 Medical Services

A clinic and ambulance service shall be provided by the Contractor on site for provision of basic medical treatment, immunization services and causality arrangements for the site workers. For treatment of accidents on site, persons trained in first aid should be located at convenient centres throughout the work. All Contractor's foremen shall be equipped with first aid kits.

## 6.19 Provisional Sums, Prime Cost Sums, Contingencies and Day Works

A provisional sum is usually a round figure quoted by the Project Manager against an item, which the Contractor is not called upon to price himself. It is a kind of reserve fund to pay for doing that particular item, which may or may not be spent, wholly or in part. The amount to be paid to the Contractor for carrying out the item shall be that agreed upon later, either by reference to the bill rates for the work actually carried out, or by a lump sum agreement, or on a cost plus percentage basis.

Prime Cost Sums are monies provided in the Bill of Quantities to cover works or services to be executed by a nominated Sub-Contractor or for supply of goods from a nominated supplier, together with an opportunity to add a percentage to cover his related work and profit.

Usually, prime cost sums cover supply and installation of certain materials.

Contingencies is a provision of a round sum in the Bill of Quantities accepted by the employer for ordering extra works of a contingent nature arising from essential need for changes.

The Project Manager shall have to seek approval of the Employer before ordering extra works which he/she deems essential for the right construction of the works.

Day works is a reimbursement to the Contractor for extra or varied works. The prices to be paid for Day works are usually set out in a schedule attached to the Contractors Tender and priced by him.

The typical Day work Schedule contains three parts which provide for reimbursement to the Contractor on the basis of: -

1. The cost of labour plus a percentage for overheads.
2. The cost of materials used plus a percentage for handling etc.
3. The cost of plant at certain rates for each type of plant.

When the Resident Engineer authorises some extra works to be carried out on a Day work basis, he/she must arrange that the labour, materials and





### 3.4.2 Social Studies (Women's Role in the Transport Sector)

This study is conducted to assess women's role in the transport sector in so far as the project road influences the lives of women, children and the elderly, and to quantify the benefits which would accrue to them during and after the construction of the road. The Consultants are also required to indicate the positive and negative effects of the development of the project on women in the project area and should recommend appropriate modifications to the project to minimise any negative effects.

# 4.0 DETAILED ENGINEERING DESIGN

## 4.1. General

The work consists of furnishing engineering services complete in all respects including all field and office works in accordance with highest standard of the engineering profession and as approved by the Employer.

The Consultant will prepare all the necessary documents as required in the Terms of Reference based on the works volume and approved by the Employer, to call for bids in such further details as may be required for the construction of works to be satisfactorily implemented by a Contractor.

The Study should take proper account of development master plans of the towns traversed by the proposed route. A joint session meeting (Employer, town administration officials and the Consultant) will be conducted to have a common understanding to the town's future development plans to incorporate as practical as possible in to the road design. These may include but not limited to the extent of town sections standard of the main highway crossing the towns, bus bays, utility locations and all the information shall be tied to the design of the project road.

## 4.2 Data Collection and Analysis

**i) Climate**

The Consultant shall examine existing data and provide the climatic information conditions of the study area providing details of: -

a) Rainfall (length of records, monthly distribution and intensity, etc);
b) Temperature (length of records, monthly minimum, maximum and average values) and;
c) Any other climatic features of importance and indicate the effects on the construction work.

**ii) Geology, Land Use, Mapping and Aerial Photography**

The Consultant should compile a catalogue of the relevant geological features of the study area including a description of the soils and rocks encountered along the existing and new alignment and their effect and influence on such factors as route location and design. The Consultant shall use also relevant maps and aerial photographs from the Department of Lands and Surveys.

The Consultant shall assess the need for and separately include in his proposal the cost of any additional mapping and aerial photography considered necessary for the study.

**iii) Route Selection**

Alternatives of new realignments shall be proposed when the existing route is not to the standard in different aspects. Horizontal and vertical alignments shall be improved for the existing route in conformity with the design standards.

**iv) Design Standards**

The geometric and loading standards for the different options shall comply with current Uganda standards appropriate to the traffic and engineering





placed on the Contractor, it is necessary for the Resident Engineer's staff to check all the setting out. A procedure for checking and approval of the Contractor's setting out must be established early in the contract.

## 6.16 Materials, Testing and Quality Control

The Contractor shall set up a site laboratory with experienced staff to carry out materials testing. The Contractor's Materials Engineer shall be approved for the post by the Resident Engineer. All materials testing and quality control activities both in the field and laboratory shall be executed jointly and as directed by the Consultant's Materials Engineer.

The Consultant shall design and establish a workable quality control procedure early in the contract and ensure that all site laboratory staff understand the correct approach to sampling, interpretation of results and the criteria for acceptance/rejection of tested sections of work to avoid site disputes and confrontations that often arise from the test results.

Central Materials Laboratory (CML) shall carry out independent testing of materials on site or completed sections of work, whenever it is found necessary. The Contractor shall send samples of all materials proposed for use in the permanent works to CML for independent testing and approval prior to placing orders for their procurement in bulk. Site materials that fall in this category include lime, cement, other soil stabilizing agents, bitumen, aggregates, road base materials, sub-base materials, mild steel bars, gabions, mattresses, guard-rails, road signs, road marking paint, road chippings etc.

The following aspects for materials testing and quality control shall also be approved by CML prior to implementation on site:

(i) Variations in project materials specifications;
(ii) Replacement of the Consultants Materials Engineer for project supervision;
(iii) Materials testing standards;
(iv) Type and make of equipment to be procured for the site laboratory.

