



CLIMATE RESISTANCE ROADS FOR THE NORTH (CRRN)

(P500488)

TERMS OF REFERENCE

CONSULTANCY SERVICES FOR SUPERVISION OF THE CONSTRUCTION OF SUB-STRUCTURES AND INSTALLATION METALIC BRIDGES IN NIASA PROVINCE

OCTOBER 2026

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ABBREVIATIONS / ACRONYMS

AfDB	African Development Bank
ANE	Administração Nacional de Estradas, Instituição Público (National Roads Administration (Public Institution))
ARAP	Abbreviated Resettlement Action Plan
SH	Sexual Harassment)
C-ESMP	Construction Environmental and Social Management Plan
CRRN	Climate Resilient Roads for the North
CVRA	Climate Vulnerability Risk Assessment
DLP	Defects Notification Period
EAS	Exploração e Abuso Sexual (Sexual Exploitation and Abuse)
EHS	Environmental, Health and Safety
EMP	Environmental Management Plan
ESIA	Environmental and Social Impact Assessment
ESF	Environment and Social Framework
ESHS	Environmental, Social, Health and Safety
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standard
E&S	Environmental and Social
EU	European Union
GBV	Gender-Based Violence
GCMs	Global Circulation Models
GoM	Government of Mozambique
GRM	Grievance Redress Mechanisms
IDA	International Development Agency
IDPs	Internally Displaced Persons
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization of Standardization
LRP	Livelihood Restoration Plan
M&E	Monitoring and Evaluation
MTL	Ministry of Transport and Logistics
MTL	Ministério de Transportes e Logistics
MPA	Multi-phase Programmatic Approach
PAD	Project Appraisal Document
PAP	Person Affected by the Project+
PBMC	Performance-Based Maintenance Contracts
PIM	Project Implementation Manual
PIU	Project Implementation Unit (Unidade de Implementação do Projecto)
QAP	Quality Assurance Plan
QC	Quality Control
RAM	Road Asset Management
RAP	Resettlement Action Plan

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Metallic Bridges

SATCC	Southern African Transport and Communications Commission
SEA	Sexual Exploitation Abuse
SEP	Stakeholder Engagement Plan
SME	Small and Medium Enterprises
SOP	Safe Operating Procedure
ToR	Terms of Reference
US\$	United States Dollar
VRU	Vulnerable Road User

1 BACKGROUND INFORMATION

1.1 Country background

Republic of Mozambique is located on the south-eastern coast of Africa. It borders with Tanzania to the north, Zambia, Malawi and Zimbabwe to the west and South Africa and Eswatini to the south. It is endowed with ample arable land, water, energy, as well as mineral resources and newly discovered natural gas offshore; three deep seaports, and a relatively large potential pool of labour. It is also strategically located; four of the six border countries are landlocked, and hence dependent on Mozambique as a conduit to global markets. The country's strong ties to South Africa underscore the importance of its economic, political, and social development to the stability and growth of Southern Africa as a whole.

Mozambique covers 786,380 square kilometres, with a population of 31.5 million. The country's economy grew at an average annual rate of 6%-8% in the decade leading up to 2015, one of Africa's strongest performances. However, the sizable external debt burden, donor withdrawal, elevated inflation, and currency depreciation contributed to slower growth in 2016-17 with growth at 3.5%.

Furthermore, the escalation of conflict since 2016 in the north of the country is further stressing the economic development with an increase in the number of Internally Displaced Persons (IDPs). Those escaping poverty and conflict in the north often settle in the periphery of urban areas with limited infrastructure and services, which exacerbate their social and economic exclusion.

Social and economic growth continues to be hindered by recurrent climate impacts. Most recently, due to the impact of cyclones Idai and Kenneth, the country faced an economic slowdown in 2019, with GDP growth dropping from 3.4% to 2.2%. Floods, triggered by cyclones and intense rain events, have become more frequent in recent years and are expected to follow this trend due to climate change effects, posing a threat to the province's road network. Rainfall projections based on 35 available Global Circulation Models (GCMs) used by the Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report estimate that the number of heavy rainfall events (defined as a daily rainfall total which exceeds the threshold that is exceeded on 5% of rainy days in the current climate of that region or season) will increase by 2060, particularly during the dry season (January-June).

Mozambique's growth and poverty reduction strategies are based on environmentally sustainable and inclusive private sector growth. But the public administration remains weak, despite significant reform and improvement, and it continues to face challenges of capacity and resources to deliver basic infrastructure and services and to properly enforce a consistent legal and regulatory framework essential for private sector development.

The COVID-19 pandemic presented a further setback on the country's economic prospects. The pandemic dimmed the short-term growth opportunities for Mozambique. It had a very negative impact on economic activity as social distancing and travel restrictions adversely affected demand for goods, services and mobility of people.

1.2 Current situation

Due to recurring climate impacts, the road network has suffered extensive damage over the last 20 years, with substantial sums of financial resources being diverted from improving the network to repairing flood-related damage. As the Mozambican road network has low redundancy, these disruptions sometimes isolate communities for long periods of time and therefore have a significant negative impact on their local economy¹. In Niassa Province, the cyclones, heavy rains and floods destroyed various infrastructures including roads and bridges, hitting an already vulnerable population, which was in many areas affected by poverty. In the districts of Nipepe, Lago, Metarica, Maua, Cuamba, Majune and Mandimba, habitations in a lot of villages were destroyed either partially or completely with communities in need of humanitarian assistance but the poor condition of roads and bridges created difficulties for the transportation of the human aid for the population.

The delays in rebuilding of road infrastructures caused by insufficient financial resources, had increased the degradation of the road network and bridges, especially steel bridges, causing partial isolation of some areas in districts mentioned above, affecting thousands of people. In the province of Niassa, there is a need to urgently reconstruct the affected road network to ensure the implementation of all reconstruction projects and provide the minimum conditions for the movement of goods and people.

In view of these, Government of Mozambique requested the World Bank for help to develop a long-term program of socio-economic integration through Climate Resilient Roads for the North in Northern Region of Mozambique. To this end, the Bank approved and made available in the year 2024, US\$ 125 million in the form of an International Development Agency (IDA) Grant to finance the project. The project implementing entity for the Climate Resilient Roads for North (CRRN) project is the Road Fund under the Ministry of Transport and Logistics (MTL). To facilitate project implementation and allocation of responsibilities, the Road Fund entered into legally binding and enforceable cooperation agreements with ANE and other beneficiary institutions of the project. A Project Implementation Unit (PIU) was created at ANE to facilitate the implementation of the project.

Overall coordination for the project will be provided by the MTL while the Road Fund will be responsible for implementation, coordination with ANE, budgeting, monitoring, financial management and auditing of project resources. ANE will oversee execution of the works, including procurement, environmental & social standards, and engineering aspects. The PIU at ANE in-charge of some on-going World Bank financed projects will be responsible for this project and where need be, additional PIU staff can be assigned/hired to enhance its capacity.

The Climate Resilient Roads for The North was prepared under the World Bank's Environment and Social Framework (ESF) as well as Mozambican environmental and social regulations. Therefore, in accordance with the Environmental and Social Standard 1 (ESS1) on assessment and management of social risks and impact between December 2023 and January 2024, in the provinces of Nampula, Cabo Delgado and Niassa ANE carried out the social assessment within the scope of CRRN, in order to ensure the management, and monitoring of social risks and impacts associated with the project supported by the World Bank, for achievement of social outcomes consistent with the Environmental and Social Standards (ESSs).

From the social assessment that was carried out, the MTL aims to improve climate-resilient, safe, and sustainable road connectivity in the Northern Provinces of Mozambique. Through this project, the World Bank seeks to assist the Government of Mozambique (GoM) in responding to the problems of imbalances in regional socioeconomic development that have had harmful effects on the northern region and with repercussions on the country as a whole.

2 PROJECT DESCRIPTION AND LOCATION

2.1 Introduction

The Government of Mozambique (GOM) has received a Grant from the International Development Association (hereinafter referred to as 'IDA') for the purposes of improving the transport infra-structure of Mozambique and strengthening the institutional capacity of the road sub-sector and intends, through the National Road Administration (ANE), to apply a part of this grant for eligible payment under the contract for above mentioned services.

ANE is responsible for the management of the classified network of national and regional roads in Mozambique covering planning, construction, rehabilitation and maintenance. It is a public institution with its own Board of Directors. The design, construction, rehabilitation, maintenance and Supervision of the works on classified roads are implemented by ANE using engineering consultants and contractors.

The main objective of this consultancy services is for the supervision of the construction of 12 (twelve) Metal Bridges in Niassa Province

The works will be executed under the traditional admeasurement (unit price) consultant supervised civil engineering construction contract.

These services will be undertaken as part of CRRN Project, which the Government of Mozambique (GoM) is undertaking with the financial assistance from the World Bank.

The development objective of CRRN is to improve the climate resilient road connectivity in the northern provinces of Mozambique.

These Terms of Reference (ToRs) describe the nature and scope of the services to be provided by the consultant who shall carryout Supervision of the construction of sub-structure and installation of metallic bridges indicated herein.

2.2 Project Area

The target area of the project for the Supervision Consultancy covers selected roads in the province of Niassa where access was cut due to drainage structure washaways, destruction, or nonexistence and the Client opted as a solution, the construction of reinforced concrete sub-structures and erection of metallic decks as presented in Table 1 below:

Section 7. Terms of Reference for Consultancy Services for Supervision of Construction of Sub-structure and Installation of Metallic Bridges

Table 1: List of Metal Bridges to be constructed in Niassa Province

Lot No.	Bridge Reference	Road	Bridge Location	River Name	Bridge Length (m)	GPS Coordinates
Lot 1	PM #1	N/C Matola/Ligogo Village	Km 8+270	Rio Luangua	90	13°17'34.73" S 36°04'58.23" E
	PM #2	N/C Matola/Ligogo Village	Km 10+500	Rio Lochesse	90	13°16'26.35" S 36°05'05.62" E
Lot 2	PM #3	N/C Cheia - Cheia/Muluco	Km 2+270	Rio Naurenge	90	14°07'02" S 38°19'05" E
Lot 3	PM #4	R1206 - Ngofi/Matchedje	Km 48+735	Rio Nzinje (Tulo)	90	11°45'25" S 35°12'49" E
Lot 4	PM #5	R1204 - Mecula/Gomba	Km 68+900	Rio Naulala	30	11°44'59.18"S 38° 3'48.74"E
	PM #6	R1204 - Mecula/Gomba	Km 127+000	Rio Mitope	30	11°21'40" S 38°17'40" E
	PM #7	R1204 - Mecula/Gomba	Km 75+100	Rio Messalu	60	11°42'52" S 38°06'14" E
Lot 5	PM #8	R726 - Mecula/Matondovela	Km 297+500	Rio Matondovela	30	12°04'26" S 37°02' 03" E
	PM #9	N/C - Mossoma/Menhuce	Km 1+350	Rio Menhuce	60	12°26'46.77"S 37°40'44.06"E
Lot 6	PM 10	R728 - Ntoto/Cholue	Km 36+000	Rio Luambala	90	13°33'11" S 35°28'47" E
Lot 7	PM #11	R1203 - Crz Iringa/Nkatapa	Km 12+424	Rio Nnenge	30	12°31'13" S 36°08' 28" E
	PM #12	R1202 - Mavago/Milepa	Km 17+350	Rio Lussanhando	30	12°28'46.28"S 36°13'25.09"E
				TOTAL (m)	720	

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Below are the locality maps of the target bridges shown in Table 1 above,

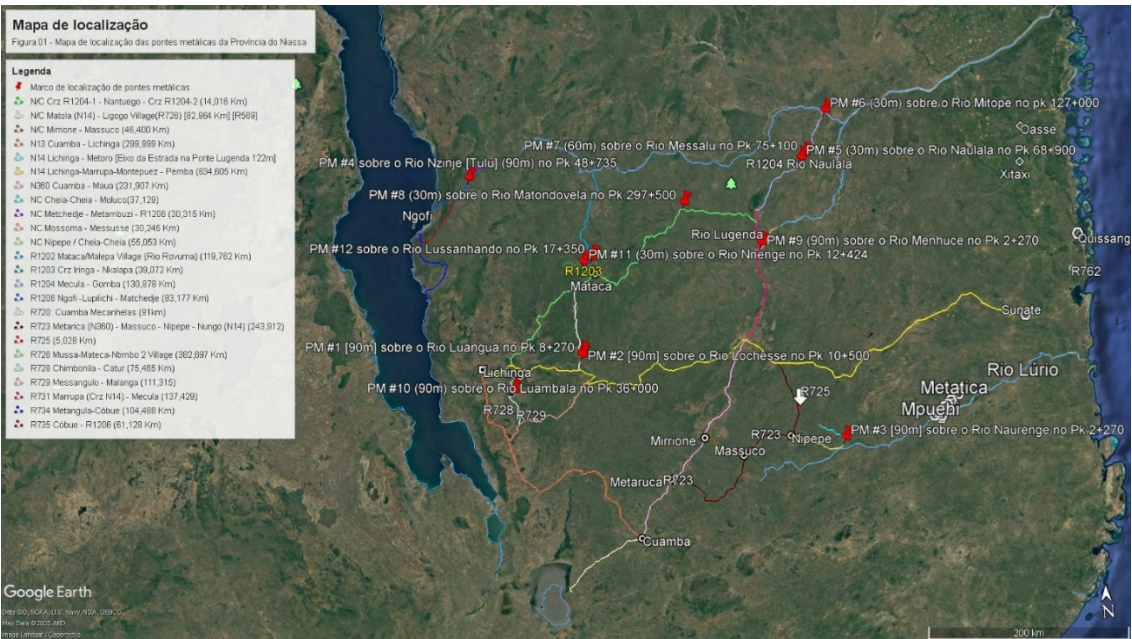


Figure 1: Locality map the Metal Bridges to be erected in Niassa Province

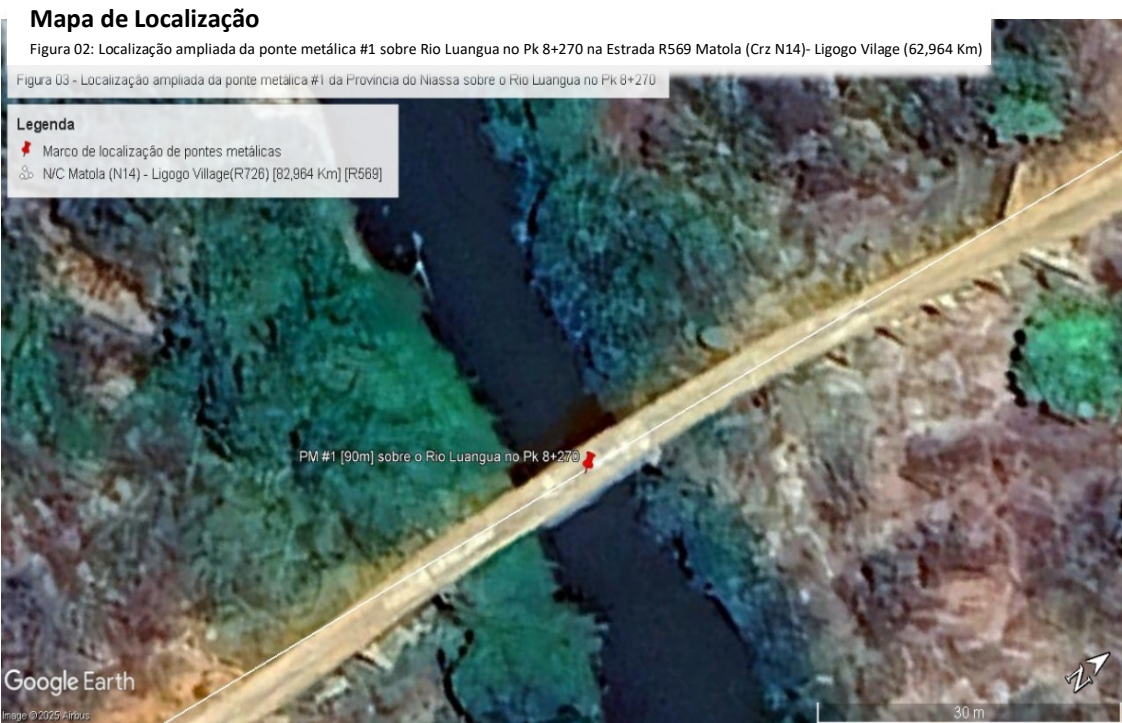


Figure 2: Amplified location map of Metal Bridge #1 above Luangua River at Km 8+270 of road R569 Matola – Ligogo Village in Niassa Province

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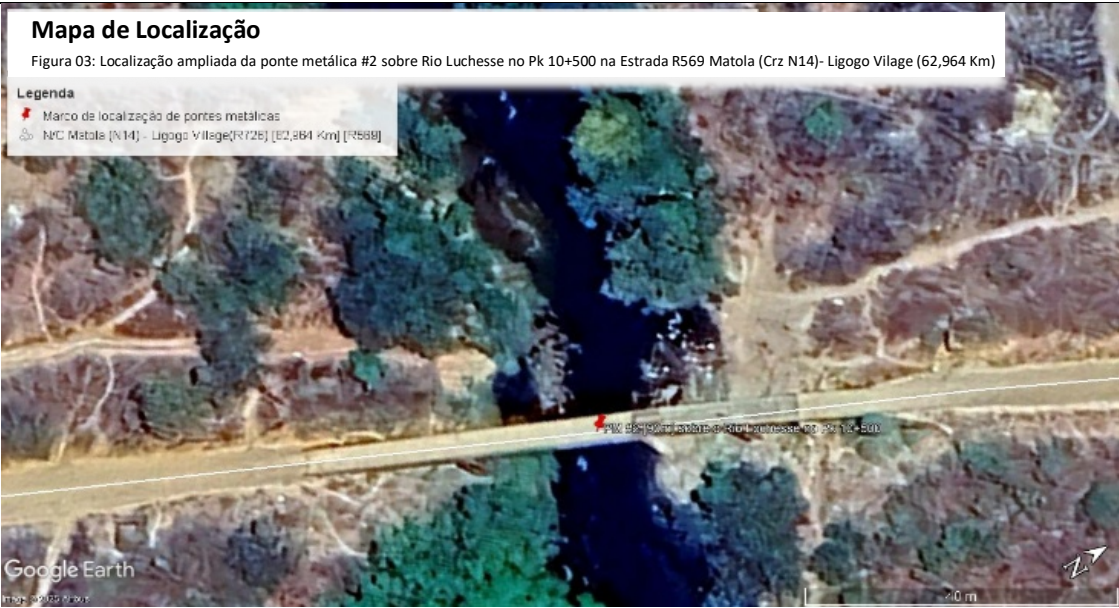


