



# AFCAP



## Consultancy Services for Preparation of Design Manuals for Low Volume Roads in Tanzania Inception Workshop Report - Final

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January 2014

CONTRACT REF NO. AFCAP/TAN/057



British Expertise  
International Awards 2013:  
**Outstanding International  
Collaboration**



**This project was funded by the Africa Community Access Programme (AFCAP) which promotes safe and sustainable access to markets, healthcare, education, employment and social and political networks for rural communities in Africa.**

Launched in June 2008 and managed by Crown Agents, the five year-long, UK government (DFID) funded project, supports research and knowledge sharing between participating countries to enhance the uptake of low cost, proven solutions for rural access that maximise the use of local resources.

The programme is currently active in Ethiopia, Kenya, Ghana, Malawi, Mozambique, Tanzania, Zambia, South Africa, Democratic Republic of Congo and South Sudan and is developing relationships with a number of other countries and regional organisations across Africa.

This material has been funded by UKaid from the Department for International Development, however the views expressed do not necessarily reflect the department's or the managing agent's official policies.

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## Report summary

Roads agencies in Tanzania face a major challenge with the management of their rural road network of just over 50,000 km. This network is relatively lightly trafficked, almost completely unpaved, in mostly poor condition, and generally impassable during the rainy season. The agencies are now striving to find more appropriate, cost-effective solutions for maintaining their unpaved roads or upgrading them to a paved standard.

There is a concern that the current design manuals do not cater adequately for low volume roads. This has led to a need to develop a new design manual specifically for low volume roads—an initiative that is being supported by the UK Department for International Development (DFID) through its Africa Community Access Programme (AFCAP).

The purpose of the project is to prepare a design manual for low volume Roads in Tanzania as a basis for promoting rational, appropriate and affordable implementation of projects providing such roads in a manner that makes appropriate use of local resources in a cost-effective and sustainable manner. It is expected that the new manual will be based on similar documents prepared previously under AFCAP in other countries such as South Sudan, though other relevant local and regional experience will also be incorporated.

One of the first activities to be undertaken on the project is the holding of an Inception Workshop and the production of a report on the event. To this end, this Inception Workshop Report:

- Presents the details of the workshop in terms of its objectives, venue, programme and attendance.
- Summarizes the opening remarks made by representatives of AFCAP, PMO-RALG and the Ministry of Works.
- Provides an overview of the workshop presentations and ensuing deliberations.
- Summarizes the main outcomes of the workshop and the agreements reached in terms of the immediate way forward.

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## List of Abbreviations

AFCAP	African Community Access Programme
CI	Complementary Intervention
DCP	Dynamic Cone Penetrometer
DFID	Department for International Development
DN	Rate of DCP penetration in mm/blow
EOD	Environmentally Optimized design
EU	European Union
HVR	High Volume Road
HV	Heavy Vehicle
ILO	International Labour Organization
IRAP	Integrated Rural Accessibility Planning
Km	Kilometre
LCC	Life Cycle Costing
LGA	Local Government Authority
LVR	Low Volume Road
LVSR	Low Volume Sealed Road
MESA	Million Equivalent Standard Axles
PMO-RALG	Prime Minister's Office-Regional Administration & Local Government Authorities
RFB	Road Fund Board
RTC	Roads Technical Committee
ToC	Table of Contents
ToR	Terms of Reference
TWG	Technical Working Group
TRL	Transport Research Laboratory
UK	United Kingdom

It should be noted that the BSI Symbol and UKAS Accreditation mark signify that Crown Agents operate a documented Quality Management System registered with the British Standards Institution to the international quality standard BS EN ISO 9001:2008. The provision of consultancy services in revenue enhancement and expenditure and debt management including: customs, taxation and trade, human institutional and organisational development, engineering, procurement management advice and reform, health logistics and procurement services. The management of third party quality assurance and inspection services related to the supply of manufactured and processed products. International freight forwarding services utilising in house sub-contract warehousing. Verification of service as follows: Air Import – Clearance UK airport; Exports – Airport of departure; Sea Imports – Clearance UK port; Sea Exports – Port of loading.