In addition to the above, the Consultant shall submit a monthly materials report in a separate cover, summarising results of all tests carried out and indicating sections approved, rejected or repeated prior to approval. The Consultant shall also submit a certificate of calibration for all site laboratory equipment at commencement of the project and the end of each year in case of projects lasting more than one year.

## 6.17 Safety

Under the construction regulations, the Contractor is made responsible for the safety of his own employees and he/she is also responsible in certain circumstances for the safety of other people such as when he/she undertakes blasting operations, or in the use of machinery.

The specifications usually spell out Safety and Public Health requirements.

## 6.18 Welfare

based upon the programme submitted by the Contractor as part of his Tender and shall not deviate from the said programme. The Contractor shall whenever required by the Project Manager also provide in writing for his information a general description of the arrangement and methods which the Contractor proposes to adopt for the execution of the works (Method Statement).

## 6.12 Facilities for the Project Manager

The Project Manager's facilities to be provided and maintained by the Contractor are usually spelt out in detail in the specifications.

## 6.13 Records of Construction

There are five principal categories of records that the Resident Engineer must keep on a construction site.

These are: -

i) Historical – showing progress stage by stage, as proposed and as achieved, including all relevant information having a bearing on this subject such as records of weather, notes of discussions, decisions and other key matters influencing the course of the job.

ii) Quantitative and Financial – Measuring all that is done, the time and rate it is done, together with all relevant particulars, so as to form the basis of fair payment to the Contractor and for furnishing of figures which show the cumulative cost of the job, the cost of the separate parts of it, and the estimated total final costs at any time.

iii) Qualitative – Being a record of all measurements and observations of the quality and behaviour under test of the component parts of the works the raw and made-up materials used and the foundation and other conditions whose characteristics have an influence on the behaviour of the works.

iv) As built records – Being a pictorial record (the Record Drawings, etc of all works as completed, showing the whereabouts and dimensions of all parts as they exist at completion, together with factual descriptions of their origin, their operation as described in the instruction manuals and their performance under test.

v) Environmental – Being a record of measures taken to safeguard the environment

## 6.14 Monthly Progress Reports

These are short but comprehensive reports complied by the Resident Engineer and submitted to the Employer on a monthly basis in the first week of each calendar month.

The report shall contain records of site meetings, site visits, physical and financial progress of the contract, Contractors plant, equipment and labour deployment, weather conditions and all other relevant details.

## 6.15 Checking of Line and Level

A major function of the site supervisory staff shall be to ensure that work are built to correct line and level. Although the onus for correct setting out is





characteristics of the road, which will be agreed in writing with the Employer. The Consultant shall be responsible for the design details within this framework. The methodologies employed for the design of pavement, earthworks drainage and structures shall conform to current internationally accepted standards ensuring maximum use of locally available materials where appropriate.

**v) Environmental Impact Assessment**

The Consultant will prepare an EIA and social study and propose mitigating action to be carried out during construction and operation of the road in order to minimize any negative impact, which the upgrading of the road may have on the people and the natural/physical environment.

The Consultant will conduct a study, which shall detail the positive and negative effects on the environment from the development of the study road, and shall recommend appropriate solutions to minimize any undesirable effect resulting from construction of the proposed road.

The study shall asses the social benefits possible from road improvement and shall offer mitigating measures and management strategies and actions to reduce or avoid threats to local systems conservations, wild life areas and water catchments. The impacts from quarries, borrow pits and material storage areas serving the project shall be assessed as described in the TOR for the Request for Proposal.

The study Consultant shall propose mitigation measures for all adverse impacts; alternative approaches, recommendations and plan control including cost estimates for their implementation. Most importantly the Consultant shall itemize and include all the mitigation measures in the bill of quantities for costing in the construction tenders.

**vi) Traffic Data**

The Consultant shall assess and update the existing traffic data and carry out any further studies, which can be used to determine the requirements of the pavement design. The additional traffic count to be made should not be less than five days for twelve hours and two days for twenty-four hours.

## 4.3 Detailed Engineering Investigations

**i) Topographical Surveying**

Detailed ground survey along the length of the proposed project road shall be performed using the most up to date surveying equipment such as total station or GPS to examine the road alignment and cross section and any bridge sites and culvert sites that are considered necessary to complete the detailed design and the estimation of quantities.

**ii) Geometric Investigation**

1) The vertical and horizontal geometric characteristic of the road centre-line shall be computed and defined.

2) Detailed site investigation and surveys shall be carried out for areas susceptible to flooding, landslide and at all proposed new or replacement drainage structure locations including a sufficient length up stream and down stream to the structures. All topographical surveys under taken by the Consultant shall be to acceptable international standards for such works and after approval by MOWT shall be recorded in standard or

electronic survey field books which shall become the property of the Employer up on the completion of the study.

3) A computation and definition of the geometric characteristics of the centre-line survey data shall also be given at regular intervals along the curve and the longer tangent alignments. Vertical alignments will be defined and computed.

**iii) Pavement Investigations**

Investigations on the existing pavement shall be performed at the intervals of 500 m. These pavement investigations should be supplemented by an appropriate pavement and sub-grade soils sampling and testing program.

The purpose of the pavement investigation includes but not limited to

1) Identifying of problem areas i.e. areas where the sub-grade is weak or areas where the quality and the bearing capacity of the pavement materials is insufficient;
2) Determine the thickness and quality of the existing pavement layers to incorporate in the new design;
3) Designing on appropriate pavement structures for the new works.