Figure 3: Amplified location map of metal Bridge #2 above Lochesse River at Km 10+500 on road R569 Matola – Ligogo Village in Niassa Province



Figure 4: Amplified location map of the #3 metal bridge of Niassa Province over the Naurenge River at Km 2+270 of the NC Flood-Cheia Road - Moluco in Niassa Province

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Figure 5: Amplified location map of Metal Bridge #4 over Tulo River at Km 48+735 of road R1206 Ngofi - Matchedje in Niassa Province

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Figure 6: Amplified location of metal Bridge #5 over Naulala river at Km 68+900 on the R1204 Mecula - Gomba Road in Niassa Province

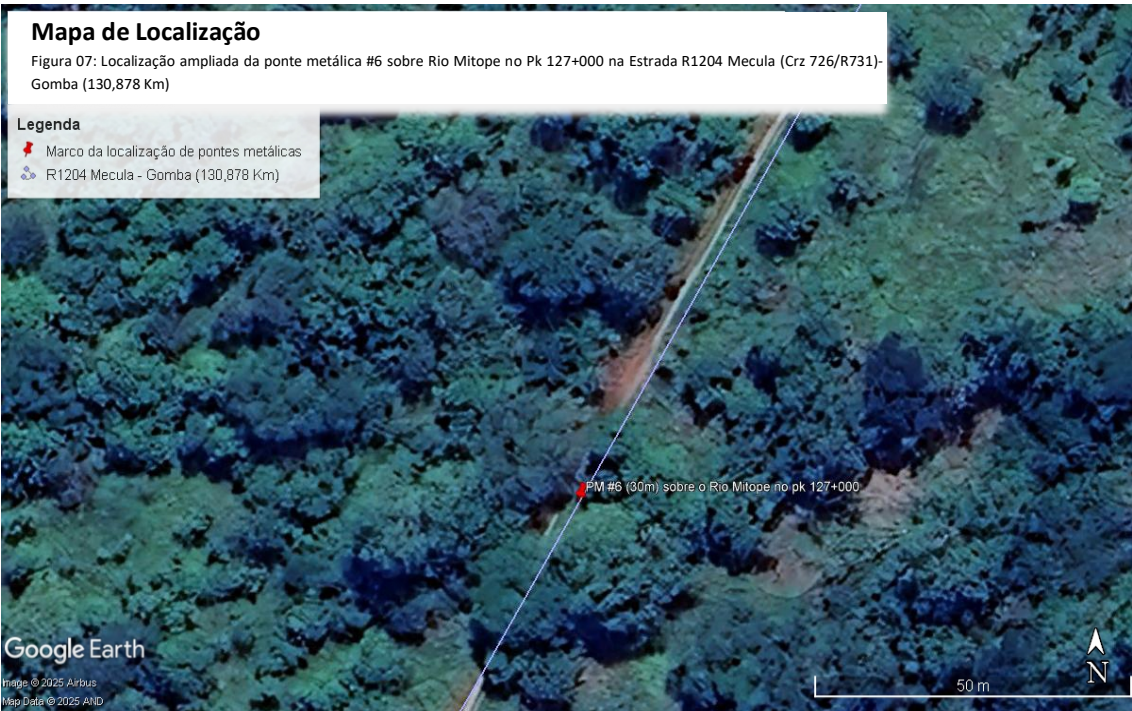


Figure 7: Amplified location map of metal Bridge #6 over Mitope River at Km 127+000 on the R1204 Mecula - Gomba Road in Niassa Province

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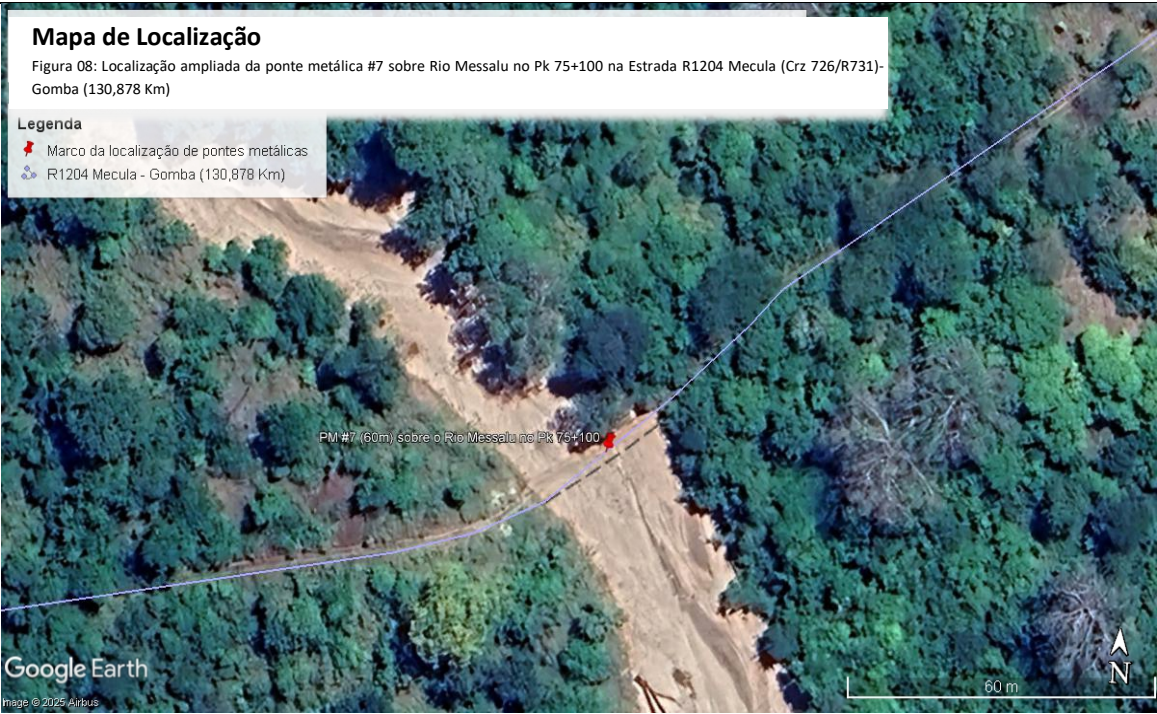


Figure 8: Amplified location map of metal Bridge #7 over Messalu River at Km 75+100 on the R1204 Mecula - Gomba Road in Niassa Province

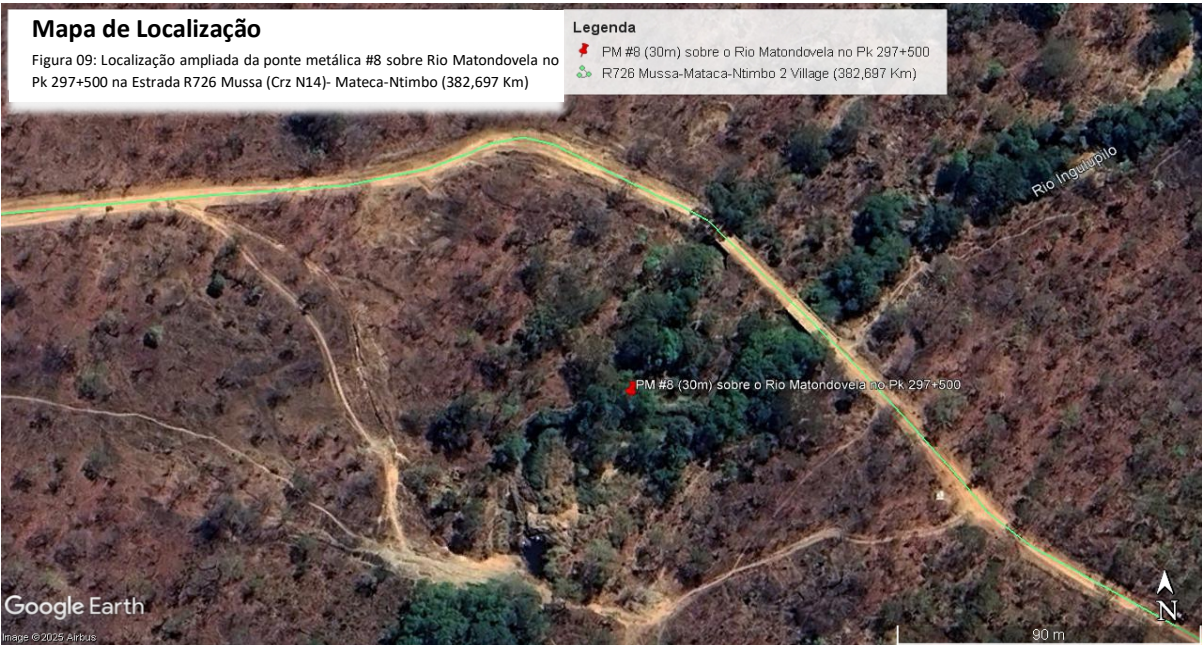


Figure 9: Amplified location map of the #8 metal bridge over the Motondovela River at Km 297+500 on the R726 Mussa-Mateca-Ntimbo 2 Village Road (382,697 Km in Niassa Province

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Figure 10: Amplified location map of metal Bridge #9 over Menhuze River at Km 1+350 on the NC Mossoma - Messusse Road (30,245 Km) in Niassa Province

Section 7. Terms of Reference for Consultancy Services for Supervision of Construction of Sub-structure and Installation of Metallic Bridges

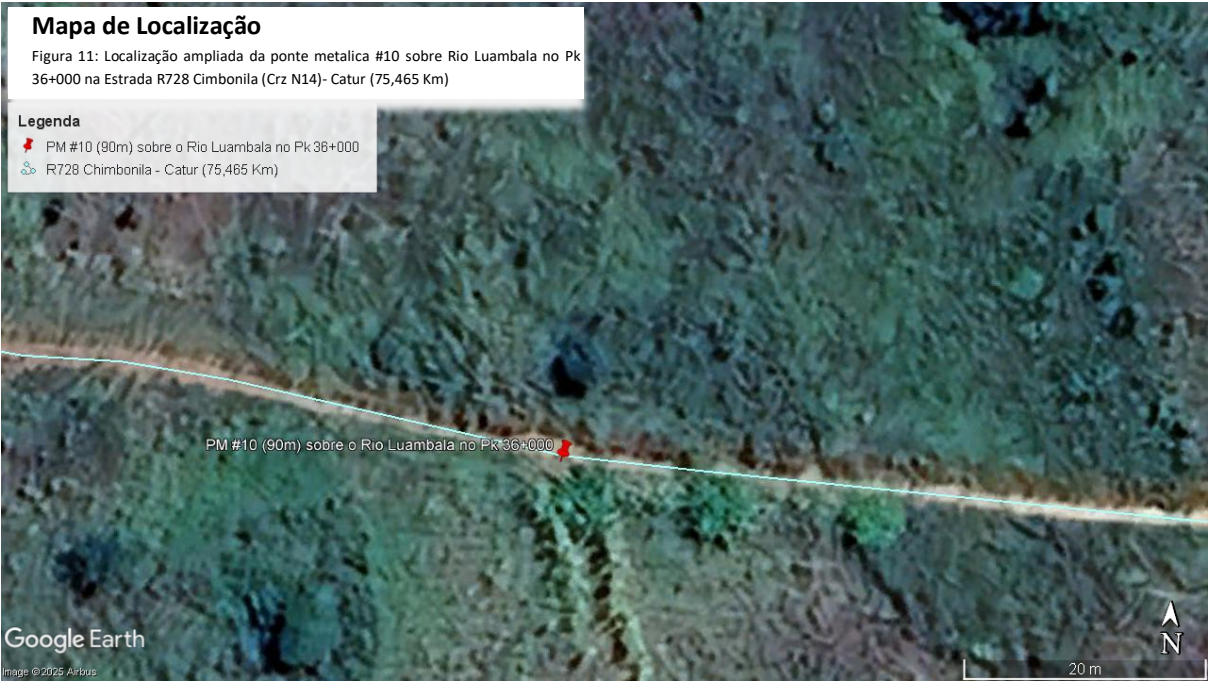


Figure 11: Amplified location map of Metal Bridge #10 over Luabala River on Km 36+000 on the R728 Chimbonila (Crz N14) - Catur (Crz R729) Road (75,465 Km) in Niassa Province.

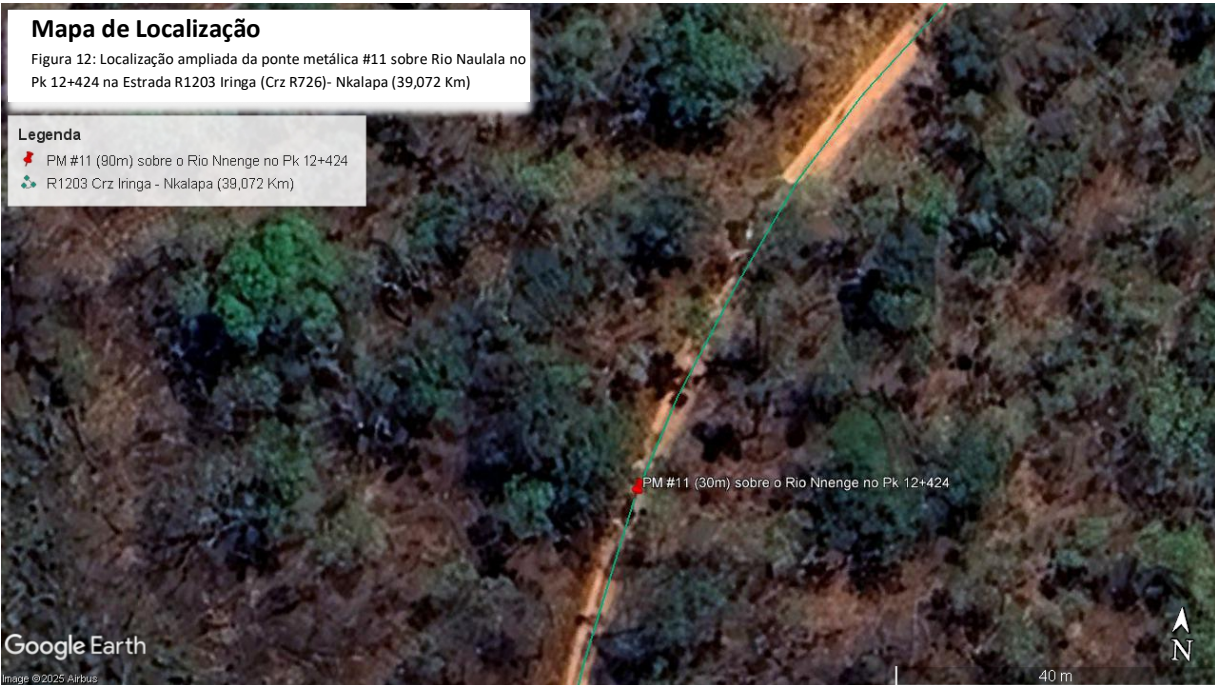


Figure 12: Amplified location map of metal Bridge #11 over Nnenge River at Pk 12+424 on the R1203 Iringa Road (Crz R726) - Nkalapa (39,072 Km) in Niassa Province.



Figure 13: Amplified location map of the metal Bridge #12 over the Lussanhado River on Pk 117+000 on the R1202 Matacaa Road (Crz R726) - Mulepa (119,762 Km) in Niassa Province

2.3 Summary of services to be carried out by the Supervision Consultant

In furtherance of the mission objectives described in these Terms of Reference, the Consultant will carry out the activities listed in Table 2 below.

Table 2: Consultancy services to be undertaken (Object of this tender)

ACTIVITY	STATUS OF PROJECT	ESTIMATED TIME FOR EXECUTION (Months)	PROVINCE
Review of detailed engineering designs, construction drawings and quantities prepared by the Design Consultant	Object of this tender for consultancy services	2	Niassa
Supervision of the execution of the contract for the construction of the substructures and installation of 12 (twelve) metallic bridges in Niassa Province located as indicated in Table 1	Object of this tender for consultancy services	12	Niassa
Supervision of the constructed bridges during the Defects Notification Period	Object of this tender for consultancy services	12	Niassa

3 ASSIGNMENT OBJECTIVES AND EXPECTED RESULTS

3.1 Assignment objectives

The primary objectives for supervising of the detailed engineering design and construction of 12 metallic bridges in Niassa Province are to, ensure bridge and access roads pavement structural integrity, and adherence to safety standards by the contractor. The project aims to provide sustainable, all-weather river crossings so as to improve transportation mobility, and foster local economic growth in Niassa Province. The overall objective of the consultancy services is to ensure that the contract for the construction of metallic bridges is implemented within the time schedule, with applicable national legislation, international and accepted quality standards and agreed costs and in compliance with the World Bank environment and social safeguard policies.