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## **1. INTRODUCTION**

### **1.1 Background**

The Africa Community Access Programme (AFCAP) is supporting the adoption of appropriate design standards for low volume roads (LVRs) in Tanzania. As part of that initiative, and in recognition of the fact that current manuals do not adequately address the specific requirements of LVRs, a consultancy has been let to develop a new Design Manual for Low Volume Roads in Tanzania. In so doing, it is expected that the new manual will facilitate the adoption of more rational, appropriate and affordable implementation of LVRs in a manner that makes appropriate use of local resources in a cost effective and sustainable manner.

One of the key, early, activities of the project is the holding of an Inception Workshop the details of which are presented below.

### **1.2 Inception Workshop**

#### **1.2.1 Objectives**

The main objectives of the workshop were to:

- Sensitize stakeholders to the details of project including its background, its scope, the approach and methodology for undertaking it and the final deliverables.
- Present the outcome of the Manuals Review Report for discussion with stakeholders.
- Propose for discussion an outline Table of Contents for the new manual.
- Discuss a number of issues related to the execution of the project.

#### **1.2.2 Venue, programme and attendance**

The workshop was held on Thursday 23 January, 2014, at the Coral Beach Hotel Conference Room, Dar es Salaam. The programme included Welcome Remarks by representatives of the Prime Minister's Office-Regional Administration & Local Government (PMO-RALG), the Ministry of Works (MoW) and AFCAP. A copy of the programme is attached as Annex A.

The workshop was attended by a total of 18 delegates, excluding the AFCAP representatives and the Consultants team, and comprising representatives from PMO-RALG, MoW, TANROADS, Road Fund Board, Association of Consulting Engineers, the donor community, and consultants involved in related projects in Tanzania. The list of participants is presented in Annex B.

The organization of the workshop and its facilitation were undertaken by the Consultants local project coordinator, Eng. A. Awadh.

#### **1.2.3 The main outputs of the workshop include:**

- The outcome of the Manuals Review Report
- General agreement on the outline Table of Contents (ToC) for the new manual.
- General agreement on the type, layout and scope of the new manual.
- The role and function of the TWG and RTC
- A heightened appreciation of the very tight programme for completing the project.

#### **1.2.4 Report**

This Workshop Report documents the outcome of the workshop proceedings and is structured as follows:

**Section 1** (this section): Provides the details of the stakeholder workshop.

**Section 2:** Presents a summary of the workshop preliminaries, including the welcome remarks by the various stakeholder representatives.

**Section 3:** Presents the key aspects of the Consultants presentations and summarises the questions and comments arising from them.

**Section 4:** Summarizes key agreements reached on various aspects of the execution of the project.

**Annexes:** Annex A presents the workshop programme whilst Annex B provides the list of workshop participants and Annex C the PowerPoint presentations made at the workshop.

## **2. WORKSHOP PRELIMINARIES**

### **2.1 Welcome Remarks**

The welcome remarks were made by Eng. Jackson Masaka on behalf of the Director of Infrastructure Development. On behalf of PMO-RALG he thanked all the Development Partners, in particular the UK Department for International Development (DFID), for supporting the improvement of road infrastructure in the Local Government Authorities (LGAs) of Tanzania including the preparation of a Design Manual for Low Volume Roads. During the course of his remarks he stated that:

- The need for a LVR design manual had arisen after the LGAs had experienced a number of challenges in achieving the economic, efficient and effective provision of LVRs.
- The challenges faced were probably caused by lack of an integrated and holistic approach to the design of LVRs.
- There were a number of existing manuals but there was concern over their applicability to LVRs.

In concluding his remarks, Eng. Masaka expressed the hope that the outputs of the project would be beneficial to the LGAs and that stakeholders would contribute to the development of the manual.

### **2.2 Opening Remarks**

The opening remarks were made by Eng. Fintan C. Kilowoko, Assistant Director for Regional Roads in the Ministry of Works. During the course of his remarks he stated that:

- The Ministry of Works is mandated to develop design manuals, standards and specifications for use by the Road Agencies in the country.
- Over the time there had been a desire to develop a Design Manual for Low Volume Roads in order to facilitate the appropriate use of local resources in a cost-effective and sustainable manner.
- The use of existing Standards and Specifications are more suitable for major roads and not for LVRs with traffic levels of less than 100 vehicles per day. When applied to LVRs, the current manuals result in the inefficient use of scarce resources.
- The Development of the Design Manual for Low Volume Roads will help in ensuring that the available resources are used prudently.