**iv) Soil and Material Investigations**

Material investigations on the existing as well as any new alignment shall be performed to approved standards. The samples taken from centre-lines and existing embankment materials shall be tested.

The general study shall be carried out on the existing pavement condition sub-grade soils and construction materials along the route. The sampling and testing program shall be proposed by the Consultant and approved by Employer.

For new alignment sub-grade soils shall be sampled and tested. For existing alignment pavement depths will be established and sub-grade soils shall be tested for classification, in-situ density and moisture content at an interval of not greater than 1km. Proposed additional tests appropriate for the pavement analysis will also be made. The tests are to include soil/moisture/density relationships and CBR values of sub-grade soils.

Investigations for sources of construction materials for embankment, pavement and drainage structures shall be carried out and suitable materials sources will be surveyed and shown in the plans. Quantities of over burden and material will be proved and sampled by pitting or drilling where necessary.

A soil and material report should be prepared showing exact locations of all construction materials available with an indication of their approximate quantities.

**v) Drainage and Bridge Site Investigations**

Detailed hydrological analysis along the road alignment shall be performed and plans for drainage structures and a detailed drainage schedule shall be provided.





10) The agreement of on-account rate for work for which no rates exist in the Bill of Quantities until such time as they have been fixed.
11) Maintenance of records of measurement together with level and dimensions of work as executed and details of any deviations from the working drawings, if any.
12) Maintenance of temporary records in relation to any claims put forward by the Contractor and agreement at site on factual data related to claims.
13) Channelling of any claims received from the Contractor to the Project Manager. This would include proposed new schedule rates with his recommendations to the Project Manager.
14) Order stoppage of works if it is considered unsafe or is not in compliance with the specifications.

## 6.9 The Site Agent

The Site Agent is the Contractor's top most man on site. He/she is the person who undertakes the construction of works in the project as the Contractors Site Representative.

The Agent is responsible for directing and controlling the whole of the construction works on site.

The Agent has on the spot responsibility for programming of works and keeping progress in line.

Instructions from the Resident Engineer are written to the Site Agent who then relays them to his foreman.

The Site Agent is the man the Resident Engineer deals with on all matters to the Construction Works.

## 6.10 Commencement Order

The order of commencement of works is issued on MOWT Form 757 by the Employer to the Contractor and copied to the Project Manager or Consultant shortly after the contract agreement has been signed between the Government and the Contractor. The commencement order will state the name and address of the Project Manager's representative.

## 6.11 Work Program

The Work Programme is the Contractors own proposals of carrying out works in compliance with the completion period stated in the Appendix to Tender.

This proposal is usually presented in form of bar charts giving the duration of working on particular operations.

Clause 27.1 of General Conditions of Contract requires the Contractor to submit to the Project Manager for his/her approval a detailed programme of work within a prescribed period.

The Programme submitted should show the order of procedure in which he/she proposes to carry out the works. This detailed programme shall be

The Project Manager may be firm of Consulting Engineers or an individual thereof, or he/she may be an individual within the organisation of the Employer. If the Project Manager is an individual from within the organisation of the Employer, the Employer will give him full scope to carry out his duties without allowing policy to override the Project Manager's independence in matters calling for fair decisions.

Usually, the Employer engages the services of an independent Project Manager – a Consulting Engineer. He/she will enter into a contract for supervision of construction of the project.

In return for this service the Employer will pay the Consulting Engineer a professional fee.

At this stage the Consulting Engineer becomes designated as the Project Manager for the project. The Employer agrees to accept the Project Manager's advice on matters of engineering.

## 6.8 The Project Manager's Representative

The Project Manager's Representative is the chief responsible person on site designated as the Resident Engineer.

The function of the Project Manager's representative is to watch and supervise the construction to completion and maintenance of the works.

The Project Manager's representative shall have no authority to relieve the Contractor of any duties or obligations under the contract (except to order minor variations involving delay or extra payment by the Employer) to make any variation of or in the works.

The duties that the Project Manager's Representative may carry out may be expressed in the following terms: -

1) The organisation of the supervision of the works according to the agreed program.
2) Agreement of detailed programmes to conform with the overall construction programme.
3) Checking of progress of works at regular intervals in relation to agreed progress.
4) Supervision of the permanent works and ensuring that the materials and workmanship comply with the specifications.
5) Checking of the setting out of works to ensure that they are in accordance with drawings and the intent of the contract.
6) The examination of method statements for the execution of permanent works and for temporary works proposed by the Contractor with special reference to the safety of such proposals.
7) Issue of site instruction to the Contractor in the way of clarification of construction drawings, modifications required thereto to the extent of such powers that are delegated to him by the Project Manager.
8) The admeasurements and agreement with the Contractor's site staff of quantities of works executed.
9) The issue of instructions for work to be carried out on Day works, the receipt and checking of statements relating thereto and in prime cost items, before they are incorporated by the Contractor into the Interim and Final Payment statements.





This shall include an assessment of the adequacy of the size and spacing of the existing structures and recommendations for ensuring the integrity of these structures with the analyzed requirement.

Hydrological studies shall be carried out for all drainage structures with careful analysis of stereoscopic aerial photography, available maps and field investigations.

**vi) Traffic and Axle Load Studies**

In addition to the evaluation of existing traffic records and forecasting the future traffic to consider in the pavement design requirements the likely level of traffic on the project road will be established by conducting traffic surveys at least for a minimum of five days for twelve hours and not less than two days for twenty-four hours.

