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ENGINEERING SERVICES FOR RURAL ROADS REHABILITATION (ES3R)

CONTRACT NO: EDH-I-00-08-00023

INCEPTION REPORT

ENGINEERING SERVICES FOR RURAL ROAD REHABILITATION (ES3R) CONTRACT NO. EDH-I-00-08-00023

INCEPTION REPORT

Prepared for: USAID/Liberia

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The views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government. This report was prepared for the U.S. Agency for International Development. It was prepared by CDM International, Engineering Services Rural Roads Rehabilitation (ES3R)

Acronyms

COP	Chief of Party
COR	Contracting Officer Representative
CSF	Critical Success Factor
CSIR	Council for Scientific and Industrial Research
EOI	Expression of Interest
ESMMF	Environmental, Social Mitigation and Monitoring Framework
ESMMP	Environmental, Social Mitigation and Monitoring Plan
ES3R	Engineering Services for Rural Roads Rehabilitation
ETL	Engineering Team Leader
FE	Field Engineer
FED	Food and Enterprise Development
FRDM	Feeder Road Design Manual
FTF	Feed the Future
FTL	Field Team Leader
F2M	Farm to Market
F2MRR	Farm to Market Road Rehabilitation
GIS	Geographic Information System
GOL	Government of Liberia
GTKP	Global Transport Knowledge Partnership
IFGRRE	International Focus Group on Rural Road Engineering
LESSP	Liberia Energy Sector Support Project
L-MEP	Liberia Monitoring and Evaluation Program
LMWP	Liberia Municipal Water Project
MCA	Multi Criteria Analysis
MOA	Ministry of Agriculture
MOF	Ministry of Finance
MPW	Ministry of Public Works
PAT	Priorities, Activities, Tasks
PEA	Programmatic Environmental Assessment
PQM	Project Quality Management
QA/QC	Quality Assurance / Control
QMP	Quality Management Procedures
SI	Site Inspectors
SIDA	Swedish International Development Agency
USAID	United States Agency for International Development

ENGINEERING SERVICES FOR RURAL ROADS REHABILITATION (ES3R)

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1. INTRODUCTION

1.1 Appointment of Contractor

The U. S. Agency for International Development's (USAID) 'Engineering Services for Rural Roads Rehabilitation (ES3R)' was awarded to Camp Dresser McKee International (CDM) under the following USAID contract number: EDH-I-00-08-00023 and task order AID-669-TO-13-00002 which records the period of performance as 8 October 2013 to 20 October 2015.

1.2 Feed the Future Goals and Objectives

Feed the Future (FTF) is a U.S. Government initiative which aims to address the root causes of global hunger by sustainably increasing agricultural productivity which will facilitate and /or assist the following:

- Meet the demand for food
- Facilitate access to strong markets
- Increase incomes for the poor
- Reduce under-nutrition

The Farm to Market Road Rehabilitation (F2MRR) activity, which is allied to the objectives of the FTF initiative, will provide infrastructure investment in the rehabilitation of rural farm-to-market roads to support the following:

- USAID /Liberia FTF program Food and Enterprise Development (FED),
- Capacity development for routine maintenance systems within the Government of Liberia (GOL),

- Capacity development of Ministry of Public Works (MPW) rural roads engineers and local A & E firms,
- Development of alternative low volume road pavement pilot projects, standards and design specifications.

The immediate objective of F2MRR is to rebuild much needed physical infrastructure using Liberian contractors and local communities, while the project's medium term goals to establish a sustainable system that can repair, maintain and rebuild infrastructure long after donor assistance has ended.

1.3 ES3R Project Objectives and Results

ES3R is an implementing mechanism within F2MRR activity, which will provide construction oversight, design and training to complement the various mechanisms within F2MRR.

The objectives, together with corresponding results, of ES3R are as follows:

Objective 1:

Provide construction oversight for three (3) local contracts for the rehabilitation of a total of 83.5 kilometers farm-to-market roads in Bong, Lofa, and Nimba counties from 2013 to 2015.

The results of the construction contracts will be the completed rehabilitation of 83.5 kilometers of gravel surfaced roads by local firms.

Objective 2:

Produce engineering designs and construction documents for the 450 kilometers farm-to-market roads in Bong, Lofa, Nimba, and Grand Bassa counties to be rehabilitated in 2015 to 2018.

The results of the design and documentation will be as follows:

- By the end of year one, the selection and design of 225 kilometers of farm to market roads.
- By the end of year two, the selection and design of 450 kilometers of farm to market roads.

Objective 3:

Training and pre-qualification of five (5) local architect-engineer firms capable of providing oversight for road rehabilitation activities by 2015.

The results of the training component will be by the end of year two, trained A & E firms shall be able to demonstrate a capability to design, prepare contract documentation, manage procurements, supervise and manage feeder road and basic building construction projects based on internationally accepted best practices.

1.4 Project Team Composition

The composition of the project team consists of three firms as follows:

Prime Contractor: CDM International Inc.

Key Subcontractors: Cardno

Training Resources Group

1.5 Operational Areas

There will be a project office set up in Monrovia from which the COP will be based together with the office manager, F & A manager. The design staff will spend the majority of their time in the field conducting on site surveys, data collection and liaison with county and district engineers of the Ministry of Public Works (MPW). In addition the project office will be the base for short term professional staff such as the A & E Development Team Leader and the Environmental Specialist.

The map hereafter shows the operational areas in which the field staff will be involved in design and construction oversight duties.



2. MOBILIZATION – CURRENT STATUS

2.1 Key Staff Mobilization

A CDM advance-mobilization team was initiated for arrival in Monrovia, a few days prior to the scheduled arrival of the Chief of Party (COP).

These permanent staff members of CDM were as follows:

- John Gavin, Senior Project Manager, arrived Monrovia on 5 November 2013
- Shannon Dotson, Client Services Strategist arrived on 6 November 2013

Thus initial contact was made for enquiries on the following:

- Business registration
- Office premises
- Office facilities, power back up, furniture etc.
- Project vehicles
- IT hardware & software
- Banking matters
- Office staffing

Key staff members were mobilized thereafter as follows:

Howard M Shelmerdine, COP arrived in Monrovia on 9 November 2013 in order to join the advance team members in mobilization activities.

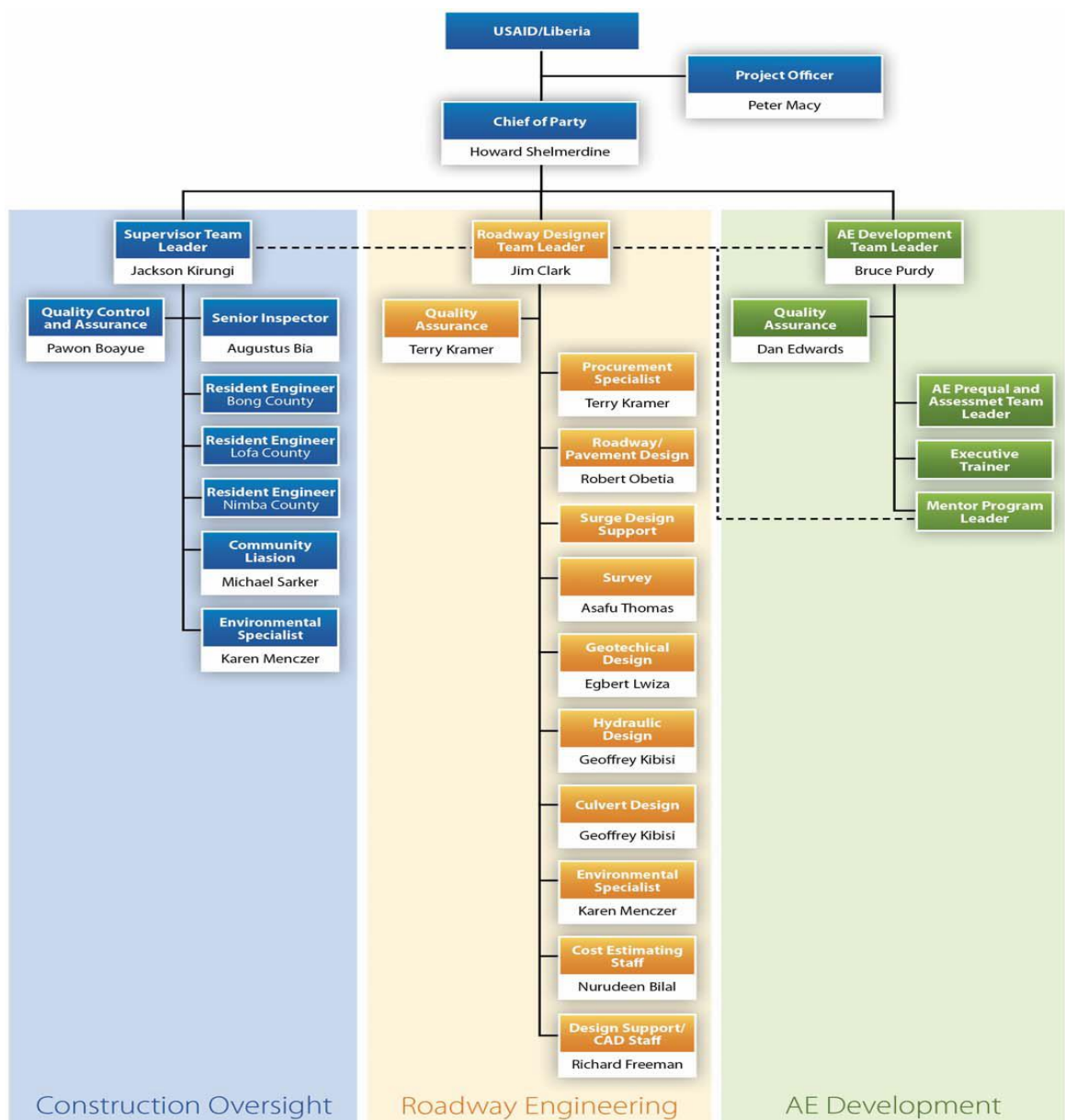
Jim Clarke, Road Design Team Leader, arrived in Monrovia on 23 November 2013.

