



República Democrática de São Tomé e Príncipe
Ministério de Infraestruturas, Recursos Naturais



INSTITUTO NACIONAL DE ESTRADAS



afap Agência Fiduciária de Administração de Projetos

Second Transport Sector Development and Coastal Protection Project [P178353]

Financing:  WORLD BANK GROUP
Transport

TERMS OF REFERENCE PREPARATION OF THE FEASIBILITY STUDY AND DETAILED DESIGN FOR

**REHABILITATION OF EN1, SECTION S2 [EN1-S2: GUADALUPE-
NEVES]**

**REHABILITATION OF EN1, SECTION S3 [EN1-S3: NEVES – PONTA
FURADA]**

**REHABILITATION OF MARGINAL I [BAIA LAGARTO AND
PROMONTORY BETWEEN BAIA LAGARTO AND BAIA ANA
CHAVES]; [ROAD LINKING EN1 AND ES101] AND [ROAD 1013A -
PASSADEIRA]**

**EX-POST EVALUATION OF THE REHABILITATION OF EN1,
SECTION S1 [EN1-S1: SÃO TOMÉ - GUADALUPE]**

**ROAD SAFETY AUDIT EN1-S2 AND EN1-S3/ GUADALUPE – NEVES –
PONTA FURADA/ AND MARGINAL I**

TERMS OF REFERENCE

Update of the Feasibility Study and of the Detailed Design for the Rehabilitation of EN1, Section S2 [ENIS2: Guadalupe-Neves]

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Preparation of the Environmental and Social Impact Assessment, Feasibility Study and Detailed Design for the Rehabilitation of EN1, Section S3 [EN1-S3: Neves – Ponta Furada]

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Update of the Feasibility Study and Detailed Design for the Rehabilitation of Marginal I [Lagarto Bay and the Promontory between Lagarto Bay and Ana Chaves Bay]; [Road Linking EN1S1 and ES101 (Baia Lagarto)] and [Road 1013A known as Passadeira]

- | -

**Ex-post assessment of the rehabilitation of EN1, Section S1 [ENIS1: São Tomé -
Guadalupe], including socio-economic assessment and preparation of maintenance plans.**

- | -

Road Safety Audit of the Guadalupe-Neves-Ponta Furada Section [EN1S2 and EN1S3] and Marginal I

[illegible]

Fig. 1: Graphic Scheme of National Road n° 1 within the scope Project of Transport and Coastal Protection (PTPC)

also heavily used by heavy trucks to transport fuel and beer from Neves to the rest of the country.

Within the scope of the First and Second Development Project for the Transport Sector and Coastal Protection of São Tomé and Príncipe (P161842 and P178353), financed by the World Bank, the Government of STP applied for financing the rehabilitation of sections **S1** and **S2**, i.e. [*São Tomé – Guadalupe – Neves*].

The rehabilitation of the first section, *São Tomé – Guadalupe (S1)*, with approximately 13.375 km, as can be seen in *Fig. 1*, was completed in November 2023 through financing from the World Bank.

The second section, *Guadalupe - Neves (S2)*, with approximately 14.125 km, as can be seen in *Fig. 1*, has an extensive portion of coastal road where on the left you can generally see extremely unstable excavated embankments with a very steep slope (in some sections the slope even reaches 90°); on the right, embankment slopes are generally visible (in some sections there is strong and constant erosion caused by sea waves and in others, coastal protections can be seen with retaining walls in reinforced concrete, cyclopean concrete and/or gabions, most of them were recently built. Regarding this section, S2, there are studies and projects carried out around four years ago that require updates to be carried out and an execution project to be drawn up for its rehabilitation.

The third and final section *Neves - Ponta Furada (S3)*, with around 20,900 km, as can be seen in *Fig. 1*, has subsections with similar characteristics to **S2**. A large part of its length, particularly between Diogo Vaz and Santa Catarina, is the most exposed to the effects of climate change, being subject to frequent flooding, coastal erosion, landslides, falling trees.

REHABILITATION OF MARGINAL I¹[ES101]

Within the framework of this Project and in accordance with the scheme in *Fig.-2*, the Rehabilitation of the Agua Grande Bay Road, also known as Marginal, is subdivided into three sections indicated below:

1. MARGINAL I, which includes:
 - a. Lagarto Bay Road (ES101)
 - b. Promontory between Lagarto bay and Ana Chaves Bay (ES101),
 - c. The road segment known as **Passadeira**², between the end of Lagarto Bay and the beginning of Ana Chaves Bay, bordering the coast and passing close to the CkDO Supermarket Building. This road is included in *Fig. 2*, and can be seen on the map in Annex 01.
2. MARGINAL II: Ana Chaves Bay and goes to Fortaleza San Sebastião “PM beach”; and
3. MARGINAL III: Coast that goes from PM to Pantufo.

