

CONSULTANCY SERVICES FOR DESIGN REVIEW AND CONSTRUCTION SUPERVISION OF THE REHABILITATION OF LIWONDE – MATAWALE (M003) ROAD

TERMS OF REFERENCE

1. INTRODUCTION

The Government of Malawi has sought financing from the World Bank under the Southern Africa Trade and Connectivity Project (SATCP), P164847. The project development objective is to reduce trade costs and time, improve road safety, and increase value chain development in targeted corridors of Malawi and Mozambique. The project has four components: i) reduce trade costs; ii) improve regional coordination and project implementation; iii) increase investments in value chains; and, iv) strengthen transport infrastructure to improve market access.

Therefore, in line with component four of SATCP, the Government of Malawi through the Roads Authority (RA) intends to use resources from the World Bank towards the cost of undertaking a design review and construction supervision of the rehabilitation of Liwonde - Matawale (MO03) Road. The improvement of the road will contribute in achieving the Government's programme of developing the road sector in the country by raising the standards of national road network and connecting the country with neighboring countries. Furthermore, improvement in the efficiency of traffic and safety measures on the current roads, integration of the roads network in the country, will help in improving the agricultural activities and social services, reduce travel time and operation costs, which will lead to reduction in travel and transportation costs as well as maintenance costs for the current road section.

2. BACKGROUND

The Liwonde - Matawale Road is approximately 45 km long. The road section is part of the road that connects the commercial city of Blantyre to the Nacala Corridor through Zomba City and passes through Machinga and Zomba districts. The Liwonde - Matawale road section is paved but currently in poor condition.

The feasibility study and detailed design for the rehabilitation of the Liwonde - Matawale Road were completed in May 2021 and the following documents are available;

- a. Final Economic Feasibility Report
- b. Environmental and Social Impact Assessment (ESIA) Report
- c. Soil and Construction Materials Investigations Report
- d. Traffic Study Report
- e. Topographic Survey Report
- f. Pavement Design Report

- g. Hydrology, Hydraulics and Structures report
- h. Geometric Design Report
- i. Road Safety and Project Implementation Plan Report
- j. Tender Documents
- k. Drawings

3. OBJECTIVES OF THE ASSIGNMENT

The Roads Authority requires the services of a consultant to carry out design review, construction supervision and contract administration, quality assurance, implementation and compliance monitoring of the project Environmental and Social Management Plan.

The assignment shall be performed in three phases. The first two phases are lump sum deliverables, and the final phase is a time-based assignment.

Phase 1 – Design Review and Validation

Part A. The primary objective under Phase 1 Part A is a design validation and revision (as necessary), acceptable by the client, before proceeding to tender. Thereafter, the Design Review consultants will bear the professional liability for the accuracy of the design, which will be covered by this contract. The design review shall include, but not limited to, the following tasks:

- a. Conduct a design-stage road safety audit of the current designs applying a recognized international good practice tool or technique and the World Bank's Good Practice Note on Road Safety (2019).
- b. Conduct a design-stage climate vulnerability assessment using the Malawi *MoTPW Guidelines on Climate Adaptation for the Road Sector* and confirm relevant robustness and resilience measures consistent with 20, 50, 100-and 1000 year flood return periods, especially design specification for drainage lines and river crossings.
- c. Validate the detailed engineering design for the road section in accordance with international conditions of contract, standards and best practices
- d. Validate the economic feasibility study of the road section, including the GHG accounting analysis.
- e. Review and update the Environmental and Social Impact Assessment of the road section in line with Environmental Management Act (2017); prepare an Environmental and Social Management Plan that conforms to the project Environmental and Social Management Framework.
- f. Review the compensation schedule, compensation rates and develop Resettlement Action Plan in line with the project Resettlement Policy Framework and Stakeholder Engagement Plan.
- g. Prepare a design review report clearly indicating the areas of the design that are modified and the reasons for the modification
- h. Prepare Engineer's estimates of the works to be carried out and provide a confidential cost estimate.

Part B. The primary objective under Phase 1 Part B is to support RA in strengthening technical specification and particular conditions of contracts

for improving climate resilience, environmental and social management practices. Roads Authority considers the FIDIC conditions of contract and SATCC standards and codes of practice appropriate for use on this project.

The consultant will recommend modifications to RA's standard Particular Specifications to provide additional protection to the RA and contractors against the construction site risks that are emerging due to climate change. This should include reviewing SATTC specifications for bituminous binders used in surfacing seals and asphaltic concrete on this project. Where the consultant proposes a deviation from these standards and codes of practice, this shall require approval of the Roads Authority.

Phase 2 – Technical Assistance during Tendering

- a. Provide technical review and advise tender committee members, independently or together, on Client considerations during the tendering stage

Phase 3 – Construction Supervision

- b. Construction supervision of the works

Note: Award of Phase 2 and Phase 3 is subject to satisfactory performance of Phase 1

4. SCOPE OF CONSULTING SERVICES - PHASE 1 (DESIGN REVIEW)

4.1. General

The consultant shall perform all services, provide due diligence of current design reports, and carry out any additional necessary investigations, to enable validation or revision (if necessary) of the detailed design for Liwonde – Matawale road section. The consultant will undertake a design stage road safety audit, update the economic analysis inclusive of Greenhouse Gas (GHG) effects, prepare final detailed engineering designs, bill of quantities, and cost estimates and revised environmental and social impact assessment report. Should there be omissions in the reports the Consultants shall carry out the necessary additional surveys and investigations.

The Roads Authority (RA) shall wherever possible assist the consultant in obtaining information and data to enable the effective execution of the services described herein. However, the consultant shall be solely responsible for executing the works, analysis and interpretation of all data received and for their findings, making appropriate conclusion and recommendations. The consultant shall ensure that data is accurate and available for ease of supervision of the works.

Element of Design	Codes
Bridges	<ol style="list-style-type: none"> 1. British Standard 5400 2. SATCC- Draft Code of Practice for the Design of Road Bridges and Culverts (September 1998 (Reprinted July 2001)) 3. The south African National Roads Agency Limited, Drainage Manual, 5th Edition 4. Standard Specifications for Roads & Bridge Works (Metric Edition) Ministry of Works and Supplies 1978 5. WRB No TP12 Malawi, Guideline for Peak Flood Estimate for Design of Culverts and Bridges
Pavement	<ol style="list-style-type: none"> 1. SATCC- Draft Code of Practice for the Design of Road Pavement (September 1998 (Reprinted July 2001)) 2. South African Pavement Engineering Manual, Chapter 10, Pavement Designs 3. The Overseas Road Note 31, A Guide to the Structural design of bitumen- Surfaced roads in tropical and sub-tropical countries
Geometry	<ol style="list-style-type: none"> 1. Addendum to SATCC Code of Practice for the Geometric Design of Trunk Roads (Roads Authority, 2014) 2. SATCC- Draft Code of Practice for the Geometric Design of Trunk Roads (September 1998 (Reprinted July 2001)) 3. The Overseas Road Note 6, A Guide to Geometric Design
Traffic Counts	The Overseas Road Note 40, A Guide to Axle load surveys and traffic counts for determining traffic loading on pavements
Road Safety	Road Safety Engineering Manual (February 2014)

The languages of all drawings, documents and reports shall be English.

All drawings, documents and reports, including shapefiles and associated metadata, produced by the consultant under the contract shall become the property of the Roads Authority upon completion of the consultancy services.

4.2. Design Review of the Liwonde - Matawale Road Section

The Consultant shall validate the designs as follows;

4.2.1 Topographic surveys

The Consultant shall check and validate the topographic surveys of the existing alignment, pertinent existing features, centerline and benchmarks, and setting out beacons on the road. Any survey marks, benchmarks or beacons shall be sufficiently permanent as agreed with the Roads Authority. No major deviation from the existing alignment shall be made without the prior approval of the Roads Authority.

The Consultant shall confirm that the coordinates of all intersection points, benchmarks and setting out beacons are tied to the National Survey Grid and levels related to the National Benchmarks.

4.2.2 Classified Traffic Surveys and O-D Surveys

The Consultant shall check and validate the classified traffic counts and the Origin and Destination survey outcomes that were carried out during design.

4.2.3 Pavement Condition Investigations of the road alignment

The Consultant shall check and validate the following road condition parameters as presented in the Soils and Construction Materials Investigation Report:

- (a) Visual Pavement Condition
- (b) Road Roughness Surveys – Visual survey
- (c) Deflection tests using the Falling Weight Deflectometer (FWD)

4.2.4 Analysis of Pavement Condition and Selection of Design Sections

- a. The Consultant shall review the selected road maintenance options that were proposed by the previous design consultant to decide their appropriateness and relevance with regard to the current condition of the road;
- b. In order to carry out the task stated in 4.2.4 (a) above, the Consultant shall validate design considerations done for homogeneous sections in terms of current traffic, pavement construction, pavement condition, subgrade bearing capacity etc. in order to select uniform sections for pavement design.

4.2.5 Construction Material Survey

The Consultant shall undertake a review of the sources of materials listed in the previous materials report. Should it be found that the materials have been used on other projects, the consultant shall carry out additional investigations to locate new sources of materials indicating their properties, use and location from the road. The estimated quantities shall meet the minimum required for the project.

4.2.6 Drainage Inventory

The consultant shall check and validate the full inventory of the longitudinal drains, lined drains and subsurface drains along the road, as well as design capacity of river crossings.

4.2.7 Hydrological and hydraulic assessments

The Consultant shall validate results from hydrological/hydraulic studies that determines necessary hydraulic and drainage structures as well as all the arrangements and provisions necessary for the protection of the road and its surrounding lands against erosions resulting from the discharges from road and drains and flow in line with

climate resilience. Designs shall consider impact to environment at point of discharge especially in terms of erosion and mitigated accordingly. The consultant shall make reference to and follow the Guidelines for the Road Sector to increase its resilience to the Effects of Climate Change when carrying out the validation of the previous designs.

4.2.8 Structure Condition Assessment

The Consultants shall carry out detailed inspection of existing structures and based on condition of the structure, and recommendations from the climate vulnerability assessment, shall recommend retention of existing structures or replacement. Where existing structures are retained, design for widening/ extension of existing structures shall be reviewed or carried out to commensurate with national standards for cross-section of the road and structures.

In assessing bridges particular attention shall be paid to the safety aspects of the structure and its approaches, both for vehicles and NMT, and recommendations from the climate vulnerability assessment. The Consultant shall note any deficiencies in the condition or existence of walkways, handrails, kerbs etc as well as any other safety issue related to the structure.

Should any structure be found to be structurally inadequate, the consultant shall carry out the design of the replacement structure. For all structures that are structurally adequate, the consultant shall design the extension of the structures to match the new cross section of the road.

The previous structure condition assessment identified three major structures and one of the structures was found to be hydraulically inadequate and is proposed for replacement. The concrete for the superstructure of the two bridges was found to be adequate. The reinforcement for all the bridges was not assessed and as built drawings are not available. The substructure for all the bridges was also not assessed. The existing bridges are narrow and would require widening to accommodate the new cross section. The previous report recommended a separate bridge for the non-motorised traffic.

The design review consultant is therefore expected to conduct the outstanding investigations, and review and update the design of the drainage structures.

4.2.9 Star Rating for Schools Assessment on the Nacala Corridor

The Consultant shall carry out Star Rating for Schools Assessment for the schools along part of Nacala Corridor from Liwonde through Mangochi Boma to Chiponde Border

including the project from Liwonde to Matawale. The recommended option on treatment for the road section from Liwonde to Matawale in Zomba will be incorporated into the bidding document as part of the works. Refer to Annex 5 for detailed terms of reference for this sub activity.

4.2.10 Road Safety Audit

Road safety issues shall also be considered in the design review in line with the Road Safety Engineering Manual (February 2014) prepared for Malawi. The following data shall be collected and analysed:

Accident Statistics

The Consultant shall make contact with the Directorate of Road Traffic and Safety Services and Malawi Police stations along the project road to obtain from them accident statistics as may exist for the project road for the past three years as well as details of the main causative factors in accidents and the locations of known accident black spots. Particular attention should be paid to accidents and black spots involving non-motorized transport and pedestrians.

Road Safety Audit

Upon submission of a draft detailed report, an independent design-stage road safety audit shall be conducted by an individual road safety consultant appointed by the Client. The road safety consultant shall use an iRAP design stage audit process and attain a 3 star rating.

NMT Risk Profile

The Consultant shall use the sectioning of NMT traffic levels and the accident data provided by the Malawi Police to develop a profile of risk to NMT using the road. High risk areas will be identified and possible remedial actions in these areas will be suggested.

NMT Design elements

The consultant shall reflect the NMT in the cross section proposals.