The COP is responsible for managing and coordinating overall implementation. He will serve as the principal liaison and interlocutor with the USAID COR and the GOL on management and policy matters.

The Road Design Team Leader shall be the lead technician for the rural roads rehabilitation component. He will coordinate the roads rehabilitation works for the roads targeted by the project.

2.2 Organization Chart

The Organization Chart of the original proposed team hereunder:



2.3 Key Meetings and Activities

2.3.1 Project Quality Management (PQM) Meeting

The first of the key meetings for the project was held with the client, USAID, on 14 November 2013.

CDM were represented by the three staff members in country and USAID were represented as follows:

David Wounuah	Contracting Officer Representative
Sonja Stroud-Gooden	Contracting Officer
Rosalind Sika	Supervising Contracting Officer

The highlights of the meeting were as follows:

The development of a Project Mission Statement as follows:

Provide engineering services to USAID/Liberia for the development and implementation of rural roads rehabilitation projects in support of the Feed the Future (FTF) Initiative. From designs produced by others, supervise the construction of farm-to-market roads in Bong, Lofa, and Nimba counties; develop engineering designs of 450 km farm-to-market roads in Bong, Lofa, Nimba, and Grand Bassa counties in preparation for tendering by the end of the project; assessment/capacity building of five local A&E firms.

The project is important to:

- Facilitate transport of agriculture produce in the regions where roads are built, along with other economic benefits of enhanced roads
- Improve local capabilities and experience in the construction and design of rural roads for development of roads into the future.

-Improve the lives of the local population with improved access to social services, medical, education, commerce, etc.

The meeting took the form of a workshop, during which, critical success factors (CSF) were addressed in comparison with activities and tasks. The result of this exercise was the formulation of a Priority Matrix which identified five Process, Activities and Tasks (PAT's) which will require the most focus, which are as follows:

- Assessment of A&E firms/identification of their needs,
- Mobilization of key/project staff,
- Provide ongoing site technical assistance,
- Prepare bid documents,
- Conduct Design Studies

The CSF's / PAT's table together with the PAT's Matrix are included in Annex A of this report.

2.3.2 Other Key Meetings

Meetings have been held with other USAID contractors as follows:

- DAI, contractor for Food and Enterprise Development Program (FED)
(three meetings to the submission of this report)
- Winrock, contractor for Liberia Energy Sector Support Program (LESSP)
- Tetra Tech, contractor for Liberia Municipal Water Project (LMWP)
- L-MEP Liberia Monitoring and Evaluation Program (two meetings)

Introductions have been provided for contact with partners, LAUNCH, RBHS and Advancing Youth, with whom contact will be made during January 2014.

In addition, a meeting was held with the Ministry of Public Works when our two key staff members and the USAID COR, met with the following officials:

Mr. Victor B Smith, Deputy Minister for Technical Services

Mr. Jackson J Paye, Assistant Minister for Rural Development/Feeder Roads

Weekly progress meetings between USAID/Liberia and key staff members were initiated which commenced on 25 November 2013. These have been a particularly useful form of contact which maintains a close team liaison to which both parties have stated their commitment.

On 26 November 2013 our key staff attended a USAID pre bid meeting which was called for the guidance of tenderers who intended to bid on the three F2M road construction tenders.

2.4 Outstanding Items

Item	Outstanding Issue	Status	Action Required	Responsible
1.	CDM registration in Liberia	Application docs submitted	Documents were issued on 12/20/13	Closed
2.	First vehicles to be delivered	PO issued to vendor and payment made	Two vehicles delivered on 12/20/13	Closed
3.	New office establishment	Refurbishment almost complete. Lease signed	Take over at end December	Closed
4.	Office fit out and security	PO's placed generally	Take over at end December delivery fit out 3rd January.	CDM
5.	Appointment of Office Manager	Preferred candidate identified	Started work on contract on 12 December	Closed
6.	Appointment of F&A Manager	Preferred candidate identified	Offer made to preferred candidate	CDM
7.	Recruit RE staff	Response to advert under	Interviews in progress	CDM

		assessment		
8.	Recruit Design and supervisory TCN's	Contact proposed staff members	Progressing and approval applied	All
9.	QAC Scope	Scope of RFT and solicitation docs not compatible	Review to be carried out	USAID
10.	EOI for A & E Firms	Advertisements placed	Response to adverts under review	CDM TRG
11.	Staff Travel Request for TRG	Letter for travel clearance issued to USAID	Letter of approval received from USAID	Bruce Purdy scheduled arrival on 4 January 2014
12.	Development of road selection prioritization tool	Initiated and in progress	Finalize prioritization tool	Team
13.	Fine tune team structure	Team structure included in Inception Report	Three team structure favourably reviewed	Team
14.	Inception Report - PMP Report	PMP Report to be forwarded to L-MEP for review	L-MEP to review PMP and respond	USAID L-MEP
15.	Final Inception Report	Request for submission by 8 January 2014	Ok, subject to timely receipt of reviews	USAID/L-MEP CDM
16.	USAID Implementing Partners	USAID to provide introduction to further partners	Contact info provided for LAUNCH, RBHS and Advancing Youth	CDM to set up meetings in early January
17.	Budget update to end 2013	USAID request for budget information	Contact HO for expenditure update	CDM with response to USAID
18.	F2M road construction contracts	Status of bid assessment	USAID evaluation in progress	USAID
19.	Office Signage	CDM request approval of new office signage	USAID to assess and comment	USAID
20.	Employment of SI site staff	In progress	Interviews pending contract awards	USAID CDM Cardno

3. PROJECT CONTROLS

3.1 General

Effective overall project management at multiple levels will require the effective use of management tools which include those used for planning, scheduling, reference documents, continuous monitoring, and evaluation. Weekly meetings are a proven means of quick and effective determination of the status of current activities and problems to be addressed. Issues for resolution by action can be highlighted, so that any potential delays to implementation can be minimized.

3.2 Management Tools

Management tools which have been developed over the years and implemented successfully on previous projects will be appropriately adapted and utilized including the following:

- Procedures for document control, in-country logistical policies, home office backstopping arrangements, etc.
- Quality Management Procedures (QMP) and guidelines specifying the rigorous quality procedures required on all CDM Smith projects.
- Project reporting templates such as meeting agenda formats, reporting procedures, QA/QC forms, etc.
- Communications plan to establish protocols and maintain written and verbal communications with key parties as agreed with USAID/Liberia.
- Project scheduling to adhere to program milestones and deliverables.

3.3 Performance Management Plan

To facilitate successful project implementation requires a management tool that can be used to easily and efficiently demonstrate ongoing implementation progress at any point in the project timeline. This will ensure that the project remains on track and that potential problems can be foreseen and mitigated to the maximum extent possible.

This tool is the Performance Management Plan (PMP).

The PMP will provide timely, accurate, and appropriately assessed information in order to fully inform all critical project decisions, and enable effective management and achievement of project objectives. It provides a simple and consistent performance monitoring and evaluation framework across the two main scope components. The performance indicators of intermediate and sub intermediate results will be reported upon on a quarterly and annual basis.

The PMP, which is an integral part of the Inception Report, has been prepared and submitted as a separate document.

3.4 Integration with Implementing Partners

A positive management approach requires the cooperation of an integrated team creating the involvement of all stakeholders. USAID/Liberia has facilitated numerous introductions and meetings with other USAID contractors and stakeholders. Continued liaison and close contact will be maintained with these entities in order that construction oversight and design progress is freely continued smoothly. In particular, the ES3R project is closely allied to the FED program, the demonstration projects of which have a significant influence as to the selection of target roads. Similarly, we will keep close contact in the field with the county officials of Bong, Lofa, Nimba and Grand Bassa.

3.5 Time Management

Effective planning and scheduling activities provide the basis of many valuable decision making tools. The Work Schedule will be developed in MS Project in order to:

- fully describe the scope of work for successful completion of the project
- be responsive to the USAID/Liberia brief and the design deliverables
- be the basis for reporting of actual progress

3.6 Report Deliverables

Report deliverables, as a result of Modification 01 to the contract, will be submitted in accordance with the following schedule:

Deliverable table	
Deliverables	Reports Due date
Draft Inception Report (including work plan for Year 1 and Performance Management Plan)	December 21, 2013
Monthly progress reports	10 days after the end of each calendar month
Quarterly Reports (documenting quarterly progress-designs, construction against plans and an outline plan for the following quarter, performance status of individual construction and A-E firms, and any special report or findings from short-term consultants)	Quarterly on October 20, Jan 20, April 20, July 20 of each calendar year
Quarterly Financial Reporting	Quarterly on October 20, Jan 20, April 20, July 20 of each calendar year
Annual Report (outlining annual progress on the performance of construction contracts, designs and work plans and recommendations for following year)	November 20 of each contract year
Annual Work Plan	September 1, 2014
Pre-Qualification Report (Assessment of the capacity and training needs of Liberian A&E firms and prequalification of 5 firms and plans for implementation of training and mentorship program)	February 20, 2014
Design Report (Road designs and bidding documents to USAID for review and approval in two batches of 225 km each, separated by county into four packages)	October 20, 2014 and August 20, 2015
Final Project Report	December 20, 2015

These deliverables are shown schematically in the Table of Deliverables included hereafter.