Key Assignment Objectives

- **Supervision of the Climate Resilience:** The contractor shall implement recommendations from the climate vulnerability risk assessment provided by the client as part of the project specifications to ensure long-term stability and functionality against environmental challenges and the Consultant shall ensure compliance to specified climate resilience standards set by the Client performance requirements including dealing with climate-related dispute resolution.
- **Construction Supervision:** The contractor shall construct new metallic bridges to enhance safety and durability to withstand climate change impacts whilst the Consultant shall supervise the construction activities to ensure compliance with the designed technical specifications, quality standards, and safety norms. [
- **Traffic Safety Management:** Traffic safety management on bridge construction projects is essential to protect workers and the public, requiring comprehensive planning to separate traffic from machinery, by utilization of clear signage, and implementation of speed limits lower than the normal speed limits. The Consultant must ensure that the Contractor implements effective strategies for traffic safety control like installing concrete barriers, using flagmen for traffic flow, and establishing dedicated work zones. The Contractor shall implement an integral approach to road safety for communities that reside along the project corridor and the Consultant shall ensure compliance to the defined road safety management standards.
- **Quality and Safety Control:** In carrying out the work, the contractor shall set up construction quality control procedures based on quality control plans approved by the Consultant and in turn, the Consultant shall inspect all steel components, factory fabrication processes, welding, and surface treatment (e.g., galvanizing, painting) to ensure durability and quality. The consultant shall also inspect and verify all construction materials for compliance with defined standards, structural

installation, and workmanship during construction to prevent failures and ensure road safety. Quality Control of Metallic Structures.

- **Environmental and Social Safeguards:** During the project execution, the contractor shall setup environmental and social management protocols in accordance with the Environmental and Social Management Plan (ESMP) that has been defined for the project and the Consultant shall ensure compliance to the defined environmental and social management standards by reviewing, approving and monitoring the rigorous implementation of environmental and social management instruments, which also includes elements relating to occupational health and safety, resettlement.
- **Violence Based on Gender:** The contractor shall implement the defined VBG prevention and management standards in accordance with the WB guidelines and the Consultant shall be responsible for reviewing, approving and monitoring the rigorous implementation of issues relating to VBG in the project area.
- **Institutional Strengthening:** The Consultant shall support ANE and [Road Fund](#) with management, capacity building, and emergency response capabilities.
- **Social Development:** The contractor shall include in the project plans the provision of community infrastructure (markets, schools, health centers) along project's zone of influence and the Consultant shall ensure compliance to the defined building codes and standards.
- **Project Management & Scheduling:** Monitor construction progress against the contractor's programme, identifying delays, and recommending remedial actions to prevent cost overruns.
- **Contract Administration:** Act as the authorized engineer to process payment certificates, manage variations (change orders), resolve technical disputes, and maintain comprehensive records.
- **Defects Liability Monitoring:** Supervise the works during the defect notification period (DNP/DLP), identifying any defects to be repaired by the contractor.

3.2 Client's Expectations from the Supervision Consultant

The Supervision Consultant is expected to provide technical and financial supervision throughout the entire construction contracts execution periods, in order to ensure that the construction works are carried out in accordance with the works' contract provisions and to the satisfaction of the Contracting Authority.

In particular, the consultant will be required to undertake inter alia the following tasks:

3.2.1 Manage Project Documentation

The consultant shall be responsible for ensuring that all documents required for the contract for the construction of metallic bridges in Niassa `Province are available at all times for use by the contractor and contracting authority. The consultant shall therefore undertake the following among other things:

- a) Check all contract documents for completeness before issuing them into the implementing parties.
- b) Issue and cause the responsible party to issue the contract documents, clarifications, and additional information necessary for implementation of the project in a timely manner.
- c) To keep all project documentations including all correspondences reports etc. in any orderly manner for easy retrieval when required.

3.2.2 Manage Start-up Activities for the Project

The consultant shall ensure that the Parties (Contracting Authority and Contractor) fulfil their obligations for smooth start-up of the project. In this respect the consultant shall ensure the following among others:

- a) Ensure that the site for the works is ready for handing over to the Contractor and notify timely of any problems.
- b) Ensure timely possession of sites by the Contractors.
- c) Instruct the Contractors to submit the required guarantees within the prescribed time and ensure that Advance payment is paid upon internal confirmation of the acceptability of the guarantees.
- d) Ensure timely issuance of the Commencement Order for the works.
- e) Chair the first site meeting (kick-off) convened at the appropriate time to enable proper coordination, including EHS monitoring approach and reporting during implementation of the project.

3.2.3 The Consultant shall carryout , verification of the design consultant's detailed engineering design, drawings, and technical specifications to ensure compliance with standards, and validate "issued for construction" (IFC) drawings.

3.2.4 Supervision of Construction of Metal Bridges and Time Control

The consultant shall ensure that the works are completed within the agreed contract period. To ensure this, the supervisor shall among other tasks undertake the following:

- a) Ensure that the Contractor submits and implement a work program according to the prescribed time contract provisions.
- b) Ensure that monthly progress review and other ad-hoc meetings are convened to deliberate on projects issues and participate fully in the meetings.

- c) Follow up closely implementation of resolutions made in the meetings and advise the Manager for donor funded projects on necessary actions by ANE PIU management to ensure that the works progress as planned.
- d) Ensure that consultant staff perform their duties in accordance with the provisions of contracts in relation to construction works time control.
- e) Proactively initiate necessary actions within the scope of the contract to mitigate any causes that may lead to delays in completion of Works.

3.2.5 Monitor Quality of Works

The consultant shall ensure that the Works are constructed to the specified quality in the contract and in accordance with the contract drawings. The following are among the tasks the consultant has to undertake:

- a) Review adequacy of the quality assurance plans by the consultants and ensure implementation of the same at site.
- b) Review contractors' works methodology in line with contract specifications and bring up shortfalls that may result to poor quality for timely innervation pursuant to the contracts provisions.
- c) Review monthly progress reports and bring up comments for any corrective actions required to ensure the quality of the works.
- d) Conduct site visits and inspect the works for conformity with specifications and drawings.
- e) Proactively initiate necessary actions to mitigate any causes that lead to poor quality of the works.

3.2.6 Manage Payments and Cost Control

The consultant shall see to it that, payments to Contractors are made timely and in alignment with the actual works and services delivered. To achieve this the supervisor shall undertake among others the following:

- a) All payments certification and invoices are reviewed properly to ensure their correctness in line with contract provisions.
- b) Ensure that payments to Contractors and the Consultants are made within the period stipulated in the Contracts.
- c) Prepare realistic budget forecast for payment applications to ensure that adequate funds are allocated for due payments at all times that is as per the payment plan provided by the consultant and approved by the Contracting Authority.
- d) Review timely project expenditure vis-à-vis the approved Contract Price and advise timely on the likely causes of cost overrun for ANE decision making.
- e) Ensure maintenance of records of payments for future references and audit.

3.2.7 Manage Contractual Issues

The consultant shall attend all contractual and any other correspondences related to the Project implementation. To this end the supervisor consultant shall among other things attend the following:

- a) Review claims/recommendation on claims by the Consultant and advises the Employer timely.
- b) Initiate contractual actions timely to defend Employer's right under the contract

3.2.8 Manage Closing Activities of Contracts

The consultant shall be responsible to ensure that substantial completion of the Works and Final Completion of Works are performed in accordance with contract requirements. To achieve the proposed goals, the supervisor will be required to ensure among others the followings:

- a) Substantial completion inspection is made thoroughly by its staff and list of defects and acceptable snag list recorded properly.
- b) Coordinate adequate representation by ANE PIU during substantial completion inspection and final inspection for taking over works.
- c) Ensure that the Contractors fulfil their obligations during the Defects Notification Period.
- d) Cause timely submission of Final Construction Report, Maintenance Manual, As- Built Drawings, and Final Account and ensures their adequacy in line with contract requirements.
- e) Ensure eventual release of guarantees, in accordance with contract provisions.
- f) Ensure proper handling over of properties that revert to the Employer's as per Contract.

3.2.9 Environmental, Health, Safety and Social Safeguards supervision

Ensure that all the ESHS measures from (environmental and occupational health and safety, traffic safety, social issues which includes gender, GBV/SEA/SH and stakeholder's engagement) will be addressed in accordance with provisions developed among the contractor's contract.

The consultant must ensure that the contractor elaborates and implements a traffic management plan that includes transport plan of the metallic bridges to site.

3.2.10 Climate Resilience standards supervision

The Supervision consultant shall supervise the implementation by the Contractor of climate resilience measures defined for the project, climate-resilient operations, and evaluate climate-resilient performance requirements including dealing with climate-related dispute resolution

3.2.11 Any Other Duties

The consultant shall undertake any other duties as may be assigned from time to time.

4 ASSUMPTIONS & RISKS

4.1 Assumptions underlying the project

The following assumptions underlie the success of the project:

- a) A competitive and transparent procurement process will result in timely mobilization of Contractors with adequate capacity to complete the works, and with a contract price adequate to complete the works within time and budget.
- b) Contractors will engage local organizations as Works' Sub-Contractors for components of the works to be agreed with the contracting authority.
- c) All Contractors will ensure fair treatment of labourers and adopt a high level of personal and professional commitment to the overall objectives of the project.

4.2 Risks

Risks to successful completion of the project and attainment of the objectives include:

- a) Local firms fail to take up sub-contracting opportunities or fail to perform.
- b) Local communities affected by road improvements disrupt the works while demanding compensation.
- c) Risk of road blockages, or the abnormal weights impacting culverts can likely result into traffic disruptions.
- d) Elevated journey times due to bad roads which have not been properly maintained for a long period of time.
- e) Some bridge sites are located very remote from population centres which may give rise to delays due to lack of labour force.
- f) There is a significant escalation of civil unrest in the project areas which disrupts project activities.
- g) The insurgent campaign against the government and local communities is likely to disrupt construction operations if mitigation measures are not taken timeously.
- h) Bridge and road construction works are affected by extreme climate events such as heavy rains and flooding.

5 PROJECT IMPLEMENTATION ARRANGEMENTS

The project implementation arrangements for the Climate Resilient Roads for the North Project (P500488) involve a multi-agency approach, with the Ministry of Transport and Logistics (MTL) providing overall coordination. The project will be implemented by the Road Fund (FE) with support from the National Road Administration (ANE). A Project Implementation Manual (PIM) will be developed to detail roles and responsibilities.

Mozambique's decentralization reforms and its road sector institutional framework helped define the implementation arrangements of the project. The project is premised on a field-based implementation mechanism supported by three entities at the centre. MTL will be responsible for the overall coordination of the project. The Minister of MTL will chair a Project Steering Committee (PSC) that convenes key Government stakeholders both at the centre and in the province. The FE will be the implementing agency with responsibility for financial management. ANE will be responsible for project execution through a PIU based in Cabo Delgado. The PIU embedded in the ANE Provincial Delegation will be responsible for all aspects of project implementation, including procurement, through a mechanism of transition and increased responsibility in a phased manner. It will manage road works, consultant assignments, and procurement. A Project Implementation Manual (PIM), which will be finalized within one month after effectiveness, will describe the roles and responsibilities of the various entities under the project.

ANE will assign a Focal Point who will be the contact point for all interactions for the Works Contract.

6 SCOPE OF THE SERVICES

The consultant firm to be contracted shall acquaint its team with the formulation studies (including all the technical annexes) and the detailed design, the tender dossier with all the tender addenda and with the tender submitted by the selected Contractor. Where necessary or useful, the consultant firm shall acquaint itself with the relevant background information as available within the feasibility and design study reports. The consultant firm shall inform the Project Coordinator of any project design updating he considers necessary. Thereafter the consultant firm will formally adopt the design as "suitable for implementation" under his responsibility.

The Consultant firm shall provide full supervisory services on behalf of the Contracting Authority. To this end, the consultant will set up the supervisory organisation answering the main demands for efficient construction supervision i.e. quality control, quantity assurance, monitoring of progress and contractual administration of the works.

During the performance of its services during the Construction Stage, the Consultant firm will ensure that appropriate environmental, health and safety protection measures are applied at all stages, in line with local legislation in Mozambique and international standards.

The services of the Consultant firm will cover three stages:

- a) Stage I – Pre-construction phase
- b) Stage II – Activities/Services during the Construction Phase; and
- c) Stage III - Activities/Services during the Post-Construction Stage, which includes the Defects Notification Period (DNP).

6.1 Pre-Construction Phase (Stage I)

6.1.1 Planning and Review of Contractors' Programs

The Contractor shall submit project execution plans, resources allocation, cashflow projections and the plans for site accommodation to the Consultant for checking and approval by the supervision consultant. Contractor's mobilization shall invariably be done in parallel with field investigations and is estimated to take 2 months from site possession date. The Consultants shall ensure the Contractors mobilization is in compliance with all project specifications.

To this end, the Consultant will carry out the following activities:

- (i) **Review Contractor Submissions:** Critically review the contractor's master construction program, cash flow projections, and equipment/manpower deployment schedules.

- (ii) **Method Statements:** Approve method statements for early operations like demolition, earthworks, and temporary works.
- (iii) **Risk Identification:** Identify bottlenecks in the proposed work plan and require the contractor to submit mitigation mechanisms.

6.1.2 Quality and Compliance Assurance

- (i) **Quality Management Plans:** Review, analyze, and approve the contractors' Site Quality Management Plans (SQMP) and site testing protocols.
- (ii) **Testing Facilities:** Inspect the contractors' proposed materials, laboratories (or third-party testing labs), and establish quality control checklists and procedures.
- (iii) **Environmental and Social Safeguards:** Ensure the contractor has incorporated COVID-19/safety protocols, labour standards, and environmental mitigation measures into their mobilization plan.

6.1.3 Site Setup and Administration

- (i) **Site Handovers:** Participate in the official site handovers to the contractors.
- (ii) **Camp and Facilities Inspections:** Verify that the contractors' site offices, labour camps, storage facilities, and safety setups meet contract requirements.
- (iii) **Asset/Condition Registers:** Prepare or review schedules of condition for adjacent structures and establish asset registers.

6.1.4 Financial and Contractual Preparations

- (i) **Pre-Construction Meetings:** Organize and chair pre-contract meetings to align on procedures, lines of communication, and reporting.
- (ii) **Payment Systems:** Develop or finalize measurement and payment systems, including interim payment certificate formats.
- (iii) **Key Personnel Approvals:** Review and approve the contractor's key supervisory and engineering staff.

6.1.5 Preliminary Field survey:

- (i) The consultant is required to perform preliminary surveys at the bridge sites in order to minimize of the environmental and social impacts and avoid resettlement impacts. PAPs need to be adequately compensated before the commencement of the works. Design drawings will be superimposed with the cadastral drawings of environmental sensitive areas and identified by the Environmental and Social Management Plans In the event of any economic or physical displacement, RAP/LRP must be prepared, implemented before the commencement of the civil works and should be made available by ANE.

- (ii) The consultant is required through site visits, to check and validate the contractor's construction plans in harmony with strip maps of environmental sensitive areas and socio-economic activities of occupation under the trunk rout section.

6.1.6 ESMP – Environmental and Social Management Plan

- (i) The consultant shall provide capacity support in environmental, social, health and safety management through analysis and development of prevention and mitigation measures and ensure its implementation in order to ensure compliance with the safeguard's procedures established by the project seminars, workshop and on-the- job training to Contractors' approved staff and ANE indicated staff with regards to ESMP (The ESMP shall be made available by ANE).
- (ii) Review the environmental, social, occupational health and safety and traffic safety acceptability of the construction methodology (both temporary and permanent works), relevant design plans and documents submitted. Where necessary, the Consultant shall seek and recommend the least environmental impact alternative in consultation with the designer, the Contractor(s), and ANE;
- (iii) Approval of Contractors' C-ESMP, ESHS policies, ESHS component specific work procedures and management and traffic management plans, community engagement plans, Grievance Redress Mechanisms (GRM), as well as, the labour management systems including codes of conduct and compliance to provisions of relevant national laws, GBV, Sexual Abuse and Exploitation and Sexual Harassment (GBV/SEA/SH) prevention and response measures, implementation of the sexual harassment policy, HIV/AIDs prevention program. The Consultant shall ensure that the Contractors' policies, work procedures and plans are complied with and, shall periodically evaluate and report on their implementation progress.
- (iv) Oversee the preparation of the C-ESMP and ensure its adherence to the project brief, proposed preventive or mitigation measures for environmental, social, health and safety risks, including GBV/SEA/SH and World Bank Standards requirements.

6.1.7 Verification of Design Consultant's Designs, Drawings and Documentation

- (i) **Review Detailed Designs:** The Consultant shall receive and make an extensive review the detailed designs to identify any omissions or discrepancies before physical construction begins.
- (ii) **Review Working Drawings:** The consultant shall make a thorough review of the working drawings of each bridge for consistency and completeness for construction purposes and recalculate construction quantities for comparison with project scope of works as defined in the bills of quantities.
- (iii) Review the Bills of Quantities:

- (iv) **Recommendations:** Advise the client on necessary modifications, changes, or variation orders necessary for successful completion of the works. The client reserves the right of acceptance or non-acceptance of the Supervising Consultant's recommendations.

6.2 Construction phase (Stage II)

6.2.1 Receive, check and approve Contractor's plans.

- (i) Receive, check and approve quality assurance, quality control, traffic safety management plans.
- (ii) Receive, check and approve all required Standard Operation Procedures and Method Statements for all high-risk activities.
- (iii) Receive, check and approve the detailed work programs and implementation schedule including verification and approval of the site set-up layout for all contractors to ensure a safe working environment.
- (iv) Receive, check and approve the contractors technical and ESHS resource planning for the overall project.
- (v) In the event of any resettlement, receive, check and approve the plans for site-specific RAP/ARAP preparation and implementation, Labour Management Plan and Gender, GBV/SEA related mitigation measures and risks.
- (vi) Advise ANE PIU on the status and management of pending compensations, as well as the impact on delayed project completion in terms of time and increased costs.