The following specifications will apply:

- NMT lanes should not be placed where angled parking is provided.
- The design of bicycle lanes should also include appropriate signing and pavement markings at intersections to reduce the number of conflicts.

- The minimum paved width for a one-way bike path shall be 150 cm
- The vertical clearance to obstructions across the width of a bike path shall be a minimum of 250 cm and 200 cm over shoulder.
- NMT lanes intersections and their approaches should be on relatively flat grades.
- At unpaved roadway or driveway crossings, including bike paths or pedestrian walkways, the crossing roadway or driveway shall be paved a minimum of 5m to minimize or eliminate gravel intrusion on the path.
- Bicycle path intersection design should address both cross-traffic and turning movements.

The AASHTO Guide for the Development of Bicycle Facilities shall be the reference document when designing for NMT facilities.

4.2.11 Economic Evaluation

The Consultant shall, using the new data, conduct an economic re-evaluation of the road for the design options in order to allow for the selection of an optimal solution for the various uniform road section identified.

The basis of the analysis and prioritization should be the Economic Internal Rate of Return (EIRR), Net Present Value (NPV) and Benefit/ Cost ratio comparing the chosen interventions with a “Do-minimum” scenario. The discount rates used for the analysis and to determine viability shall be consistent to those used by the client. The consultant shall also calculate the First Year Rate of Return ratios to ascertain the optimal start date for the intervention. The consultant is expected to use the HDM4 version 2 for the economic evaluation. The consultant shall also compare the GHG emissions between the chosen intervention and the “Do - minimum” scenario.

Economic benefits shall be expressed primarily in terms of:

- a. Savings in vehicle operating costs;
- b. Savings in road maintenance expenditure;
- c. Residual value of the road’s structures at the end of the evaluation period;
- d. Value of time savings and reduced accident cost;
- e. Greenhouse gas emission reduction, and

Any other factors (exogenous benefits) that the consultant shall consider relevant for the analyses, for example: employment generation induced agricultural production, accident prevention, etc. These factors will need to be agreed with the client before the evaluation.

A Road Safety Screening Appraisal Toolkit shall be applied to the detailed design to determine a project safety impact' to estimate fatality rates under scenarios with and without the project, as well as the associated economic costs.

The consultant is also expected to carry out appropriate sensitivity and formal risk analysis for the key parameters of interest within limits that the consultant may justify. The consultant should also estimate switching values for the key parameters of interest.

4.2.12 Geometric Design

The Consultant shall review and validate the horizontal and vertical alignment of the road to ensure its compliance with the standards as stipulated in the SATTC Draft Code of Practice for the Geometric Design of Trunk Roads.

4.2.13 Pavement Design

The optimum pavement design for the upgraded road, in particular under consideration of rehabilitation requirements shall be confirmed and verified by comparison with at least two other internationally accepted methods in order to produce an optimum design for the project.

4.2.14 Structural Design

Based on the results of the hydrological and hydraulic studies review, climate vulnerability assessment, and structural investigations, the Consultant shall where required carry out detailed designs in accordance with the SATCC Draft Code of Practice for the Design of Road Bridges and Culverts, September 1998 in conjunction with the provisions of BS 5400: Steel, Concrete and Composite Bridges, Parts 1,2,3,4,5,9 and 10 as appropriate and as amended by the provisions of the relevant UK Department of Transport Memoranda. Specifications and recommendations for materials and workmanship are given in Parts 6,7,8 and 9.2 of BS 5400. These parts should be read in conjunction with the SATCC Standard Specifications for Roads and Bridge Works.

The provisions of BS 5400 Part 2: loading, will be adjusted and amended in consultation with the Roads Authority to take into account of local conditions in Malawi. In implementing these adjustments and amendments due guidance shall be taken from the SATTC Draft Code of Practice for the Design of Road Bridges and Culverts September 1998. Sections of BS 5400 Part 2 to which this paragraph particularly applies are as follows:

5-3 Wind load

- 5.4 Temperature
- 6.0 Highway Bridge live loads

4.2.15 Prepare RAP and ESMP

The Consultant shall review the Environmental and Social Impact Assessment (ESIA) report and then develop the detailed Environmental and Social Management Plan (ESMP) and Resettlement Action Plan (RAP) in line with the national legislation and policies as well as the World Bank's Operational Policies and Bank Procedures (OP/BP) and environmental and social standards and the Environmental and Social Framework/Resettlement Policy Framework for the project.

The consultant shall also review the Roads Authority Stakeholder Engagement Plan and Labor Management Procedures.

The following safeguard policies shall apply to this project;

- (i) Environmental Assessment (OP4.01), including the WBG General EHS Guidelines;
- (ii) Natural Habitats (OP/BP4.04);
- (iii) Pest Management (OP4.09)
- (iv) Physical Cultural Resources (OP/BP4.11); and
- (v) Involuntary Resettlement (OP4.12).

The Consultant shall review the Environmental and Social Management Framework (ESMF) and prepare a detailed Environmental and Social Management Plan (ESMP), integrating the specific performance metrics and regulatory requirements that contractors are expected to comply through respective Management Strategies and implementation Plans. General guidelines listed under Annex 1.

It is expected that as a minimum the following shall be addressed in the ESMP;

- Safety of communities arising from construction traffic
- Drinking water management (workers and community)
- Storage of hazardous substances and associated safety procedures and equipment for spills or fire;
- Waste generation, storage, management and disposal arising from construction activities and labour camps
- Vibration, Noise and air pollution
- Grievances arising from project implementation
- Occupational Health and Safety issues e.g. safety procedures around heavy equipment, safety around tipper trucks, increased HIV transmissions
- Labour influx Management Plan

- Stakeholder engagement (including engaging PAPs, District councils, relevant regional regulatory authorities, relevant national regulatory authorities, local leaders, faith based organization, civil society organizations, NGOs etc);
- Covid 19 Management
- Gender Based Violence Management
- Child Protection
- Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH)

The ESMP shall list the MSIPs required for the project implementation (i.e. Water Resource Management Plan, OHS Plan, Traffic Management Plan, Borrow pit Management Plan, Labor Influx Management Plan, Waste Management Plan, Grievance Redress Mechanism, GBV/SEA/VAC Prevention Plan etc) which shall also form part of the bidding documents

The Resettlement Action Plan (RAP) shall be developed in line with the Malawian laws and World Bank Policy and guidelines on involuntary resettlement for the project. The RAP will assess the project impact on involuntary relocation, identify potential project affected persons and design an appropriate Resettlement Action Plan that will offer social safeguard measures to minimize the impacts of involuntary resettlement on the livelihoods of the PAPs. The Consultant's key staff selected to undertake the services shall have had extensive experience in preparation of RAPs for infrastructure development projects and the World Bank's standard for major infrastructural assignments projects. The specific objectives of the RAP review will be as follows: -

- To prepare RAP of the project in line with the Bank's policies.
- To undertake census survey and ensure that all potential PAPs and the impacts of the proposed projects on their livelihoods are identified and appropriate measures to minimize resettlement effects and safeguard livelihoods are recommended.
- To undertake socio-economic survey of the RAP and ensure that baseline data for monitoring and evaluation during project implementation period is generated.
- To undertake asset inventory survey and ensure that all potential assets that will be affected by the proposed project are enumerated.
- To verify compliance with the Bank's Involuntary Resettlement Policy and any other national relocation and resettlement regulations that govern the infrastructural development sector.
- To provide guidelines to stakeholders participating in the minimizing resettlement impacts of the project during RAP preparation and implementation.

- To recommend cost effective measures to be implemented to safeguard the livelihoods (livelihood restoration plan in order to carter the vulnerable PAPs).
- To prepare a Resettlement Action Plan (RAP) report compliant to the World Bank and Government of Malawi regulations.

The consultant shall be responsible for addressing all the comments from the World Bank, client (RA) and the Malawi Environment Protection Authority (MEPA).

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4.2.16 Bidding Document, Bill of Quantities and Cost Estimate

(a) Bidding Documents

Procurement will be done based on the World Bank’s “Procurement Regulations for IPF Borrowers” dated July 2016 “Procurement Regulations” and updated November 2020. The consultant shall prepare a project procurement strategy document, that includes a construction market analysis of potential bidders to justify the cost estimate, and package.

Bidding document shall be prepared fully in accordance with the latest World Bank Standard Bidding Documents.

In terms of technical specifications, the SATCC Standard Specifications for Road and Bridge works, 2001, shall be used.

(b) Bill of Quantities

Calculated quantities for the items of work to be executed shall be based on the finalized construction drawings. A final detailed bill of quantities shall be produced in compliance with SATCC Draft Standard Specifications for Road and Bridge Works as closely as possible. Where items don’t fall within the standard specifications, these shall be clarified in the Particular Specifications, based on the final detailed engineering design. A breakdown of quantities calculations will be supplied to the client in electronic form.

The bills of quantities shall also include the costs of implementation of measures identified in the ESIA study. These shall include costs of implementation of Environmental and Social Management Plan and Environmental and Social Monitoring Plan for each stage

of the project (a summarized costs of implementation of measures for each stage of the project shall be provided).

(c) Cost Estimate

The Consultant shall prepare an estimate of the construction cost based on the final bills of quantities. The cost estimates will be based on unit price analysis of each item using basic cost elements: labour, materials, equipment, tolls, overheads, profit and supervision etc. but excluding and showing separately the cost of all taxation (direct or indirect). A detailed comparison of the overall bid price/km of other similar contracts awarded through international competitive bidding shall also be included. The estimate shall also incorporate provisional sums of Environmental, Social, Health and Safety considerations.

4.2.17 Engineering Drawings

The Consultant shall prepare the following detailed engineering drawings in A1 and A3 sizes for each section for which a detailed design is prepared:-

- a. Location plans as part of or whole of Malawi at a scale of 1: 1,000,000
- b. Plan and profile drawings to a scale of 1:1,000 horizontal and 1:100 vertical for A1 size drawings, and 1:2,000 horizontal and 1:200 vertical for A3 size drawings showing running chainages, natural ground levels and design levels all at 25m intervals, horizontal and vertical curve details, side drain locations, descriptions and references to all drainage and bridge works, location and values of benchmarks and traverse stations, location of road furniture, contour lines superimposed on plans, the boundaries of the road reserve and any other relevant information, in a format approved by the client.
- c. Typical cross sections, scale 1:25 showing all details of road cross section cuts and fills, side drains, pavement thickness, camber and super elevation, shoulders and pavement widening.
- d. Cross sections at minimum intervals of 20m for the entire project.

- e. Typical culverts: showing details of all types of culverts and other drainage structures, their inlets and outlets including the protection works necessary for the project.
- f. Major structures: For all bridge structures, detailed engineering design plans will be produced at appropriate scales, including contoured site plans, substructures and foundation details, protection or ancillary works and bar bending schedules.
- g. Soils plan or table showing the characteristics of soils for various sections of the route.
- h. Ancillary Works: showing plans of all other ancillary works including related works.
- i. Road furniture: Having due regard to current practice, ensure appropriate road furniture, pavement markings and traffic calming measures.
- j. Accommodation of traffic: The Consultant shall prepare a traffic operation plan detailing the construction sequencing, use of traffic control devices and other activities designed to minimize traffic distraction. This operation plan will be complemented by drawings showing typical traffic management, including appropriate signage for the typical construction situations expected to be encountered.
- k. The Consultant is to produce a mass-haul diagram for the earthworks and pavement materials required to complete the project.

4.2.18 Work Programme and Cash Flow Forecast

In order to assist in preparing the required construction period and forward budget needs, the consultant shall prepare a work programme and cash flow requirements showing:

- a. A bar chart showing the proposed sequencing and duration of the major activities for the entire construction period.
- b. Anticipated monthly value of work executed presented in the form of an S-curve.

In preparing this programme, the Consultant shall take into account the climatic conditions prevailing in the areas concerned.

4.3. EXPERTISE REQUIRED

The key professional staff input is expected to be approximately 26 man-months as detailed below:

Item	Description	Man Month
1	Team Leader/ Highway Design Engineer	3
2	Materials Engineer	3
3	Pavement Design Engineer	2
4	Bridge/Structures Engineer	2
5	Hydrologist	2
6	Transport Economist	2
7	Contract Specialist	2
8	Road Safety Specialist	2
9	Environmental Expert	2
10	Sociologist/Resettlement Specialist/RAP Team Leader	2
11	Biodiversity Specialist	2
12	Surveyor	2
Total Man-months		26

The Consultant shall provide sufficient resources to carry-out the design review services for Liwonde - Matawale Road Section as required under the assignment and the minimum requirements for the key professional staff are as indicated below;

(a) Team Leader/Highway Design Engineer

In addition to holding a graduate degree, the Team Leader shall be a Registered or Chartered Civil Engineer of not less than 15 years' general experience, and shall have undertaken at least 10 projects as a Highway Design Engineer. The Team Leader shall have specific experience in working in, and, managing consultancy teams working on feasibility studies and detailed road design in the region. Fluency in written and spoken English is mandatory.