ENGINEERING SERVICES FOR RURAL ROADS REHABILITATION																							
SCHEDULE OF DELIVERABLES																							
Report/Deliverable	YEAR																						
	2014												2015										
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Inception Report	17																						
Monthly Progress Report		10	10		10	10		10	10		10	10		10	10		10	10		10	10		
Quarterly Report	20			20			20			20			20			20			20			20	
Prequalification Report		20																					
Annual Work Plan								1															
Design Report									20										20				
Final Project Report																							20

3.7 Risk Management

A realistic approach to project management requires an understanding of the risks involved in the design and implementation of the project, and how to mitigate them. In the case of ES3R, simply the remote geographic location of the various F2M rural road sites involves significant challenges. Risks associated with the project which were initially identified pre-contract, were biased towards construction and field related delays will be further assessed as the project moves into the construction and field design stages. The following table indicates those items which are considered to be the most likely sources of risk.

Consideration of Risk	Mitigation Measure
Limited contract enforcement capability does not allow effective management of works contractor performance	Experienced home office and well qualified / experienced field staff to undertake construction oversight
Rigidity of implementation design limits availability of value engineering options	Authority to contractor for design approval and insitu changes within contract limits
Insufficient number of suitably qualified firms and personnel to construction oversight and survey / design activities	Introduce identified A & E firms personnel to skills transfer training in field oversight and design interventions
Potential delays from the due diligence and approval process for all design and bid documentation	Review / approval process to be established with clear roles for all parties in the process
Logistical challenges that can result in implementation delays and procurement compliance issues	Seamless approach with field office decisions enhanced, supported and monitored by Monrovia based team.

3.8 Cost Management

Procedures for cost control are indispensable tools for project managers and team members during all phases of the project. These serve the purpose of recording the cost transactions that occur on the project, the live records of which are maintained by a dedicated accountant assigned to the project in CDM Smith head office. Thus, the financial position on the contract is visible at any time. Regular budget reports will include information on the approved budget, commitments, forecasts, and variances during the performance of the work as well as cash flow projections.

4. STRATEGY AND METHODOLOGY

This section articulates the strategy and methodology of approach to the delivery of project objectives.

The section is divided in to 5 sub-sections:

1. Describes the structures the project envisages as the most suited for delivery of the three project objectives.
2. Describes the approach for the selection and prioritization of the 450km of road section and design, quantification and packaged process; objective 2 of the Project.
3. Describes the approach for the construction oversight and contractor mentoring for three contracts and 83.5km to be constructed between January 2014 and June 2016; object 1 of the project.
4. Describes the rationale underpinning the integration of tasks associated with objectives 1 and 2 and the potential integration of objective 3.
5. Describes the status of capacity building component; objective 3.

Preamble: Challenges and the Formulation of Strategy

- Farming activities generate crops, horticultural and livestock products. FED sponsored interventions aim to increase productivity. An integral part of the value chain is exporting goods from source to markets. The condition of the existing transport network severely constrains the transport of goods and this contributes to the demotivation of farmers

from producing a surplus. ES3R aims to address these constraints within its project boundaries.

- Funding for low traffic volume rural roads is calibrated to its low economic rate of return. Liberia possesses a particularly aggressive climate and unsealed road degradation is rapid. Road improvement investments must be carefully selected, balancing scarce funds and durable designs. Meticulous selection of road sections and appropriate cost effective interventions are essential to minimise over investment.
- In the recent post conflict period, projects addressing feeder road improvements have been dominated by two donors, SIDA and USAID. Engineered designs have come primarily from contractors connected with these two donors. Private sector involvement has been minimal. MPW involvement is restricted to the Feeder Roads Department within the Department for Rural Development. The necessary skills for planning, designing and contract managing feeder road improvements is therefore very limited.
- Government of Liberia (GOL) policy envisages a move towards decentralisation of power and responsibility. MPW is part of this initiative. A move to transfer responsibility for feeder road management to the county level is now visible on the time horizon. MPW's county resident engineers need to be prepared for the transition in the county administration's mandate following decentralisation. GOL policy also envisages engaging stakeholder participation from grassroots, through district, county and national entities. The participatory policy had been initiated but needs to be reinforced and developed. Policy formulation and implementation is a work in progress.

The strategy for the project is crafted to address these challenges. The organisational structures and the planning frameworks presented within this section are further refinements of those presented in the original submission. The fine tuning presented in this report is a consequence of CDM's enhanced understanding of the feeder roads sector development landscape. CDM will remain sensitive to any external changes in direction and timing, the development landscape and its own enhanced comprehension. The strategy is therefore emergent by design and driven by the projects target objectives.

The project work schedule in Annex B indicates planned activities for year 1 of the project. The narrative below describes in detail these activities and their indicative resource allocations.

4.1 Project Landscape

4.1.1 Project Structure

The organisational structure is graphically illustrated in Figure 1.

The project envisages a Head Quarters base in Monrovia. Its primary functions are:

- High level stakeholder coordination and resource allocation
- High level planning and reporting
- Coordination, monitoring and quality assurance of field based activities
- Conduit for communication from national to country level and vice versa
- Venue for training and operations workshops
- Financial management of the project
- Logistics and operations control

The Monrovia team is composed of the following staff:

Chief of Party – Overall coordination of project activities.

Engineering Team Leader – Coordinating field based activities.

Office Manager – Operational and logistical support

Finance/Administration Manager – Financial and administrative management.

Capacity Development Specialist – regular visits to assess capacity, define capacity gaps, develop training programme, identify suitable training providers and develop mentoring skills of project staff.

Environmental Specialist – visits to advise field staff and ensure compliance with Programmatic Environmental Assessment (PEA) report.

In addition, the initial visit will be timed and coordinated to include meetings with works contractors during the early stages of the projects.

The project envisages 3 field based teams. A graphical illustration of the structure is illustrated in Figure 2.

Each team is composed of:

- Field Team Leader (FTL), an experienced road engineer, probably an expatriate but with rural roads design and construction supervision and construction management experience in Liberia. The FTL is responsible for overall coordination of design and construction oversight activities and the allocation of resources within its geographical coverage. It is envisaged that this position will be filled by Field Engineer by end of year one.
- Field Engineer (FE), probably a Liberian national with substantial experience of design and supervision activities. FE is subordinate to Field Team Leader but manages the Site Inspector. In the absence of the FTL e.g. trips to Monrovia, the FE assumes command of field operations.

Level of delegated responsibility will be aligned to FE capacity. Efforts will be made at continuous improvement of the FE skill set. As it grows so delegated responsibility expands. By end of year 2 it is anticipated that the FE will be in a position to assume full responsibility for design and construction oversight. At the end of the Project the FEs will have been exposed to the full cycle – planning, design and contract management. FE's will then be available for A & E firms trained through component 3.

- Site Inspectors (SI) will focus exclusively on monitoring and recording construction activity. As for FE, the SI's level of delegation regarding contract supervision will be consistent with the SI's capacity. Effort will be made at continuous improvement of SI skill set. As this grows so delegated responsibility expands. It is anticipated that by end of year 1 the SI will be sufficiently competent to assume the role of FE. At the end of the ES3R project the SI's, then FE's, will have been exposed to design and contract management and will be available to A & E firms trained under component 3.

- A & E firm Site Based Trainees

It is anticipated that selected firms will identify suitably qualified engineers to be placed within each of the field based teams. Potential A & E firms have been given guidelines regarding education qualifications and work experience for trainees. The capacity and potential of the trainees will be evaluated during an assessment period and a training program tailored at each field site to accommodate 'entry level' and year 2 exit level. It is expected that by end of year 2 trainees will have a competent understanding of road improvement construction

supervision and an introduction to rural road design using ‘basic access’ as the design brief.

The three teams will be based in the county capitals of Voinjama, Gbarnga and Ganta. At this moment it is envisaged the Nimba based team will also cover Grand Bassa. Resource allocation for this team needs to reflect its greater work load in design document formulation.

It is anticipated that the teams will share the office of the County Engineer. These arrangements must be finalised, however, approval in principle has been given by Deputy Minister for Technical Services, MPW and endorsed by Assistant Minister for Rural Development/Feeder Roads.

These arrangements maximise exposure of the project and its objectives with MPW county based staff and MPW’s engagement in project activities.

During field related activities for both design and construction components, project staff will engage with district administrators and key community representatives.

A geographical division of project staff ensures the development of meaningful and constructive relationships with the full profile of national and donor sponsored development stakeholders.

The Field Teams are linked to project head office by the Engineering Team Leader (ETL), thereby ensuring full rural roads sector stakeholder communication and collaboration.

Figure 1: Illustrates the Project Organisational Structure.