A traffic engineering analysis shall be prepared to specify the design of necessary traffic control features. Based on traffic assignment the Consultant shall determine the location of signs, pavement markings and other control features. The Consultant shall design the road furniture such as road signs and markings, guard rails, rest areas, and bus stops in accordance with Uganda Standards and guidelines (when available) and/or other standards approved by the Employer.

## 4.4. Engineering Design Requirements

The Engineering design shall be done using Computer Aided design and drafting soft ware or appropriate design software.

**i) Geometric Design**

The horizontal alignment of the road line shall be determined by study of the optimum alignment between control points specified as a result of the engineering investigations.

In selection of vertical and horizontal alignment improvement and new realignment safety consideration will be applied to the alignment design.

The vertical alignment shall take into account the design standard adopted. While optimizing the earthwork involved, there shall be coordination between horizontal and vertical alignments to the extent possible.

The following points shall be considered in the design of town sections:

- The development master plan of the town.
- The volume of non-motorized traffic and the requirement of parking lanes, bus bays and footways;
- Assessment of existing junctions and incorporating changes including intersections and interchanges;
- The provision of adequate road furniture like safe drainage signing and pedestrian crossings;
- The geometric design shall incorporate the environmental mitigation proposed by the Consultant.

**ii) Pavement Design**

In consideration of the materials available for construction, existing pavement structure, testing results and the anticipated traffic composition and loading the Consultant shall propose alternatives of adequate pavement structures.

A comparison between the different design standards will be presented and recommendation will be made on the design standard to be adopted for the work.

The pavement shall be designed on the basis of the anticipated traffic in consideration of the legal load limits of Uganda. The design period shall be 15 years.

The carriageway width shall be 7m including shoulders in town sections. For difficult terrain the Consultant shall propose width of the carriageway and shoulder to the Employer for approval.

**iii) Drainage Structures and Bridges**

All existing data, field investigations and analysis shall be incorporated in the bridge design or rehabilitation proposals. The optimum solution concerning replacement, repair, extension of existing structures shall be established having regard to economy, applicable construction method and level of future maintenance. Proposals to bridges design shall be recommended for approval by the Employer and the design work shall be to an approved bridge design standard.

Structures of less than 6 meters shall be specified as standard structures which shall be fully designed with supporting hydraulic and structural calculations. The additional new pipes and culverts and the extension of existing pipes and culverts shall be designed using these standards. Where drainage away from the road is problematic the Consultant shall provide details of invert levels and dimensions of side drains.

**iv) Engineering Plans**

The following plans for the project shall be prepared using a format agreed upon with the Employer. The originals will become the property of the Employer.

i) Plans and profiles: Scale 1:2000 and 1:200 respectively, showing natural ground levels horizontal and vertical curve details; drainage; cross sections; side drains and etc.
ii) Typical and other necessary cross sections Scale 1:50, showing all details of road cross sections in cuts and fills, side drains: pavement thickness: camber and super elevation: pavement widening. Etc
iii) Cross sections shall be prepared at scales of 1:200 showing details of all types of drainage structures with inlet and outlet details and any necessary protection works.
iv) Soils plans

Soil plans showing the characteristics of soils for various sections of the road and plans showing locations of borrow and quarry sites.

**v) Construction Quantities**

The calculated quantities for the items of construction shall be based on the final design drawings. The earthwork quantities shall be derived from calculation based on the field cross sections along the road centre-lines and in accordance with accepted methods of measurement that shall be agreed with the Employer. A detailed bill of quantities shall be prepared generally under the following sections: preliminary and general: clearing and earth works: drainage (culvert and protection works): sub base and base: surfacing: major structures including bridges: road furniture: ancillary works: schedule of day works.





It is usual for the Employer to make an interest free loan to the Contractor for the cost of mobilisation in respect of the works. The amount is stated in the Appendix to Tender, usually 10% of the Tender sum less provisional sums.

The Contractor shall provide a guarantee from a bank acceptable to the Employer in an amount equal to the Advance Payment; the Contractor may provide a separate guarantee for each currency.

The Advance Payment shall be repaid by percentage deductions from the Interim Payments certified by the Project Manager under the contract.

## 6.5 Insurance of Works

The GCC require the Contractor to take full responsibility for the care of the works from their commencement to 14 days after substantial completion.

Further, the Contractor is required to exercise this responsibility and care to any outstanding work undertaken by him to finish during the period of maintenance until such outstanding works are complete.

According to the GCC the Contractor is required to repair and make good at his own cost any damage, loss or injury from any cause whatsoever (unless they are excepted risks) that shall happen to the works while the Contractor is responsible for the care of the works.

Under the General Conditions of Contract, the Contractor is required to insure the permanent and temporary works, materials on site and constructional plant to their full value against loss or damage for which the Contractor is responsible under the terms of the contract.

This insurance shall be effected in the joint names of both the Employer and the Contractor.

The type of policy and amount is usually stated in Appendix to Tender.

## 6.6 Parties to the Project

There are three main parties to a Project namely, the Employer, the Consultant and the Contractor.

1. The Employer is the owner of the project. He/she pays for the development of the project and takes it over at completion.

2. Consultant is a specialist adviser to the Employer. The Consultant undertakes to supervise the construction works of the project on behalf of the Employer.

3. The Contractor is the person or entity who undertakes the construction of works in the project. He/she tenders to construct the works for a given sum. If his tender is accepted he/she enters into agreement with the Employer to construct the works. He/she uses his skills and competence in building the works in every respect that the engineer requires. He/she is directed by drawings, specifications and instructions issued to him by the Project Manager in accordance with the rules laid down in the contract.