6.2.2 Supervision of Site Activities

- (i) Receive, check and approve contractor's work schedules in comparison with the project execution plan.
- (ii) Confirm that the contractor's schedule of personnel is as stated in the contract and recommend changes in the contractor's personnel where necessary
- (iii) Ensure coordination and supervision of all the works, materials and equipment delivery and stored, construction procedures in compliance with the relevant Standards (including environmental and social standards, EHS guidelines) and Codes of practice,
- (iv) Consult and confirm with the Client that all the PAPs have been duly compensated before tampering with their respective properties in accordance with the World Bank social standards as well the national requirements.
- (v) Check the preliminary tests prior to the works on the concrete formulas and ratios proposed by the contractor (where applicable);
- (vi) Supervise the performance of all tests required to ensure the good quality of all materials used in construction, in particular soils, rocks, aggregates, cement, etc. and analyse test results to ensure good-quality construction;
- (vii) Supervise the works to ensure works are carried out in compliance with the specifications and contract plans including procurement of materials and deployment of personnel as well as equipment.

- (viii) Guarantee that contractors develop specific SOP/Method Statement for all high-risk activities including risk assessment and permit to work system. Revise and approve prior to commencement of such activities.
- (ix) Supervise the excavations (areas to be backfilled, foundations where applicable) including environmental aspects (erosion, river crossings/stream);
- (x) Supervise all construction including contractor's construction procedures, schedules, delivery, handling, positioning and concrete heavy structures (for example culverts).
- (xi) Advise, monitor and ensure full implementation of the construction ESMP and occupational Health and Safety Management Plan.
- (xii) Conduct regular site inspections and review the status of implementation and effectiveness of the environmental mitigation measures against the ESMF and/or ESMP (Environmental and Social Management Plan) and contract documents;
- (xiii) Provide regular feedback through environmental, health and safety inspections, audit and investigation results of any non-compliance of the ESMP.
- (xiv) Instruct the Contractor(s) to take actions to reduce or remedy impacts, within a specified timeframe, and carry out additional monitoring according to the contractual requirements and procedures in the event of non-compliances or complaints;
- (xv) Instruct the Contractor(s) to stop activities which generate severe adverse impacts or creates high risk of injury or death, and/or when the Contractor(s) fails to implement the ESMP requirements / remedial actions.
- (xvi) Advise the Client on the need to assess and compensate PAPs in the event of any proposed variation orders being considered.
- (xvii) Assist the Client with regard to all questions relating to the contract, in particular compliance with insurance and time extensions and claims, etc.;
- (xviii) In case of change (variation) orders, completion time extension and/or financial claims arising from the contractors, make in depth assessment and recommendations to the executing agency based on the day-to-day records and applicable conditions of contract.
- (xix) Ensure enforcement of standard contract billing procedures, verification and certification of all contractor billing before submission to executing agency for issue of authorization of payment,
- (xx) Witness and approve the contractor's on-site tests and commissioning for each equipment, accessories and materials covered by the Project.
- (xxi) Monitor construction methods and quality control; certify that the quality of works conforms to the specifications, norms, standards and drawings;
- (xxii) Supervise and monitor construction of all project components, verify modifications of designs as required by site conditions and issue variation orders to all the contractors; check measurements for works completed and verify bills for payments to all the contractors as per the conditions of contract;

6.2.3 Inspection, testing and acceptance during manufacturing

The work includes inspection and factory test witnessing of equipment and materials for the project. The equipment and materials to be supplied under this project should be inspected and tested in the manufacturers testing stations.

The consultant shall be responsible for quality assurance of all equipment and material to be supplied under the project.

The consultant shall also:

- (i) Ensure contractor's compliance with the project ESHS requirements.
- (ii) Ensure contractor's compliance with deadlines for manufacturing, testing, shipping and supplying equipment on site if that is the case;
- (iii) Ensure that equipment and materials conform with contract specifications and standards;
- (iv) Ensure that the equipment and materials do not contain any internationally banned chemicals or substances and also ensure that specifications are in line with the national environmental requirements and standards.
- (v) Examine any modification in relation to the contract specifications that the contractor may wish to make. Any modification leading to additional costs must be submitted to the Client for approval;
- (vi) Examine and approve the program for factory testing and acceptance proposed by the contractor, participate in works acceptance procedures and draw up the reports for each works inspection;
- (vii) Ensure that all equipment and materials have been subjected to type tests already and certified and all additional test described in the Bid documents have to be performed accordingly.
- (viii) Participate at factory acceptance tests (FAT) and others for main items of equipment, at contractor/supplier's factories in collaboration with the Client. The Consultant together with the Client's personnel shall inspect and witness all FATs for above mentioned equipment supplied under all contracts. It is not required to assign permanently an Supervision Consultant in the manufacturer's country.

The Consultant proposal shall include at least seven (7) tests witnessing at factory per each type of material (travel expenses including allowances will be born from the equipment supplier) if that is required under the construction project.

Written reports shall be provided by the Consultant on each test witnessed by the Consultant together with the Client. The Consultant shall be responsible for quality assurance of all materials to be supplied under all contracts.

6.2.4 Inspection of material and equipment deliveries

The Consultant shall ensure that equipment and materials delivered to the Contractor's warehouse are in conformity with the stipulated specifications and work schedules, as follows:

- (i) Check that materials delivered meet technical specifications;
- (ii) Inspect and monitor damages, defects and accordingly reject unacceptable materials, and ensure corresponding replacement of damaged equipment and materials;
- (iii) Issue delivery and acceptance certificates for goods;
- (iv) Checking proper storage of materials and equipment as per the manufacturer's storage procedure and recommendation;
- (v) Check Contractor's materials ordering schedule;
- (vi) Check the quantities of equipment/materials supplied;
- (vii) Maintain records of all plant, labour and materials used in the construction of the Works.

6.2.5 Monitor mobilization and progress of works and services:

- (i) The Consultant shall organize monthly meetings between the Client and all the contractors to review the progress of the project and resolve any problem encountered during the progress of construction including EHS aspects (e.g.: incident status). Minutes of the meetings shall be prepared by the Consultant and signed by all the participating parties. The Consultant shall be responsible for chairing the meetings and handling of the minutes.
- (ii) Prepare monthly progress reports, draft project completion report one month before the completion of the services and final project completion report within one month of the completion of the services;
- (iii) Maintain detailed records of scope of the completed works.
- (iv) Approve interim certificates for progress of payments and verify the quantities for such certificates and recommend for payment to the Client;
- (v) Verify and certify all the contractors' invoices to ascertain that the invoiced amount conforms to the works done;
- (vi) Monitor cost and project accounting;
- (vii) Examine the contractor's claims for variations/extension, additional compensation, etc., and prepare recommendation for approval by the Project Coordinator;
- (viii) Assist in resolution of contractual issues in liaison with the Client;
- (ix) Check and certify 'as-constructed' drawings/reports for the works prepared by all the contractors at the end of assignment and ensure that the client receives as constructed drawings for all works carried out/done;
- (x) Ensure the monitoring and reporting in table form on all project relevant guarantees pursuant to the relevant financier's guidelines and obligations of ANE PIU towards the Financiers to ensure that these guarantees will remain in place until the complete fulfilment of all claims under the services agreements secured by such guarantee. The Consultant shall also inform the Client immediately and in a timely manner before the expiring of the guarantee if relevant problems occur with the extension of the guarantee and if necessary, will assist the Client with the call on the guarantee;
- (xi) Advise ANE PIU on the status and management of pending compensations, as well as the impact on delayed project completion in terms of time and increased costs.

6.2.6 Measurement and payment

- (i) Make measurements and keep measurement records;
- (ii) Check the consumption of the materials of executed items from the original bills/stores of the suppliers;
- (iii) Issue interim certificates for progress payments;
- (iv) Certify completion of part or all of the works;
- (v) Prepare quarterly cash flow projections for ABE, IP PIU in an acceptable format. Cash flows should identify budget estimates for all outstanding work;
- (vi) Analyse any contractual claim submitted by the Contractor and prepare a report for ANE addressing the contractual basis, in terms of both technical and financial issues, for the claim and recommendations for a response to the Contractor;
- (vii) Quality Control

6.2.7 Works completion and site tests and commissioning

At the end of the construction works the consultant shall:

- (i) Notify the Client on the readiness of the project to enable mobilization of key stakeholders.
- (ii) Coordinate all the tests to be performed by the contractor in line with the equipment and network test protocols when its required. Carry out final inspection of the works, witness commissioning tests, perform acceptance procedures for all equipment, and issue the corresponding completion certificates in accordance with the relevant conditions of contract with prior consent of the Client.
- (iii) Ensure that the Contractor prepared and submitted the as-built drawings, operation and maintenance manuals as per the requirement and quantity specified in the contracts.
- (iv) Ensure that the contractor provides guidelines and procedures to maintain a safe work environment during operation or maintenance, including emergency response protocols and best practices for personal and collective safety.
- (v) Review for adequacy and completeness of the as-built drawings, operation and maintenance manuals provided by contractors.
- (vi) Undertake a structure-by-structure audit exercise with the participation of the Client (as needed) and prepare the report. The Client shall provide the structure audit template.
- (vii) Approve the contractor's as-built drawings.
- (viii) Ensure availability of hand-over requirements including manuals, drawings, list of PAPs compensated and wayleaves consent forms for handover to the service provider.
- (ix) All the areas (if any) and support facilities like storage yards are restored and decommissioned in line with the Contractor's decommissioning plans.
- (x) Carry final environmental and social checks to ensure that no environmental liabilities are left behind by the Contractors. Prepare an environmental and social management closure report.
- (xi) Upon completion of the project construction activities of all Contracts/lots, the Consultant shall prepare a Project Completion Report (PCR) which will form a comprehensive record of the

designs, construction and installation works accomplished as well as the environmental and social performance including the number of infringements, resolutions, work accidents, etc.

6.2.8 Consultant's Quality Assurance Plan

The Consultant should prepare and submit to the Client a Quality Assurance Plan (QAP) that shall include but not be limited to the following:

- (i) Check the setting out of the Contractor.
- (ii) Check the Calibration of the Contractor's Plants and Equipment
- (iii) Evolve a system of Quality Assurance of the works, including, but not limited to establishing testing frequencies and acceptance criteria for all construction activities based on the Specifications mentioned in the construction contract agreement or international best practice where such Specifications is not mentioned in the construction contract;
- (iv) Testing and sampling frequencies shall be in accordance with the project specifications.
- (v) Inspect the performance of the work with regard to workmanship, compliance with the specifications and World Bank ESHS standards and guidelines, all necessary testing required for acceptance of any item of work;
- (vi) Inspect all material sources nominated by the Contractor and recommend the same for approval by ANE PIU;
- (vii) Assess and check the laboratory and field tests carried out by the Contractors and carry out independent tests;
- (viii) Issue orders to the Contractor to remove or make good any work which is found to be:
 - Not in accordance with the drawings;
 - Not in accordance with the specifications in terms of either work method or materials specification;
 - Covering work which has not been inspected for acceptance or reflected as unacceptable;
- (ix) Maintain records of all testing work, including cross referencing to items of work to which each test refers and location from which any samples were obtained for testing.
- (x) In general, the purpose of quality audit exercise is to ensure that the works are:
 - Executed according to the designs, drawings and specifications as specified in the bidding documents / applicable standards, and that good engineering practices are followed in construction.
 - True to desired lines, levels and finishing.
 - Executed following the EMP provisions included in the bidding documents and in general follow the agreed provisions in the ESMF.
 - Executed following the relevant laws / statutes and practices / guidelines related to workers welfare, safety at worksite, insurances, etc.

- (xi) Assess independently the quality of construction vis-à-vis the standards specified in the bidding documents and good engineering practices including disaster resistant construction standards.
- (xii) Review the degree of quality control exercised during the construction by the contractor maintaining adequate arrangements / practices (tests, numbers, frequency, approach and timing etc.) / documentation (QC registers, test reports, observations of supervisory staff, compliances etc.) and the degree of monitoring done by the line department identify non compliances and suggests necessary improvements and compliance methodologies.
 - Through the agreed Audit strategy and a series of test procedures:
 - Review that the materials have been procured stored and used in accordance with the quality standard requirements set forth in the contract agreement.
 - Review that the workmanship of the work confirms to specified standards.
 - Review that the test reports of the materials / workmanship that were tested by the contract as required in the individual contract document are satisfactory.
- (xiii) Carry out additional testing of the materials and works where necessary at site or in the approved laboratories. Care should be taken to minimize the additional testing and shall preferably be carried out where a prima facie doubt arises related to quality of works and / or compliance of standards.
- (xiv) Review the action taken on the earlier reported non-compliances and re-certify including following up with the heads of implementing agencies for action on earlier reported non compliances.
- (xv) Assist ANE PIU in resolving the issues related to non-compliances. The consultant's responsibility does not end by merely pointing the defects rather they should facilitate the follow up action required to rectify the defects.
- (xvi) Create photo documentation of quality related issues including its compliances with date and geo tags
- (xvii) Check and report on compliance to:
 - Environment Management Plans (EMP) defined in the contract document and the Resettlement Action Plans (RAP) (if any)
 - Environment laws / regulations of Govt. of Mozambique and rules formulated by the concerned State Government.
 - Labour laws/ regulations applicable to construction sites.
 - Health and Safety management at the construction sites.
- (xviii) Review contractors' work program and advice on need for corrective measures in cases where such matters are referred by the Engineers.
- (xix) Review the works progress in accordance with agreed milestones and work schedules and provide regular updates to including need for increasing resources and/ or change in work plan for timely execution.
- (xx) Subject to quality of works covered under every bill submitted, counter-sign the Quality certificate as applicable.

- (xxi) In case any specific quality testing is required by the ANE PIU for any work within the site, it shall be carried out and reports shall be furnished with a reasonable time.
- (xxii) To the extent possible field testing and sampling shall be done in the presence of Engineer/Contractor's representative and the process should be photo documented with geo tagging.
- (xxiii) It is proposed that some field visits shall also be carried out without advance information to be decided randomly.
- (xxiv) Upon field inspection and tests the Consultants, where required and in critical cases through the Resident Engineer shall arrange to issue 'stop work' notice in consultation with ANE PIU, to the contractors and assist in remedying the defects. This shall be done only in exceptional cases where continuance of works may jeopardize the ultimate quality and safety of structure, safety of workers and of third parties etc.
- (xxv) The Contract Documents are the basis of all works to be undertaken under the Project. These are standard documents which will be made available to the Consultant.
- (xxvi) The Supervision Consultant will process interim and final payments to the contractor.
- (xxvii) Interim monthly payments shall be based on interim payment certificates processed by the Supervision Consultant following claims filed by the Contractor within the ambit of the Contract. The Supervision Consultant will be accountable for the quality and the quantities of the work. Whenever final measurements are to be made, the Supervision Consultant's Team Leader will inform the Contractor several days in advance. The representative of ANE PIU participation in such measurements will not be mandatory; however, he may wish to participate or be represented by his representative, to check any measurement.
- (xxviii) The Supervision Consultant shall provide any of the following Services (a) prepare reports, including technical appraisals, additional contract documentation and/or reviewing and commenting on Contractor's proposals, as may be required for any additional work required for the successful completion of the Project; and (b) provision of any other specialist services as may be required from time to time.
- (xxix) All Additional Services, other than minor extras which do not materially affect the scope of work, will be authorized by ANE PIU at the rates established in the Construction Supervision Contract, or, when services require the use of specialists not listed in the Contract, as mutually agreed upon.

6.3 Post-Construction Phase (Stage III)

6.3.1 Assistance During the Defect Notification Period (DNP)

The consultant shall:

- (i) Undertake quarterly site inspection, identify snags and issue instructions to the contractor to rectify all snags.
- (ii) Ensure that all defects and remarks are properly cleared/removed by the contractors before the end of the defect's notification period.

- (iii) Assist and advise the Client with regard to any matter that may be subject to adjudication, arbitration, inquiry or litigation up to delivery certificate of completion.
- (iv) Maintain detail records of relevant events & activities, drawings & documents, minutes of meetings.
- (v) At the end of the liability period, the Consultant shall undertake project closure activities, final project site inspection (to prepare an Operational Acceptance Certificate) and prepare a final project closure report including:
- (vi) Highlight on the performance of the facility during the DLP;
- (vii) All snags recorded during DLP and the status on their rectification by the project closure date;
- (viii) Record of the equipment manufacturers and the rating of the equipment during DLP;
- (ix) Recommendations for future projects;
- (x) Performance on environmental and social Standards including social risk management.

Note: Approval by the Employer: The Consultant will be required to obtain specific approval of the Client before taking any of the following actions specified below:

- (i) Issuing variation orders
- (ii) Approving extensions of time.

Upon closure of Defects Notification Period, the consultant will undertake project closure activities and preparation of the project closure report including;

- (i) Highlight on the performance of the facility during the DLP;
- (ii) All snags recorded during DLP and the status on their rectification by the project closure date;
- (iii) Record of the equipment manufacturers and the rating of the equipment during DLP;
- (iv) Recommendations for future projects.
- (v) Performance on environmental and social Standards including social risk management

6.3.2 Management and Administration

The Consultant shall implement an acceptable Quality Management System (e.g. ISO 9001), either within the framework of his own organization's quality management systems or specifically for this assignment. In particular, the Consultant shall prepare a Project Quality Control Plan that shall define how they intend to ensure Key Deliverables are produced on time within budget and to the technical standards required. The Project Quality Control Plan shall include:

- (i) Work schedule and timelines controls;
- (ii) Budget and cost controls (earned value analysis);
- (iii) Technical verification and quality controls;
- (iv) Risk management controls;
- (v) Document controls;
- (vi) Project reviews and progress reporting requirements;

- (vii) Quality Records to be maintained.
- (viii) EHS approach and control plan

The Consultant shall submit the Project Quality Control Plan to ANE PIU for review and approval. ANE PIU reserves the right to carry out audits to assess whether the Consultant is complying with their Quality Management System and Project Control Plan. The Consultant shall include Quality Management issues in their Quarterly Reports.