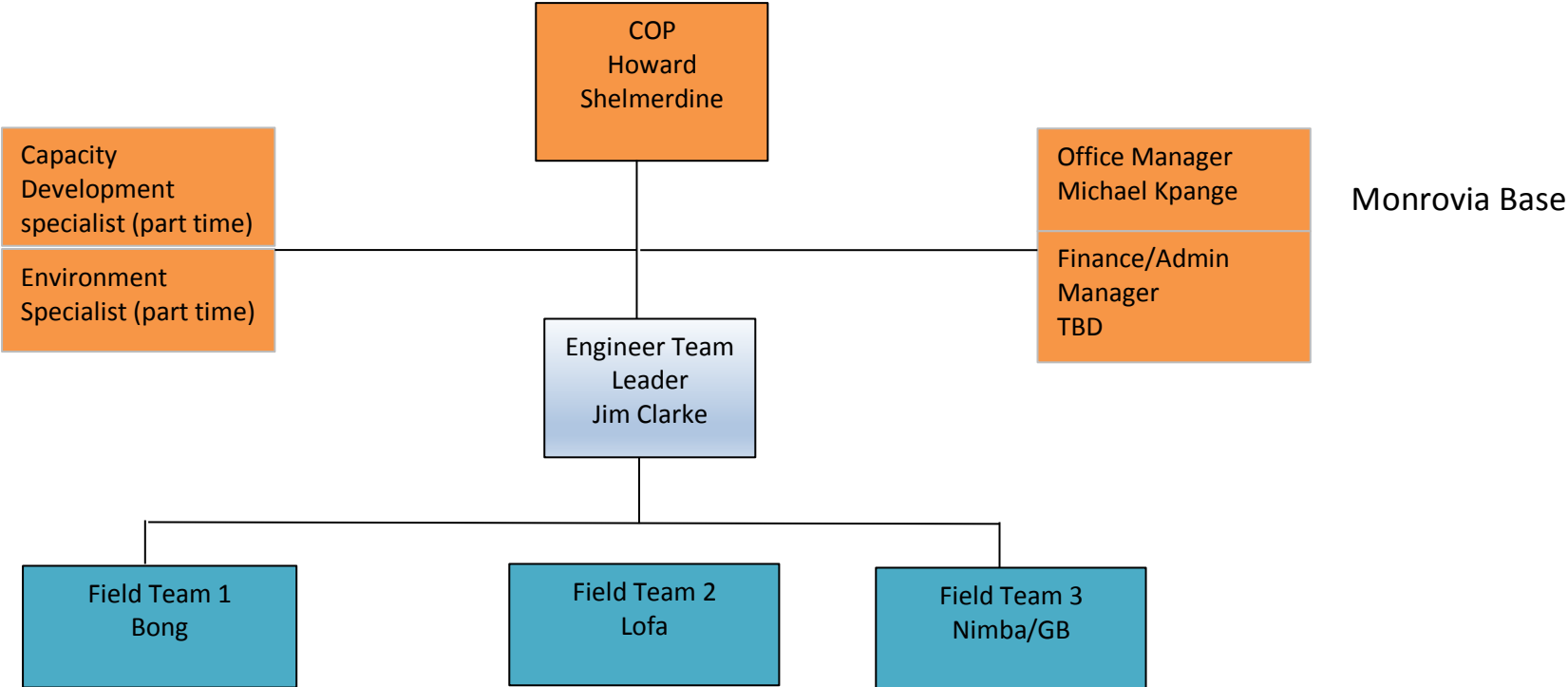
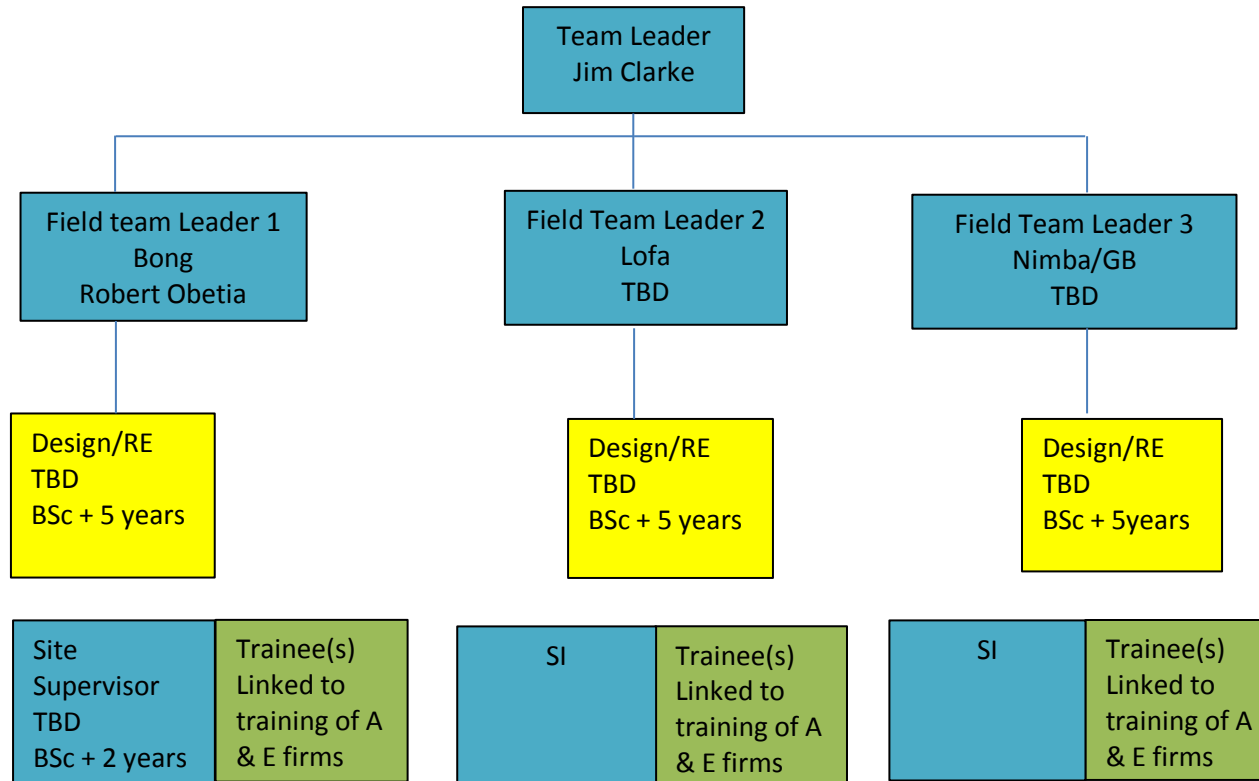


Figure 2: Field Team Structure (Year 1)



Engineering Team Leader Principle Tasks

- * Coordination of Field Teams
- * Support for design and Construction oversight
- * Support for Nimba Based Team for design in Grand Bassa
- * Linking with MPW Monrovia on issues related to field works
- * Support for teams during Field Team Leader vacations

Field Team Engineer Principle Tasks

- * Design, quantification, tender dossier compilation
- * Environmental assessment
- * Construction oversight, contract management/compliance
- * Mentor FE, SI & Trainee

Field Engineer, Principle Tasks

- * Support for design, quantification & tender dossier compilation
- * Support for environmental assessment
- * Support for construction oversight, contract management/compliance
- * As skills develop take increasingly active role in Contract administration and contract management

Site Inspector Principle Tasks

- * Monitor Contractor activities
- * Record resources allocated to contractor activities
- * Record details of contractor activities
- * As skills develop take active role in Contract Supervision



Lofa Team based in Voinjama
- in County admin bldg, with MPW.

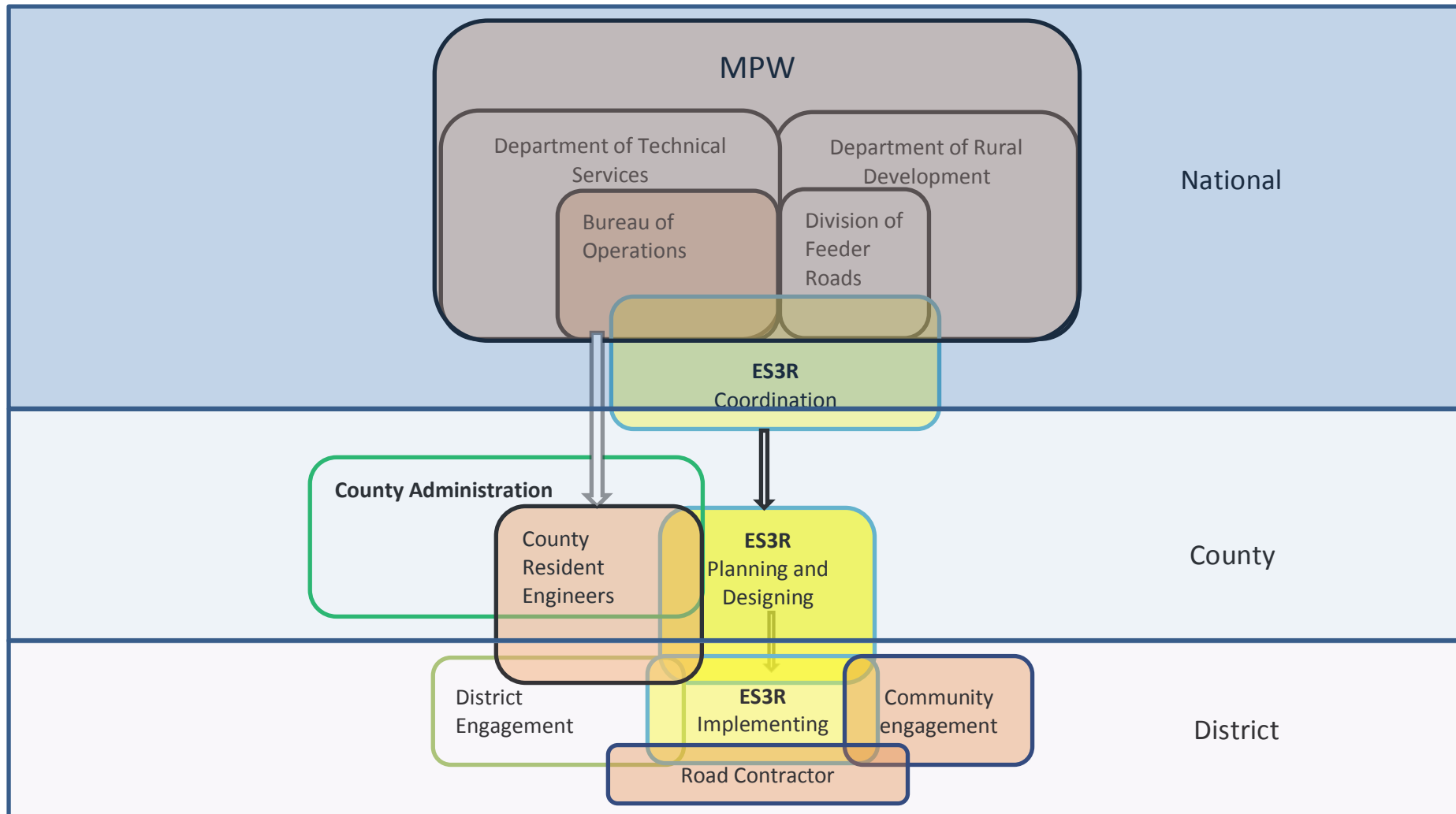
Nimba/Grand Bassa Team
Based in Ganta, in MPW Engineers office

Bong Team based in Gbarnga in County Admin Bldg with MPW

4.1.2 Institutional Framework

The Project organisational structure is designed to complement the Ministry of Public Works and county administration institutional framework. Figure 3 graphically illustrates the linkages at national, county, district and grassroots levels.