## 6.7 The Project Manager

1) **The Contract Drawings: -** These Pictorially shows the works to be built, their dimensions, levels, etc.
2) **The Specifications: -** These describe in words the works to be built, the quality of materials and workmanship to be used, and methods of testing, **directions** for measurement and pricing.
3) **The Bill of Quantities: -** This sets out the expected measures of each operations of construction as calculated from the drawings, classified according to trade or location within the proposed works.
4) **The General Conditions of Contractor**: - This define the liabilities, responsibilities and powers of the Employer, the Contractor and the Project Manager. It also covers such matters as methods, liability of parties to the contract, etc.
5) **Environmental Management Plan:-** This describes the measures that the Contractor has to take to safeguard the environment.
6) **The Tender: -** This is the signed financial offer of the Contractor to construct the works in accordance with 1-4 above.
7) **Memorandum of Understanding: -** This spells out all that has been agreed between parties during contract negotiations seeking clarification on the Tender. These agreements will apply during the execution of the works and fall within the scope of the contract.
8) **A letter of Acceptance: -** This is a letter issued by the employer to the Contractor accepting his tender and stating the amount to be paid to completion and maintenance of the works. It also states who the Project Manager is and reminds the Contractor to furnish a performance Security Bond within 30 days from the date of receipt of the Acceptance letter.
9) **The Agreement: -** This is the document signed by both parties, confirming their respective intention to have a contract between them as defined by all the above foregoing documents.

## 6.3 Performance Bond

This is a guarantee which a Contractor obtains from an insurance company or a bank against sufficient sureties binding the insurance company or bank jointly and severally with the Contractor for the sum required for the purpose of the contract by the employer.

The guarantee is usually 30 percent of the contract sum and is provided within 28 days from the date of receipt of letter of Acceptance by the Contractor.

It shall be in writing and must be under seal.

It provides that if the Contractor completes and maintains the works the covenant becomes void.

The Employer may call in the bond if the Contractor defaults after notifying the Contractor on the nature of default.

## 6.4 Advance Payment Guarantee





**vi) Cost Estimate**

In order to make a fair and reasonable estimate of the construction costs the Consultant will prepare a unit price analysis of each item using basic cost elements (labour, material, equipment overhead and profit) including Environmental mitigation measures cost but excluding and showing separately the cost for taxation. The estimate for the right of way acquisition shall also be made with due consultation with the owner. If necessary, the Consultant will also break down the costs into foreign and local currency components.

## 4.5 Prequalification, Tender and Contract Documents

The Consultant shall prepare a complete set of prequalification, tender and contract documents. The conditions of contract to be used will be agreed with the Employer at the contract preparation stage.

The Prequalification documents shall comprise;-

Section 1. Instructions to Applicants

Section 2. Application Data Sheets

Section 3. Qualification Criteria

Section 4. Application Forms

Section 5. Eligible Countries

Section 6. Scope of Works

The Tender document shall comprise; -

Volume I: Invitation to Tender, Condition of Tender and Instruction to Bidders. Appendix to Tender, Tender and Agreement Forms, Schedules, Conditions of Contract, Technical Specifications, Bill of Quantities, Schedule of Basic Rates.

Volume II: Complete set of Drawings

Volume III: Soils and Material Report

Volume IV: Hydrological/Hydraulic and Structural Report

a) Pre-qualification questionnaire and notice according to a format agreed by the MOWT.
b) Instructions to Tenderers, giving general information, list of equipment and senior staff, proposed sub-Contractors, work schedule etc.
c) Form of Agreements, Form of Performance Bond, Form of Surety Bond, Form of Declaration of Transferable foreign exchange requirements.
d) General Conditions of contract and conditions of particular application.

## 4.6. Reports

The Consultant shall prepare and submit the following reports. All reports shall be in English and prepared on metric size papers:

### 4.6.1 Inception Report

The Inception Report, which briefly describes the planning which the Consultant has established for the project, staffing, detailed program and methodology of executing the work, preliminary recommendations on design standards and such other remarks as are deemed appropriate.

### 4.6.2 Progress Reports

These shall be submitted at monthly intervals from the date of contract signature and shall give a brief statement of work performed during the preceding month and a schedule of work for the next month. The progress report shall also contain comments and recommendations describing the effects of the accomplishment on future activities and any proposed change to the work plan for future months.

### 4.6.3 Design Standard Report

This report summarizes the design standards to be used for the project. A review of all appropriate standards and recommendation for the use of one document for each of the main design elements (Geometric, pavement, structure and hydrology) shall be included. Parameters from different standards should not be mixed to project standard. A brief description of recommended standards and reasons for recommendation and list of "departures" from standard recommended and reason for departure shall be included.

### 4.6.4 Engineering Report

The engineering report summarizes all the assumptions and criteria used in the analysis and design of the work together with details of all standards used and the rehabilitation/upgrading/construction strategies and implementation program.

### 4.6.5 Soils and Materials Report

The soil and materials report shall summarize all the geotechnical findings and adoption of those findings to the design. This report shall be a factual report. Specific design information shall be discussed in the Engineering Report.

This report should cover the quantities of pavement materials needed for the construction and indicating locations of possible material sources with estimated available quantities, thickness of overburden, thickness of the investigated material and a proposed material utilization diagram. The report shall provide full details, descriptions and locations of all geotechnical problems with regard to weak sub-grade soils, slope stability problems and landslide areas. Test results and information concerning borrow areas, quarries etc. shall be included in this report as an Appendix. All design calculations for pavement should also be included as an appendix.