¹ Marginal I is also known as Agua Grande Bay Road or Lagarto Bay Road

² The road denominated in this TOR as Passadeira has been translated in previous studies as Pathway Road

The Marginal I Road is a very important road in São Tomé, because it is the main access to São Tomé airport, the Dr. Ayres Menezes Central Hospital and the country's capital, with intense economic activity, tourist and population potential along the coast. The population and economic activities of the island of São Tomé are located mainly along the coast, away from the steep inland slopes that make up the rest of the islands. Until now, tourism has been associated with these coastal areas and continues to be an important source of income for the national economy.

According to previous studies carried out in the Preliminary Environmental Impact Assessment, the effect of climate change has been leading to strong erosion of the coastline and beaches throughout the island of São Tomé, with particular incidence in the bays located in the capital; Damage to pavements and collapse of retaining walls, erosion of beaches and consequent reduction in fishermen's landing sites, occasional wave overflows and consequent flooding of the roads that make up the waterfront are extremely prominent.

The rehabilitation of the sections corresponding to Marginal II (Baía Ana Chave) and Marginal III (Baía Pantufo) has already been awarded under financing from the European Investment Bank (EIB) and Invest Internacional (Dutch Cooperation Fund).

Marginal I, is now integrated into the Second Transport and Coastal Protection Project, P178535, financed by the World Bank with the co-financing of the Global Environmental Fund (GEF).

The segments that make up Marginal I, as can be seen on the Map in Annex-I, are: *Lagarto Bay*, which starts next to the Airport, beyond the Hotel “O Bigodes” (PK 0+ 000), continues along Lagarto Bay for a length of 1.90km, covers the Promontory between Lagarto Bay and Ana Chaves Bay, and ends south of Hospital Central Ayres Menezes specifically next to the access to Passadeira Supermercado CkDO (PK 2+760). It also includes the road known as Passadeira 1013A, 1.50km long.

Under this lot, the unpaved road segment with a length of 1.5 km linking ES101 to the EN1-S1, passing through the Tourism School, marked as a red dotted line in the map in the Annex I, is a very important alternative detour in emergency situations (cases of serious crashes that require traffic to be cut off or, even if required during the rehabilitation works of the remaining sections of the Marginal) should be the subject of studies by the Consultant.

B. OBJECTIVES AND SCOPE OF WORK

The Government of São Tomé and Príncipe, through its road agency, the National Roads Institute (*INAE*), requires consultancy services to carry out the following activities:

Rehabilitation of EN1, Section S2 and S3

A – EN1-S2/Guadalupe - Neves/ - Update of the existing studies relating to the rehabilitation of this section, namely: A₁ – the Feasibility Study; A₂ - the detailed engineering design, bidding document, so that they are ready to be used for the tender of the civil works.

B – EN1- S3/Neves - Ponta Furada/ - Preparation of: B₁ - Environmental and Social Impact Assessment (ESIA) and preparation of the Environmental and Social Management Plan and *the Resettlement Policy Framework (RPF) for the Rehabilitation of the Road Section*; B₂ - Feasibility Study; B₃ - Detailed engineering design, bidding documents and Resettlement Action Plans. Deliverables have to be ready to be used in the tender for the civil works, complying with the standards and requirements for World Bank financed projects.

Rehabilitation of Marginal I [Baía do Lagarto and Promontory (ES101); Passadeira (1013A) and Road Linking ES101 to EN1S1]

C – Lagarto Bay and Promontory; Passadeira/ - Update of elements of existing studies relating to the rehabilitation of the section, namely: C₁ - the Feasibility Study; C₂ - the detailed engineering design, which has to be ready to be used in the tender for the civil works, complying with the standards and requirements for World Bank financed projects.

D – Road Linking ES101 (Lagarto Bay) to EN1S1 (Bairro Liberdade)/ - Preparation of: D₁ - Feasibility Study; D₂ - Detailed engineering design and bidding documents.

Ex-post assessment of Rehabilitation of EN1, Section S1

E – Ex-post assessment of the rehabilitation of EN1, Section S1 [EN1S1: São Tomé - Guadalupe], including socio-economic assessment and preparation of maintenance plans.

Road Safety Audit on EN1, Section S1 and Marginal I

F – Road Safety Audit of the road design of EN1S2 and EN1S3 /– Guadalupe – Neves and Neves – Ponta Furada/ and of the roads composing the Marginal I lot.