Figure 3: Illustrates the Project Institutional Arrangements

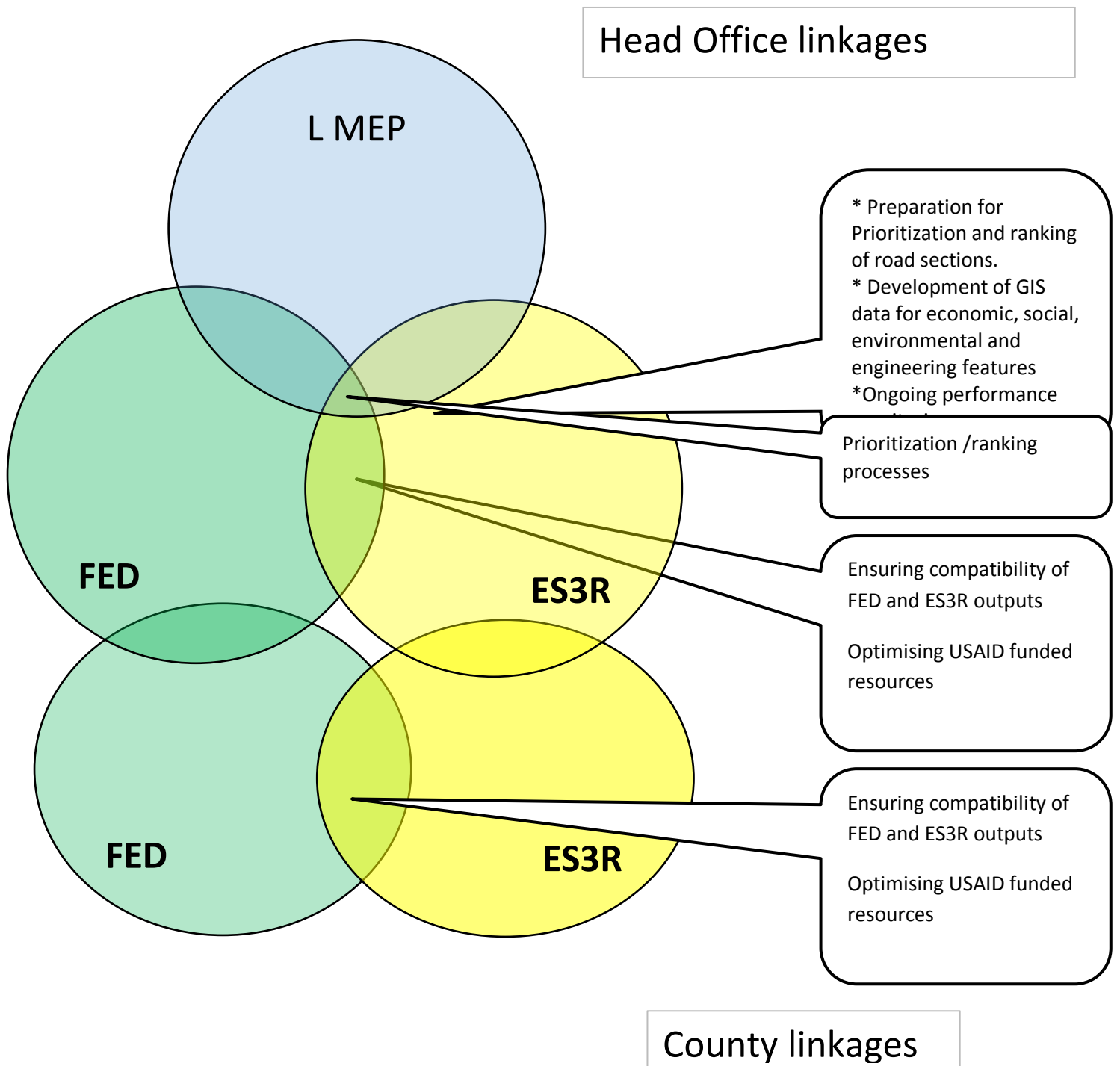


4.1.3 USAID project linkages

The structure positioning ensures a robust and durable interaction with both FED and L-MEP. The relationship with FED ensures that investments are directed / focused on elements within the road network most suited to FED activities and outputs. The relationship with L-MEP ensures that ES3R remains focused, builds on GIS data which enhances exploitation of the GIS tool for road network planning.

These relationships are reflected in Figure 4 hereafter.

Figure 4: Optimized USAID Program Linkages



4.2 Road Design Methodology

4.2.1 Principles

The project recognises the presence of other donor agencies operational in the rural road sector.

Hifab, SIDA's agent, has been active within the Feeder Roads sector since 2011. The Project recognises that the SIDA project is structured in a different manner, within the MPW institution while ES3R is external. However the design process and the design philosophy for both projects are guided by the Feeder Roads Design Manual (FRDM).

ES3R intends to review the design processes utilised by Hifab / MPW with a view to harmonise the various approaches to the extent possible. If judged appropriate, the ES3R can align and complement existing procedure without compromising the ES3R objectives.

The methodology ultimately adopted by MPW as a standard, requires that the donor funded projects seek coalescence and unification.

The methodology described below is considered to be a starting point for this harmonisation

Elements of the design principles are taken from World Bank Technical Paper No. 496¹

¹ Design and Appraisal of Rural Transport Infrastructure- Ensuring Basic Access for Rural Communities – Lebo and Schelling

4.2.2 Planning

4.2.2.1 Current status of Road link Prioritization

FED in collaboration with COR has generated a total of over 600km of road sections as candidates for improvement. The project defines a total of 450km are to be improved. ES3R recommends that transport networks in the vicinity of FED projects be defined and assessed. ES3R will then be in a position to validate the of 600+ km, amend as necessary, then prioritize 450km and rank road sections in order of impact importance for FED program outputs and other relevant criteria (see section 4.2.2.4)

4.2.2.2 Participatory Planning

ES3R advocates for promotion of active participatory planning, both at the national and county levels. In this sense, planning refers to process of transparently, systematically and rationally selecting and ranking road sections. This can be achieved using a broad range of primary stakeholders, the most appropriate of which have yet to be identified. This process and its outputs is managed, and thus shared by GOL, target beneficiaries and development partners.

4.2.2.3 Multi Criteria Analysis (MCA)

ES3R has suggested the use of multi criteria analysis for the ranking and prioritization process for each road section. It is recommended because of its simplicity, transparency, ability to take account of otherwise difficult to quantify social benefits together with its facility to incorporate community choices and preferences.

Transport Research Laboratory², UK has developed a variety of MCA based tools.

World Bank Technical Paper 496³ also recommends this tool.

The version particularly suited to the FTF initiative in the Liberian context is outlined below:

$$\text{Ranking index} = \frac{\text{Benefit factor} \times \text{population with road section catchment}}{\text{Cost of road investment (life cycle cost)}}$$

Where:

Benefit factor is the sum total of various selected social, economic and road network connectivity benefits. It is the output of criteria raking matrix.

Population is the sum total of people living within the road catchment area

Cost of road investment is the cost of interventions required to establish all weather access (usually with bridge structure cost factored down) and normally includes maintenance components.

4.2.2.4 Selection Criteria

A series of stakeholder consultations is planned to establish best suited criteria. Examples could be; number of FED customers along road section, presence of schools, health centres, criteria relating to road section's importance in local network connectivity.

² Transport Research laboratory Overseas Road Note 20

³ World Bank technical Paper 496, Lebo and Schelling

4.2.2.5 Weighting

Weighting each selected criteria allows for criteria importance to be reflected. An example could be 'agriculture potential' related criteria be rated twice as important as other social/economic criteria.

Determination of weighting can be established through key high level stakeholder consultation.

Road Link Survey

A rapid road condition/inventory survey is undertaken by each of the three field based teams along all road links validated for potential inclusion within the 450 km. The purpose is twofold:

- To determine preliminary cost estimates for road section improvements
- To collect social, economic, environmental and engineering features data not currently available with FED or L-MEP, but identified as necessary for the selected criteria.

The survey has spin offs. The road network definition within the L-MEP GIS system is not validated. The road survey will correct this. Also, detailed asset inventories for road sections to be surveyed probably do not exist. This will also be corrected. The development of L-MEP GIS database is recommended in the Programmatic Environmental Assessment of Feeder Roads, 7th May 2013.