He concluded his remarks by thanking by thanking the UK Department for International Development (DFID) for supporting the project through its African Community Access Programme (AFCAP) and assuring delegates that the Ministry will provide the necessary support that will ensure success of the project.

### **2.3 AFCAP Statement**

The AFCAP Technical Manager, Eng. Nkululeko Leta, provided a general background to the project which, he stated, was identified by the AFCAP Tanzania Steering Committee as a priority one for the country. In this regard, he mentioned that the host institution in Tanzania is PMO-RALG under which the ongoing project fell.

Eng. Leta then went on to outline the support that AFCAP had provided for a number of other projects in Tanzania in the areas of engineering, transport services and related rural roads programmes.

As regards the LVR Manual project, Eng. Leta mentioned that:

- The implementation period was January – June 2014
- The strongest possible consulting team has been assembled
- The project will benefit from latest innovations in LVR technology



- A Technical Working Group and Roads Technical Committee had been formed and will be coordinated by the MoW.

He concluded his remarks by urging all stakeholders to contribute to the development of the manual by playing a proactive role in its review thereby engendering local ownership of the outputs of the project.



**Presentation of Opening Remarks  
By Eng. Jackson Masaka**



**Presentation of Welcome Remarks  
by Eng. Fintan Kilowoko**



**Workshop in progress**

### **3. WORKSHOP PRESENTATIONS AND DELIBERATIONS**

#### **3.1 General**

The main objective of this aspect of the workshop was for the Consultants to present the details of the project, as well as the outcome of the Manuals Review Report as a basis for plenary discussions and comments by stakeholders, including the Technical Working group. To this end, the various PowerPoint presentations made are summarized below and attached as Annex C:

#### **3.2 Project Activities**

##### **3.2.1 Background and purpose of presentations**

This presentation focused on the background to the project and addressed the following issues:

- The LVR rural road setting in Tanzania
- Road network statistics and conditions
- Purpose and scope of the manual

##### **3.2.2 Project overview**

This presentation focused on the key role players on the project and addressed the following issues:

- The organizations involved in the implementation of the project
- The composition of the RTC and TWG and their role and function
- The Consultants project team
- The project work plan

##### **3.2.3 Review of project documentation**

This presentation focused on the outcome of the review of existing documentation on LVRs as captured in the Manuals Review Report that was submitted to stakeholders before the workshop. The presentation by the Consultants project team covered each of the envisaged parts and chapters of the new LVR manual as follows:

- Part A: Introduction
  - Chapter 1: General Introduction
- Part B: Planning
  - Rural Accessibility Planning
  - Complementary Interventions
- Part C: Investigations
  - Site Investigations and Route Selection
  - Geotechnical Investigations and Design
  - Construction Materials
- Part D: Design
  - Environment
  - Traffic
  - Geometric Design
  - Road Safety
  - Hydrology, Drainage and Erosion
  - Drainage Structures
  - Pavement Design
  - Unpaved Roads
  - Surfacing
  - Comparison of Designs and Implementation

- Part E: Design
  - Documentation, Tendering and Award
- Part F: Construction
  - Construction and Quality Assurance
  - Borrow Pit Management
- Part G: Construction
  - Maintenance

### 3.2.4 Other related presentations

A number of other presentations on projects that are related to, and can have an impact on the new LVR manual, were made by the respective project leaders as follows:

- Technical Assistance to PMO-RALG IDU to develop Road Research Capacity in Dodoma: Briefing Note – Mike Head, Team leader, I T Transport, UK. The objectives are to:
  - Assist IDU in setting up a low volume road research unit in Dodoma
  - Develop a strategic plan for implementation of its research priorities
- EU funded project: Improvement to Rural Roads in Iringa, Ruvuma and Morogoro Regions – John Jarvis, Project Manager, SMEC Consultants, Australia. The objectives are to:
  - Improve rural access roads to provide 365 day access to communities and agriculturally productive areas that lack this at present.
- EU funded project: Technical Management Capacity Building in Tanzania – Dave Jennings, Project Manager, I T Transport, UK. The objectives are to:
  - Develop guidelines, training courses and practical training in various aspects LVRs for Songea, Iringa and Morogoro Regions.
- EU funded project: Technical Capacity Building of the Transport Sector in Tanzania – Jan Bijl, Technical Advisor, MoW. The objectives are:
  - Increase efficiency, effectiveness and accountability of the transport sector
  - Facilitate adoption of a Sector Wide Approach by improving capacity and competences of the transport sector stakeholders

## 3.3 Workshop Deliberations

### 3.3.1 Background and purpose of presentations

The following is a summary of the comments made and issues raised following the above presentation:

- The project is long overdue as there are a number of on-going low volume rural roads projects in the LGAs, e.g. the EU funded project on Improvement to Rural Roads in Iringa, Ruvuma and Morogoro Regions, which would benefit from the existence of the new LVR manual.