7 CONSULTANT OBLIGATIONS

The consultant obligations are, but not limited to:

- a) Comply with the Terms of Reference in its entirety, taking responsibility for the perfect fulfilment of the object of the contract;
- b) Follow specific rules and regulations for consultancy services of the National Roads Administration (ANE - Administração Nacional de Estradas) aligned with World Bank guidelines with focus on transparency, anti-corruption, gender equality and grievance redress procedures;
- c) Communicate to the ANE PIU, in writing, any abnormalities that interfere with the conditions for perfect execution of the contracted object, proposing the necessary corrective actions;
- d) Hire specialized, qualified labour in sufficient quantity for the perfect execution of the services, in its name and under its responsibility without any solidarity from the Client, being responsible for carrying out all legal obligations in force in the country, as well as insurance and any other necessary;
- e) Provide information and clarifications regarding the purpose of this contract that may be requested by the agents appointed by the Client;
- f) Observing and complying with all the requirements in the guidelines, council postures and other guiding documents related to the object of the contract;
- g) Observing and complying with all the requirements of the environmental and social clauses;
- h) Comply with the Government of Mozambique and World Bank fraud and anti- corruption guidelines.

8 CONTRACTING PARTY'S OBLIGATIONS

The contracting party's obligations are:

- a) Provide information necessary for the execution of the services, providing the conditions for the Supervision Consultant to fulfil the contract;
- b) Notify the Supervision Consultant about irregularities observed in the services with a view to the immediate adoption of mitigation measures;
- c) Indicate the contract manager who will monitor compliance with the object and other contractual clauses;
- d) Validate the quality of the products delivered as stipulated in the contract, forwarding the approved invoices for payment within the specified period;
- e) Provide information necessary for compliance with environmental and social Standards; It is;
- f) Comply with the Government of Mozambique and World Bank fraud and anti-corruption guidelines.

9 LOGISTICS AND TIMING

9.1 Location

During contract implementation (stage I and II), the experts of the Consultant will be based in Niassa Province, which will be considered the normal place of posting in regard to travel costs and subsistence allowances. The Consultant's control office shall be established in Pemba whilst the works supervision teams shall be based on the construction sites. The experts will be required to attend meetings at ANE PIU office in Pemba and on special occasions in Maputo.

During contract implementation, the Contractor's staff employed for the provision of the Services are required to reside on construction site camps established on approved location along the roads under construction and, during working hours, shall only leave site on official business. The approved site camps will be considered the normal place of posting in regard to travel costs and subsistence allowances. The Supervisor will be required to carry out final inspections of the works on site during Stage II.

9.2 Start date & period of implementation

The intended start date is August 2027 and the period of implementation of the contract will be 26,5 months from this date. The combination of Stage I and II will be of 14 months, and it will be governed by the Contractor's mobilization. The period of implementation is broken down as follows:

Stage I: 2 months (dependent on the Contractor's mobilization).

Stage II: 12 months

Stage III: 12 months

Total: 26 months

The Works Contract will allow for Sectional Provisional acceptance of works, bearing in mind the varying works construction periods for the various interventions.

The consultant shall elaborate a detailed schedule of activities and corresponding deployment of manpower, which will ensure that all duties entrusted to him will be adequately performed. This schedule, together with a comprehensive statement justifying the proposed deployment will be incorporated in the methodology statement and reflected in the budget annex.

The schedule of activities and deployment of personnel of the consultant must reflect and be commensurate with the Contractor programme and tempo of the works, always ensuring sufficient personnel to undertake the assignment while at the same time maximising the utilisation of personnel. Any departure from this will require the pre-approval of the Contracting Authority. The consultant must plan and programme time off for his staff in such a way that there is always staff continuity and as a

minimum there will always be a combination involving two main team members between Team Leader, Resident Engineer or the Deputy Resident Engineer on site.

Based on the description of the aforementioned services, the Supervisor must prepare a work plan and include it in his proposal, indicating the work methodology and the approach he intends to adopt, not limited to:

- a. Consultant's work plan, including the organization and description of tasks assigned to each member of the proposed team who will work directly on the project or support the project from the firm's headquarters;
- b. Collection of elements, data, inventories and surveys;
- c. Internal communication and production of reports;
- d. Description and quantification of services and work that the Consultant will subcontract to third parties, if applicable; It is
- e. Program in the form of a bar graph clearly indicating the expected duration and time allocated for each member of the proposed technical team, including any other participation of the management personnel of the firm's headquarters, with the total in number of person/day. This program should be in line with the agreed and updated reporting program and key activities.

9.3 Logistics support from the Client

ANE PIU will indicate a technical representative who will serve as a liaison, through which all requests for information and contacts with ANE PIU will be forwarded. All support considered necessary will be provided including contacts with other government institutions and access to any important data regarding the contract.

The Client will be responsible for providing, free of charge, the following:

- a) Any other type of support deemed necessary and essential for the satisfactory provision of services, including dossiers and other working documents within the scope of this consultancy, as long as they are not classified as restricted access;
- b) All relevant reports, documents and maps updated;
- c) Necessary authorizations for the inspection team to carry out its tasks.

10 PROFILE OF THE CONSULTANT FIRM

The consulting firm that is to be selected shall have its core business and experience as consultancy in design and supervision in roads and infrastructure projects. Must be an officially registered consulting firm on its country of origin.

The consulting firm shall have relevant specialized knowledge and experience on similar services done in the region or country.

Key personnel to be assigned shall have adequate academic and professional qualifications and substantial experience in the sector. International experience associated with local knowledge and experience to carry out the assignment. The Consultant shall employ well-qualified and competent professional staff with experiences as described in Section 11 and shall therefore propose a team of experts that is fully able to deliver the services in accordance with the technical requirements defined in this TOR and its Annexes.

For the purpose of evaluation of the quality of the proposed staff, the consultant should understand that apart from other important details, the CVs shall clearly indicate the experiences of the staff including types of activities performed and respective client references.

The Consultants are free to propose a staffing plan and skill mix necessary to meet the objectives and scope of services taking in consideration the Person- months provided. If all the required skills are not available within the firm, consultants may associate with others to make up for the skills.

11 THE CONSULTANT’S STAFFING AND EQUIPMENT

The Consultant shall include in his proposal the following mandatory Key Experts, detailed on the Table below (see Section 11.5 below), as well as propose Non-Key Experts to complement his team duration execution of the assignment. CVs and Statements of Exclusivity and Availability shall however be submitted in the technical proposal for assessment by the Client, and all the CVs must meet the minimum requirements to be considered compliant. Non-compliant CVs will be rejected. Those who do not meet the requirements shall have to be replaced at negotiations stage.

11.1 Employment of Civil Servants

Note that civil servants and other staff of the public administration, of the partner country or of international/regional organisations based in the country, shall not be permitted to work as experts on this project.

11.2 Key Professional Staff

Key Professional Staff have a crucial role in implementing the contract. These terms of reference contain the required key experts’ profiles. As presented in Table 1 of these ToR’s the project is divided into 7 lots and the Professional staff to be provided by the Consultant for Metal Bridges shall be per Lot as follows:

- Lot 1: Metal Bridges #1 and #2,
- Lot 2: Metal Bridge #3,
- Lot 3: Metal bridge #4,
- Lot 4: Metal Bridges #5, #6, #7,
- Lot 5: Metal Bridges #8, and #9,
- Lot 6: Metal Bridge #10, and
- Lot 7: Metal Bridges #11 and #12.

As indicated in Table 4 below the estimated time for the consultancy services is 26 months requiring 442 person-months covered by the services of the following experts:

- 1 Resident Engineer (Team Leader),
- 1 Assistant Resident Engineer,
- 1 Bridge/Structural Engineer,

Section 7. Terms of Reference for Consultancy Services for Supervision of Construction of Sub-structure and Installation of Metallic Bridges

- 1 Hydrologist/Drainage Engineer
- 1 Geotechnical Engineer
- 7 Senior Inspectors of Works
- 7 Junior Inspectors of Works
- 7 Topographical Surveyors,
- 1 Environmentalist, Sociologist,
- 1 Sociologist,
- 7 Quantity Surveyors, and
- 7 Health and Safety Officers

The Consultant shall provide the above-mentioned key professional staff with academic and professional qualifications and experience to recognize and to deliver good international industry practice with respect to the supervision of civil works, Environment, Social Sexual Exploitation and Abuse (SEA) and Gender-Based Violence (GBV) requirements in order to fulfil the objectives of the services and for which he/she will receive remuneration as specified in the Contract Document.

The Consultant shall employ only such key staff whose CVs have been approved by the Client. In addition to the expert personnel, the Consultant shall determine the support staff to assist with on-site supervision of the works.

The Consultant must provide in the proposal, CVs and copies of the highest education certificates for all professional and technical staff including the duration in person-months during which the staff will be deployed under the Contract.

The tenderer shall submit CVs and statements of exclusivity and availability for the key experts indicated in the table.

11.3 List of Key Professional Staff

Table 3: List of Key Professional Staff

Stage	Lot 1 [Metal Bridge #1 (90m), Metal Bridge #2 (90m)]		Lot 2 [Metal Bridge #3 (90m)]		Lot 3 [Metal Bridge #4 (90m)]		Lot 4 [Metal Bridge #5 (30m), Metal Bridge #6 (30m), Metal Bridge #7 (60m)]		Lot 5: [Metal Bridge #8 (30m), Metal Bridge #9 (60m)]		Lot 6: Metal Bridge #10 (90m)		Lot 7: [Metal Bridge #11 (30m), Metal Bridge #12 (30m)]	
Phase I	During Design Check and Field Investigations		During Design Check and Field Investigation		During Design Check and Field Investigation		During Design Check and Field Investigation		During Design Check and Field Investigation		During Design Check and Field Investigation		During Design Check and Field Investigation]	
	Key Position	Staff Month	Key Position	Staff Month	Key Position	Staff Month	Key Position	Staff Month	Key Position	Staff Month	Key Position	Staff Month	Key Position	Staff Month
K1	Team Leader / Senior Resident Engineer	2	For all bridges											
K2	Assistant Resident Engineer	2	For all bridges											
K3	Bridge/Structural Engineer	2	For all bridges											
K4	Hydrologist/Drainage Engineer	2	For all bridges											
K5	Geotechnical Engineer	2	For All Bridges											
K6, K7, K8, K9, K10, K11, K12	Topographical Surveyor	2	Topographical Surveyor	2	Topographical Surveyor	2	Topographical Surveyor	2	Topographical Surveyor	2	Topographical Surveyor	2	Topographical Surveyor	2
K13	Environmentalist	2	For all bridges											
K14	Sociologist	2	For all bridges											
K15, K16, K17, K18, K19, K20, K21	Quantity Surveyor	2	Quantity Surveyor	2	Quantity Surveyor	2	Quantity Surveyor	2	Quantity Surveyor	2	Quantity Surveyor	2	Quantity Surveyor	2
	Sub-Total 1	18	Sub-Total 1	4	Sub-Total 1	4	Sub-Total 1	4	Sub-Total 1	4	Sub-Total 1	4	Sub-Total 1	4
Phase II	During Construction Supervision		During Construction Supervision		During Construction Supervision		During Construction Supervision		During Construction Supervision		During Construction Supervision		During Construction Supervision	
	Key Position	Staff Month	Key Position	Key Position	Key Position	Staff Month	Key Position	Staff Month	Key Position	Staff Month	Key Position	Staff Month	Key Position	Staff Month
K1	Team Leader/ Senior Resident Engineer	12	For all bridges											
K2	Assistant Resident Engineer	12	For all bridges											
K3	Bridge/Structural Engineer	12	For all bridges											
K5	Geotechnical Engineer	12	For all bridges											
K6, K7, K8, K9, K10,	Topographical Surveyor	12	Topographical Surveyor	8	Topographical Surveyor	11	Topographical Surveyor	8	Topographical Surveyor	11	Topographical Surveyor	8	Topographical Surveyor	6

Section 7. Terms of Reference for Consultancy Services for Supervision of Construction of Sub-structure and Installation of Metallic Bridges

Stage	Lot 1 [Metal Bridge #1 (90m), Metal Bridge #2 (90m)]		Lot 2 [Metal Bridge #3 (90m)]		Lot 3 [Metal Bridge #4 (90m)]		Lot 4 [Metal Bridge #5 (30m), Metal Bridge #6 (30m), Metal Bridge #7 (60m)]		Lot 5: [Metal Bridge #8 (30m), Metal Bridge #9 (60m)]		Lot 6: Metal Bridge #10 (90m)		Lot 7: [Metal Bridge #11 (30m), Metal Bridge #12 (30m)]	
K11, K12														
K13	Environmental	12	For all bridges											
K14	Sociologist	12	For all bridges											
K15, K16, K17, K18, K19, K20, K21	Quantity Surveyor	12	Quantity Surveyor	8	Quantity Surveyor	11	Quantity Surveyor	8	Quantity Surveyor	11	Quantity Surveyor	8	Quantity Surveyor	8
K22, K23, K24, K25, K26, K27, K28,	Health and Safety Office	12	Health and Safety Officer	8	Health and Safety Officer	11	Health and Safety Officer	8	Health and Safety Officer	11	Health and Safety Officer	8	Health and Safety Officer	6
K29, K30, K31, K32, K33, K34, K35	Senior inspector of Works	12	Senior inspector of Works	8	Senior inspector of Works	11	Senior inspector of Works		Senior inspector of Works	11	Senior inspector of Works	8	Senior inspector of Works	6
K36, K37, K38, K39, K40, K41, K42	Junior inspector of Works	12	Junior inspector of Works	8	Junior inspector of Works	11	Junior inspector of Works	8	Junior inspector of Works	11	Junior inspector of Works	8	Junior inspector of Works	6
	Sub-Total 2	132	Sub-Total 2	40	Sub-Total 2	55	Sub-Total 2	40	Sub-Total 2	55	Sub-Total 2	40	Sub-Total 2	30
Phase III	During Defects Notification Period		During Defects Notification Period		During Defects Notification Period		During Defects Notification Period		During Defects Notification Period		During Defects Notification Period		During Defects Notification Period	
	Key Position	Staff Month	Key Position	Staff Month	Key Position	Staff Month	Key Position	Staff Month	Key Position	Staff Month	Key Position	Staff Month	Key Position	Staff Month
K1	Resident Engineer	4	For All Bridges											
K2	Bridge Engineer	4	For All Bridges											
	Sub-Total 3	8	Sub-Total 3	0	Sub-Total 3	0	Sub-Total 3	0	Sub-Total 3	0	Sub-Total 3	0	Sub-Total 3	0
	TOTAL	158	TOTAL	44	TOTAL	59	TOTAL	44	TOTAL	59	TOTAL	44	TOTAL	34

11.4 Back up Staff

Project Director: The Project Director shall provide the overall direction of the project, coordinate design review, guide and support the site supervision staff and liaise with the Client for the duration of the project. He shall be based at the Consultant's head office and shall co-ordinate any specialist services that may be required from the Consultant.

11.5 Staff Qualifications and Requirements

11.5.1 Staff Requirement during Design Review

(i) Resident Engineer/Team Leader (K-1):

She/he must be a registered Professional Engineer with a degree in Civil Engineering. Postgraduate qualification in Highway Engineering is added advantage. She/he must have a minimum of fifteen (15) years of cumulative experience related to road/metallic bridge design and construction. She/he must have served as a Team Leader/Resident Engineer or equivalent capacity in at least three (3) metallic bridge construction projects of similar magnitude and complexity in the last ten (10) years. A working experience in Sub-Saharan countries of at least 3 years is required. She/he should be able to write and speak in English. She/he shall be the head of the site staff and shall be responsible for all technical and administrative aspects on site.

(ii) Assistant Resident Engineer K-2

She/he must be a registered Professional Engineer with a degree in Civil Engineering. Postgraduate qualification in Highway Engineering is added advantage. She/he must have a minimum of (10) years of cumulative experience related to road/metallic bridge design and Construction. She/he must have served in a similar capacity on at least three (3) metallic bridge construction projects of similar magnitude and complexity in the last 10 years. A working experience in Sub-Saharan countries of at least 3 years is preferred. She/he should be able to write and speak in English.

(iii) Bridge/Structural Engineer (K-3):

She/he must be a registered Professional Engineer with a degree in Civil Engineering. Postgraduate qualification in Bridge/Structural Engineering is added advantage. She/he must have minimum of ten (10) years cumulative experience in bridge design and construction. She/he must have served in similar capacity on at least three (3) road/metallic bridge projects of similar magnitude and complexity in the last 10 years. A working experience in Sub-Saharan countries of at least 3 years is preferred. She/he should be able to write and speak in English.

(iv) Hydrologist/Drainage Engineer (K-4):

The Hydrologist shall be a holder of a degree in Applied Sciences or a Degree in Civil Engineering or

an equivalent qualification. Post-graduate qualification in Hydrology/Hydraulics Engineering is an added advantage. He/she must have at ten

(10) years working experience related to roads and highways infrastructure hydrology and hydraulics. The ability to use appropriate flood design models is essential. He/she should have served as a Hydrologist on at least two (2) projects of similar magnitude and complexity within the last 10 years. In addition, He/she must have at least 3 years working experience in Developing Countries. Fluency in written and spoken English is mandatory.

(v) Geotechnical Engineer K-5

She/he must be a registered Geotechnical Engineer with at least a BSc. in in Geotechnical Engineering. Postgraduate qualification in Highways Engineering is an added advantage. She/he must have a minimum of ten (10) years of specific experience in geotechnical matters related to bridge and road works. She/he must have served in at least two (2) road projects of similar magnitude and complexity in the Last 10 years. She/he shall be responsible for ensuring the stability of the bridge foundations and the quality of all materials to be incorporated in the works, as well as the completed works, conform to the contract specifications. In addition, he/she must have a working experience of at least 3 years in Sub-Sahara countries. Proficiency in written and spoken English is mandatory.