(b) Materials Engineer

In addition to holding a graduate degree, the Materials Engineer shall be a Registered or Chartered Engineer with at least 10 years' general experience, and shall have undertaken at least 8 projects as a Materials Engineer. He shall also have been involved in road design and rehabilitation projects. Fluency in written and spoken English is mandatory.

(c) Pavement Design Engineer

In addition to holding a graduate degree, the Pavement Design Engineer shall be a Registered or Chartered Engineer with at least 10 years' general experience, and shall have undertaken at least 8 projects as a Pavement Design Engineer. He shall also have been involved in road design and rehabilitation projects. Fluency in written and spoken English is mandatory.

(d) Bridge/Structures Engineer

The Bridge/Structures Engineer shall be a qualified and competent chartered or registered professional civil engineer with a degree in civil engineering or equivalent qualification and with a minimum of 10 years' general experience, and shall have undertaken at least 8 projects as a Bridges Engineer. Fluency in written and spoken English is mandatory.

(e) Hydrologist

The Hydrologist shall be a qualified and competent chartered or registered professional civil engineer with a degree in civil engineering or equivalent qualification and with a minimum of 10 years' general experience, and shall have undertaken at least 5 projects as a Hydrologist. Fluency in written and spoken English is mandatory.

(f) Contract Specialist

The Contract Specialist shall be a qualified and competent chartered or registered professional civil engineer with a degree in civil engineering or equivalent qualification and with a minimum of 10 years' general experience, and shall have undertaken at least 5 projects as a Contract Specialist including contract document preparation and claims resolution. Fluency in written and spoken English is mandatory.

(g) Road Safety Specialist

The Road Safety Specialist shall be a qualified and competent chartered or registered professional civil engineer with a degree in civil engineering or equivalent qualification and with a minimum of 10 years' general experience, and shall have undertaken at least 2 projects as a Road Safety Specialist and

should hold a certificate of completion of the Star Rating for Schools course taken online. Fluency in written and spoken English is mandatory.

(h) Transport Economist

Transport Economist with a minimum qualification of a Degree in Economics and must have at least 8 years of working experience in road works or transport infrastructure. Experience in economic appraisals of road projects using the HDM-IV economic model is obligatory. The Transport Economist should have undertaken at least 5 feasibility study and detailed design projects as a Transport Economist.

(i) Environmental Expert

Environmental Expert with at least a MSc in Environmental Science or its equivalent and must have 5 years of working experience, and should have undertaken at least 2 feasibility study and detailed design projects as an Environmental Expert. The consultant must be one registered or recognized with Malawi Environment Protection Authority (MEPA). He / She must have proven expertise in preparing at least five ESIA studies for large infrastructure developments.

(j) Sociologist

The Sociologist with a degree in social management, or related social science degree or Community Development. The Specialist shall have at least 10 years' experience working on social management in infrastructure development with sound knowledge of social issues, initiatives and managing mitigation measures. Experience in preparation of Resettlement Action Plans (RAPs). Fluency in both written and spoken English is essential. Experience in social management issues in construction projects will be an added advantage.

(k) Biodiversity Expert

Biodiversity Expert with at least a MSc in Biology or its equivalent and must have 5 years of working experience, and should have undertaken at least 2 feasibility study and detailed design projects as a Biodiversity Expert. He / She must have proven expertise in preparing at least five ESIA studies for large infrastructure developments

(l) Engineering Surveyor

The Surveyor shall be a qualified surveyor with Bachelor of Science degree or equivalent with a minimum of 5 years' relevant experience in topographic surveys in highway engineering works for road project using computerized survey software for longitudinal and cross - sections profile for existing and new proposed alignments and shall have undertaken at least 5 projects as a surveyor.

4.4. REPORTING REQUIREMENTS

The Consultant shall prepare and submit the following reports and documents, in English, in an approved format to the Client. The comments of the Client shall be incorporated in the final version of the reports and documentation. The Consultant shall also present to the client in power point the Design Review Report and the Draft Detailed Engineering Design report at meetings to be arranged in consultation with the RA.

(a) Design Review Report

This report shall incorporate an assessment of the available documents, describe the findings of the design review and update the detailed design. The report shall be submitted after 4 weeks from the date of commencement of the services. Ten (10) hard copies and one (1) soft copy of each of the reports/documents shall be sent to the Client.

(b) Draft Detailed Engineering Design Report and Bidding Documents

The consultant shall submit a draft detailed engineering design report and bidding documents containing as a minimum the activities under Section 4.2. For any major structures, in addition to the drainage design report, the consultant will submit all the calculations for the structural design as an appendix to the report. This report will be submitted after 10 weeks from the date of commencement of the services. Ten (10) hard copies and one (1) soft copy of each of the reports/documents shall be sent to the Client. In addition, copies of all Word, Excel, AutoCAD or other similar files used in compiling the reports shall be submitted.

(c) Draft Environmental and Impact Assessment Report (including Environmental and Social Management Plan) and Draft Resettlement Action Plan

The ESIA and RAP shall be submitted as separate reports. The reports shall be submitted after 12 weeks from the date of commencement of the services. Ten (10) hard copies and one (1) soft copy of each of the reports/documents shall be sent to the Client. The ESIA and RAP reports shall be submitted following the development of the Draft Design report.

(d) Final Detailed Engineering Design Report and Bidding Documents

After approval of the draft detailed design report, draft ESIA and RAP, the consultant shall submit the final detailed engineering design report complete

with drawings and bidding documents and Engineer's Confidential Cost Estimate, acceptable to the Client. The final ESIA (inclusive of Environmental and Social Management Plan) and RAP reports shall also be submitted. This detailed engineering design report shall be submitted within 2 weeks after receipt of the client's comments.

Ten (10) hard copies and one (1) soft copy of each of the reports/documents shall be sent to the Client. In addition, copies of all Word, Excel, AutoCAD or other similar files used in compiling the reports shall be submitted. In addition, ten (10) sets of the final bidding documents in hard copy shall also be provided. Four sets shall be provided with A1 size drawings and six sets with A3 size drawings.

4.5. PAYMENTS

The contract is a lump sum contract and the payment schedule shall be as follows:

- 10% of the lump sum contract sum shall be paid upon submission of an acceptable Design Review Report.
- 15% of the lump sum contract sum shall be paid upon submission of an acceptable revised ESIA and Draft Resettlement Action Plan.
- 25% of the lump sum contract sum shall be paid upon submission of an acceptable Draft Detailed Engineering Design Report and Bidding Documents;
- 25% of the lump sum contract sum shall be paid upon submission of an acceptable Final Detailed Engineering Design Report including acceptable final ESIA (including Environmental and Social Management Plan), and RAP.
- 15% of the lump sum contract sum shall be paid upon submission of an International Star Rating for Schools assessment of the Nacala Corridor. Breakdown of payments for sub deliverables are indicated under Annex 5
- 10% of the lump sum contract shall be paid upon submission of an acceptable tender evaluation report

5. SCOPE OF CONSULTING SERVICES - PHASE 2 (PRE- CONTRACT)

5.1 Tender Period

During the tender period, the consultant shall:

- (a) Assist the Client in the conduct of a compulsory site inspection of the project road.
- (b) Assist the Client in the conduct of a compulsory pre-bid meeting
- (c) Assist the Client in drafting responses to Bidders' requests for clarifications and in the preparation of any amendments that may be required to the bidding documents.
- (d) Assist the Client in the conduct of contract negotiations.

5.2 Expertise Required and Payment

The Consultant shall provide a Contract Specialist to carry out the services under phase 2. The Contract Specialist shall be the same one that will provide the services under phase 1. The estimated time input under phase 2 is 1.5 months.

The Consultant shall be responsible for ensuring the key expert is provided with such head office support as may be required for the execution of the services.

Payment shall be lump sum as stated under Item 4.5 above.

6.1 SCOPE OF CONSULTING SERVICES - PHASE 3 (SUPERVISION)

6.1.1 General Requirements

- (e) The Consultant's supervision teams shall work in close co-operation with the Roads Authority. The team is to operate from the consultant's offices on site.
- (f) The Road Authority will provide all relevant information available. Interpretation of such information will, however, be the sole responsibility of the Consultant. Any additional data will be collected by the consultant.
- (g) Accommodation of the Consultants site teams will be the responsibility of the Consultant.
- (h) The provision of support staff and transport for the Consultant inclusive of fuel and drivers will also be the responsibility of the Consultant.
- (i) The consultant shall be responsible for providing office space and facilities, accommodation, transport and support staff for the supervision teams for the period of the services.
- (j) The Roads Authority will provide through the works contract, laboratory and survey facilities for use by the consultant.
- (k) Preparation of minor designs that may be required can be covered by using standard drawings available from the Road Authority. Where standard drawings are not available for a particular item, the Consultant is to prepare such drawings.

6.1.2 ADMINISTRATIVE/TECHNICAL TASKS

6.1.2.1 Consultant's Representative on Site

The Consultant shall undertake full time supervision and contract administration during the construction works and shall provide the full- time supervision team described below:

- (i) Resident Engineer
- (ii) Materials Engineer
- (iii) Pavement Engineer (intermittent)
- (iv) Measurement Engineer
- (v) Bridge Engineer
- (vi) Hydrologist (intermittent)
- (vii) Environmental Occupational Health and Safety Expert
- (viii) Social Expert
- (ix) Contract Specialist
- (x) Surveyor
- (xi) Materials Technicians
- (xii) Inspectors of works

6.1.2.2 Contract Preliminaries and General

- (a) The Resident Engineer shall review the qualifications of the proposed key site management personnel of the Contractor and make appropriate recommendations to the Client;
- (b) The Resident Engineer shall receive from the Contractor, check for compliance with Contract requirements, approve and forward to the Client all performance bonds, insurance certificates and policies and guarantees relating to the Contract before submitting to the Client for acceptance.
- (c) During the mobilization of contractor's equipment, camp and personnel, the Resident Engineer shall monitor the contractor's progress against the approved program.
- (d) The Resident Engineer shall prepare and compile detailed works specific forms and check lists relevant to the nature of works. These shall be used and maintained by the inspectors for monitoring work activities. These forms shall be available for inspection by the Client at all times.

6.1.2.3 Work Programme

- (a) The Resident Engineer shall review the program submitted by the Contractor for the execution of the Works to establish whether the methods, arrangements, order and timing of the activities are realistic and coherent in relation to the conditions pertaining on Site.
- (b) The Resident Engineer shall identify from the approved program the information needed by the Contractor for the execution of the works and ensure that such information is made available to the Contractor in a timely manner. The requirement for detailed drawings and information related to the works should be given adequate consideration.

6.1.2.4 Quality Assurance Management

- (a) The Resident Engineer shall review and approve the Quality Assurance and Quality Control Procedures submitted by the Contractor.
- (b) The Resident Engineer shall ensure that all material tests results are kept secure preferably backed by a cloud-based data repository for future retrieval and use.

6.1.2.5 Review of Work, Rejection of Defective Work and Tests

The Resident Engineer using the resources of the supervision Teams shall:

- (a) Conduct on-site observation of the work in progress to determine if the work is proceeding in accordance with the contract schedule, and that the completed work conforms to the contract's technical specifications;
- (b) Carry out quality control of construction materials through testing on site or in the laboratory, for compliance with the relevant clauses in the technical specifications in line with the agreed Quality Assurance and Quality Control procedures. Soils and materials testing records shall be kept on site, with comments in the monthly report. The onus for all testing and control rests entirely on the Consultant.
- (c) Verify that selection and use of materials is in accordance with the design specifications. Establish procedures, criteria, and testing methods to verify the quality of the materials;
- (d) Inform the Contractor when work is to be corrected or rejected or to be uncovered for observation, or special testing, inspection or approval and ensure that defective work is properly corrected in a timely manner;
- (e) Suggest or review and approve substitute materials when necessary. Estimate the cost of such materials and make appropriate adjustments in the specifications in consultation with the Client.
- (f) Inspect and test the works including testing of materials for incorporation in the works and ensure compliance with the relevant clauses in the Technical Specifications. Soils and materials testing records shall be kept on site, with comments in the monthly report.
- (g) Advise the Contractor of the necessity for special inspection and testing of materials and plant to be supplied for incorporation in special maintenance requirements.
- (h) Receive, review and approve or recommend revisions as necessary the Contractors Traffic Management Plan and monitor that once approved this is implemented as proposed.
- (i) The Consultant is to monitor all aspects of health and safety during the execution of the works and ensure that the relevant regulations and requirements are complied with by the Contractor
- (j) The Consultant is to report on all incidents or accidents on the site of the works or associated with the implementation of the works and liaise as necessary with the local authorities and/or police and promptly provide the client with copies of such reports
- (k) Accompany visiting Inspectors representing public or other agencies having jurisdiction over the project, and record the outcomes of these inspections and report as appropriate
- (l) Ensure the contractor's compliance to all Environmental and social safeguards as contained in the Contractors' Environmental and Social Management Plan (C-ESMP), Stakeholder Engagement Plan (SEP) and Labour Management Procedures (LMP)

- (m) Oversee the implementation of the Grievance Redress Mechanism (GRM) for both community and workers by the contractor and/or sub-contractors at project implementation level.