C. PREPARATION OF THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

The Preparation of the Environmental and Social Impact Assessment [ESIA] mentioned in "B1" above shall be carried out in accordance with **Annex 2**.

D. FEASIBILITY STUDY

When preparing the Feasibility Study, the Consultant must consider alternative engineering and environmental solutions that promote climate resilience in order to determine economically viable solutions for all elements. Whenever possible, hybrid solutions must be considered, utilizing green and grey solutions, especially nature-based solutions. Design flexibilities should be considered whenever useful cost savings can be achieved and where road safety and climate resilience are not significantly affected.

The study will examine the comparative costs of alternatives and identify environmental and engineering advantages and disadvantages. Future maintenance requirements (integration of climate change) must be taken into account when comparing alternatives.

The Consultant must prepare an exhaustive report on the feasibility study, describing the engineering options, environmental and social constraints, traffic analysis, estimated costs, expected impacts of climate change and economic analysis, conclusions and recommendations for the preferred alignment.

In order to allow INAE to ensure different sources of financing and methodologies, the study corridor will focus on the 2 sections, S2 and S3 of EN1 and Marginal I, defined previously. In other words: (i) EN1S2/Guadalupe-Neves [14,125 km], this being the update of the existing study; (ii) EN1S3/Neves-Ponta Furada [20,900 km]; and (iii) Marginal I [2,760 km] which includes the 1.50km ES101-EN1S1 road link. Design standards, traffic volumes and composition, safety for all road users, resilience to climate change and disaster risks, rehabilitation costs and economic assessment will be defined and assessed by the Consultants.

The Client will provide the Consultant with all available data and existing information relevant to the services to be provided by the Consultant under this Terms of Reference. However, the Consultant cannot claim from the Client the failure to fulfill its obligations under the terms of the contract due to the lack of data made available to it.

DATA COLLECTION

The Consultant and their key experts will collect and study the topographic, geological, climatic and hydrological characteristics (including expected future conditions) of the corridor area and their effects on the project's road alternatives to be examined to choose the preferred options. Surveys, investigations and other studies and additional works will be prepared by the Consultant to enrich your data and optimize the preparation of feasibility studies for each of the two sections of EN1, EN1S2 and EN1S3, and Marginal I [Baia Lagarto, the Promontory], [Passadeira 1013A] and [Road link ES101 to EN1S1].

CLIMATE CHANGE ANALYSIS

As the climate is expected to change, and this change will have direct impacts on road infrastructure, the Consultant will collect and analyze existing information on the current weather conditions that affect the two sections of EN1, EN1S2 and EN1S3, and Marginal I [Baia Lagarto, the Promontory], [Passadeira Urbano 1013A] and [Section connecting Baía Lagarto (ES101) to EN1S1] , and their possible future evolution in the context of climate change, at least until 2050 – including information available in study documents (Resilience

Climate of the Transport Network, Through the Vulnerability Assessment and Management of Climate-Informed Road Assets in São Tomé and Príncipe) already completed, carried out by FinnOC/INAE. The Consultant will select, in agreement with the Client and the World Bank, two climate change scenarios (one that can be considered moderate and the other high), including at least the evolution of temperature, precipitation, increase in average sea level and change in storm conditions.

WORKS TO SURVEY ROAD AND PAVEMENT CONDITIONS

As the feasibility study requires prediction of highway pavement conditions over time for both the *"do"* and *"do nothing"* alternatives, the condition of the pavement and in particular roughness will determine (along with other factors such as speed, alignment, cross-section and traffic) vehicle operating cost and time savings. The Consultant will perform traffic and road/pavement condition surveys necessary to conduct the feasibility study and economic assessment of the project, including road roughness survey to determine the International Roughness Index (IRI).

The Consultant will examine at least two different design standard options and carry out an economic assessment to compare and select the most economical solution in terms of technical difficulties, construction cost, long-term social and economic benefits, integrating the impact of temperature evolution.

TRAFFIC DATA AND ANALYSIS

The Consultant shall verify the type and volume of existing traffic for the roads in question, analyzing all existing statistical data, carry out and analyze the necessary traffic counts and surveys, to determine the nature of the traffic and the current volume of freight movements and passengers on the road. The Consultant, if necessary, must carry out other field investigations.

Traffic studies will include:

- (i) The composition of existing traffic, occupancy and volume of traffic disaggregated by type of vehicle
- (ii) Forecasts of annual average daily traffic composed of normal, attracted, generated and diverted flows, by appropriate vehicle types.
- (iii) Speed measurements to determine average speed and free flow on different sections of the road and for each type of vehicle.