# 6.0 CONSTRUCTION SUPERVISION AND MANAGEMENT

## 6.1 General

Having conceived the aim of an intended works and designed it to practical details, the third stage is the construction works.

The construction works may last for a few months to several years. It may use the labour of thousands of men, the accumulated knowledge of generations of experts.

Till such time when the works are completed there must be a continuous resolve to pursue their construction to finality.

Resources must be provided in the form of money, manpower, machines and materials to support this resolve throughout the construction period.

Construction works must be commissioned or ordered in advance.

There must be an Employer who resolves to undertake the works, agrees to pay for them and to own them when completed.

Payments must be progressive throughout the stages of development.

Until the final stage is reached the Employer acts in faith that what his expert advisers say can be done will be done; that what they say will be the cost, will in fact be the cost.

**The obligations of the Employer are: -**

1. To define the functions the works must perform.
2. To evaluate the worth of the intended project and to be assured this satisfies his predicted requirements.
3. To obtain the necessary powers for the construction of the works.
4. To find the money to pay for the works.

The Employer can be a person or a group of persons acting as corporate body such as a local government authority or a government department or a company.

To exercise his powers effectively he/she will, on the engineering side, require two key specialist advisors and executives – the Project Manager who undertakes the supervision and the Contractor who undertakes the construction.

## 6.2 Contract Documents

The contract for the construction of the works binds the Contractor to execute the works and the employer to pay for the works.

Contract documents describe comprehensively what the works are, and how payment is to be made. The works are often complex involving the Contractor in numerous different operations and requiring him to buy various manufactured items and materials and to employ a variety of men and machinery.
Therefore the contract itself shall comprise a number of documents as listed below: -

Contract Negotiations are carried out with the next firm. The process can be repeated until the contract is successfully negotiated.

### 5.4.7 Award of Contract

After the successful conclusion of Contract negotiations, a draft Contract Agreement plus the minutes of the negotiations are sent to the Funding Agency for review and approval. A copy of the same draft Contract Agreement is also submitted to the Solicitor General (SG) for their legal opinion and clearance for Contract Signature. On receipt of the "No Objection" from the Funding Agency the Contract is signed and awarded to the firm to implement the project.

A typical time scale for Procurement of Consultancy Services and Contractor for an average 12 months contract is shown in appendix 1 in Clauses 1 -9.





### 4.6.6 Hydrological/Hydraulic and Structural Report

The hydrological/hydraulic and structural report summarizes all hydrological and hydraulic analysis/calculation together with assumptions and criteria used for the design of drainage structures. All details of standards used shall also be included. Detailed calculations with regard to waterway openings for major water courses during peak flood condition with the needed protection of the road slopes and structures, list of structures showing existing discharge capacity, estimated design flood and proposed new culvert or bridges, and description of the structural condition investigations shall be included in this report.

The report shall further elaborate on the availability of water for the construction and measures required/proposed to obtain such water. The water has also to be analyzed with regard to quality and quantity. All design calculations for structures should also be included as an appendix.

### 4.6.7 Environmental Impact Assessment Report

The report shall include but not limited to:

- Description of environment in the area affected by the project;
- Anticipated environmental impacts and mitigation measures;
- Consideration of alternate projects or approaches;
- Institutional requirements and environmental monitoring program and;
- Public involvement and environmental impact monitoring.

### 4.6.8 Land Acquisition Plans and Report

For the purpose of land acquisition, land acquisition plans are to be prepared based on the available cadastral maps and the available data collected from location surveying. In addition, the intersection between the new road reserve and the plot boundaries shall be set out and referenced on the ground with an accuracy of 1m.

The plans are to be supplemented by a listing of the affected plot numbers, the area required of such plot and list of all properties in the right of way and their cost estimate.

### 4.6.9 Topographic Survey Report

This report shall contain a detailed description of the method of survey, list of established control points with their coordinates, method of approach to the established control points, location of traverse control points, list of inter-visible control points, list of scale factor for each established control point, check control points, etc..

The report should be detailed so as to provide the supervision Consultant and the Contractor with adequate survey information and for easy reference during construction stage.

### 4.6.10 Final Consultancy Completion Report

This report has to be prepared and submitted after the completion of Consultancy services. It shall be a comprehensive report on the Consultancy services throughout the project. It shall describe the aims of the project, the achievements, any problems encountered and any recommendation to be made by the Consultant, etc. It shall also include the Consultant's final statement.

# 5.0 PROCUREMENT

## 5.1. General

Project Implementation now reaches the stage of procurement of goods, works and/or services. Procurement may take various forms depending on the funding agencies as shall be discussed elsewhere in this Manual.

The basic principles in procurement of goods, works and/or services is that proceeds (funds) secured for implementation of a given project be used with due attention to considerations of economy and efficiency. This principle therefore calls for competitive bidding for procurement of goods, works and/or services needed for the implementation of the projects.

The following forms of procurement methods are commonly used:

i) International Competitive Bidding (ICB)
ii) Limited International Competitive Bidding (LICB)
iii) Local Competitive Bidding (LCB)
iv) International Shopping
v) Local Shopping
vi) Force Account (FA)
vii) Direct Purchase (DP)

## 5.2 Project Funding

Project funding forms a very essential and vital component during project implementation and can take the following forms:

1) Sole funding – only one party, i.e. GOU, Bank (WB, ABD, IDA) etc. provides all required funds.
2) Co-funding – Two or more parties other than the "burrower" (e.g. GOU) are providing funds during implementation of a project either on parallel or joint basis.
3) Parallel funding – Two or more parties are providing funds for separate packages of the same project during implementation of a project.
4) Joint funding – Two or more parties are providing funds for the same project during implementation of a project.