6.1.2.6 Interpretation of Contract Documents

The Resident Engineer shall:

- (a) Maintain liaison with contractor, working principally through the contractor's senior personnel and assist them as necessary in understanding the intent of the contract documents.
- (b) Issue in good time additional details and drawings necessary for the proper execution of the contract;
- (c) Provide interpretations necessary for the proper execution and progress of work, with reasonable promptness and in accordance with agreed time limits;
- (d) Provide written recommendations within a reasonable time, on all claims, disputes and other matters in question relating to the execution or progress of work or the interpretation of the contract documents.
- (e) Instruct the contractor to immediately stop in the event that an activity commences before the contractor has made appropriate submissions and obtained necessary approvals.
- (f) Issue written instructions to the contractor as required.
- (g) Recommend suspension of work when the contractor consistently fails to comply with instructions or to perform the work in accordance with the contract, and recommend appropriate action.

6.1.2.7 Claims Control

The Resident Engineer shall:

- (a) Conduct regular meetings with the Contractor to identify issues of design, technical and commercial challenges that may give rise to delays or claims. Ensure that measures are put in place to address these.
- (b) Ensure that the Client is kept fully informed of all issues that the consultant believes may result in claims.
- (c) Identify any correspondence from the Contractor that may be construed as early warning of a claim and ensure proper record keeping is in place to monitor the issue.
- (d) Review the Contractor's 'early warnings' submissions and claim submissions and make recommendations in accordance with the requirements of the Contract.

6.1.2.8 Modifications of Contract

The Resident Engineer shall:

- (a) Consider and evaluate the Contractor's suggestions for modifications in drawing or specifications and report them to the Client with recommendations;
- (b) Examine Contractor's proposals for changes in construction and provide recommendations to the Client for approval when changes affect cost or quality. Changes, which do not affect cost or quality may be approved on-site and recorded in the monthly progress reports. Such changes shall be effected by written orders issued by the Consultant; and
- (c) Prepare any further design and drawings necessary for the information of the Contractor to enable him to carry out the Works. In particular, the Consultant

shall issue all instructions related to the works for which the Contract contains only provisional items.

6.1.2.9 Surveying, Setting Out and Measurements (where applicable)

The Resident Engineer using the resources of the supervision team shall:

- (a) Indicate to the contractor the location of all survey control points established during the design stage and where necessary re-establish any points that have been lost or disturbed.
- (b) Check all alignment and elevation control points provided to the Contractor;
- (c) Check all setting out of the works undertaken by the Contractor; and
- (d) Compile necessary field measurements and calculate quantities of materials incorporated in the works.
- (e) Check the setting out of the alignment and elevations and maintain the corresponding documentation. Continuous control of pavement levels, culvert levels and levels of any other structures;

6.1.2.10 Measurement of Works

The Resident Engineer through the Measurement Engineer shall:

- (a) Carry out measurement of the works certified as complete on site together with the Surveyor to be used in checking contractor's payment and progress claims; and
- (b) Maintain a record of measured works on site.

6.1.2.11 Payment Certificates

The Resident Engineer with assistance of the Measurement Engineer shall review monthly interim payment applications submitted by the Contractor in accordance with the conditions of contract and the Resident Engineer shall certify these for payment or return them to the Contractor for revision. Upon certification the Resident Engineer will forward five copies of the approved payment certificates plus all supporting measurements sheets and supporting documentation within two weeks of receipt from the Contractor to the Client, who will forward these for payment to the Road Fund Administration.

The interim payment certificates shall detail the actual quantities of work items completed to date compared with the total billed quantity for each item together with the contract unit rates for each work item, materials on site, details of Dayworks, price adjustments, any other payments to which the Contractor may be entitled to under the contract, and deductions for retentions and advance repayments.

Any matters of dispute on the extent of payments shall be resolved between the Resident Engineer and the Client and any agreed adjustments advised to the Contractor by the Resident Engineer and included as adjustments in the subsequent month's certification.

6.1.2.12 Keeping Records

The Resident Engineer shall:

- (a) Maintain at the project office files for correspondence, reports, minutes of meetings, product and material submissions, additional drawings issued subsequent to the execution of the Contract, as well as Consultant's clarifications and interpretations of the documents, progress reports and other related documents;
- (b) Keep a diary or log book, recording Contractor's staff hours on job site, equipment availability/ operation, weather conditions, data relative to questions of extras or deductions, list of visiting officials, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and
- (c) Maintain a set of drawings (As-built drawings) recording all details of the work as actually executed.

6.1.2.13 Monthly Progress Meetings

The Resident Engineer shall:

- (a) Arrange monthly progress meetings with site inspections and notify those expected to attend. In arranging these meetings, he is expected to circulate the meeting agenda and to subsequently maintain and circulate minutes thereof;
- (b) Prepare monthly progress reports recording the contractor's and the consultant's activities, physical and financial progress in relation to the contractor's program, quality of materials and workmanship, and comment on any unusual occurrences. Eight copies of the reports are to be submitted to the Client within 10 days following the month reported.

6.1.2.14 Health, Safety, Social and Environmental Management

The Resident Engineer shall:

- (a) Ensure that the contractor complies with all national labour, Environment, Social, Occupational Health and Safety rules and requirements of the contract documents as per the local legal and regulatory requirements, and project requirements;
- (b) Ensure that all contractor's staff are properly equipped with personal protective equipment;
- (c) Ensure that the contractor carries sufficient training of their personnel to ensure a safe working environment;
- (d) Ensure that any accidents are properly reported within 24 – 48 hours after occurrence and that investigations on the causes are carried out so that preventative measures are put in place to prevent recurrence;
- (e) Monitor the contractor's implementation of their traffic management plan to ensure safety of road users including pedestrians and non-motorized traffic during the rehabilitation works;
- (f) Ensure that the contractor has appointed all safety personnel required by the contract documents, trained them and set up systems to allow them to function properly;
- (g) Conduct regular safety meetings with the Contractor's nominated health and safety officers;
- (h) Ensure that an HIV and AIDS awareness program is implemented in accordance with the requirements of the works contract;

- (i) Monitor HIV and AIDS awareness activities to ensure that the program is being implemented as required by the works contract;
- (j) Check that the contractor has put in place environmental and Social management procedures compliant with the contract Environmental and Social Management Plan;
- (k) Ensure that Contractor prepares Standard Operating Procedures (SOPs) for each work site and that these are translated in a language understandable by local workforce and are displayed in visible and accessible locations within worksites;
- (l) Ensure that the Stakeholder Engagement Plan (SEP) and Labour Management Procedures (LMP) are implemented by the contractor;
- (m) Monitor compliance with the Environmental and Social Management Plan; and
- (n) Report on environmental and social compliance in the Monthly Progress Report.
- (o) Refer to Annex 3 for a detailed description of monitoring the implementation of RAP and ESHS Management Strategies and Implementation Plans (ESHS-MSIP)

6.1.2.15 Financial Progress Monitoring

The Resident Engineer shall:

- (a) Ensure that the Contractor provides regular cash flow updates in accordance with the works contract;
- (b) Monitor actual cash flows against programme;
- (c) Maintain a “Final Job estimate” which shall be published at least once per quarter and shall contain the base estimate of the final job cost taking into account changes in quantities, variation orders, and claims.

6.1.2.16 Completion of Works

The Resident Engineer shall:

- (a) Inspect the works in the company of representatives of the Client, the Contractor and the Sub-contractor, if any, prior to handing over of any section of the works;
- (b) Prepare a final snag list of items to be completed or replaced together with a time schedule for remedying of the same;
- (c) Verify that all items on the final snag list have been completed or corrected; and
- (d) Prior to the commencement of the Defects Notification Period for any section, provide written affirmation that the works have been completed in accordance with the requirements of the contract, plans and specifications, and issue a Taking-Over Certificate.
- (e) The Consultant shall maintain and keep updated a set of ‘As-Built Drawings’. The As-Built drawings shall be finalized for submission with the final report before the end of the Defects Notification Period
- (f) The Consultant shall ensure that all Environmental and Social issues and grievances are closed as per the project’s ESMP and the approved Contractor ESMP (C-ESMP)

6.1.2.17 Required Input During Defects Notification Period

- (a) Immediately prior to the expiration of the Defects Notification Period for any section of the works for which a Taking-Over Certificate has been issued, the Resident Engineer shall in the company of the Client, and the Contractor inspect the said section and provide written affirmation that the works have been completed and maintained in accordance with the contract, and issue a Maintenance Certificate for the relevant section subject to the approval of the client.
- (b) Upon receipt from the Contractor within 56 days of the issue of the Maintenance Certificate for the last section for which the defects notification period has expired, the Resident Engineer shall prepare in co-operation with the Contractor the Final Account for the contract.

6.2 CONTRACT DURATION

The duration for this phase is estimated at a total of 18 months based on the anticipated durations of the works contracts plus a Defects Notification Period of Twelve (12) months.

6.3 REPORTING AND DELIVERABLES

The following reports shall be submitted:

6.3.1 Monthly Progress Reports:

The Resident Engineer shall submit comprehensive monthly reports on the progress of the works, the Contractors' Performance Assessment Reports and Environmental Monitoring Forms by the 14th of the month following the month reported.

The Resident Engineer shall furnish the client with project progress photographs for each contract in a CD together with the monthly reports.

Non-compliance with that requirement will attract a penalty. For each calendar day of delayed submission (after the tenth day of each month) a deduction of 0.25 % of the Consultant's monthly Invoice will be applied as penalty.

An example of the Monthly Progress Report which includes all the required information will be submitted to the Team Leader at the beginning of the assignment. A total of six (6) copies of the reports shall be submitted to Roads Authority.

6.3.2 Minutes of Meetings:

The Resident Engineer shall issue comprehensive minutes of regular and special meetings and submit three copies to Roads Authority. Minutes of the regular meetings may be attached to the Monthly Progress Reports or, depending on the circumstances, may be submitted separately.

6.3.3 Final Report:

Within 28 days of the issuance of the Taking Over Certificate, the Resident Engineer shall prepare a Final Report, which shall highlight all major points of interest that arose during the Contract. The report will also include the

summary of the type, quality, quantities and sources of materials used on the project; Contractor's plant and personnel; problems encountered and solutions employed; changes in design and specifications and the reasons therefore; a breakdown of the final cost item by item; a summary of variation orders and expenditures of provisional sums and contingency sums.

6.3.4 Accident Reports:

A report of the circumstances of accidents occurring on the site shall be forwarded to the Client with all due dispatch.

6.4 STAFFING

The following expertise will be required to carry out the consultancy services. For each expert proposed, curriculum vitae of no more than four pages shall be submitted.

	Description	Man Month
	A – Key Personnel	
	Resident Engineer (1 No)	19
	Materials Engineer (1 No)	18
	Pavement Engineer (1 No)	10
	Measurement Engineer (1 No)	18
	Bridge Engineer (1No)	10
	Hydrologist (1 No)	10
	Environmental Expert (1 No)	18
	Occupational Health and Safety Expert (1 No)	18
	Social Expert (1 No)	18
	Contract Specialist	6
	Engineering Surveyor (1 No)	18
	SUB-TOTAL A	163
	B - Other Personnel	
	Materials Technician (2 No)	36
	Inspector of Works - Structures (1 No)	18
	Inspector of Works - Surfacing (1 No)	12
	Inspector of Works - Earthworks (1 No)	18
	Inspector of Works - Pavement (1 No)	12
	SUB-TOTAL B	96

The consultant's personnel, nominated for this project, shall be suitably qualified and experienced. As a guide, the following is an indication of the minimum level of training and experience expected of the key members of the Consultants supervision team:

6.4.1 Resident Engineer:

A professionally qualified Civil Engineer with a minimum qualification of B.Sc. in Civil Engineering or the equivalent, with a minimum of 20 years' experience of which at least fifteen (15) years must have been in the design and supervision of road construction works. Candidates must have documented experience in the position of Resident Engineer on at least five (5) projects of a similar size and nature in the general region of Sub Saharan Africa.