4.2.2.6 Population of Matrix

This process takes place at the county level at workshops and is composed of selected key stakeholders representing each criteria sector e.g. County MOE representative for education related criteria, FED/MOA representatives for agricultural related criteria and MPW representatives for road section related criteria. Populating the matrix is an inclusive process with each stakeholder leading discussions relevant to stakeholder's role on the 'value' to be chosen for each criterion. The stakeholder leading the discussion facilitates consensus and the value for the criteria concluded. Each road section is assessed for each criterion.

The process continues until the matrix is fully populated.

4.2.2.7 Computation of Matrix

The benefit factor is computed for each road section i.e. value of criteria multiplied by weighting.

The benefit factor is inserted in the formula above and the road section ranking computed in the presence of the stakeholders at the workshop.

4.2.2.8 Final Ranking

This presents an opportunity for high level stakeholders to express their preference and conclude on ranking with the support of the output of the ranking tool.

A conclusion is reached and the final result presented to county level stakeholders with the reason for any deviation from the ranking process outcome.

It is estimated that the final ranking order of road sections will be completed by end of March 2014.

4.2.3 Detailed Design

Commencement of detailed design is triggered by a conclusion on the ranking process.

Detailed design process follows a conventional approach.

The Liberian Feeder Road Design Manual allows the use of Basic Access as a design principle.

Basic access level of service is defined as:

‘The least cost intervention (in terms of total life cycle costs) for providing reliable all season access for the prevailing means of transport⁴’

Road Geometry

Road geometry is composed of vertical, horizontal alignments and roads cross section. The Feeder Road Design Manual provides the basis for the selection of specifications for these elements. The elements as they relate to ES3R are discussed below:

Roads Cross Section

To a large extent, predicted traffic flows determine cross section geometry. Agricultural outputs and associated movements of goods and services generate traffic flows. FED is able to provide predicted outputs of goods related to its project activities as well as timing of the outputs. ES3R will convert this data into traffic in terms of numbers and vehicle type envisaged to transport goods and services.

⁴ World Bank Technical Paper 496. Lebo & Schelling

The FED generated traffic is added to existing traffic flows. The current poor road conditions suppress traffic flow. Improved levels of service offered by road improvements immediately increase traffic volumes. Total traffic flows will be corrected for predicted future growth in agricultural activity and road improvements. It is likely that market day traffic flows will be more suited for geometric and structural design rather than conventional 'Annual Average Daily Traffic'⁵.

Horizontal and Vertical Geometry

Topography defines existing horizontal and vertical geometry. Major changes to both have significant impacts on improvement costs. No major changes of vertical and horizontal geometry are envisaged except in circumstances where storm drainage and safety issues demand otherwise. As a principle the final road elevations and horizontal configuration will, as far as feasible, follow the existing line and level.

Funding Ceilings

Funding limits will determine the extent to which road geometry selected can follow the specifications of the FRDM. There will be circumstances where FRDM specifications cannot not be economically justified. These circumstances will be noted and brought to the attention of MPW and USAID/COR.

⁵ Transport Research Laboratory Overseas Road Note 20

Assessment of interventions

Community Consultation:

This marks the entry point for community engagement. Key road side community members will be encouraged to provide information on past road section performance, identify bottlenecks along the section and provide historic details of traffic type, wet weather performance, watercourse flooding etc.

Triangulation techniques will be used to verify historic details of road performance and storm events as they relate to streams, rivers and areas prone to flooding.

PEA report contains guidelines for community engagement. ES3R will follow these guidelines. This will ensure that due consideration be given to road side residents both with regard to services provided by improved access and mitigation maximised for any adverse environmental or social impact arising from the improvement and operation of the road.

Carriageway Assessment and Remedies:

Inspection of the carriageway will focus on the underlying cause of observed defects e.g. poor strength of insitu soils, drainage issues, lack and/or absence of maintenance, traffic characteristics etc. Remedies will be selected based on the principles of basic access and predicted traffic volumes. FRDM provides guidance regarding pavement structures for a variety of different soil types and strengths.

Where issues related to slope instability are encountered interventions will be guided by GTKP ‘Low Cost Slope Stabilization’⁶.

Assessment of Imported Materials:

Materials from existing borrow pits and quarries will be examined visually and with simple field tests. MPW engineers will be consulted with regard to material performance. Where there is still evidence of imported materials on the road section, these will be examined for performance. Where materials appear to be marginal for the intended purpose, a judgment will be made regarding an alternative, more distant source, balancing additional costs of haulage of suitable material and increased maintenance costs associated with use of marginal materials. ES3R may invest in ‘Gravel Roads Test Kits’, available from CSIR⁷. At this moment however this is not considered necessary.

Assessment of Storm Water Drainage and Remedies:

For cross drainage through community consultation will generate a suitable design storm event as recommended in IFGRRE technical note⁸, reviewed to take account for anticipated climate change variations from past events. A topographic survey will provide hydraulic gradients and the structure designed accordingly. Intervention types include conventional culverts but also wet crossing such slashes and drifts, semi wet crossings such as vented

⁶ Global Transport Knowledge Partnership- International Road Federation ‘low Cost Slope Stabilization’ SECAP 21

⁷ www.CSIR.co.za

⁸ International Focus Group on Rural Road Engineering – Estimating Maximum Flows in Water Courses – www.ifgworld.org

drifts. Interventions will always be cognisant of environmental impact and mitigation will be implicit in the design of the structure. Where the water course is used as a resource by local communities the structure(s) can include elements to facilitate ease of access to the watercourse.

For longitudinal drainage, suitably protected side drains are envisaged. Mitre drains, discharging storm water away from the road will be selected in full consultation of local communities and designed such that inconvenience and environmental impact is minimised and mitigated.

For low lying areas such as swamps, carriageway will need to be elevated above flood levels and balancing culverts installed.

For structures not contained in FRDM, ES3R will adapt those from 'Small Structures for Rural Roads'⁹ with approval from MPW and COR.

Environmental and Social Dimensions:

To underline the importance given to environmental and social issues this section of the report highlights the attention attributed.

Field team leaders are well versed in environmental and social issues as they relate to road improvement activities. ES3R field teams will follow the guidelines laid down in the PEA Report with particular reference to the ESMMF and the ESMMPs and it will be impressed on works contractors that these are to be followed up and acted upon.

⁹ Small Structures for Rural Roads, DfID, Larcher, Petts and Spence

Intervention selection will be guided by mitigation measures where ever negative impacts are likely. Social engagement with impacted communities will be guided by recommendations of PEA.

Interventions will be guided by an ‘Environmentally Optimised Design’ approach¹⁰.

Bio engineering solutions e.g. slide slopes and drainage channels using suitable vegetation as a stabilizer will be given preference over more conventional concrete and stone pitching.

Timing of visits by the environmental specialist will be coordinated to attain compliance with PEA Report. These efforts will be further complimented by use of the publications cited.

Harmonization of Intervention Selection:

For each road section, checks will be made to ensure that each and every proposed intervention is consistent with the design level of service and that they are environmentally and socially friendly. During the course of the project, feedback will be provided on the FRDM documentation, particularly regarding the appropriateness of specifications for low cost F2M roads.

¹⁰ gTKP ‘Low Volume Rural road Environmentally optimised Design Manual - Suzanna Zamataro’

Quantification:

Converting selected interventions into bill of quantity items will be done following the design of each road selection. Engineer's estimates will be based on rates taken from current road rehabilitation contracts. Unit rates analyses will be generated for each item.

4.2.4 Packaging and Preparation of Tender Documents

It is anticipated that packaging will take place after completion of each detailed design period. Packaging can then be guided by contractor performance noted between January–September 2014. Packaging may then reflect contractor capacity and a decision made as to the suitable size of each contract. It is anticipated that approximately 150 km of road identification, survey, design and documentation will be completed at the end of the first year of the project, which will consist of approximately 40 km for each of the four counties. As a consequence of the project commencement being timed for October 2013, and in consideration of essential activities described herein, which are required to be undertaken in advance of the target road selection process, road survey and inventories will be commenced at the earliest in each of the counties as of late March 2014. Thus it is proposed that the road design and documentation deliverable output for the first year of the project be reduced from 225 km (450/2) to approximately 150 km. Particular team output is estimated in the following section which also includes our anticipated survey and design output scenario for year 2 of the project, when the road survey teams will be able to commence survey on a 'running start' in November 2014, thus

enabling output deliverables which will meet the total of 450 km of design and documentation for the project period of 2 years.

4.2.5 Time Related Outputs.

It is reasonable to estimate that the teams will generate on average, between April and September 2014, 25km / month of quantified road section designs with the later months compensating for any short fall in earlier months, which coincide with construction oversight. Following packaging of the road sections into contracts, by end October 2014, approximately 150 km of road sections, packaged into four contracts will be available for solicitation. Two further 6 months periods, November '14 to April '15 and May '15 to October '15, will both generate on average 25km / month i.e. 150 km / 6 month period, thereby giving a total of 300 km of road sections during year 2.

4.3 Construction Oversight

4.3.1 Contractor Work Program.

At the time of writing the 3 contracts have not been awarded. Resources required for construction oversight needs to be tailored to the contractor's work program. Contractor's competence needs to be assessed particularly in regard to their design capacity. Solicitation documents state that the contractor is obliged to submit incremental design within 45 day of 'Notice to Proceed'. The contractors' work programs need to reflect approved incremental design to which ES3R resource allocation must be sensitive.

4.3.2 Construction Time and Activity Intensity.

It is anticipated that contractors' programs will target cross drainage structures as a priority. The contractors' pace is not yet known. It is also likely that works activity will be at a peak between March and May 2014. Contractor competence (the extent to which it requires mentoring, for design and construction management, and supervision for contract compliance) will influence the availability of the team to undertake preliminary road surveys and subsequent detailed design which coincide with this peak period. Additional time has been allocated for the initial detailed design phase to compensate for demanding contractors.