(vi) Topographical Surveyor (7 Nos; K-6, K-7, K-8, K-9, K-10, K-11 & K-12):

She/he must be a recognized Topographical Surveyor with a relevant professional body with a minimum of a diploma in Land Surveying. She/he must have at least ten (10) years cumulative experience in road design and construction. She/he must have served in similar capacity on at least three (3) metallic bridge construction projects in the last 10 years. A working experience in Sub-Sahara countries of at least 3 years is preferred. Fluency in written and spoken English is mandatory.

(vii) Environmentalist (K-13):

She/he must be a registered Environmental Expert with a degree in Environmental Engineering Studies. A Post graduate qualification in Environmental and Social Management is an added advantage. She/he must have sound knowledge of environmental issues, initiatives and implementation of mitigation measures related to civil engineering infrastructure projects. He/she must have a minimum of ten (10) years working cumulative experience related to environmental impact assessment for metallic bridges on roads and highway projects. She/he must have served as an Environmental Specialist/Expert on at least three (3) projects of similar magnitude and complexity. She/he should be able to write and speak in English. A working experience in Sub- Sahara countries of at least 3 years is preferred.

(viii) Sociologist (K-14):

She/he must be a holder of Degree in Sociology, Social Sciences, Community Development or related discipline. A Post graduate qualification in related disciplines including law, is an added advantage.

She/he must have sound knowledge of environmental and social issues, initiatives and implementation of mitigation measures related to civil engineering infrastructure projects. He/she must have a minimum of ten (10) years working experience related to social assessment for road and highway metallic bridge projects. She/he must have served as Social Specialist/Expert on at least three (3) projects of similar magnitude and complexity. She/he should, ideally, have knowledge of GBV, SEA/SH, stakeholder engagement, and labour management, including labour influx issues in relation to linear infrastructure projects. She/he must have experience in undertaking social impact assessment and management of Health and Safety issues in accordance with the requirements of Occupational Health and Safety Authority (OSHA) or international recognized institution for the same. She/he should be able to write and speak English. Communication skills in the main languages spoken in Niassa Province, Emakhuwa (the most widely spoken as a mother tongue), Jawá, Chichewa, and Lomué, is an added advantage. A working experience in Sub-Saharan countries of at least 3 years is preferred.

(ix) Quantity Surveyor (7 Nos; K-15, K-16, K-17, K-18, K-19, K-20 & K-21):

She/he must be a registered Quantity Surveyor with degree in Building Economics or Quantity Surveying. A Postgraduate qualification in related fields is an added advantage. She/he must have a minimum of (10) years of cumulative experience related to infrastructure design and/or construction. She/he must have served in similar capacity in at least three (3) projects of similar magnitude and complexity within the last 10 years. A working experience in Sub-Saharan countries of at least 3 years is preferred. She/he should be able to write and speak in English.

(x) Health and Safety Officer (7 Nos; K-22, K-23; K-24, K-25, K-26, K-27 & K-28):

She/he must be certified in NEBOSH/OSHA and must be a holder of Degree in Occupational Health and Safety from a recognized institution or related discipline. A Post graduate qualification in Health and Safety related disciplines is an added advantage. She/he must possess at least five (5) years of cumulative experiences in monitoring of Health and Safety issues in work place, initiatives and implementation of mitigation measures related to roads and highways metallic bridges projects. She/he must have served as Health and Safety Expert on at least three (3) projects of similar magnitude and complexity within the last ten (10) years. She/he must have at least 3 years working experience in developing countries and must be proficient in written and spoken English.

(xi) Senior Inspector of Work (7 Nos. K-29, K-30, K-31, K-32, K-33, K-34 & K-35)

She/he must be a qualified technician with a Higher-Level Diploma in Civil Engineering. She/he must have a minimum of fifteen (15) years of cumulative experience related to road/metallic bridge construction supervision. She/he must have served as a Senior inspector of Works in at least three (3) metallic bridge construction projects of similar magnitude and complexity in the last ten (10) years. A working experience in Sub-Saharan countries of at least 3 years is required. She/he should be able to write and speak in English.

(xii) Junior Inspector of Work (7 Nos. K-36, K-37, K-38, K-39, K-40, K-41 & K-42)

She/he must be a qualified technician with a Basic Level Certificate in Civil Engineering. She/he must have a minimum of ten (10) years of cumulative experience related to road/metallic bridge construction supervision. She/he must have served as a Junior Inspector of Works in at least three (3) metallic bridge construction projects of similar magnitude and complexity in the last ten (5) years. A working experience in Sub-Sahara countries of at least 3 years is required. She/he should be able to write and speak in English.

(xiii) Support Staff:

In addition to the key personnel designated above, the Consultant shall determine the support and backup staff deemed necessary to assist in the successful execution of this assignment. These staff shall include the Project Director, who shall guide and support the site supervision staff for the duration of the project for both Lots. He shall be based at the Consultant's head office and shall co-ordinate any specialist services that may be required from the Consultant. Other Support staff include the following:

- (i) Climate Resilience Experts (7 Nos) – one for each lot,
- (ii) Materials Technicians - (7 Nos) – One for each lot,
- (iii) Assistant Topographical Surveyor - (7 Nos) – one for each lot,
- (iv) CAD Technician (7 Nos) – one for each lot,
- (v) Civil Technician (7 Nos) – one for each lot,
- (vi) Office Secretary/Administrator (except Office attendants and housekeepers who shall be provided under the Works Contract), and
- (vii) Drivers.

Note: CVs for Support Staff will not be evaluated. However, evidence of professional registration and academic certificates for Key staff should be submitted and will be evaluated

11.5.2 Staff Requirement during Defects Notification Period (DNP)

The Consultant shall assemble a team led by the Resident Engineer to conduct the inspection during the DNP as described above.

11.5.3 Additional Requirements for the Consultant's Staff

The Consultant's staff shall:

- (a) Be available mobilize to the works site upon the commencement of the contract; and
- (b) Accord officials from ANE PIU and the Ministry of Works, Housing and Water Resources the opportunity to inspect the works and the related documentation.

11.6 Support staff & backstopping

The Consultant will provide support facilities to their team of experts (back-stopping) during the implementation of the contract. This shall include any CAD input required for the update of the design drawings and head office advice on administration of the works contract.

Backstopping and support staff costs must be included in the fee rates.

Experts will be mobilized upon request from the Client and based on the Consultant's work program.

11.7 Expert's role during design review, construction supervision, and the DLP.

11.7.1 The Resident Engineer

During the design review the Resident Engineer (RE)/Team Leader, acting as the client's representative in the supervision of 12 metallic bridges in Niassa, Mozambique, holds comprehensive responsibility for validating the design and investigating site conditions to ensure structural integrity and compliance with technical specifications. For this project, the RE serves as the primary technical liaison, preventing construction delays by anticipating issues through rigorous design validation and thorough field investigation.

As a key project contact, he/she must also ensure that all works align with the established Construction Supervision Plan and that they are familiar with all contract documents before work starts. Furthermore, their role is essential for maintaining safe and efficient operations on-site

The RE's key responsibilities regarding design check and field investigations shall be as follows but not limited to:

1. Design Check and Review Responsibilities

- **Detailed Design Validation:** Review and approve the design consultant's technical designs, shop drawings, and calculation notes, particularly focusing on the structural integrity of substructure and metallic elements, connections (welding/bolting), and abutment design.
- **Compliance with Standards:** Ensure that the design adheres to Mozambican standards (or specified international codes) regarding loads, corrosion protection (e.g., paint systems), and seismic requirements.
- **Verification of Materials:** Review specifications for cement, reinforcement steel and structural steel grades, fasteners, and bearing materials to ensure they are suitable for the Niassa environment.
- **Design Change Management:** Identify discrepancies between the original design and site requirements, authorizing necessary revisions (design variations) through formal change orders.
- **Hydraulic and Geotechnical Verification:** Check if the bridge span and vertical clearance are sufficient based on flood level calculations, and verify that pile depths/foundation designs match local soil conditions.

2. Field Investigations and Site Verification

- **Geotechnical Assessment:** Supervise and verify geotechnical investigations, including soil borings (N-values) at each abutment and pier location to confirm foundation design parameters.
- **Topographic Survey Verification:** Review topographic surveys to confirm horizontal and vertical alignments, ensuring the bridges integrate properly with existing roads and watercourses.
- **Site Condition Analysis:** Identify and mitigate risks related to site accessibility, hydrological conditions (river flow behavior), and existing infrastructure interference.
- **Hydrological Study:** Review flood history and hydraulic data to ensure foundation stability against scour, critical for metallic bridges.

3. Reporting and Technical Documentation

- **Pre-construction Report:** Receive, check, review and approve reports outlining field investigations, confirming the suitability of site conditions for construction.
- **As-Built Document Coordination:** Set-up protocols for maintenance of detailed records of changes made to the design during field investigations for final "as-built" documentation.
- **Material Certification Review:** Verify that cement, reinforcement and structural steel materials delivered to the site have appropriate certification and meet contractual requirements.

During the construction phase, the Resident Engineer/Team Leader shall be responsible for the management of the consultant's team carrying out on-site supervision, quality control, and contract administration to ensure the project is completed according to plans, specifications, and safety standards. Key duties include monitoring progress and budget, ensuring contractor compliance, managing and approving materials, verifying quantities for payment, and resolving technical and safety issues.

1. Project oversight and administration

- **Supervise construction activities:** Oversee all on-site work, including paving, drainage, and other related structures, to ensure adherence to the contract.
- **Monitor progress:** Track work against the schedule, prepare progress reports, and inform project managers of any delays.
- **Manage budget:** Monitor construction costs, assist in creating budgets, and provide recommendations for contractor payments.
- **Coordinate stakeholders:** Act as the main point of contact and liaison between the client, contractor, and other stakeholders.

2. Quality control and technical management

- **Ensure compliance:** Verify that all work is completed according to the approved plans, specifications, and relevant standards.
- **Approve materials and submittals:** Review and approve shop drawings, method statements, and material submittals to ensure they meet project criteria.
- **Oversee material testing:** Ensure quality control through lab and field testing, such as concrete cube tests, soil compaction tests, and slump tests.
- **Provide technical advice:** Offer technical guidance to site staff and resolve design-related issues on-site.

3. Health, safety, and environment

- **Enforce safety practices:** Monitor and enforce health and safety procedures on the construction site, ensuring personnel use proper personal protective equipment (PPE).
- **Manage safety records:** Keep records of any accidents or near-miss events and review the contractor's safety reports.

4. Documentation and reporting

- **Maintain project records:** Keep detailed and accurate records of all project activities, including daily reports and quality control documentation.
- **Verify quantities:** Certify measurement sheets and verify quantities of work completed for contractor billing and payments.

- **Review as-built drawings:** Review and approve as-built drawings and Operation and Maintenance (O&M) manuals before project completion.

11.7.2 Assistant Resident Engineer

During the design review the Assistant Resident Engineer (ARE) shall ensure that all structural designs and field investigations comply with the contract specifications, technical standards, and safety regulations. He/she shall act as the technical arm of the Resident Engineer in ensuring structural integrity and quality.

Key responsibilities during the design check and field investigations include:

1. Field Investigations and Data Collection

- **Geotechnical Assessment:** Conducting or overseeing soil sampling (SPT), boreholes, and rock core analysis to verify the suitability of foundation designs for steel abutments and piers.
- **Hydrological Data Collection:** Reviewing hydraulic data to establish proper water levels for bridge design, specifically identifying flood levels in Niassa to protect metallic structures from erosion.
- **Site Survey and Access Analysis:** Verifying the accuracy of topographical surveys (contour maps) and assessing site accessibility for heavy equipment needed to install pre-fabricated metallic sections.
- **Material Source Inspection:** Identifying, testing, and approving local material sources (borrow pits, quarries) for concrete in substructures.

2. Design Check and Technical Review

- **Review of Structural Drawings:** Detailed checking of shop drawings for the 12 metallic bridges, ensuring compliance with structural steel design standards.
- **Verification of Metallic Components:** Confirming that the specifications for structural steel, protective coatings (against corrosion), welding details, and bolted connections meet the contractual requirements.
- **Constructability Review:** Ensuring that the proposed design can be realistically constructed on-site, including verifying crane capacity, temporary supports, and assembly procedures for the steel spans.
- **Foundation and Abutment Design Approval:** Checking the interaction between the metallic superstructure and concrete substructures, specifically checking bearing pads and anchoring bolts.

3. Contractual and Quality Control Responsibilities

- **Issuing Instructions:** Directly communicating with the contractor to correct deficiencies in design or work procedures identified during field investigations.
- **Method Statement Review:** Reviewing the contractor's Method Statements for the installation of the steel components and the concreting of foundations.
- **RFI Response:** Responding to Requests for Information (RFIs) from the contractor regarding discrepancies between drawings and actual site conditions in Niassa.
- **Progress Reporting:** Preparing technical reports on the status of design approvals and the outcome of site surveys.

4. Specific Focus for Metallic Bridges

- **Corrosion Protection:** Ensuring all metallic components are properly galvanized or painted with appropriate anti-corrosion materials before installation.
- **Structural Safety:** Verifying the integrity of temporary works to ensure safety during the lifting and placement of bridge segments

During the construction phase, the Assistant Resident Engineer (ARE) will support the Resident Engineer in managing the Supervision of construction projects by supervising site activities, ensuring quality and safety, and handling project documentation. Duties include conducting site inspections, reviewing technical drawings, preparing progress reports, coordinating with contractors, and assisting with budget and schedule management. The ARE shall also responsible for ensuring compliance with all project specifications, safety standards, and relevant regulations.

1. Project management and coordination

- Assist the Resident Engineer in managing project schedules, budgets, and resource allocation.
- Collaborate with contractors, subcontractors, and other stakeholders to facilitate project progress.
- Coordinate with the design team to resolve technical issues.
- Attend and help organize site meetings with contractors and other parties.

2. Site supervision and quality control

- Conduct routine site inspections to monitor construction progress.
- Ensure that roadworks, including pavement, drainage, and signage, are built to the required quality and safety standards.
- Verify that all construction activities align with engineering drawings and project specifications.
- Oversee the implementation of safety procedures and ensure safety goals are achieved on the project site.
- Monitor the performance of inspectors and surveyors.

3. Documentation and reporting

- Review engineering drawings, specifications, and other technical documents for accuracy.
- Help prepare technical and progress reports, such as weekly and monthly reports.
- Maintain accurate and complete project records, including daily diaries and reports from inspectors.
- Assist with contract administration, including preparing variation orders and handling claims.

11.7.3 The Bridge/Structural Engineer

During Phase I (Design Check and Field Investigations) for the supervision of 12 metallic bridges in Niassa, the Bridge/Structural Engineer shall primarily be responsible for verifying the technical soundness, safety, and constructability of the designed structures before construction begins. In this phase ensures all 12 bridges are "fit-for-purpose" and that construction risks are identified and mitigated early His/her key responsibilities during this phase shall include but not limited to:

1. Design Review and Technical Check

- **Structural Analysis Verification:** Review and approve the contractor's structural calculations, drawings, and design reports to ensure compliance with relevant standards, including analyzing the structural integrity and load-bearing capacity of the steel superstructures.
- **Metallic Structure Specifics:** Validate the design for corrosion protection, fatigue analysis, connection details (bolted/welded), and material specifications for the steel components.
- **Foundation Design Review:** Check the foundation designs (piles or spread footings) against geotechnical reports to ensure stability, particularly bearing capacity for the substructure.
- **Hydraulic Adequacy:** Confirm the bridge deck levels and span lengths are adequate for flood mitigation, reviewing the calculated scour depth.
- **Validation of Quantities:** Review and approve the bill of quantities and technical specifications prepared by the contractor for accuracy.

2. Field Investigations and Site Verification

- **Site Condition Assessment:** Conduct site visits to verify the accuracy of topographical surveys and existing site conditions.
- **Geotechnical Verification:** Verify that the borehole logs and soil investigation reports provided align with the foundation design assumptions.
- **Identify Utilities and Environmental Constraints:** Identify existing utilities or environmental risks that could affect construction, ensuring compliance with environmental, social, and safety (E&S) requirements.
- **Access Assessment:** Evaluate site access for logistics and installation of heavy steel sections.

3. Preparation for Construction

- **Review of Construction Methodology:** Evaluate the contractor's proposed method statement for installation, including girder erection, crane logistics, and temporary works.
- **Quality Assurance Plan:** Review the inspection and test plans (ITP) for materials and workmanship.
- **Final Approval Report:** Prepare a technical report approving the final design and construction drawings before issuing the permit for construction to begin.

During the construction phase, the Bridge/Structural Engineer's specific responsibilities shall include overseeing construction, ensuring structural integrity, and providing technical guidance to ensure the project adheres to the design and safety standards. She/he shall be responsible for ensuring the bridges and other associated drainage structures are constructed according to design and conform to the contract specifications.

Key duties involve conducting site inspections, reviewing contractor submittals, and resolving any issues that arise on-site to guarantee the structure is built safely and correctly.

1. Supervision of contractor's designs and planning

- Review and approve contractor submittals for materials and construction methods.
- Provide technical guidance on structural elements and problem-solve issues that arise during construction.
- Ensure that the construction adheres to the design specifications and all relevant safety and building codes.
- Conduct site visits and inspections to monitor progress and ensure quality control.

2. Construction supervision and quality assurance

- Supervise construction activities to ensure they are carried out safely and in compliance with the project's approved plans.
- Monitor the contractor's work, including the quality of materials, execution, and adherence to safety and environmental plans.
- Inspect and certify the permanent works as they are completed to ensure they meet contract specifications.
- Provide guidance and direction to the project team and junior engineers.