## 5.3. Procurement of Consultancy Services

The procurement of Consultancy Services is described in detail MOWT publication "Request for Proposal for Consultancy Services". The process, in general is as described here below:

### 5.3.1 Prequalification (Shortlist)

Usually a notice is run in a public and widely circulated newspaper including the UN Newsletter "Development Business" requesting firms who are eligible to participate on a given project to apply to be pre-qualified to bid.
In preparation of the Shortlist, the funding agency and the borrower must make use of several factors in compiling the Shortlist of Consultants i.e.





This method is not very commonly used as it is laborious and time consuming due to large number of firms who may wish to bid. The EEC employs this method.

### 5.4.4 Invitation To Tender (ITT)

On completion of the above Procurement process i.e. Prequalification and Open Tender, the firms selected are issued with Invitation to Tender (ITT) as prepared by the borrower and approved by the funding agency.

**The ITT shall usually include: -**

(i) a brief description of the services to be supplied;
(ii) Conditions for obtaining the bidding documents and the place for having access to them;
(iii) date for the invitation to bid as well as the date, hour and place for the latest delivery of bids;
(iv) date, hour and place for the public opening of bids;
(v) name, address, telex, cable, cable and telephone numbers of the executing agency i.e MOWT or any other agency capable of giving sufficient information to bidders;
(vi) any indication of any restriction to procurement i.e. eligibility; and
(vii) sources of funding with reference to the funding agency and GOU.

### 5.4.5 Evaluation of Tenders

Another stage of Project Implementation is the Evaluation of Tenders.

Depending on the period indicated in the ITT as noted under 5.4.4 (iii) bids received in time shall be publicly opened at the Contact Committee and the tenders shall then be evaluated by the MOWT.

The evaluation is usually carried out by a team/committee with well laid out guidelines for scoring based on the funding agencies rules of procurement. In more complicated cases (large tenders) Consultants may be engaged to carry out the evaluation on behalf of the Ministry.

The Evaluation Report which shall be based on the funding agency's rules of evaluation shall then be sent to both the funding agency and contract committee for review and approval. If any of the two bodies are not satisfied with the Report, they may request for a further review. One must not hear that at this stage of procurement, a lot of lobbying takes place although the process of evaluation is meant to be confidential.

After clearance of the Evaluation Report, the firm so selected shall be invited to come for negotiations with the MOWT.

### 5.4.6 Contract Negotiations

The MOWT would then invite the selected firm to come to negotiate the Contract during which time all the shortfalls raised in the Evaluation Report are discussed and negotiated with the firm until satisfactorily concluded. In the rare event that negotiations are not successful, the MOWT would then inform the Funding Agency recommending that negotiations be initiated with the second highest firm. On getting clearance from the Funding Agency,

iv. International Shopping (IS)

This method is applied by public competition through request for quotations at International level in a situation where the value of the works are too small or works are so diverse to warrant a single Contract or works cannot be carried out by LCB. This procurement procedure is more relevant to the supply of goods and is rarely used in Works Contracts.

v. Local Shopping (LS)

LS is similar to the circumstances in IS above except that the works can be contracted in the borrower's country and there is sufficient number of Contractors to ensure completion in bids. Again this method of procurement is common during the supply of goods.

vi. Force Account (FA)

This method is usually applied when both the funding agency and the borrower are satisfied that FA may be the most efficient and economic way of executing certain works and that the borrower has adequate staff, equipment and the works can be expeditiously executed at a reasonable cost.

vii. Direct Purchase (DP)

DP is a method of procurement where the funding agency has waived altogether any other form of public competition as described above and has authorised the borrower to procure through direct negotiation with a specified Contractor. These is applicable where the works are already satisfactory under construction and are to be extended so long as the on-going Contract had been awarded based on ICB or where specific technologies and processes are obtainable only from one manufacturer holding exclusive patents and manufacturing rights.

Based on any of the above modes of procurement the funding agency and the borrower can then agree on how to proceed to the next stage of procuring of Contractors. Two common methods are used at this stage of procurement i.e. Prequalification and Open Tenders.

### 5.4.2 Prequalification

This method of procurement of works involves mostly large or complex projects and it ensures that only capable firms participate.

Usually a notice is run in a public and widely circulated newspaper requesting firms who are eligible to participate on a given project to apply to be pre-qualified to bid. Most funding agencies prefer this method of procurement.

The borrower i.e. GOU would then prepare an evaluation report on the applications received making recommendations on the number of firms qualified to bid.

The funding agency would then approve the list of firms who then shall be considered as the pre-qualified firms.

### 5.4.3 Open Tenders

The method of open tenders for procurement of Contractors calls all eligible interested firms to submit their bids for consideration to provide the works.





(a) Borrower's own experience of individual Consultants and Consulting Firms;

(b) List of Consultants who have expressed interest in providing the proposed services; and

(c) Funding agency's own record of Consultants.

The borrower i.e. GOU would then prepare an evaluation report on the applications received making recommendations on the number of firms found acceptable to bid.

The funding agency would then approve the list of firms normally ranging from 5 to 7 who then shall be considered as the pre-qualified firms. This method is sometimes called Short listing.

### 5.3.2 Prequalification (Long list)

This method of procurement of Consultancy Service is usually not encouraged as it has serious disadvantages: better Consultants may not be inclined to submit proposals and other Consultants may be discouraged from putting enough effort into their proposals.