### 3.3.2 Project overview

The following is a summary of the comments made and issues raised following the above presentation:

- Clarification: The project falls under PMO-RALG, the host organization. However, its coordination would be undertaken by the MoW - the organization responsible for standards and specifications in Tanzania.
- Confirmation: The names of the individuals comprising the RTC and TWG and would be confirmed officially by the respective parent organizations in the near future.

- Comment: The time allowed for completion of the project is too short and the TWG would be hard pressed to complete the review of the deliverables in the time allowed. Would it be possible to extend the project duration?

Response: The AFCAP Technical Manager confirmed that the current AFCAP programme ended in June 2014 and there is no possibility of extending the deadline. Thus, all parties would have to observe the project deadlines at various stages of its execution.

Comment: Would it be possible to update or amend the documents(s) later – say after 1 or 2 years?

Response: The AFCAP Technical Manager confirmed that this would certainly be the case.

### **3.3.3 Review of project documentation**

The outcome of the review of existing documentation on LVRs – more than 30 in all - was summarized by the Consultants as follows:

1. There is no single existing document in Tanzania that caters specifically for all the requirements of LVRs. However, a number of existing manuals do address aspects of LVR provision that are appropriate for inclusion in the new manual.
2. Most of the Tanzania manuals cater primarily for HVRs although aspects of their make-up are applicable to LVRs.
3. There are a few gaps in the coverage of the existing Tanzanian, and other regional manuals that need to be filled. They include, for example, Materials and Borrow Pit Management and Construction and Quality Control.
4. Almost all the information required to be included in the development of the new LVR manual for Tanzania can be sourced from the extensive range of documents available to the Consultants.

As a result of the above, the Consultants informed stakeholders that they had concluded that:

1. There is a need to develop a new manual for Tanzania that caters specifically for the requirements of LVRs.
2. The new LVR manual should be developed in close consultation with stakeholders so as to capture their specific requirements. There is no existing document in Tanzania that caters specifically for all the requirements of LVRs.

### **3.3.4 Proposed scope of new LVR manual**

The Consultants proposed that the scope of the new LVR manual should, for completeness, address all the activities that are typically associated with the provision of LVRs. However, they suggested that a distinction should be drawn between core and complementary issues whereby the latter, fundamental LVR issues, would be addressed in some depth so as to provide not only the principles concerned but, also, sufficient guidance to enable the practitioner to either undertake the activity himself, or to seek specialist assistance to do so. In contrast, complementary issues would be addressed in a less detailed manner with the objective of raising awareness of the related importance of the matter that may be undertaken by another party.

Based on the above considerations, the Consultants proposed the following outline ToC for developing the various parts and chapters of the new LVR manual:

Part	Chapter	Focus
A. Introduction	1. General Introduction	Core
B. Planning	2. Rural Accessibility Planning 3. Complementary Interventions	Complementary Complementary
C. Investigations	4. Site Investigations and Route Selection 5. Geotechnical Investigations and Design 6. Construction Materials	Core Core Core
D. Design	7. Environment 8. Traffic 9. Geometric Design 10. Road Safety 11. Hydrology, Drainage and Erosion 12. Drainage Structures 13. Pavement Design 14. Unpaved Roads 15. Surfacing 16. Comparison of Designs and Implementation	Core Core Core Core Core Core Core Core Core Core
E. Contracts	17. Documentation, Tendering and Award	Complementary
F. Construction	18. Construction and Quality Assurance 19. Borrow Pit Management 20. Technical Auditing	Core Core Complementary
G. Maintenance	21. Management, Operations and Procedures	Complementary

The TWG confirmed their agreement in principle with the above approach to which they would give further consideration before providing their official approval. Moreover, the TWG confirmed the following details pertaining to the type, layout and scope of the manual:

- **Type:** Single (rather than a series of stand-alone documents), thermally bound spine
- **Layout:** Single column with box inserts – as per the Malawi DCP Design Manual
- **Scope:** Intermediate, i.e. basic principles plus guidance for core issues.