4.3.3 Skills Transfer and Succession Planning:

Field team profile ensures positive skills transfer to both national staff within the ES3R team and the road contractors' key staff. Skills transfer associated with 'design elements and intervention selection' and 'contract management and supervision' will be prioritised. FE benefits since s/he will have assumed the role of FTL in year 2, the SI benefits since s/he will assume the role of FE in year 2 and Trainee to the role of SI; this progression on the assumption that satisfactory performance is proven by the various individuals during year 1. The 'Design and Construct' contract model will not be used for future contracts. The skills acquired by contractors' key staff – project manager and engineer - in years 1 and 2, could be available for A & E firms trained under the ES3R project. It is appreciated that for realistic skills transfer to be enacted, there should be a close relationship between adjacent staff levels. Engagement from the

MPW county engineers should also result in further developments of skills sets required for the anticipated decentralization. However, while MPW engineers will be encouraged, their meaningful engagement cannot be guaranteed.

4.3.4 Time Related Outputs

Contractor performance is very much related to human, physical and financial resources allocated to the construction team by decision makers of the contractor. These, particularly the latter, are somewhat beyond the control of the construction overseers.

The construction contract time of 16 months is generous. It is anticipated that contractors' will complete in advance of the contractual completion date.

4.4 Integration of Planning Design and Oversight Components

4.4.1 Complementary Activities and the Promotion of Skills Transfer.

Integration creates a very potent learning environment. ES3R anticipates nationalizing design and construction oversight components by year 2. The complimentary activities of design and construction ensures FE's and SI's are fully conversant with 'buildability' and 'ease of construction' of selected interventions, familiar with human and physical resource allocations for each stage in construction and thus able to estimate unit rates with accuracy, aware of construction techniques, methods of working etc. The arrangement of design and construction activities running side by side

enhances and accelerates understanding of both design skills and contract management.

4.4.2 Maximize Use of Human Resources

Field based teams can take advantage of reduced oversight requirements during contractors' lows in productivity through inclement weather and activities that are not oversight intensive. During these periods, the teams will focus on design activities, be they field based – surveying, or office based – design and quantification. The arrangement optimises engagement and productive outputs of all three members of each team. Outputs for design are maximised and succession planning for year 2 optimised.

4.5 Capacity Development

This project component aims to develop the skill sets of five Liberian-based A & E firms. A request for Expressions of Interest (EOI) had been published on line and advertised in the national press. We have received nine separate responses from Liberian firms. The quality of the responses varied widely from a simple written acknowledgement that the firm was interested in being considered for the project and willing to participate in the training, to firms submitting more elaborate qualifications and experience statements, sharing multiple projects they had worked on as well as staff CVs that they believe would be valuable for this particular road rehabilitation project. The firms also varied in their scope of services ranging from general consulting firms to engineering, architectural, planning and environmental services.

Capacity Building Specialists at TRG have formulated an ‘Organizational Capacity Assessment (OCA) Tool’ that has been used to document a baseline skills condition for each firm, which will later be used after a year to document the firm’s progress. This (OCA) tool has been submitted to USAID for perusal and information.

To date, seven of the nine firms have been interviewed by the TRG Consultant using the OCA tool. The output of the first intervention is a ‘Prequalification Report’. This report will be the basis for the development of the training program. It should be noted that the structure and capacity of the field based teams permit full road rehabilitation project cycle exposure for A & E firm engineers. The ES3R senior team members will be all experienced trainers capable of designing and delivering classroom and field based training.

It should further be noted that at the end of the Project, Oct 2015, three nationalized design and construction supervision teams trained through the project will be available for participating A & E entities.

TRG plans a series of country visits, the first of which is currently taking place as of January 2014. This visit has entailed on-site interviews and assessments of each candidate firm using the OCA tool. Follow-on trips will include developing and executing a training program for local A&E firms aimed at enhancing the technical, managerial and financial skills of employees of these firms so they can better perform road engineering work in the future.

5. WORK SCHEDULE

The Work Schedule for the activities described in the previous section, which are to be undertaken in the first year of the project, is included in Annex B of this document. The schedule has been prepared on the assumption that the procurement process for the Works Contractors may be awarded in early January 2014.

The Mobilization Plan for the field staff is included in Annex C.

6. BUDGET

The budget for the project is included in the following table:

Contractor: CDM International Inc.

Project Title: Engineering Services for Rural Roads Rehabilitation (ES3R)

Client: USAID

Date of Submission: 26 September 2013

Period of Performance: 8 October '13 - 20 October '15

BUDGET SUMMARY			
	Year 1 (Oct 2013 - Sep 2014)	Year 2 (Oct 2014 - Sep 2015)	Total
I. Direct Labor	\$ 310,929.60	\$ 303,539.06	\$ 614,468.66
II. Fringe Benefits	\$ 115,044.00	\$ 112,310.00	\$ 227,354.00
III. Consultants	\$ 63,388.00	\$ 39,221.70	\$ 102,609.70
IV. Subcontractors (IQC Partner and Local) IQC Partner Subcontractors	\$ 1,573,039.18	\$ 1,047,600.14	\$ 2,620,639.32
V. Travel and Transportation	\$ 36,267.50	\$ 17,791.53	\$ 54,059.03
VI. Allowances	\$ 92,207.50	\$ 91,724.80	\$ 183,932.30
VII. Equipment	\$ 231,200.00	\$ -	\$ 231,200.00
VIII. Other Direct Costs	\$ 141,143.76	\$ 140,070.15	\$ 281,213.91
IX. Overhead COSTS	\$ 457,066.51	\$ 446,202.42	\$ 903,268.93
X. G&A Costs	\$ -	\$ -	\$ -
XI. TOTAL ESTIMATED COST	\$ 3,020,286.05	\$ 2,198,459.81	\$ 5,218,745.85
XII. FIXED FEE	\$ 219,320.92	\$ 160,089.13	\$ 379,410.05
XIII. TOTAL CPFF	\$ 3,239,606.97	\$ 2,358,548.94	\$ 5,598,155.91

ENGINEERING SERVICES FOR RURAL ROADS REHABILITATION (ES3R)

ANNEX A

**PROJECT QUALITY MANAGEMENT
MEETING AND WORKSHOP**

Critical Success Factors (CSF's)

And

Priorities, Activities, Tasks (PAT's)

ES3R Project Startup/PQM Workshop											
Critical Success Factors/Project Activities & Task Matrix											
	Project Activities & Tasks	Owner/ Responsible	Critical Success Factors							Count	Rating
			1	2	3	4	5	6	7		
			Adhering to project schedule while maintaining reasonable expectations	Identify challenges and customize capacity building for local A&E firms (service providers)	Maintain Focus on project objectives and avoid distractions/ outside influences	Bring in/hire appropriate and proactive personnel	Establish and maintain teamwork and communication at every key level.	Develop consensus on design criteria	Provide quality [products/services] that exceed expectations		
A	Determine target roads	All	1	0	1	0	1	0	0	3	C
B	Develop criteria for selection of A&E firms (service providers)	TRG	1	1	1	1	1	0	0	5	B
C	Assessment of A&E firms/identification of their needs	TRG	1	1	1	1	1	0	1	6	D
D	Select A&E firms (service providers)	All	1	1	1	1	1	0	0	5	B
E	Mobilization of key/project staff	COP/RDE	1	1	0	1	0	0	1	4	D
F	Administrative setup of project	COP	1	0	0	1	0	0	1	3	A
G	Hire of qualified personnel	COP/RDE	1	0	1	1	0	0	1	4	C
H	Award to construction contractors	USAID	1	0	1	0	1	0	0	3	C
I	Prioritize target roads (after selection)	COP/RDE	1	0	1	0	1	1	0	4	B
J	Conduct design studies	RDE	1	0	1	1	1	1	1	6	C
K	Conduct contractor performance reporting	RE/CM	1	0	1	1	1	0	1	5	A
L	Review contractor resourcing	RE/CM	1	0	1	1	1	0	1	5	B
M	Conduct monthly site visits/meetings	COP/RDE	1	0	1	0	0	0	1	3	B
N	Provide ongoing site technical assistance	RE/CM	1	0	1	0	1	0	1	4	D
O	Coordinate with stakeholders	COP/RDE	1	1	1	0	1	0	0	4	C
P	Identify key stakeholder representatives	USAID	1	1	1	0	1	0	0	4	A
Q	Prepare bid documents	Team	1	1	1	1	1	1	1	7	C

Established at PQM on 19Aug2013

PAT Counts:

For each PAT in the matrix, count the number of X's or dots ("1" was used) in the boxes, and place the total in the "COUNT" column. This gives an indication of how important an individual PAT is to the success of the project. A "high" PAT count means that this particular PAT has the potential to impact multiple CSFs and deserves careful attention.

USAID/Liberia
**Engineering Services for
Rural Roads Reconstruction (ES3R)
PAT MATRIX**

		<i>Risk (How well do we do it? / Influenced by outside forces.)</i>						
		<i>Least understood</i>				<i>Most understood</i>		
		Highest	←—————→					Lowest
		E	D	C	B	A		
CRITICAL SUCCESS FACTORS (CSFs) AFFECTED	Number of Responses (CSFs and PATs)			Q				
	7			J				
	6	Zone I	C					
	5				B, D, L	K		
	4		E, N	G, O	I	P		
	3	Zone II		A, H	M	F		
	2							
	1	Zone III						
PAT count	Zone I (most critical) - 5							
	Zone II (moderately critical) - 7							
	Zone III (least critical) - 5							

Analyse Activities Needing Most Attention:

The activities affecting the greatest number of CSF's and/or having the highest 'complexity' rating require the most attention to maximize project success. This is the essence of managing project quality effectively and is at the core of the PQM process. These activities are depicted as data points on a Priority Matrix (a graph of the count and rating for each activity); the letter is the matrix correspondsto a PAT (see PAT or CFS-PAT table).