6.4.2 Materials Engineer

A professionally qualified Materials Engineer with a minimum qualification of B.Sc. in Civil Engineering or equivalent with at least ten (10) years working experience in supervision of road works as a Materials Engineer and documented experience in the capacity of Materials Engineer on at least three (3) road projects of similar size and nature in the Region of Sub Saharan Africa

6.4.3 Pavement Engineer

A professionally qualified Pavement Engineer with a minimum qualification of B.Sc. in Civil Engineering or equivalent with at least ten (10) years working experience in supervision of road works as a Pavement Engineer and documented experience in the capacity of Pavement Engineer on at least three (3) road projects of similar size and nature in the Region of Sub Saharan Africa

6.4.4 Measurement Engineer

A minimum qualification of a B.Sc. in Civil Engineering or quantity surveying or equivalent, and at least ten (10) years working experience in supervision of road works as a Measurement Engineer with documented experience in the capacity of Measurement Engineer on at least three (3) road projects of similar size and nature in the Region of Sub Saharan Africa

6.4.5 Bridge Engineer

A professionally qualified Bridge Engineer with a minimum qualification of B.Sc. in Civil Engineering or the equivalent, registered and at least ten (10) years of working experience in supervision of road works as a Bridge Engineer with documented experience in the capacity of Bridge Engineer on at least three (3) road projects of similar size and nature in the Region of Sub Saharan Africa

6.4.6 Hydrologist

A minimum qualification of B.Sc. in Civil Engineering or the equivalent, registered and at least ten (10) years of working experience in supervision of road works as Hydrologist with documented experience in the capacity of Hydrologist on at least three (3) road projects of similar size and nature in the Region of Sub Saharan Africa

6.4.7 Contract Specialist

The Contract Specialist shall be a qualified and competent chartered or registered professional civil engineer with a degree in civil engineering or equivalent qualification and with a minimum of 10 years' general experience, and shall have undertaken at least 5 projects as a Contract Specialist including contract document preparation and claims resolution. The Contract Specialist shall note any early warnings for claims, review any proposals and recommendations for amendment submitted by the contractor and also assist in claims resolution. Fluency in written and spoken English is mandatory.

6.4.8 Environmental Expert

A minimum qualification of a degree in a relevant discipline and 5 years' general related experience in the implementation of environmental management requirements and the monitoring and implementation of health and environmental requirements on three (3) construction projects.

6.4.9 Occupational Health and Safety Expert

A minimum qualification of a degree in a relevant discipline and 5 years' general related experience in the implementation of occupational health and safety requirements on three (3) construction projects. He/She must have at least a certification in Health and Safety.

6.4.10 Social Expert

A minimum qualification of a degree in a relevant discipline and 5 years' general related experience in the implementation of social management requirements and the monitoring and implementation of social and safety requirements on three (3) construction projects

6.4.11 Engineering Surveyor

A minimum qualification of a BSc in Surveying or a Diploma in Civil Engineering previous experience of at least five (5) years in setting out and survey control with not less than documented experience in the capacity of Surveyor on at least three (3) road projects of similar size and nature in the Region of Sub Saharan Africa

6.4.12 Materials Technicians

A minimum qualification of either a BSc Degree in Civil Engineering and 2 years' experience in materials testing or a Diploma in Civil Engineering and 3 years' experience in materials testing on a road project in the Sub Saharan Africa Region.

6.4.13 Inspectors

A minimum qualification of either a Diploma in Civil Engineering and 5 years' experience in a site capacity on road works in the region or a NCIC Grade II Roads Foremanship Certificate or Ministry of Works Certificate with at least 10 years of working experience in road works.

6.5 WORK PLAN

On the basis of the activities outlined in 6.1.2 of these Terms of Reference, the consultants will prepare a work plan for the assignment and include this in their technical proposal as well as state the approach to be taken in carrying out the assignment. The work plan should set out the consultants' approach to the following activities.

- Organization of the Project team and interrelations between the members of the team;
- Description of tasks and duties of each member of the Project team
- Mobilization of the Team and deployment of each expert;
- Bar-charts displaying activities to be carried out on site, period of holidays of each expert indicative dates for short term missions of each expert, etc.;
- Reporting

6.6 START-UP MEETING

The successful Consultant shall attend together with all their proposed supervision staff (i.e. Resident Engineer, Materials Engineer, Bridge Engineer and Measurement Engineer) to a meeting with the Client to be held before the commencement of the supervision services. The client or his representative shall elaborate the expected inputs and deliverables from each level of staffing. The client shall not be responsible for the costs incurred by the consultant in attending this meeting.

6.7 PRESENCE OF SITE SUPERVISION STAFF ON SITE

In order to satisfactorily perform the tasks it is a requirement that the all site supervision staff are present on site at all times while the works are in progress.

6.8 LEAVE, RESIGNATIONS, TRANSFERS AND REPLACEMENTS

The Consultant's staff shall arrange their annual leave to coincide with the Contractor's annual recess. Should a staff member however be granted special leave outside the Contractor's annual close-down, the Consultant shall provide at no additional cost to the Employer an equally qualified person to stand in for the period that the permanent site staff member is on special leave.

The special leave of a permanent site staff member as well as the person relieving a permanent site staff member shall be approved by the Client prior to such leave being taken. The Consultant shall not transfer any staff without prior written permission of the Client and shall replace personnel, if deemed necessary by the Client and fill vacancies which are created for whatever reason, e.g. resignation, illness, non-performance etc., at no additional costs to the Employer, with equally or better qualified persons approved by the Client.

The remuneration to be paid for any of the Personnel provided as a replacement shall not exceed the remuneration which would have been payable to the Personnel replaced. In case of lesser qualifications and working experience, the client shall have either the right to reject the proposed replacement or to negotiate reduced remuneration.

6.9 ASSISTANCE TO THE CONSULTANT BY THE CONTRACTING AUTHORITY

The Contracting Authority will make available the following information and support to the consultant:

- (i) Introduction letters to facilitate the access of the consultants' staff to Ministries, Government administrations, public organizations, authorities and agencies, etc. whose activities and roles are relevant to the consultancy assignment.
- (ii) Senior Staff of the Roads Authority when necessary and relevant.

6.10 FACILITIES TO BE PROVIDED BY THE CONSULTANT

The Consultant shall be responsible for the provision of all facilities required to undertake the efficient and effective site supervision of road works with the exception of laboratory and survey facilities which will be provided through the works contract.

With respect to transport, the consultant shall provide five (5) motor vehicles for the supervision of the works and the measurement unit for the transport shall be "vehicle-months".

6.11 CONTACT PERSON

- (a) The Consultant's liaison person shall be the Resident Engineer and as necessary the stated representative of the Consultants firm in the Head or Regional Office;
- (b) The Clients liaison person on this project shall be the designated Project Engineer in the Roads Authority.

6.12 PAYMENTS

Payment for site supervision services shall be on monthly basis and shall depend on the actual time inputs of the various staff on site supported by time sheets confirmed by the Resident Engineer and countersigned by the Clients representative.

ANNEX 1 - Environmental and Social Management Plan (ESMP)

An environmental and social management plan (ESMP) consists of the set of mitigation, monitoring, and institutional measures to be taken during implementation and operation to avoid, prevent, or eliminate adverse environmental and social impacts, reduce them to acceptable levels, or offset them, . The plan also includes the actions needed to implement these measures. To prepare an ESMP, project proponent will (a) identify the set of responses to potentially adverse impacts; (b) determine requirements for ensuring that those responses are made effectively and in a timely manner; and (c) describe the means for meeting those requirements. More specifically, the ESMP will include the following components.

Mitigation

The ESMP identifies feasible and cost-effective measures that may reduce potentially adverse environmental and social impacts to acceptable levels. The plan includes compensatory measures if mitigation measures are not feasible, cost-effective, or sufficient. Specifically, the ESMP:

- identifies and summarizes all anticipated adverse environmental and social impacts (including those involving indigenous people or involuntary resettlement);
- describes--with technical details--each mitigation measure, including the type of impact to which it relates and the conditions under which it is required (e.g., continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate;
- estimates any potential environmental and social impacts of these measures; and
- provides linkage with any other mitigation plans (e.g., for involuntary resettlement, Indigenous Peoples, or cultural property) required for the project.

Monitoring

Environmental and social monitoring during project implementation provides information about key environmental and social aspects of the project, particularly the environmental and social impacts of the project and the effectiveness of mitigation measures. Such information enables the borrower and the Bank to evaluate the success of mitigation as part of project supervision and allows corrective action to be taken when needed. Therefore, the ESMP identifies monitoring objectives and specifies the type of monitoring, with linkages to the impacts assessed in the ESIA report and the mitigation measures described in the ESMP. Specifically, the monitoring section of the ESMP provides:

- a specific description, and technical details, of monitoring measures, including the parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions; and
- monitoring and reporting procedures to (i) ensure early detection of conditions that necessitate particular mitigation measures, and (ii) furnish information on the progress and results of mitigation.

Capacity Development and Training

To support timely and effective implementation of environmental and social project components and mitigation measures, the ESMP draws on the ESIA's assessment of the existence, role, and capability of environmental and social units on site or at the agency and ministry level. If necessary, the ESMP recommends the establishment or expansion of such units, and the training of staff, to allow implementation of ESIA

recommendations. Specifically, the ESMP provides a specific description of institutional arrangements--who is responsible for carrying out the mitigation and monitoring measures (e.g., for operation, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting, and staff training). To strengthen environmental and social management capability in the agencies responsible for implementation, most ESMPs cover one or more of the following additional topics: (a) technical assistance programs, (b) procurement of equipment and supplies, and (c) organizational changes.

Annex 2 – Outline of a Resettlement Action Plan

The Resettlement Action Plan (RAP) shall be developed in line with the Resettlement Policy Framework which was developed based on Malawian laws and World Bank Policy (OP 4.12). The RAP will assess the project impact on involuntary relocation, identify potential project affected persons and design an appropriate Resettlement Action Plan that will offer social safeguard measures to minimize the impacts of involuntary resettlement on the livelihoods of the PAPs. The RAP shall therefore consist of the following areas;

1. Description of the Project, Project Area and Area of Influence

Provide a general description of the project and the area of influence.

○ Policy, legal, and institutional framework:

- Discusses the policy, legal and administrative framework within which the RAP is carried out. This should include both national relevant policies and strategies and international legislations.
- It assesses and presents the applicable legal and administrative procedures, including description of the remedies available to displaced persons in the project area and the normal time frame for such procedures, and any available dispute resolution mechanisms that may be relevant to resettlement under the project.
- It identifies and presents relevant laws and regulations (including customary and traditional law), the law governing land tenure, valuation of assets and losses, compensation, and natural resource usage rights; customary personal law related to displacement; and environmental laws and social welfare legislation.
- It identifies and presents laws and regulations relating to the agencies responsible for implementing resettlement activities.
- It presents a gap analysis, between local laws covering eminent domain and resettlement and the Bank's resettlement policy, and the mechanisms to bridge such gaps; and any legal steps necessary to ensure the effective implementation of resettlement activities under the project, including, as appropriate, a process for recognizing claims to legal rights to land—including claims that derive from customary law and traditional usage (see OP 4.12, para.15 b) and a comparative analysis between world bank OP 4.12 and Malawi legislations.

○ Institutional Framework:

The following will be discussed under this section:

- Identification of the main agency responsible for resettlement activities.
- Assessing the institutional capacity of such agencies, including prior experience in preparation and implementation of the RAP and ESMP.
- Presentation of any steps that are proposed to enhance the institutional capacity of agencies and NGOs responsible for resettlement implementation.

○ **Socio-economic Survey and inventory of all assets and Census of PAPs and their Properties:**

The present section executes a socio-economic survey covering the following issues:

- Current occupants of the right-of-way, at the material sites and/or construction camp site, to avoid inflow of people for eligibility for compensation using GIS mapping;
- Standard characteristics of displaced households (baseline information on livelihood, economic and social information to provide PAPs households profile, etc);
- The magnitude of the expected loss (total or partial) including business loss;
- Information on vulnerable groups or persons (for whom special provision may have to be made);
- Provisions to update information on the displaced people's livelihoods and standards of living at regular intervals so that the latest information is available at the time of their displacement;
- Land tenure and transfer systems;
- The patterns of social interaction in the affected communities, including social networks and social support systems, and how they will be affected by the project;
- Public infrastructure and social services that will be affected and
- Social and cultural characteristics of displaced communities in terms of gender, migrants and settled; professions and a description (to the extent feasible) of their preferences as regard to assisted resettlement or self-resettlement).