3. Documentation and reporting

- Maintain records and prepare technical reports documenting the construction progress and any issues encountered.

Address any technical matters that arise during the construction phase.

11.7.4 The Hydrologist/Drainage Engineer

During the design review the Hydrologist/Drainage Engineer shall hold the critical responsibilities during Phase I (design check and field investigation) to ensure the structural longevity and safety of the crossings against hydraulic forces. His/her primary role is to verify the design against site conditions and prevent future failures from flooding or erosion. The Hydrologist/Drainage Engineer shall also have the important role of verifying the technical, budgetary, and environmental safety of the project.

His/her key responsibilities during Phase I shall include but not limited to:

1. Design Check and Review

- **Hydrological Analysis Verification:** Verify the adequacy of the design return periods (typically 50–100 years for bridges) and estimated peak discharge rates, as mentioned in.
- **Scour Assessment Review:** Evaluate the contractor's estimated maximum scour depths, particularly for pier foundations of the 12 metallic bridges.
- **Hydraulic Model Validation:** Review the HEC-RAS or similar hydraulic models used by the contractor to ensure they accurately represent the river channel, floodplains, and the proposed bridge geometry.
- **Culvert and Drainage Structure Design:** Review the sizing of approach drainage, embankments, and culverts to ensure proper drainage and prevent undermining of the bridge approaches.

2. Field Investigation and Site Reconnaissance

- **High Water Mark Verification:** Physically identify and verify high water marks and gather data on past flooding events.
- **Channel Stability Assessment:** Assess lateral stability (meandering) and vertical stability (degradation/aggradation) of the riverbed to ensure the bridge spans are placed correctly.
- **Geotechnical/Hydraulic Link:** Examine the, as outlined in, to ensure that the water table level and soil permeability allow for stable foundation excavation.
- **Debris Potential Assessment:** Analyze the risk of heavy debris or ice flow, crucial for metallic structures, and check for signs of existing scour around existing or historical bridge piers.

3. Reporting and Documentation

- **Field Investigation Reports:** Prepare detailed reports of site visits, including photographic evidence of channel characteristics, erosion, and debris potential. **Design Validation Report:** Submit a formal evaluation report validating the design or recommending amendments to the design drawings.

11.7.5 The Geotechnical Engineer

During Phase I (Design Check and Field Investigations) for the construction of 12 metallic bridges in Niassa, the Geotechnical Engineer shall be responsible for validating the foundation design, verifying site subsurface conditions, and ensuring the design consultant's investigation methods meet international standards. He/she shall act as the technical authority to prevent foundation failures by ensuring the design accommodates specific site geological and hydrological conditions. His/her role in the team shall be to ensure that the foundations of the 12 metallic bridges design and verification took into account long-term safety and performance.

The Geotechnical Engineer's key responsibilities during this phase shall include but not limited to:

1. Design Review and Technical Approval

- **Reviewing Design Documentation:** Analyzing the design consultant's geotechnical design reports, foundation calculations, and bearing capacity analyses.
- **Verifying Assumptions:** Checking that soil/rock properties, groundwater levels, and slope stability assumptions used in the design are realistic and consistent with regional conditions.
- **Checking Foundation Type:** Verifying that the proposed bridge foundations (e.g., deep piles for scour mitigation) are appropriate for the specific river crossings.
- **Validating Safety Factors:** Ensuring all geotechnical calculations meet the project's specified safety standards and design codes.

2. Field Investigation Supervision and Validation

- **Overseeing Site Investigations:** Directing and verifying the contractor's field investigations, including Standard Penetration Tests (SPT), Cone Penetration Tests (CPT), and boring operations.
- **Scour Assessment:** Evaluating soil susceptibility to erosion around foundations in local rivers, a critical risk factor for bridge failures.
- **Quality Assurance of Testing:** Ensuring laboratory tests for soil strength and compressibility are accurate and meet technical specifications.
- **Reviewing Test Results:** Interpreting boring logs, CPT soundings, and trial pit results to confirm the suitability of soil for foundation loads.

3. Risk Management and Compliance

- **Constructability Assessment:** Identifying potential geotechnical issues (e.g., weak soil, high water tables) that could delay construction or cause failures.
- **Environmental Considerations:** Evaluating the site to ensure the proposed methods minimize erosion and respect local environmental constraints.

4. Providing Recommendations: Reporting any necessary modifications to the design or construction methods to the team based on site investigation findings.

During road construction, the Geotechnical Engineer's responsibilities include Supervision of site investigations, soil and rock analysis, and contractor's compliance during construction of foundations, slopes, and retaining structures to ensure stability. She/He shall also oversee material testing, ensure compliance with design specifications, and provide recommendations for ground improvement techniques to mitigate risks like landslides and erosion.

Specific responsibilities and duties during construction phase

1. **Supervision of contractor's Site investigation and materials quality analysis:** Ensure that the contractors conduct site investigations, collect soil and rock samples, and perform laboratory and field tests to analyze the site's physical properties, such as strength, stability, and permeability according to set standards.
2. **Supervision of contractors' compliance with de project design and execution planning:**
 - Supervision of the contractors' adherence to designed slopes, embankments, and cuttings to prevent landslides and erosion.
 - Supervision of contractors' adherence to designed foundation systems, retaining walls, and subgrade to support the road pavement.
 - Plan and design dewatering systems to ensure construction can proceed in dry conditions.
 - Assessment of adequacy of drainage design for flagging potential flooding risks and environmental protection required.
3. **Construction oversight and quality control:**
 - Monitor and inspect construction activities to ensure they adhere to the design specifications.
 - Supervise the contractors' materials investigations and testing for components like gravel, sand, and clay.
 - Verify that the foundation and subgrade are being constructed correctly and are suitable for the pavement.
4. **Risk assessment and management:**
 - Identify and assess risks associated with the site, such as landslides, sinkholes, and soil settlement.
 - Develop and implement solutions to mitigate these risks.
5. **Reporting and communication:**
 - Prepare detailed geotechnical reports to document findings and recommendations.
 - Communicate technical information, findings, and safety conditions to project managers, clients, and other stakeholders.
6. **Material recommendations:**
 - Provide recommendations on the most suitable construction materials based on the soil and rock analysis.
 - Suggest and design ground improvement techniques if the existing soil is inadequate.

11.7.6 The Topographical Surveyor

During the design review the responsibility of the Topographical Surveyor shall verify that the proposed bridges fit the physical landscape. He/she shall be responsible for the provision of accurate river cross-sections, establish survey control networks, and identify hazards to ensure the foundation and approach roads are safe, properly aligned, and compliant with structural design limits.

His/her specific responsibilities during the review process shall include:

- **Site Geometry & Positioning:** Providing the precise horizontal and vertical measurements between bridge abutments to determine the exact required span.
- **Control Network Verification:** Establishing and validating permanent or semi-permanent survey control points and benchmarks on both river banks so that structural dimensions map correctly to the ground.
- **Subaqueous & Cross-Sectional Profiling:** Accurately measuring the riverbed to understand scouring conditions, water levels, and elevations. This data is crucial for the design of the substructure and to prevent insufficient foundation embedment.
- **Approach Road Alignment:** Mapping the surrounding topography to help civil engineers

design approach roads that facilitate a smooth, safe launch of the heavy prefabricated steel trusses.

- **Hazard Identification:** Pinpointing topographic hazards (e.g., steep embankments, unstable soil conditions, or flood-prone areas) that may dictate the selection of specific excavation or foundation methods.
- **Data Integration:** Correlating field survey findings with existing site plans to ensure the final design meets all site-specific constraints

During the construction phase the Topographical Surveyor shall be responsible for supervising the survey team in day-to-day surveying activities. He/she will be responsible for planning of the fieldwork, select known survey reference points, and determine the precise location of important features in the survey area. He/she shall be responsible for searching legal records, look for evidence of previous references survey points (geodetic reference points and national benchmarks) and analyse the data to determine the location of boundary lines and record the results of the survey, verify the accuracy of data, and prepare plans, maps, and reports. The Surveyor has to mark all properties to be affected by road alignment.

The Topographical Surveyor's duties during construction phase shall involve confirmation of the contractor's setting out of the construction alignments, monitoring ground movement, and performing quality control checks to verify the project adheres to the design specifications and legal requirements.

Topographical Surveyor's specific duties during-construction phase

- **Confirmation of the contractor's setting out and staking:** Confirmation of the the proposed road alignment and boundaries on the ground using the control points and design plans to make sure that the bridge and other associated drainage structures are constructed on the correct horizontal and vertical alignment.
- **Monitoring quality control:** Regularly checking and verifying that construction activities, like earthwork and material placement, are being done according to the plans and specifications.
- **Monitoring ground movement:** Using instruments to detect any deformations or movement in the ground or structures that could affect stability.
- **Verifying existing conditions:** Performing "as-built" surveys to document the final placement of elements like drainage ditches, utilities, and the road itself.
- **Providing ongoing guidance:** Collaborating with engineers and construction crews to resolve issues and ensure the project stays on track.

11.7.7 The environmentalist

The environmentalist during the design review of the metallic bridge projects shall ensure compliance with environmental laws, minimize ecological disruption (wildlife habitats, water bodies), and optimize sustainability by recommending eco-friendly materials and erosion control. He/She shall review hydraulic studies for proper water flow, confirm waste management, and ensure the design includes mitigations like noise barriers and drainage systems. These actions ensure that metallic bridges are not only structurally sound but also socially and ecologically responsible, minimizing the total footprint on the surrounding

environment.

Key Responsibilities During Design Review:

- **Environmental Impact Assessment (EIA) Integration:** Ensuring EIA findings and regulatory requirements are incorporated into the technical design, including studies on water bodies and forested areas.
- **Ecological Protection:** Reviewing bridge alignment and site layout to minimize habitat fragmentation, protecting vegetation, and preventing wildlife disturbance.
- **Waterway Protection:** Evaluating design components like cofferdams and bridge piers to limit suspended solid production and prevent construction wastewater discharge into water bodies.
- **Material Selection:** Promoting the use of sustainable, recycled, or low-impact construction materials for the metallic structure, as outlined in sustainable construction frameworks.
- **Hydrologic & Hydraulic Safety:** Ensuring the bridge spans large floodplains correctly and includes adequate drainage systems to manage runoff, preventing erosion.
- **Mitigation Planning:** Defining specific measures within the design, such as noise mitigation or habitat restoration areas.
- Review Environmental Impact Assessment (EIA) and revise/update ESMP to conform with environmental and social Regulations, policies and guidelines,
- Review the technical specifications and Bill of Quantities (BOQ) for ESMP,
- Review the compliance requirements of the Project with conditions set on EIA approval, and
- Assist the Team Leader in the Preparation of Design review Reports.

The responsibility of the Environmentalist during the construction phase would include the following:

- Monitoring and assessment of the Environmental Impact of the construction activities and recommendation of mitigation measures,
- Monitoring of the contractor's conformity with environmental and social Regulations, policies and guidelines,
- Monitoring the contractor's compliance with the technical specifications and control of executed quantities in line with the project Bill of Quantities (BOQ) for ESMP,
- Monitoring the contractor's compliance with the requirements of the Project with conditions set on EIA approval, and
- Assist the Team Leader in the preparation of the necessary reports.

11.7.8 The sociologist

During the design review the sociologist shall ensure social sustainability by integrating community needs, mitigating negative impacts, and managing stakeholder engagement. He/she shall identify affected parties, evaluate social impacts like accessibility, and ensure design complies with social safeguards and community safety standards. He/she shall play a key role in ensuring the bridges are not only technically sound but also socially acceptable and beneficial to the local population. The responsibility of the Sociologist during the design review shall include the following:

- **Stakeholder Engagement & Consultation:** Conducting, documenting, and coordinating meetings with residents, community leaders, and local authorities to address concerns.

- **Social Safeguard Integration:** Integrating social safeguards into technical contract documents to ensure compliance.
- **Impact Assessment & Mitigation:** Evaluating project effects on communities, including community disruption and loss of land, and proposing mitigation measures.
- **Compliance & Grievance Management:** Coordinating grievance redress committees (GRCs) and conducting compliance monitoring reports during the design review stage.
- **Accessibility and Safety Design Review:** Ensuring the bridge design, particularly for large metallic structures, maintains accessibility for residents and ensures pedestrian/vehicular safety.
- **Resettlement Action Planning (RAP):** Reviewing and updating RAP, and assisting with the compensation planning for affected parties.
- Assist the Team Leader in the Preparation of Design review Reports

During the construction phase, the Sociologist shall be responsible for the following:

- Supervision of implementation of the project as per environmental and social laws, regulations, policies and guidelines;
- Monitoring of the Social issues in the project in order to minimize any negative impacts from the project on the people in the project area in particular women, persons with disabilities and other members of vulnerable groups; and
- Monitor implementation of the Resettlement Action Plans (RAP) to address the resettlement impacts during project implementation as well as monitor the implementation of the Stakeholder Engagement Plan (SEP), LMP, GBV/SEA/SH Action Plan, and other ESF instruments for the project.

11.7.9 The Quantity Surveyor

During the design review stage, the Quantity Surveyor (QS) shall be responsible for cost planning, risk analysis, and ensuring the project aligns with the client's budget. Key duties include providing cost advice, preparing preliminary estimates and cost plans, analyzing design options for cost-effectiveness, and coordinating with the project team to evaluate the financial impact of design changes.

The specific responsibilities of the Quantity Surveyor during the design review shall include the following:

- Review construction plans and prepare quantity requirements,
- Review project costs prepared during the Detailed design,
- Review the unit price analysis for each work item,
- Review and update the cost estimates of the overall project cost with breakdowns as per the work item specified in BOQ, and construction cashflow projections for the client's use in payment plans.
- Assist the Team Leader in the Preparation of Design review Reports,
- **Cost planning and advice**
 - **Provide cost estimates and cost plans:** Prepare construction programs of works and cost estimates from the working drawings and compare with the project BoQ's and generate .
 - **Offer value-for-money advice:** Advise client on the cost implications of different design choices to help them get the best value for their investment.

- **Analyze life-cycle costs:** Examine the potential costs over the entire life of the building or project.
- **Risk and change management**
 - **Identify and evaluate risks:** Analyze and assess commercial and financial risks associated with the design.
 - **Evaluate design changes:** Assess the financial impact of any changes to the design and ensure the project stays within budget.
 - **Perform value engineering:** Propose cost-effective alternatives and solutions to the design team.
- **Collaboration and documentation**
 - **Liaise with stakeholders:** Work closely with the contractor to ensure costs are controlled and expectations are aligned.
 - **Update cost plans:** Regularly update the cost plan based on new design information and employer requirements.
 - **Contribute to specifications:** Provide input on specifications and contract conditions to reflect cost requirements.

During the construction phase, the Quantity Surveyor (QS) shall be responsible for cost management, risk assessment, and contract administration to ensure the project stays within budget and meets quality standards.

The specific responsibilities and duties of the Quantity Surveyor during the construction stage would include the following:

- Carry out measurements of work to be done before execution,
- Carry out daily measurements of work done by contractor,
- Carry out measurements of work done and completed in accordance to the project specifications,
- Inform the Senior Inspector of Works of non-conformities by the contractor,
- Review and update the cost estimates of the overall project cost with breakdowns as per the work item specified in BOQ,
- Monitor and control project costs against the budget, identifying any potential overruns.
- Manage and price variations and change orders as they arise.
- Liaise with site managers, contractors, and subcontractors to coordinate efforts and resolve issues.
- Valuation completed work to process interim payments to subcontractors and contractors.
- Monitor the progress of the work against the schedule and budget.
- Assess risks and develop mitigation strategies throughout the project.
- Ensure that the project complies with contractual, legal, and quality standards.
- Assist the Team Leader in the preparation of project progress reports,

At the end of construction, the quantity Surveyor shall carry out the following:

- Finalize project accounts and handle any claims or disputes that may arise.
- Prepare and submit final financial reports.

11.7.10 Health and Safety Officer

During construction, the Health and Safety Officer shall be responsible for identifying and mitigating

hazards, ensuring compliance with safety regulations, providing training, and managing emergency preparedness. Their duties include conducting site inspections, investigating incidents, implementing safety policies, and acting as a communication link between workers and management to foster a strong safety culture.

She/he shall be responsible for monitoring of day-to-day implementation of the Occupational Health and Safety (OHS) issues under the project and ensure compliance by the Contractor with all EHS Plans in order to help avoid, minimize, mitigate and remediate, if necessary, any negative related to OHS impacts and risks around the project.

Key Responsibilities and Duties

1. Planning and compliance

- **Develop safety plans:** Assist in creating site-specific health and safety plans.
- **Ensure documentation:** Confirm that all necessary documents have been submitted to relevant authorities.
- **Review contractor plans:** Assess and approve contractors' health and safety plans before work begins.
- **Stay updated:** Keep current with the latest safety regulations and industry best practices.

2. On-site inspections and risk management

- **Conduct regular inspections:** Walk the site to identify potential hazards, unsafe equipment, and dangerous practices.
- **Monitor hazardous materials:** Oversee the safe handling and storage of hazardous materials.
- **Enforce PPE use:** Ensure that workers are using personal protective equipment (PPE) correctly.
- **Check equipment:** Verify that all tools and machinery are in good working order.

3. Training and communication

- **Provide safety training:** Educate workers on safe practices and specific site risks.
- **Conduct inductions:** Lead site-specific safety inductions for new workers.
- **Communicate risks:** Establish communication structures to share safety information with all personnel.
- **Facilitate meetings:** Lead site health and safety meetings and "toolbox talks".

4. Emergency preparedness and incident response

- **Develop emergency plans:** Create comprehensive emergency response and preparedness plans for the project.
- **Conduct drills:** Organize and test emergency response plans through drills.
- **Respond to concerns:** Address safety concerns raised by employees.
- **Investigate incidents:** Investigate accidents and near-misses to find the root cause and recommend corrective actions.
- **Manage records:** Maintain detailed records of incidents, inspections, and corrective measures.