### 5.3.3 Restricted Tenders

This method of procurement of services is also similar to the ones above except the borrower in agreement with the funding agency select (shortlist) a number of firms ranging between 3 and 7 to be invited to bid without requesting for application to pre-qualify.

The selected criteria are usually based on past experience and area of speciality in relation to the project for implementation.

### 5.3.4 Invitation To Tender (ITT)

On completion of the above Procurement process which amounts to Shortlisting the firms selected are issued with Invitation to Tender (ITT) as prepared by the borrower and approved by the funding agency.

**The ITT shall usually include:-**

i) a brief description of the services to be supplied;
ii) conditions for obtaining the bidding documents and the place for having access to them;
iii) date for the invitation to bid as well as the date, hour and place for the latest delivery of bids;
iv) date, hour and place for the public opening of bids;
v) name, address, telex, cable and telephone numbers of the executing agency i.e. MOWT or any other agency capable of giving sufficient information to bidders;
vi) any indication of any restriction to procurement i.e. eligibility; and
vii) sources of funding with reference to the funding agency and GOU.

### 5.3.5 Evaluation of Tenders

Another stage of Project Implementation is the Evaluation of Tenders. Depending on the period indicated in the ITT as noted under 5.3.4 (iii) bids received in time shall be publicly opened at the Contract Committee and the technical proposals shall then be evaluated by the MOWT.

The evaluation is usually carried out by a team/committee with well laid out guidelines for scoring based on the funding agencies rules of procurement.

The Evaluation Report on the technical proposals is the submitted to Contract Committee with a request to open the financial envelopes for financial evaluation of only those firms who were found technically competent and are recommended as such in the Technical Evaluation Report.

Again based on the funding agency, the scores of the financial evaluation shall then be used to select the best firm as follows:-

(i) For ADB/ADF funded projects, the firm with the lowest evaluated financial proposal i.e. with the highest financial score irrespective of the technical evaluation score, shall be recommended for contract award.

(ii) For IDA, EEC funded projects the firm with the highest total aggregate score of the combined Technical and Financial proposals shall be recommended for Contract award.

(iii) Parallel funding – Two or more parties are providing funds for separate packages of the same project during implementation of a project.

(iv) Joint Funding – Two or more parties are providing funds for the same project during implementation of a project.

(v) Other funding agencies adopt other Methods of selection i.e. selection can be based on only technical evaluation with the highest ranked firm being recommended for Contract award. In such a case the firm's financial proposal is presented and negotiated during the stage of contract negotiated during the stage of contract negotiations.

A complete Evaluation Report is then prepared based on both the technical and financial analysis with recommendations for award of contract.

The now completed Evaluation Report on the bids received is then sent to both the funding agency and Contract Committee for clearance should any of these bodies find the Report not conforming to the general rules of Procurement for one reason or the other, they may object to the recommendation of the Report and ask the MOWT to review the whole process. Such situations although undesirable keep cropping up now and again and a lot of time delay is usually realised and Project Implementation suffers considerable time delay. The important thing to note there is that in carrying out the evaluation the team involved MUST follow the guidelines and procedure to the letter and MUST be impartial to a large degree as every part of the Report is thoroughly reviewed by the Funding Agency as a neutrals body entrusted with the funds from all member states whose firms shall benefit from bids where possible.

After clearance of the Evaluation Report, the firm so selected shall be invited to come for negotiations with the MOWT.





### 5.3.6 Contract Negotiations

This stage of Procurement of Consultancy Services involves the review of both the technical and financial proposal of the selected firm, outlining the shortfalls in the proposals. During the process of Contract negotiation all the shortfalls raised in the Evaluation Report are discussed and negotiated with the firm until satisfactorily concluded. In the rare event that negotiations are not successful, the MOWT would then inform the lending agency recommending that negotiations be initiated with the second highest firm. On getting the clearance from the funding agency, Contract negotiations are carried out with the next firm. The process can be repeated until the contract is successfully negotiated. Contract negotiations usually last between 2 – 3 days.

### 5.3.7 Award of Contract

After the successful conclusion of Contract negotiations, a draft Contract Agreement plus the minutes of the negotiations are sent to the Funding Agency for review and approval. A copy of the same draft Contract Agreement is also submitted to the Solicitor General (SG) for their legal opinion and clearance for Contract Signature. On receipt of the "No Objection" from the Funding Agency the Contract is signed and awarded to the firm to implement the project. This process usually takes approximately one (1) month, although cases where the funding agency has further clarification can take up to three (3) months.

Most Consultancy Services i.e. Supervision, Technical Assistance, Studies etc. usually take 30 days from date of signature to the Commencement of the service.

## 5.4 Procurement of Contractors

### 5.4.1 General

Procurement of Contractors is described in detail in the MOWT publication "Procurement of Bridge and Road Works" and can take any of the modes outlined under section 6.1 below. The general principle for each of the various models is described here for ease of reference: -

i. International Competitive Bidding (ICB)

ICB is used where international financing is involved and is carried out by open advertisement addressed to potential Contractors with a view to inviting them to bid.

ii. Limited International Competitive Bidding (LICB)

LICB is used where the number of potential Contractors for a particular project is proved to be limited. The same procedure where notifications are made public but the number of Contractors are limited.

iii. Local Competitive Bidding (LCB)

This method requires notification only in the local press and is usually applied when the size, location and complexity of the works are such that they are unlikely to attract bids from outside the borrower's country.