○ **Eligibility criteria for resettlement:**

This section provides a definition of displaced persons and criteria for determining their eligibility for compensation and other resettlement assistance, including the established relevant cut-off dates. The RAP shall also contain the livelihood restoration plan in order to cater the vulnerable PAPs.

○ **Valuation of and Compensation for Losses:**

It defines and presents the methodology to be used in valuing losses; determines the replacement cost and describes the types and levels of compensation proposed under local law and supplementary measures considered necessary to achieve replacement cost for lost assets. while taking into account different types of land rates based on location and provide justification for the rates

○ **Entitlement Matrix:**

This part provides a clear value of assets lost, description of the packages of compensation and other resettlement measures, such as disturbance

allowance, temporary loss of income, that will assist each category of eligible displaced persons to achieve the objectives of the policy (see World Bank OP 4.12, para. 6). In addition to being technically and economically feasible, the resettlement packages should be compatible with the cultural preferences of the displaced persons, and prepared in consultation with them. As a good practice, land for land would be a preferable option.

○ **Community participation. Involvement of Project Affected Persons and host communities:**

- A description of the strategy for consultation with and participation of Project Affected Persons and hosts in the design and implementation of the resettlement activities;
- A summary of the views expressed and how these views were taken into account in preparing the resettlement plan;
- A review of the resettlement options presented and the choices made by displaced persons regarding options available to them, including choices related to forms of compensation and resettlement assistance, to relocating as individual families or as parts of preexisting communities or kinship groups, to sustaining existing patterns of group organization, and to retaining access to cultural property
-
- Institutionalized arrangements by which displaced people can communicate their concerns to project authorities throughout planning and implementation, and measures to ensure that such vulnerable groups as indigenous people, ethnic minorities, the landless, and women are adequately represented. Description of procedures for redress of grievances by people affected to project authorities throughout the planning and implementation.
-

○ **Grievance Redress Mechanism (GRM):**

In close consultation with the impacted community and the relevant agencies, this section will present a GRM building on an existing customary and/or administrative mechanism to resolve conflicts that may arise during preparation, construction and post construction. The GRM should be agreeable to the impacted community, have a clear process for submitting complaints and redress. The GRM must include representatives of the impacted community and schools representatives as key stakeholders

2. Potential Impacts

Description of the project components or activities that would give rise to resettlement, zone of impact of such activities and the alternatives considered to avoid or minimize resettlement.

3. Organizational Responsibility

The institutional arrangements within the executing agency and provision of adequate resources to the executing agency should be discussed and all inter-agency coordination should be described. The capacity and commitment of the

executing agency to carry out the resettlement plan should also be evaluated. If necessary, strengthening of the executing agency should be considered and the steps that will be taken, together with a timetable and budget, should be described at the project preparation phase. There should be considerable scope for involving the local people and Non-Governmental Organizations (NGOs) in planning, implementing and monitoring resettlement.

4.

4. Integration with Host Communities

Consultations with host communities and local governments and arrangements for prompt tendering of any payments due to the hosts for land or other assets should be provided to resettlers. Arrangements for addressing any conflict that may arise between the resettlers and host communities should also be made.

Appropriate measures should be taken to augment public services (e.g. education, water, health and production) in host communities to make them comparable to services provided to resettlers.

5. Socio-economic Studies

- (a) A population census covering current occupants of the affected area including the description of the production systems, household organization, baseline information on livelihoods and standards of living of the displaced population.
- (b) An inventory of assets of displaced households, the magnitude of the expected loss (total or partial) for individual or group assets and the extent of physical and economic displacement.
- (c) Information on disadvantaged groups or persons for whom special provisions may have to be made.
- (d) Provisions to update information on the displaced people's livelihoods and standards of living at regular intervals so that the latest information is available at the time of their displacement.
- (d) Description of land tenure systems including common property and non-title based land ownership or allocation system recognized locally and related issues.
- (e) Public infrastructure and social services that will be affected
- (f) Social and cultural characteristics of displaced communities.

6. Legal Framework including Mechanisms for Conflicts Resolution and Appeals

- (a) The applicable legal and administrative procedures including a description of the remedies available to displaced persons in the judicial process and the normal timeframe for such procedures and available alternative dispute resolution mechanisms that may be relevant to the project.
- (b) Laws and regulations relating to the agencies responsible for implementing resettlement activities.

- (c) Any legal steps necessary to ensure the effective implementation of resettlement activities including a process for recognizing claims to legal rights to land – including claims that derive from customary and traditional law and usage.

7. Institutional Framework

- (a) The identification of agencies responsible for resettlement activities and NGOs that may have a role in project implementation.
- (b) An assessment of the institutional capacity of such agencies and NGOs.

8. Eligibility

Definition of displaced persons and criteria for determining their eligibility for compensation and other resettlement assistance including relevant cut-off dates.

9. Valuation of and Compensation for Losses

- (a) The methodology to be used in valuing losses to determine their replacement cost, a description of the proposed types and levels of compensation under local laws and such supplementary measures to achieve replacement cost for lost assets.
- (b) A description of the packages of compensation and other resettlement measures that will assist each category of eligible displaced persons to achieve the objectives of this policy.

10. Identification of Alternative Sites and Selection of Resettlement Site(s), Site Preparation and Relocation

- (a) Institutional and technical arrangements for identifying and preparing relocation sites for which a combination of productive potential, locational advantages and other factors are at least comparable to the ancillary resources.
- (b) Procedures for physical relocation under the project including timetables for site preparation and transfer.
- (c) Any measures to prevent influx of ineligible persons at the selected sites.

11. Shelter, Infrastructure and Social Services

Plans to provide or finance housing, infrastructure (e.g. roads, water supply, etc) and social services (schools, health services), plans to ensure comparable services to host populations and any necessary site development.

12. Environmental Protection

An assessment of the environmental impacts of the proposed resettlement and measures to mitigate and manage the impacts.

13. Implementation Schedules

An implementation schedule covering all resettlement activities from preparation through implementation including target dates for achievement of expected benefits to Project Affected Persons and hosts and terminating the various forms of assistance.

14. Costs and Budget

Tables indicating breakdown of cost estimates for all resettlement activities including allowances for inflation and other contingencies, timetable for expenditures, sources of funds and arrangements for timely flow of funds.

15. Monitoring and Evaluation

Arrangements for monitoring of resettlement activities by the implementing agency supplemented by independent monitors as appropriate to ensure complete and objective information, performance monitoring indicators to measure inputs, outputs and outcomes for resettlement activities, evaluation of the impacts of resettlement for a reasonable period of time after the resettlement activities have been completed.

Annex 3: Monitoring the Implementation of RAP and ESHS Management Strategies and Implementation Plans (ESHS-MSIP)

- a) The Consultant's team will include a suitably qualified person to undertake the day-to-day supervision of contractors in all matters concerning compliance with the ESHS-MSIP, and the occupational health, safety (OHS) and community health and safety.
- b) Review and approve the Contractor's Environment and Social Management Plan (C-ESMP), including all updates and revisions (not less than once every 6 months);
- c) Review and approve ESOHS provisions of method statements, implementation plans, GBV/SEA prevention and response action plan, drawings, proposals, schedules and all relevant Contractor's documents;
- d) Review and consider the ESOHS risks and impacts of any design change proposals and advise if there are implications for compliance with ESIA, ESMP, consent/permits and other relevant project requirements;
- e) Undertake audits, supervisions and/or inspections of any sites where the Contractor is undertaking activities related to the Works, to verify the Contractor's compliance with ESOHS requirements including its GBV/SEA obligations, with and without contractor and/or client relevant representatives, as necessary, but not less than once per month
- f) Undertake audits and inspections of Contractor's accident logs, community liaison records, monitoring findings and other ESOHS related documentation, as necessary, to confirm the Contractor's compliance with ESOHS requirements;
- g) Agree remedial action/s and their timeframe for implementation in the event of a noncompliance with the Contractor's ESOHS obligations;
- h) Ensure appropriate representation at relevant meetings including site meetings, and progress meetings to discuss and agree appropriate actions to ensure compliance with ESOHS obligations;
- i) Check that the Contractor's actual reporting (content and timeliness) is in accordance with the Contractor's contractual obligations;
- j) Review and critique, in a timely manner, the Contractor's ESOHS documentation (including regular reports and incident reports) regarding the accuracy and efficacy of the documentation;
- k) Undertake liaison, from time to time and as necessary, with project stakeholders to identify and discuss any actual or potential ESOHS issues;
- l) Establish and maintain a grievance redress mechanism including types of grievances to be recorded and how to protect confidentiality e.g of those reporting allegations of GBV/SEA.
- m) Ensure any GBV/SEA instances and complaints that come to the attention of the consultant are registered in the grievance redress mechanism
- n) The consultant shall supervise these activities and arrange:

Compliance monitoring:

- To measure and report progress against the RAP and ESMP schedule;
- To compile regular progress report on all ESMP monitoring indicators and propose corrective actions when needed;

- To verify that land acquisition and compensation entitlements are being delivered in accordance with the RAP;
- To identify any problems, issues or cases of hardship resulting from the resettlement process, and to develop appropriate corrective actions, or where problems are systemic refer them to the RA and the project's GRM procedure shall be used;
- To verify that agreed measures to restore or enhance living standards are being implemented;
- To collate records of grievances, follow-up that appropriate corrective actions have been undertaken and that outcomes are satisfactory;
- To follow up and document complaints and grievance and their resolution of non-compliance or recurrent problems with respect to overall social issues (including, but not limited to: employment and labour; economic and environment; public safety; and, access to project benefits and opportunities; Gender Based Violence, SEA and sexual harassment ; child abuse; incidence of HIV/AIDS); and any other social conflict.
- To regularly advise the RA on progress with the contractor's applications for permits or consents as relevant under local laws or regulations.
- To ensure that the contractor is adhering to the day-to-day requirements of the Contractor's Environmental and Social Management Plan- (C-ESMP), the environmental and social safeguard requirements under Malawi law (including conditions of consent), and the World Bank's environmental and social safeguards policies and EHS Guidelines.¹
- To coordinate reviews of safeguards instruments by the Client, Government Departments, and World Bank, compiling comments, making amendments and reviewing as required;
- To issue instructions to the Contractor to address any C-ESMP or ESMP non-compliance issues. For C-ESMP or ESMP infringements, the Contractor shall be given a Notice by the Engineer to initiate actions to remedy the issue within an agreed number of days. If remediation and restoration has been satisfactorily initiated but could not be completed during this period, the Engineer shall determine a reasonable extended period to complete the remediation in consultation with the Contractor and the Employer. If in the judgment of the Engineer the Contractor has not:
 - Initiated any satisfactory remedial action within the agreed period, or
 - Did not implement restoration activities according to the plan stated in the project RAP, or
 - The restoration is not being done in a timely manner during any extended period;

Site visits and Reporting

¹ World Bank Group Environmental Health and Safety Guidelines: <http://www.ifc.org/ehsguidelines>

- As a minimum, the Consultant's safeguards specialist shall undertake monthly site inspections at each project site, including any workers' camps and lay down areas, and complete ESMP Monitoring Plan Inspection Checklists and submit to the Client along with a report, which should include a list of grievances (with dates of receipt and resolution)
- To assist RA with quarterly inspections of the construction sites, accompanied by the Consultant's safeguard specialist and the Resident Engineer. The Consultant shall prepare a joint quarterly report to be agreed by all parties clearly identifying actions to be taken to improve safeguards compliance. Such report will be submitted to the RA for review 2 weeks before planned RA site visit.
- Prepare quarterly safeguard progress reports in an agreed format covering all aspects of the project supervision, including project progress, testing results, occupational health and safety, ESMP and CESMP compliance, workers hired on site (local vs migrant and any age violations observed), incidents, near misses, summary of grievances / complaints and actions taken, upcoming or potential issues to be any consultation undertaken, relevant training, and compliance with permits and consents.
- Provide materials and otherwise support RA to consult with the communities and stakeholders in accordance with the consultation plan in the ESMP.