The chart was divided into three sectors or zones.

Zone I is generally focused on the top left portion with activities that impact most CSFs - most complicated or difficult or highest risk (i.e. need the most attention).

Zone III is focused on the bottom right portion, activities impacting fewer CSFs,

Summary of Analysis

The PQM identified that the top five PATs (Zone I) that at this time are critical to the success of the ES3R Project and that the project team needs a higher focus are:

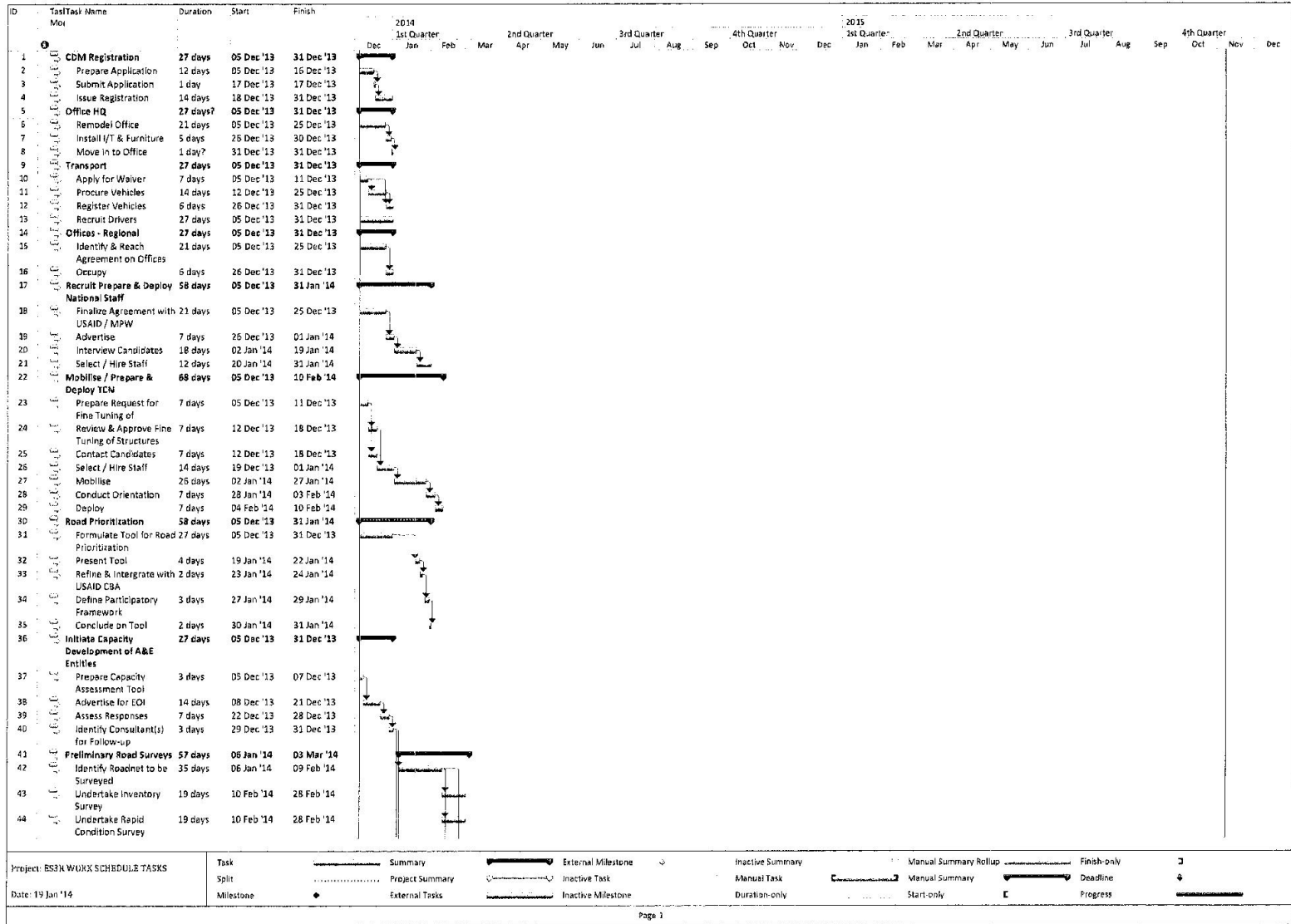
- 1) C. Assessment of A&E firms/identification of their needs
- 2) E. Mobilization of key/project staff
- 3) N. Provide ongoing site technical assistance
- 4) Q. Prepare bid documents
- 5) J. Conduct design studies

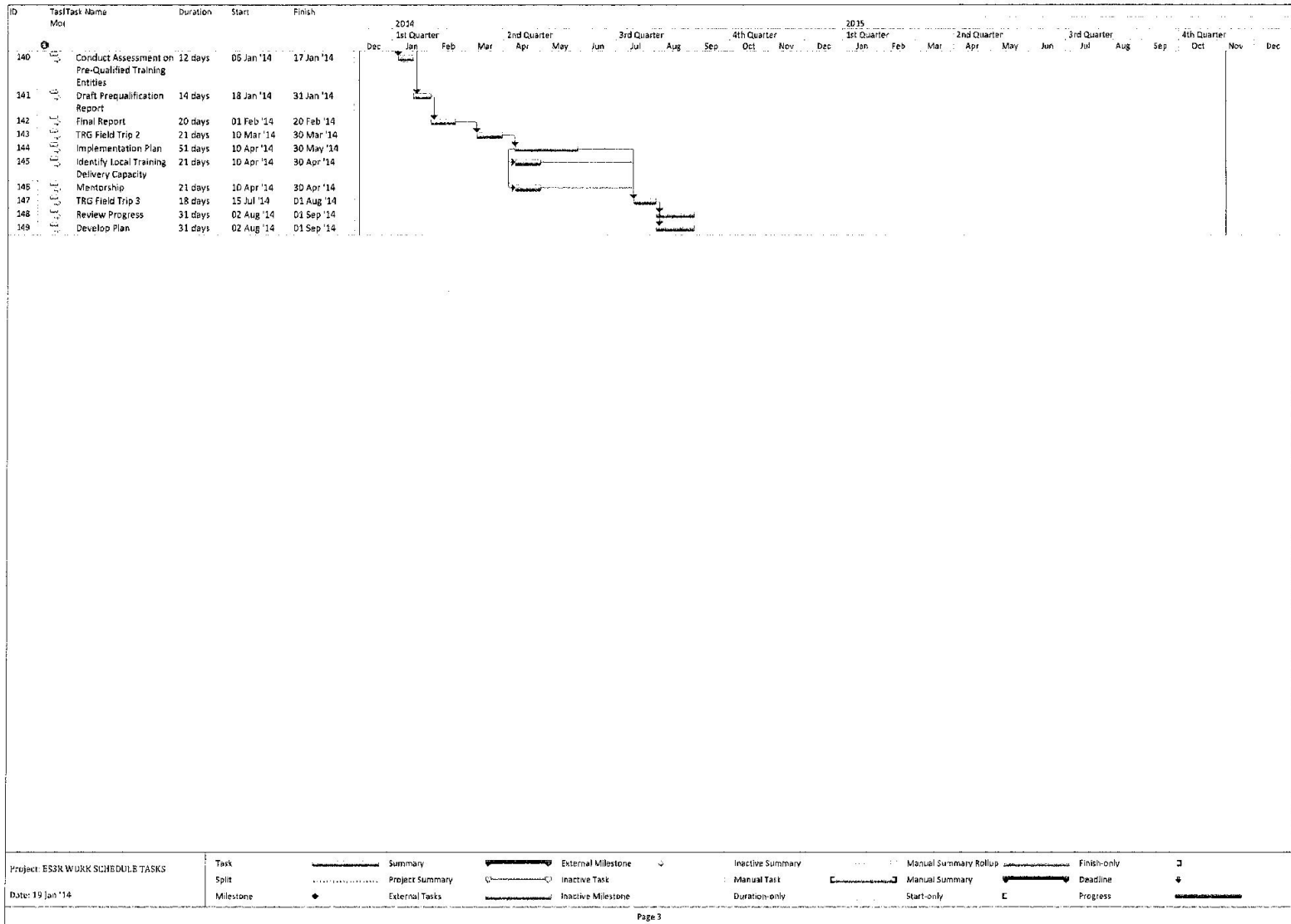
ENGINEERING SERVICES FOR RURAL ROADS REHABILITATION (ES3R)

ANNEX B

WORK SCHEDULE

YEAR 1





ENGINEERING SERVICES FOR RURAL ROADS REHABILITATION (ES3R)

ANNEX C

MOBILIZATION PLAN

FIELD TEAMS

**ENGINEERING SERVICES FOR RURAL ROADS REHABILITATION (ES3R)
MOBILIZATION PLAN FOR FIELD TEAMS**

Staff Description	Employment Offer	Mobilization to Liberia	Mobilization to Site	Deployment on Site
TCN's (3No) Field Team Leaders	Mid-late January 2014	Early February 2014	Mid-February 2014	Mid-February 2014
Resident Engineers (3No)	Mid- January 2014	Resident in Liberia	Early to mid-February 2014	Early to mid-February 2014
Site Inspectors (3No)	Late January 2014	Resident in Liberia	End-February 2014	End-February 2014
Trainee(s)	Engagement as agreed with A & E firms and to suit work schedule on particular site.			