The TWG also confirmed that reference could be made in the new LVR manual to other manuals, where appropriate, but that these manuals should be readily available to stakeholders in Tanzania.

### 3.3.5 Comments on proposed chapters of new LVR manual

The following comments were made by stakeholders on the proposed chapters of the new manual with the consultants responses indicated.

**(a) Part A: Introduction**

No comments

**(b) Part B: Planning**

**(1) Rural accessibility planning**

Comments: Stakeholders mentioned that there is: Lack of planning data in the LGAs; Need for network planning in LGAs; the IRAP rural accessibility planning approach could enhance the planning process in LGAs;

**(2) Complementary Interventions (CIs)**

Comments: The Consultants clarified that CIs are targeted at the local communities in the road corridor and offer an opportunity for the client's expedient use of the contractor's presence on site to provide particular facilities that would be much more expensive to accomplish through a separate project.

**(c) Part C: Investigations**

**(1) Site and geotechnical investigations**

Comments: Would the new manual deal separately with geotechnical and site investigations?

Response: The Consultants drew a distinction between site investigations and geotechnical investigations in that the former topic would address issues such as the gathering of information on the existing alignment, soils, hydrology and drainage. In contrast, the latter topic would be addressed in a separate chapter which would focus on investigations aimed at ensuring the proper location/founding of structures (roads, bridges, cuts, fills, etc) to allow them to be designed within acceptable risk limits.

**(d) Part D: Design**

**(1) Environment**

Comment: The issue of road environment factors should perhaps be differentiated from the natural or “bio-physical “environment and, instead, be included in the introduction to the new LVR manual.

Response: The Consultants expressed their concurrence with this suggestion.

**(2) Traffic**

Comment: It is Important to take into account the effects of attracted traffic as this may change a LVR to a relatively highly traffic road within a few years of construction.

Response: The Consultants confirmed that all components of traffic development on an improved road, such as current, normal traffic growth, diverted, and generated traffic, would all need to be considered so as to ensure that the design traffic loading did not exceed that road applicable for a LVR design philosophy.

**(3) Geometric Design**

Comment: The Road Traffic Act specified a minimum lane width of 3.1 m which should be taken into account in the chapter on Geometric Design.

Response: The Consultants confirmed that this issue would be considered in the preparation of the chapter and requested a copy of the Road Traffic Act which the TWG promised to provide.

**(4) Unpaved Roads**

Comment: Gravel (unpaved) roads should be a self-standing and complete section – moisture sensitivity must be discussed – aspects such as construction, materials location and specifications to be included.

Response: The Consultants stated that gravel roads would remain the largest component of the rural road network in the LGAs for many years and this topic would be addressed in a comprehensive manner in the new LVR manual.

**(5) Hydrology, Drainage and Erosion**

Query: The Consultants enquired as to the methods used for flood estimation in Tanzania.

Response: The East African Flood Model (developed originally by TRL in the 1970s) was one of the models used for hydrological analyses in Tanzania.



### **3.3.6 Role and function of the TWG and RTC**

In addition to the liaison and coordination role to be played by the TWG during the execution of the project, both the AFCAP Technical Manager and the Consultants emphasised the crucial role that was expected of the TWG in terms of reviewing the chapters as they were drafted. In this regard, the Consultants confirmed that they would be sending drafts of the 21 chapters in batches of 3 – 4 chapters at intervals of 2 weeks over a 6 week period between the middle of February and third week of March, 2014. During this period, it is expected that the TWG will distribute the chapters to their stakeholders and solicit comments from them which they would then compile and send to the Consultants project coordinator in Tanzania, Eng. Abdul Awadh.

Despite the tight chapter review schedule that would have to be managed by the TWG, it was emphasised that their continuous involvement in the development of the manual was critical as it would engender strong ownership of the final document which was so important for its future use in a sustainable manner.