REPORTS

- i. The Consultant will prepare and submit the following reports and documents, in English language in an approved or prescribed format. Two (2) hard copies and two (3) soft copies in digital format on CD of each of the listed reports shall be sent to the Client.
 - ii. For monthly and quarterly reports, key information on the progress of the ongoing activities only should be clear and preferably bulleted;
 - iii. Issues at hand must be clearly tabulated including any issues identified in the project meetings, with responsible parties and completion deadlines noted;
 - iv. Update on the issues that were identified in previous reports, in bullet;
 - v. Any changes in figures for the manpower resources and equipment pieces should be notified, also provide corresponding figures required in original plan, for comparison;
 - vi. Avoid unnecessary repetition of write ups between Monthly Progress Reports (MPR), Quarterly Progress Reports (QPR), and previous reports;
 - vii. The graphs and figures included should be clear and readable;
 - viii. Suggested formats for reports are noted below for guidance:
- a) Inception Report.**: This will summarise the Consultant's and Contractor's state of mobilisation, Contractor's obligations, records of site meetings and

the proposed site communications procedures and record keeping, to be submitted within four (4) weeks of commencement of works. It will serve as the first monthly report.

b) Monthly Progress Report: Up to 20 pages maximum, unless the client has additional requirements. This Report shall be submitted by or before the 10th of the following month:

- Executive summary
- Brief Project Scope Description (1 page);
- Supervision consultant comments on the monthly's activities and concerns (2 pages)
- List of issues identified /faced, with dates to be resolved by any parties responsible (up to 2 pages);
- Status of the issues mentioned in the previous MPR, if resolved or not (1 page)
- Progress Update: (i) Design issued, (ii) progress of ongoing activities per contract, or lagging behind with impact on overall schedule, and (iii) status of the due progress payments to the contractor (2 pages);
- Environmental and social safeguards brief progress with issues if any (1 page)
- Contractor's performance: (i) major concerns on the available manpower, (ii) any lack of required plant and equipment at the site, (iii) work schedule vs. any variation on the scope impacting cost and time (2 to 3 pages);
- Supervision Consultants team changes if any or any complaints (1/2 page)
- Location map, Progress photos (before and after if possible)
- A report of the circumstances of any significant accidents or fatalities occurring on the site shall be forwarded to the Employer with all due dispatch (1/2 page);

c) Quarterly Progress Report: This report shall be submitted no later than the tenth day of the first month in the following quarter.

- Executive summary
- Project background and general scope description,
- Project component in details;
- Team Leader's comments on the progress, concerns on pending items, issues not resolved, variation orders expected or requiring approval, and overall impact on the project schedule and budget;
- Contractor's work program schedule updated as of the subject QPR, S-Curve;
- Status of quarry site and issues if any;
- Financial t status: (i) Progress payment, (ii) financial targets and cash flow projections, (iii) variation orders approved/pending, (iv) project's overall cost per component incorporation variation, and counterpart funding status;
- Supervision consultant team, present as required and any changes in the key international experts, national experts, any substitution requested and its impact on the project;
- Construction supervision consultant's activities vs. scope of services: (i) contract administration, (ii) design drawing issued to the contractor, (iii) comments on the overall progress of the project vs. schedule and

financing; (iv) comments on the main issues raised in the MPR and if resolved or outstanding , new issues; etc.

- Environmental safeguard status: (i) ESMP approved by the authorities, (ii) ESMP compliance by the contractor, etc. This also includes compliance with the Occupational Health and Safety Plan prepared by the contractor.
- Social safeguards Status: (i) implementation status of the Land acquisition and Resettlement Action Plan prepared and approved, Stakeholder Engagement Plan (SEP), Labour Management Procedures (LMP), GBV/SEA-SH mitigation strategies, Grievance Redress Mechanism (GRM) etc
- Utilities relocation status: update on the progress of all utilities and actions by the responsible parties;
- Contractor's performance assessment against agreed benchmarks;
- Location map, Progress photos
- A report of the circumstances of any significant accidents occurring on the site shall be forwarded to the Employer with all due dispatch;
- A report detailing the Consultant's assessment of each claim notified by the Contractor shall be prepared and submitted to the Employer.

d) Environmental and Social Monthly Report: Submission and approval of monthly report summarizing activities carried out, difficulties, grievances management, stakeholder engagement, waste management, traffic management, labour and OHS management and activities programmed for next month among other, . environmental and Social Management. This report must be submitted within the next eight days after each month of works.

e) Safety and Traffic Monthly Report: Submission and approval of monthly report summarizing safety practices carried out, traffic management, difficulties, and activities programmed for next month among other. This report must be submitted within the next eight days after each month of works.

Annex 4: Existing Data to be Collected

ID	Data	Source
1. Data Availability/ Accuracy Guaranteed by the Client		
1.1	None	
2. Data Availability/ Accuracy not Guaranteed by the Client		
2.1	Detailed Engineering Design Reports	Roads Authority
2.2	Historical Traffic Data from departmental count stations	Roads Authority
	Hydrological/precipitation data and flood mapping information	Department of Climate Change and Meteorological Services
2.3	Other historical data from any Roads Authority Database that may exist	Roads Authority
2.4	Standard traffic count categories	Roads Authority
2.5	List of National Survey Control Beacons with co-ordinates	Surveyor General's Department
2.6	1:250,000 and 1:50,000 scale national topographic maps	Surveyor General's Department
2.7	Aerial photography	Surveyor General's Department
2.8	Geological Mapping	Geological Surveys Department
2.9	Location of other utility crossings	Malawi Telecommunications Limited, and Electricity Supply Corporation of Malawi Limited, Southern Region Water Board
2.10	Historical Construction Rates and Prices	Roads Authority
2.11	Roads Authority Standard Formats for Reports	Roads Authority
2.12	Mapping of protected land, National Parks, Forests etc.	Department of National Parks and Wildlife

Annex 5: Terms of Reference for International Roads Assessment Program (iRAP) Star Rating for Schools

1. Background

The Government of Malawi (GoM) has obtained a credit and grant from the International Development Association (IDA) under *the Southern African Trade and Connectivity Project* (Project) to support efforts to reduce trade costs and time, increase access to improved infrastructure, and increase value chain development in targeted corridors of Malawi and Mozambique. The project will be implemented over a period of 6 years.

For Mozambique and Malawi, it is particularly important to strengthen regional trade and economic links through a spatial focus on Mozambique's economic corridors by reducing trade costs. The corridors of Beira and Nacala connect central and northern Mozambique with Malawi, Zimbabwe, Zambia and by extension, Botswana and the Democratic Republic of Congo. These two corridors can be considered fundamental and the newly elected government has emphasized the need to focus on improving logistics and rail access and expanding aggregation and export processing. For Malawi, these two corridors feature the closest and potentially cheapest routes to the sea. These are therefore critical options for access to regional and global markets.

The project development objective is to Reducing trade costs and improving the road network will facilitate the development of value chains by improving access to global and regional markets. The main Project components are:

Component 1: Reducing trade costs through trade facilitation, including border infrastructure and regulatory framework reforms.

Component 2: Strengthening regional coordination and supporting Project implementation.

Component 3: Increasing investment in regional value chains; and

Component 4: Improving transport infrastructure.

The World Bank has calculated that road crash deaths and injuries are costing Malawi around 10% of GDP each year.² Fatalities are estimated to range between 2,200 – 5,600 per year according to the World Health Organization (WHO) and the Global Burden of Disease (GBD), registering 30 and 31 deaths per 100,000 people respectively according to the WHO 2018 data. The high crash rates in Malawi is a consequence of a number of factors including, but not limited to, road condition, road user behavior and lack of education, inadequate traffic management facilities, and lack of visibility after dark.³ Increasing safe infrastructure and road safety interventions in urban and rural transport

² World Bank (2019). *Guide for Road Safety Opportunities and Challenges: Low- and Middle-Income Countries Country Profiles*. Washington, DC., USA: World Bank.

³ Malawi National Transport Master Plan 2017-2037

systems have been proposed in the Malawi NTMP as one approach to addressing physical constraints.

2. Objectives

The project will focus on enhancing protection of vulnerable road users along the project corridor and related trade connectors. The project intends to pilot the [International Road Assessment Program \(iRAP\)](#) Star Rating for Schools (SR4S) application, and initiate a dedicated road safety program for schools located along the Nacala corridor. The project will assess the participating school's risks and bring the iRAP star rating per school to at least 3 stars (where 1 is the least safe and 5 is the safest school) by addressing the unsafe areas through the implementation of physical improvements (speed humps; pedestrian crossings; speed management traffic signs; etc), which will be accompanied by road safety awareness campaigns. This assignment relates to Component 4, which is designed to support transport and logistics connectivity, including road safety improvements, that facilitate safe passage along the Nacala corridor.

3. Scope of Services

Roads Authority (RA) intends to engage a road safety specialist to undertake Star Ratings for Schools (SR4S) Assessments. The assignment is expected to complete all necessary field visits, data collection, coding, and identification of treatment options to develop a SR4S Investment Plan. Related details on the approach are provided in the [FIA School Assessment Toolkit](#) and the [Star Rating for Schools website](#). The road safety expert will be under the consultant for the design review of Liwonde – Matawale road.

The following outlines provides details on the scope of services.

- (a) *Discussions and visits with Schools.* The consultant will conduct field visits to engage with schools and communities as part of the survey of the existing schools along the Nacala Corridor and the Liwonde – Matawale road section that are to be assessed. The total number of schools to be assessed will be 15.
- (b) *Coding around Schools.* Based on the discussions with schools and communities identified above, the consultant should select the locations that will be assessed around each school (3-5 locations to be assessed, especially around the main entries in the school used by students). The survey of schools will be completed in line with the *SR4S Coding Manual*. Road Authority (RA) will provide support with the data requirements related to pedestrian, vehicle counts and operating speeds.
- (c) *Current Star Rating.* The assignment is expected to set a baseline rating for the identified locations around schools. These will be assessed on the ground through any of our data collection tools: paper form, Web app or Android app.

The data will be uploaded to the SR4S central platform and submitted to a Quality Review process. The consultant is responsible to subcontract one of the accredited reviewers, submit all the locations for review and make any necessary amendments to the locations until they are approved by the reviewer and are ready to be processed to generate the Star Ratings.

- (d) *Recommended Treatment Options at each school location.* After the Star Ratings are generated, the consultant should use the SR4S Demonstrator to test scenarios of combination of upgrades to guide the countermeasures that should be implemented. After the approval in the review, the assessment team can check the Star Ratings results and simulate scenarios of upgrades.
- (e) *Develop an indicative SR4S Investment Plan.* With the Demonstrator results, the consultant should develop a plan with recommendations and suggested upgrades for each of the assessed locations. The road authority should provide the cost estimates per measure and the consultant should include in the report the expected cost and timeline for implementation of countermeasures based on consultations with the RA.⁴

4. Deliverables and Payment Schedule

Deliverable 1: An **inception report** including details on the consultant approach to meeting the following: (a) Survey plan; (b) Health and safety plan; (d) data collection process and tools (confirmation that SR4S will be done with a tablet, a mobile phone or just with a paper form); (d) RA data contributions and engagement strategy.

Deliverable 2(a): An **SR4S Assessment Report** to present the data collected and initial findings for a) School community engagement and assessment plan (including the methodology to identify the locations for assessment around each school); (b) Health and safety plan; (c) Daily assessment records; (d) GBV and SEA mitigation plan and (e) Quality and compliance review plan (the coding review of locations assessed should be independently undertaken by an accredited reviewer – either iRAP or one of the partners currently under the accreditation process).

Deliverable 2(b): A **SR4S Demonstration** to RA, Ministry of Transport and Public Works, Directorate of Road Traffic and Safety Services, and Ministry of Education to provide capacity development on the apps, tools and processes, as well as the assessment findings as part of a stakeholder engagement dialogue on protecting youth in school zones. This engagement is expected to inform the next deliverable on the SR4S Investment Plan.

Deliverable 3: A **SR4S Investment Plan**. Based on discussions with RA, Schools and community stakeholders, provide recommended treatment options designed to address problematic areas through the implementation of physical improvements (e.g. speed humps; pedestrian crossings; speed management traffic signs; etc.) to achieve a minimum 3-Star rating at each location.

⁴ SR4S does not provide an estimate of lives saved or investment as in the SRIP of iRAP assessments

#	Deliverable	Payment
1.	Upon submission and approval of the Inception report <u>2 weeks</u> from date of commencement of services	15% of the Lump Sum amount under iRAP (Section 4.5)
2.	Upon submission and approval of the SR4S Assessment Report <u>12 weeks</u> from date of commencement of services	40% of the lump sum amount under iRAP (Section 4.5)
3.	Upon submission and approval of the SR4S Investment Plan <u>14 weeks</u> from date of commencement of services	45% of the lump sum amount under iRAP (Section 4.5)

5. Specific Inputs to be provided by the Client

The client is the Malawi Roads Authority (RA). The consultant will report to RA, which will provide technical oversight, facilitate stakeholder engagement, and guide overall activity management. Road Authority must provide/support the collection of pedestrian and vehicle flow and operating speeds. RA will be available remotely or in person throughout for feedback and will commit to timely review of drafts as they become available.