5. Reporting and administration

- **Maintain records:** Keep all health and safety records updated.
- **Submit reports:** Prepare and submit required reports to management and regulatory agencies.
- **Monitor safety performance:** Track and analyze safety data to identify trends and areas for improvement.

11.7.11 Senior Inspector of Works

The Senior Inspector of Works shall be responsible for overseeing and documenting construction to ensure compliance with plans, specifications, and safety regulations. His/her duties shall include conducting inspections, verifying materials, supervising the Junior Inspectors, maintaining detailed records, and coordinating with project managers and contractors to resolve issues. She/he shall be responsible for all site inspections and orientation of the contractor on quality control and conformity with the project specifications. He/she shall also be responsible for time and cost control of the project to ensure alignment with timelines and budget.

Key responsibilities and duties

- **Project Oversight:**
 - Conduct comprehensive on-site inspections to monitor project progress and ensure adherence to plans and specifications.
 - Supervise and guide a team of inspectors, assigning tasks and ensuring consistent interpretation of standards.
- **Quality and Compliance:**
 - Verify that all construction materials and workmanship meet quality standards and project requirements.
 - Ensure compliance with all relevant safety and regulatory standards.
 - Document the quantities of materials used and work performed.
- **Documentation and Reporting:**
 - Maintain detailed daily records of construction activities, personnel, equipment, and site conditions.
 - Prepare detailed inspection reports, field notes, and other documentation for project management and regulatory agencies.
 - Manage project correspondence and maintain files for RFIs (Requests for Information) and RFCs (Requests for Construction).
- **Problem Solving and Coordination:**
 - Collaborate with project managers, engineers, and contractors to discuss inspection findings and recommend corrective actions.
 - Assist in resolving disputes related to construction quality and contract compliance.
 - Communicate effectively with the public and other stakeholders about project activities.
- **Contract Administration:**
 - Review and interpret construction documents, plans, and specifications.
 - Assist in the preparation of change orders when necessary.
 - Perform final inspections and prepare punch lists to ensure all items are completed.
- **Training:**
 - Train and instruct new inspectors on procedures and standards.

11.7.12 Junior Inspector of Work

The Junior Inspector of Works' responsibilities during road construction include ensuring the contractor adheres to contract documents and project specifications, performing on-site inspections to verify quality and safety, and maintaining detailed records of daily activities. She/He must also communicate with senior inspectors and contractors, report issues, and ensure work aligns with plans and regulations. She/he shall be responsible for all site inspections and orientation of the contractor on quality control and conformity with the project specifications. He/she shall also be responsible for time and cost control of the project to ensure alignment with timelines and budget

Key responsibilities and duties

- **Compliance and quality control:**
 - Ensure all construction work follows the project's plans, specifications, and contract documents.
 - Monitor materials and workmanship to ensure they meet quality and regulatory standards.
 - Verify alignments, levels, and dimensions of the road and related structures.
- **On-site inspections:**
 - Conduct regular site visits to monitor construction progress and identify potential issues.
 - Inspect various stages of road construction, including preparation, paving, and finishing.
 - Witness and verify critical tests, such as soil compaction and material strength.
- **Record-keeping and reporting:**
 - Create and maintain detailed daily records of work, including personnel, equipment, materials, and site conditions.
 - Document all inspection findings, non-compliance issues, and corrective actions.
 - Prepare daily, weekly, and monthly reports for senior inspectors on project status and issues.
 - Take photographs and keep records of materials delivered to the site.
- **Communication and coordination:**
 - Report project status, issues, and progress to senior inspectors.
 - Communicate effectively with contractors to clarify requirements and address problems.
 - Collaborate with engineers, project managers, and other team members to resolve conflicts.
- **Safety and compliance:**
 - Maintain awareness of safety regulations and report unsafe practices.
 - Ensure the work complies with relevant local, state, and federal road safety regulations.

11.8 Office accommodation

Office accommodation of a reasonable standard and of approximately 10 square metres for each expert working on the contract will be provided by the Client through the Works' Contract for the duration of Stage I and Stage II for all the interventions and for the first month of Stage III.

The Supervision Consultant must make provision for his own office accommodation during the last 11 months of Stage III. Any additional cost of office accommodation is to be covered by the fee rates. All office supplies must be provided by the Supervision Consultant.

11.9 Facilities and equipment to be provided by the Consultant

The supervisor must ensure that experts are adequately supported and equipped. In particular it must ensure that there is sufficient administrative, secretarial and interpreting provision to enable experts to concentrate on their primary responsibilities.

The cost of provision for the Consultant facilities (housing and office accommodation), survey equipment and office equipment including the maintenance thereof during the assignment shall be covered by the works contract. Therefore, the consultant shall not include the costs in his financial proposal.

The Consultant, through the works contract, shall be provided 6 (six) fully equipped vehicles (4x4, double cabin) to be used during Stages I and II. All costs for acquisition, maintenance, fuel, insurance, etc., should be covered by the works contract.

All equipment and means supplied to the Supervision Consultant under this contract must be in a position to be used for the desired purposes, throughout the duration of the contract.

12 REPORTING REQUIREMENTS AND TIME SCHEDULE FOR DELIVERABLES

12.1 Reporting Requirements

- Prepare and submit to client conceptual design review report with recommendations;
- Prepare and submit to client the project inception report containing contract data for the Supervision and the contracts, status on mobilization, consultant and contractor's programs of works, cash flow projections, contractors' quality control plan, contractor's ESMP, VBG prevention and management plan and information gathered and required for the detailed engineering design, and the status of contract execution by the contractor;
- Supervise the detailed engineering design by the contractor and advise client on recommendations;
- Prepare and submit to client monthly progress reports;
- Prepare and submit to client quarterly progress reports
- Prepare and interpret monthly cash flow projections for the works;
- Prepare monthly valuations of the works in progress;
- Prepare interim payment certificates, completion certificates and other certificates required under the construction contracts;
- Monitor progress of the works and advise on contractual implications of delays and other factors affecting progress and contribute to the solution of problems that may arise;
- Prepare quarterly financial statements;
- Monitor changes and variations to the contract including construction methods, negotiate prices for such changes with the contractor and report thereon;
- Prepare quarterly progress and cost reconciliation statements for the effective management of the project;
- Prepare monthly and quarterly report on environmental, social, safety and health with key corrective effort undertaken on site with recommendation.
- *immediately notify the Client of any failure by the Contractor to comply with its SEA and SH obligations;*
- *Immediately notify the Client of any allegations, incidents or accidents, which may or are likely to have a significant adverse effect on the environment, the affected communities, the public, Client's Personnel, Contractor's Personnel or Experts. In case of SEA and/or SH, while maintaining confidentiality as appropriate, the type of allegation (sexual exploitation, sexual abuse or sexual harassment), gender and age of the person who experienced the alleged incident should be included in the information. The Consultant shall provide full details of such incidents or accidents to the Client within the timeframe agreed with the Client.*
- *Immediately notify the Client of any non-conformance from the contractor.*
- *immediately inform and share with the Client notifications on ES incidents or accidents provided to the Consultant by the Contractor, and as required of the Contractor as part of the Progress Reporting;*
- *share with the Client in a timely manner the Contractor's ES metrics, as required of the Contractor as part of the Progress Reports.*

- Evaluate and negotiate on contractual issues, assess loss and expense claims submitted by the contractor and make recommendations thereon to Client;
- Assess the quantities, specifications and costs of inputs made by the Client and/or value works or goods for which the Client wishes to make a direct payment to a sub-contractor or supplier;
- Prepare bills of re-measurement for all variations, prime cost and provisional sums and provisional quantities and agree the final accounts for the construction contract (including all nominated sub-contracts). Such final accounts shall include notional final accounts and final payment certificates resulting from the termination of any construction contract by the employer or contractor, or due to the frustration of the contract due to '*force majeure*';
- Arranging the provision of record drawings (both hard copies and electronic copies in AutoCAD 2025 or later and PDF) and manuals necessary for the operation and maintenance of the works and provide any documents necessary to co-ordinate drawings and manuals supplied by others.
- Prepare and submit to the Client the Construction Completion Report.
- Prepare and submit to the Client the Project Final Report.

12.2 Time Schedule for Deliverables

The Consultant shall produce a series of reports in English language during the services. These reports shall be submitted to the ANE via the Project Implementation Unit Coordinator based in Pemba according to the following schedule and in the following quantities. These are merely indicative and does not preclude additional reports that the Consultant may be required to prepare within this consultancy. In addition to 10 hard copies, the Consultant will also be required to submit reports in acceptable electronic formats (e-copy in CD or memory stick/flash disk). The Consultant shall allow for a maximum of 15 days period in between submission of reports and review by the Client.

Table 4: Time Schedule for Deliverables

Item	Deliverable	Due date
1.	Project Inception Report • The Consultant shall prepare and submit to client an inception report after 4 (four) weeks from the start date of the Services, the Consultant must submit to the Client the Initial or Summary Report, in which the Conceptual Design is evaluated, proposing eventual changes to the project, as well as the update of the work program; • The Inception Report will be delivered to the Client, for approval, in 3 (three) printed copies of the report in English and Portuguese and an electronic copy on CD, in PDF, MS Word, Excel and CAD formats for technical drawings or in another format deemed more convenient; • Within 15 (fifteen) days, the Supervision Consultant must receive comments from the Client.	4 weeks of commencement of the assignment

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2.	Detailed Design Review Report • Prepare and submit to client conceptual design review report with recommendations;	60 days of commencement of the assignment
3.	Detailed Engineering Design Review Report • A Site Investigation report to be submitted up for completion of the consultants site investigations; • A report on the completion of the design review containing decisions made on the planning arrangement, appearance, specification and cost of the project. Drawings submitted shall include geotechnical, structural and civil works, landscaping for each bridge including all drainage works. Revised detailed design and bridge deck installation details and full specifications shall be submitted. • All planning approvals shall be obtained at this stage. • Revised Bills of quantities for all the works shall be submitted and in elemental format. • A detailed cost estimate based on the bills of quantities (pre-bid estimate). • A complete set of production information and documents in sufficient detail required under the contract to complete all the construction. • Electronic copies of all drawings and details in AutoCAD 2013 or later version format and PDF and all tender documents in MS Excel / Word 2010 format on CD's or prepared using any readily available quantity surveying package a copy of which shall be provided to the Client.	45 days from approval of inception report
4.	Construction Supervision Minutes of all meetings issued within five working days of the meeting. The minutes shall contain the following as a minimum requirement: • Issues discussed; • Recommendations made and agreements reached; • Further actions required and parties concerned; and • Target dates for actions or other objective criteria for the assessment of progress. • Brief reports on tasks completed, time spent and estimates of the time required for the completion of the remaining tasks and/or works	During construction period
5.	Progress Reports • During the execution of the services, the Supervision Consultant must submit to the Client monthly progress reports in English and Portuguese, in which all aspects of the work carried out are described in the necessary detail, both in physical execution and budgetary execution, identifying the aspects considered abnormal or of risk to the successful execution of the Works.	Monthly during construction period

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	• The progress report will include work charts, S-Curves, the list of any problems that are causing or may cause delays, including proposed measures to correct the problems shall also be reported • The monthly progress reports shall form part of the deliberations of the monthly site meetings. Such reports shall indicate elemental progress achieved for the bridge, road, drainage and erosion protection works and provide an assessment of the overall progress against the construction program. The report shall be attached to the minutes of the site meeting for the relevant month. • These reports will be submitted using the standard technical format, to be agreed at the beginning of the Services. • The reports shall be delivered to the Client, for approval, in 3 (three) printed copies of the report in Portuguese and an electronic copy on CD, in PDF, MS Word, Excel and CAD formats for technical drawings or in another format deemed more convenient; • Within 15 (fifteen) days, the Supervision Consultant must receive comments from the Client.	
6.	Quarterly Progress Reports (QPR) • The consultant shall submit quarterly progress reports, which shall consolidate the monthly progress reports and examine issues addressed in site meetings as well as other factors affecting progress in greater depth. • The Quarterly Progress Reports shall cover all aspects of Project implementation and disbursement schedules, financial summary, including implementation of environmental and social mitigation measures. • The QPRs shall also highlight issues affecting Projects implementation and proper corrective actions. • Update activity and staff schedule showing actual against planned progress and achievement milestones/ deliverables. Description of work completed in previous quarter and planned activities for coming quarter. Summary of issues addressed, identification of potential problems, delays, etc. • The reports shall make recommendations for the improvement of progress, maintenance of quality of the works and a cost appraisal of the contracts. • The report shall be issued during but not later than the second week of the month following the reporting quarter. • The reports shall be delivered to the Client, for approval, in 3 (three) printed copies of the report in Portuguese and an electronic copy on CD, in PDF, MS Word, Excel and CAD formats for technical drawings or in another format deemed more convenient;	Quarterly during construction period

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7.	Safeguards Compliance report • The report shall provide details of progress towards implementation of C-ESMP and other environmental and social requirements under the project including Grievance Redress Mechanism (GRM). • The Consultant must note that all payments shall be processed only upon recommendation of ANE CRRN safeguards unit, regarding progress in the implementation of agreed safeguards stipulate above. In other words, payments will be withheld until there is substantiative progress in implementation of safeguards measure.	Monthly during the construction period
8.	Cost Reports and Final Accounts Cost reports shall be submitted every quarter and shall indicate in detail amounts to be omitted from or added to the contract prices. Expected headings are as follows: • Prime Cost and Provisional Sums; • Provisional Quantities; • Instructions; • Loss and expense claims; and • Statutory Price Fluctuations. The final cost report shall be the final account to be signed by the Client and the contractor and witnessed by the consultants. All additions and omissions to the contract price shall be justified by detailed workings, receipts/invoices and other documents in a transparent and accountable manner. The cost reports shall be issued during but not later than the second week of the month following the quarter of the report.	Quarterly
9.	Certificates • The following certificates shall be in any format chosen by the team leader of the consultants subject to provisions of the construction contracts. ○ Extension of completion date; ○ Practical Completion; and ○ Certificate of Making Good Defects • Monthly payment certificates shall be in the ANE/Road Fund standard form to be signed by the Project Coordinator. • The amounts shall be transferred to the certificate from a valuation breakdown that shall be sufficiently detailed and clear to enable the reading of amounts certified for each building element and section of external works.	During construction period

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	• Payment Certificates shall be issued within ten days of the site valuation day or the date of receipt by the Consultants of a valuation prepared by the contractor.	
10.	Accident Reports • Throughout the contract, the Supervision Consultant may be asked to produce specific reports in English and Portuguese on anomalies or unpredictable situations. In the event of an accident, regardless of its severity, the Consultant shall inform the ANE PIU as soon as possible and in any case within 24 hours, by any means that can leave a written trace (text message, email, etc.). This initial information will be limited to the circumstances of the accident and the first measures taken to contain it. Within 72 hours, the Consultant will produce a more complete report, including at least the following elements: • circumstances of the accident (date, time, location, involved parties, magnitude); • first measures taken (in relation to the victims but also to limit the impacts including precautionary measures); • analysis of probable causes (direct and indirect); and (iv) corrective measures, including in particular support for victims and what is planned to limit/prevent the occurrence of such events, in the form of a matrix clearly indicating for each cause, the measures, the deadline and the person responsible for implementation, as well as the verification indicator. • The report will be delivered to the Client, for approval, in 3 (three) printed copies of the report in English and Portuguese and an electronic copy on CD, in PDF, MS Word, Excel and CAD formats for technical drawings or in another format deemed more convenient. • Within 15 (fifteen) days, the Supervision Consultant must receive comments from the Client.	Ad-hoc
11.	Non-compliance event report / Critical issue reports • The no-compliance event report shall cover all critical issued that may occur at site during the implementation and have to be reported immediately. • The report will be delivered to the Client, in 3 (three) printed copies of the report in English and Portuguese and an electronic copy on	Ad-hoc

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	CD, in PDF, MS Word, Excel and CAD formats for technical drawings or in another format deemed more convenient. • Within 3 (fifteen) days, the Supervision Consultant must receive comments from the Client	
12.	Construction Completion Report • At the end of construction stage, the Supervision Consultant must submit to the Client the Preliminary Construction Completion Report, written in English and Portuguese. • The Preliminary Construction Completion Report, shall be submitted in 5 (five) printed copies written in English and an electronic copy on CD, in MS Word, Excel and CAD formats for technical drawings or in another format regarded as more convenient; • Within 15 (fifteen) days, the Supervision Consultant must receive comments from the Client. The Consultant should take these comments into account when preparing the Final Report;	14 months from start of assignment
13.	Maintenance during Defects Liability Period • As built drawings submitted by the contractor; • Shop drawings submitted by the contractor; • Drawings and manuals for the operation and maintenance of the metallic bridges; • Training materials and a one-day workshop for the officials of the staff of Client; • List of minor outstanding works and defects at practical completion of the works; • List of outstanding works and defects noted and corrected after practical completion of the works; and • Certificate of making good defects	Within defects liability period of 12 months after completion of construction
14.	Final (completion / Closure) Report • At the end of the defects liability period, the Supervision Consultant must submit to the Client the Preliminary Final Report, written in English and Portuguese. • The Preliminary Final Report, shall be submitted to the client in 5 (five) printed copies written in English and an electronic copy on	26 months from start of assignment

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	CD, in MS Word, Excel and CAD formats for technical drawings or in another format regarded as more convenient; • Within 15 (fifteen) days, the Supervision Consultant must receive comments from the Client. The Consultant should take these comments into account when preparing the Final Report; • For the Final Report, the Supervision Consultant will deliver 5 (copies) printed copies of the report in English & Portuguese and an electronic copy on CD, in PDF, MS Word, Excel and CAD formats for technical drawings or in another format deemed more convenient.	
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