### **3.4 Agreements on the Way Forward**

In view of the very tight schedule for completing the project, the Consultants emphasized that all parties to the project must endeavour to play their role in an expeditious manner. In this regard, the following issues were highlighted:

1. The TWG and RTC to provide the names of their officially nominated representatives by mid-February, 2014. (Action TWG to send names to Eng. A. Awadh)
2. The TWG to review the proposed ToC for the manual as presented at the workshop (see Table above) and to confirm or otherwise propose any amendments by mid-February, 2014. (Action TWG to send any comments on draft ToC to Eng. Awadh by mid-February, 2014).
3. The Consultants to send via Eng. Awadh, batches of 3 – 4 draft chapters for review by the TWG, commencing in mid-February, 2014. (Action: Consultants).
4. The TWG to review the draft chapters and, within about 2 weeks of their receipt, to send any comments to Eng. A. Awadh who will then pass them on to the respective authors. (Action: TWG to send comments to Eng. A. Awadh, commencing first week of March, 2014).
5. The complete draft document will be compiled on the basis of the TWG comments and returned to the TWG by mid-April, 2014 for their final comments. (Action: Consultants by deadline).
6. The final draft document to be completed by mid-May 2014 (Week 24) and will be presented to the TWG and stakeholders during the following week (Week 25). (Action: Consultants by deadline).
7. Any comments made on the draft final document to be submitted to the Consultants within one week of the workshop (Week 26) on which basis the manual will be finalized by the end of the first week of June (Week 27).
8. The finalized manual to be professionally laid out by the end of the second week of June (Week 28) and to be printed and submitted to the TWG for distribution to by the end of the third week of June (Week 30).

## **4. WORKSHOP CLOSURE**

### **4.1 General**

The closing remarks at the workshop were made by the AFCAP Technical Manager, the MoW representative and PMO-RALG and may be summarized as follows:

### **4.2 AFCAP Closing Remarks**

The closing remarks were made by the AFCAP Technical Manager, Eng. Leta, and may be summarized as follows:

1. Thanks to all stakeholders for the constructive contributions to the workshop deliberations.
2. Crucially important that the TWG is closely involved in the development of the manual so as to secure buy-in and ownership.
3. The timeframe for completing the project was such that all parties must strive to meet their deadlines so as to ensure that the completion deadline is met.

### **4.3 MoW Closing Remarks**

The closing remarks were made by Eng. Fintan C. Kilowoko and may be summarized as follows:

1. Mentioned that the timeframe for the project was tight but confirmed that the TWG would do their utmost to fulfill their responsibilities under the project, including project liaison, coordination and the review of the draft chapters of the manual.

### **4.4 PMO-RALG Closing Remarks**

The closing remarks were made by Eng. Kayanda and may be summarized as follows:

1. Acknowledged the support for the project provided by DFID through AFCAP.
2. Confirmed that PMO-RALG would do all they could to facilitate the execution of the project.
3. Looked forward to the completion of the manual so that it can be applied in the LGAs.
4. Thanked the Consultants, other contributing project leaders and all participants for contributing to the success of the project.



## Annex A – Inception Workshop Programme

### Thursday 23<sup>rd</sup> January, 2014.

08.00 – 08.30	- Registration
08.30 – 08.40	- Welcome and Meeting Opening - PMO-RALG
08.40 – 08.50	- Opening Remarks - Project Coordinator, Ministry of Works
08.50 – 09.00	- General Statement - AFCAP
09.00 – 09.30	- Project Overview (ToR, Work Plan, Programme, Deliverables, etc) - Consultants
09.30 – 10.00	- Review of Manuals - Consultants
<b>10.00 – 10.30</b>	<b>- Coffee/Tea break</b>
10.30 – 12.30	- Review of Manuals (Cont'd) - Consultants
<b>12.30 – 13.45</b>	<b>- Lunch</b>
13.45 – 14.45	- Discussion – Scope/ToC of Manual - Consultants/Delegates
14.45 – 15.30	- Discussion – Outcome of Manuals Review - Consultants/Delegates
<b>15.30 – 16.00</b>	<b>- Coffee/Tea break</b>
16.00 – 16.30	- Discussion – Completion Programme - Consultants/delegates
16.30 – 17.00	- Discussion – Way Forward to Project Completion - Consultants/Delegates
17.00 – 17.15	- Closing Remarks - AFCAP/PMO-RALG/Ministry of Works

**Annex B – List of Participants**

S/N	Name	Organization	Designation	E-mail Address	Telephone
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## Consultancy Services for Preparation of Design Manuals for Low Volume Roads in Tanzania

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**Annex C – PowerPoint Presentations**

Provided as PDF file under separate cover





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