6. Period of execution

The proposed assignment is expected to be completed within **four** months.

7. Professional Experience, Education and Training Requirements

The Road Safety Expert should hold a certificate of completion of the Star Rating for Schools course (available online free of costs – can be undertaken in 2weeks).

Quality Review should be undertaken by an independent reviewer (likely one if the [SR4S Lead Partners](#) that are in the accreditation process – in the absence of any of them, it could also be Irap). The consultant could also subcontract a SR4S Lead Partner for remote support (e.g. mentoring to engage the school or select the locations for assess

Annex 6: Project Environmental and Social Management Framework Matrix

a) Matrix for potential Positive environmental and social impacts from the construction of roads

Potential Positive impacts	Source of impacts	Proposed Mitigation Measures	Responsibility for implementation of mitigation Measures
Facilitation of trade and the movement of agricultural commodities along the corridor	The construction of a selected road, inland exam center and last mile infrastructure	<ul style="list-style-type: none"> • Regular maintenance of the infrastructure • Supervision and monitoring works • Agricultural diversification 	MRA, Ministry of Trade, Roads Authority
Facilitate faster clearance of cargo	Construction of inland exam centres	<ul style="list-style-type: none"> • Regular maintenance of the infrastructure • Training of staff 	MRA
Reduce the average price of transport services	Rehabilitation of a selected road within the corridor	<ul style="list-style-type: none"> • Regular maintenance of the road infrastructure • 	Roads Authority
Improved connectivity and access to markets within the corridor	Rehabilitation of a selected road within the corridor	<ul style="list-style-type: none"> • Regular maintenance of the road infrastructure • Supervision and monitoring works • Agricultural diversification 	Roads Authority

Potential Positive impacts	Source of impacts	Proposed Mitigation Measures	Responsibility for implementation of mitigation Measures
Improved Road Safety	improved in terms of flow of traffic, management of speed, signage, post-accident care, emergency services and the development of rest stops	<ul style="list-style-type: none"> • Regular maintenance of the road infrastructure • Sensitize communities to care for road signs • Replacement of signage once vandalized 	Roads Authority, Road Traffic Directorate
Improved food security, nutrition and household incomes	The development of value chain infrastructure, improvement of trade and access to market and reduction of transportation costs	<ul style="list-style-type: none"> • Provide training to farmers; and • Promote agricultural diversification. 	Contractors
Increase in employment opportunities	The project construction activities will create job opportunities for people from surrounding project areas	<ul style="list-style-type: none"> • Employ people from surrounding communities; and • Provide equal employment opportunities for both men and women including the youth 	Contractors
Increased business opportunities for local suppliers of goods and services	The construction works shall increase business opportunities for the local suppliers of goods and services	<ul style="list-style-type: none"> • Purchase goods and services from the local communities 	Contractors

b) Matrix for potential negative environmental and social impacts from the construction of roads

NO	Potential Negative impacts	Source of impacts	Proposed Mitigation Measures	Responsibility for implementation of mitigation Measures
1	Increased risk of loss of land and Property	Construction of road infrastructure, inland exam centres and last mile infrastructure may affect some peoples land and property	<ul style="list-style-type: none"> • Develop a Resettlement Plan for the PAPs with GRM and ensure its implementation; • Carry out sensitization meetings on planned project activities and likely impacts including loss of land/property; • Develop and implement livelihoods restoration plans 	Roads Authority
2	Loss of vegetative	Clearance of land for road, inland examination centres and infrastructure for value chain construction activities	<ul style="list-style-type: none"> • Promotion of afforestation; • Limiting the clearance of vegetation to land that will be affected by the project activities 	Contractor
3	Loss of habitat for wildlife	Clearance of land for road, inland	<ul style="list-style-type: none"> • Limiting the clearance of vegetation to land that will 	Contractor

NO	Potential Negative impacts	Source of impacts	Proposed Mitigation Measures	Responsibility for implementation of mitigation Measures
		examination centres and infrastructure for value chain construction activities	be affected by the project activities	
4	Creation of borrow pits and quarries	Top soil stripping; excavation of construction soil and road gravel	<ul style="list-style-type: none"> • Develop and implement borrow pit and quarry management plans • Obtain materials from licensed borrow pits and quarries • Rehabilitate borrow pits after excavation activities prior to completion of contracts; • Fence of quarries and pits to restrict access 	Contractor
5	Increase in surface runoff and soil erosion.	Clearance of vegetation and poor compaction of roads and on other project infrastructure	<ul style="list-style-type: none"> • Limit the clearance of vegetation to land that will be affected by the project activities; • Promote afforestation. 	Contractor
6	Increased risk of labour influx leading to GBV and SEA	labour influx and increase in	<ul style="list-style-type: none"> • GBV/SEA sanitizations by GBV service provider; 	Contractor

NO	Potential Negative Impacts	Source of impacts	Proposed Mitigation Measures	Responsibility for implementation of mitigation Measures
		disposable income resulting into interactions between migrant workers and surrounding community or amongst workers themselves leading to GBV/SEA	<ul style="list-style-type: none"> • Signing and adherence to Workers' Code of Conduct; • Establish and operationalize GRM whose approach is sensitive to issues of GBV and SEA; and • Map out GBV/SEA service providers in the project areas; • Community engagement and consultation to include GBV/SEA sensitization; 	
7	Increased Risks of HIV/AIDS and other STIs	labour influx and increase in disposable income resulting into interactions between migrant workers and surrounding community or amongst workers themselves;	<ul style="list-style-type: none"> • Source much of the labor force from surrounding communities as this may decrease influx of migrant workers; • Develop a Work place HIV/AIDS policy and enforce its implementation; • Conduct sensitization meetings on the dangers of contracting HIV and AIDS and other STIs to workers and communities; • Provision of HTC Services; and 	Contractor

NO	Potential Negative impacts	Source of impacts	Proposed Mitigation Measures	Responsibility for implementation of mitigation Measures
			<ul style="list-style-type: none"> • Provision of free condoms to workers. 	
8	Occupational Safety and Health Risks	Construction activities may bring along occupational safety and health risks to workers	<ul style="list-style-type: none"> • Develop an Occupational Safety and Health Plan and enforce its use to reduce or avoid occupational health and risks; • Provide appropriate personal protective equipment (PPE) to people working in high-risk sub projects and enforce its use; • Provide first aid kits and ensure they are fully stocked at all times; and • Provide adequate warning sign in all areas where safety risks are high. • Report any accidents or incidents to the World Bank within 24 hours of accident occurrence. 	Contractor, PMSU
9	Public Safety Risks	The construction site could be dangerous to surrounding communities and	<ul style="list-style-type: none"> • Cordon off working areas; • Conduct sensitization meetings to communities; and • Level the borrow pits after construction works 	Contractor

NO	Potential Negative impacts	Source of impacts	Proposed Mitigation Measures	Responsibility for implementation of mitigation Measures
		stray animals that might walk across the site		
10	Disturbance of public utilities	Removal or movement of existing public utilities such as water and electricity supplies	<ul style="list-style-type: none"> • . Replace all public utilities disturbed • Sensitize communities before movement of public utilities 	Contractors
11	Pollution from spillage of petroleum products	Leakages or spillage of diesels and oils from storages and maintenance workshops on the construction sites.	<ul style="list-style-type: none"> • Develop and implement waste management plan that would promote; • Provide waste receptacles such as bins and toilets; • Collect and dispose of used oil at sites designated by respective municipal/district councils; • Bund all areas (with concrete) used for maintenance works and storage of oils and fuel. 	Contractor
12	Dust emissions from construction works during construction phase	Project construction activities on roads, inland exam centres and infrastructure for value	<ul style="list-style-type: none"> • Sprinkle water to minimize dust 	Contractor

NO	Potential Negative impacts	Source of impacts	Proposed Mitigation Measures	Responsibility for implementation of mitigation Measures
		chain addition		
13	Noise and vibrations from construction equipment and trucks	Project civil and earthworks during construction phase.	<ul style="list-style-type: none"> • Use well serviced machinery; • Limit the use of heavy machinery; • Fit silencers to all machinery with exhaust pipes. 	Contractor
14	Increased risk of disturbance to flow of traffic	The construction activities for roads and other infrastructure in the project will result in affecting movement of traffic	<ul style="list-style-type: none"> • Develop and implement traffic management plan; • Install road signs include speed limit signs; and • Provide detours for vehicles and pedestrians 	Contractor
15	Risks of child labour in some activities at road rehabilitation/upgrading activities	Recruitment of under aged persons and within senior staff quarters may encourage local children to drop out of school to work	<ul style="list-style-type: none"> • Recruit people who are aged 18 and above 	Contractor

NO	Potential Negative Impacts	Source of impacts	Proposed Mitigation Measures	Responsibility for implementation of mitigation Measures
16	Increased Generation of liquid and solid waste	Poor management of liquid and solid waste on construction sites and campsites	<ul style="list-style-type: none"> • Develop and implement waste management plan; • Provide waste receptacles such as bins and toilets. ; <ul style="list-style-type: none"> • Dispose-off collected waste in the manner agreed with respective local councils 	Contractors

Annex 7: Common Grievances and their solutions in Construction

Common Grievances	Description	Solution
Bullying or Harassment Grievances including Supervisory Practices	It's inevitable that members of staff in your workplace just won't get on. But that doesn't mean you should allow bullying or harassment. Abuse of authority intimidation or coercion over-supervision (snooping) inadequate supervision (failure to instruct properly) supervisor working on bargaining unit jobs discrimination favoritism	Ensure all workers know the anti-harassment policy with disciplinary procedure to be followed if somebody lodges a grievance for bullying or harassment
Workload grievances	Unreasonable Rate of Production or Workload (Speedup) violation of time or production standard can be approached from the standpoint of a physical working condition or violation of principle of "fair day's work for fair day's pay." It can also occur when another employee	Extra work and hours should be accompanied by extra benefits and this should be explained to workers

	leaves or are laid off due to redundancy	
Physical Working Condition Grievances	Unsafe or unhealthy working conditions (could be a violation of provincial, state or federal safety laws or workplace rules) - cleanliness, toilet conditions, temperatures and Health and Safety Hazards	Conduct workplace risk assessment regularly, have first aid & firefighting equipment and trained personnel, waste bins and cleaning material and clean toilets with toiletries
Pay and benefits grievances e.g. wage inequalities	Workers unhappy with salaries because they either want a higher salary or think they should be earning as much as somebody who does a similar job in the organization or might be trying to receive expenses—such as for their commute. This can also take form of failure to pay agreed rating including for overtime work	Make sure that you have a pay and benefits policy that outlines how often you will conduct salary and benefits reviews with your staff, and ensure that any documents your employees receive are in line with this policy.

Disciplinary Action	Unreasonable rule penalties without just cause employees not properly notified of rule or penalties reprimand (recording warning) disciplinary layoffs discharge	Provide Code of Conduct and expected behaviors of works with attached consequences of not adhering to that behaviour. All workers to sign the Code of Conduct and contracts with expected behaviours
Compensations	This arise from unpaid or delayed compensations and perceived or actual undervalued properties	Clearly inform communities of compensations criteria and pay compensations on time
Spread of sexually transmitted diseases and increase in illicit behaviour by contractor's workers	Often as a result of labour influx	Reduce the number of migrant workers employed on the project and enforce signing and adherence to code of conduct. If complaints arise handle them with impartiality and make sure appropriate measure are followed
GBV/SEA/SH/VAC	Often as a result of labour influx	Reduce the number of migrant workers employed on the project, sensitize the communities, provide for availability of GBV Service Provider and enforce signing and adherence to code of conduct. If complaints arise handle them appropriately
Waste Management	Poor waste storage, handling and disposal results in bad odour, eye sour and spills that contaminate water quality and ultimately cause diseases	Ensure there is a waste management plan that is followed and when complaints arise act promptly to address the complaints

<p>Damaged properties</p>	<p>This arise from poor management of storm water (flooding and sedimentation), vehicle accidents, cracking of structures due to compaction, removal of trees and unauthorized entry on private land to extract material</p>	<p>Follow the following hierarchy of mitigation on community property: avoid damage, replace or compensate. However, respond promptly and keep them informed of your progress on the matter</p>
<p>Traffic Management</p>	<p>This is caused by production of dust, over-speeding of vehicles, disturbed traffic flow, blocked passage, unmaintained diversions and lack or poor signage on the road</p>	<p>Have a traffic Management Plan in place and implement it wholly. Ensure that drivers are well trained, diversions and signage are maintained, conduct frequent inspections of road sections (including at night) and when complaints arise act with prompt</p>