The traffic inspection will generally last 1 week, comprising daytime counts with at least one nighttime count. Where deemed appropriate, the Consultant will divide the road into sections and conduct relevant traffic analyzes and studies accordingly. Detailed proposals for traffic inspections will be previously submitted for approval by the Client.

The Consultant will identify, describe and quantify existing and potential traffic generating factors in the immediate areas served by the road, or in areas likely to be influenced by its future improvements, based on the economic development of the region and future road transport needs. These needs will result, in particular, from:

- Demographic growth and changes in the distribution of the rural urban population,
- National and regional economic growth,
- Development of agriculture, industry, commerce and tourism within the project area,

- Development of social services and schools,
- Other factors identified by the Consultant.

Based on the analysis, the Consultant will:

- Detailed annual traffic forecasts for a period of ten years after the road is completed; and still
- More general projections of future traffic for the next 10 years.

While greater emphasis will be placed on accurate forecasts in the early phase of the project life, all traffic forecasts will be given at three growth rates, namely low, medium and high. The Consultant will select one of the three levels of forecasts to be used in the final evaluation of the project, indicating the reasons for the selection, and will also use the other two levels in the sensitivity analysis.

When developing final traffic forecasts, the Consultant will pay particular attention to the future mix of vehicles in the traffic population. Due attention should therefore be paid to the changes in vehicle sizes and types that will arise when improvements in road conditions are introduced.

DESIGN STANDARDS

One of the major concerns regarding the viability of the Rehabilitation of the EN1S2 and EN1S3 and Marginal I is to keep construction costs to a minimum, as well as road maintenance costs to a minimum, in order to ensure the economic viability of the project. Since higher geometric design standards mean higher costs, this implies a reasonable reduction in road standards. Therefore, the Consultant is obliged to evaluate and propose design standards balancing the costs involved.

COASTAL PROTECTION

In the case of **EN1S2**, the 14.125km section between Guadalupe and Neves has a long section of road located along the coast. During previous projects, financed by the FED in 2012, some coastal protections were built. However, not all exposed segments were protected. There is a considerable length of very unstable steep slope that occasionally, when it rains, causes mass movements (rockfalls, landslides) blocking the road.

Consultants must, taking into account existing studies, define the current and future risks (within the scope of the 2 selected climate change scenarios) of coastal erosion and flooding of the different segments of the section, considering the current level of protection. The Consultant will present the expected cumulative damage (for erosion) and maximum overflow rates (for flooding) for the expected life of the road. The Consultant will present the results to the Client and the World Bank, and will propose an acceptable level of risks to be ensured by the design. Based on this threshold, the Consultant will develop risk mitigation measures, including nature-based alternatives where relevant. If nature-based solutions are not found feasible, the Consultant will clearly explain the reasons why, and will preferably propose a grey alternative.

In the case of **EN1 S3**, a 20.90km section between Neves and Ponta Furada, it has a considerable length of road located on the coast with elevations very close to the current average sea level, on the left you can see very steep excavation embankments (very close to 90°), covered with dense vegetation, with frequent landslides and falling trees; Along this section there are bridges of different sizes, some of which are in an advanced state of degradation. During previous projects, through financing from the BM between 1997 and 1998, the Neves –

Santa Catarina - Bridge over the Lembá River sections benefited from the rehabilitation of the drainage system, pavement and some bridges. This rehabilitation was managed by the now extinct INDES (National Institute for Economic and Social Development). The approximately 5.2 km between Ponte de Lembá and Ponta Furada the pavement is tout-venant.

Due to aggressive climate conditions (storms, falling trees, landslides, floods, sea erosion and lack of maintenance, a large part of these sections is partially destroyed and requires extensive rehabilitation/reconstruction intervention.

Due to the major storm that occurred in December 2021, the bridge over the Lembá River collapsed and, through the CERC of Project P161842, studies were conducted and preliminary execution projects were drawn up, currently in the bidding phase for the design/ construction.

The Consultant must define and calculate the current and future risks (under the 2 selected scenarios of Sea Level Rise and Change in Storm Pattern) of coastal erosion and flooding of the different segments of the Itinerary. The Consultant will present the expected cumulative damage (for erosion) and maximum overflow rates (for flooding) for the expected life of the road. The Consultant will present the results to the Client and the World Bank, and will propose an acceptable level of risks to be ensured by the design. Based on this threshold, the Consultant will develop risk mitigation measures, including nature-based alternatives where relevant.

Regarding **Marginal I** [*Lagarto Bay, the Promontory*], [*Passadeira 1013A*] and [*Road linking ES101 to EN1S1*] , as seen in Fig. 2 and on the Map of the complex in *Annex I* , there are in practice three sections with specific characteristics, being: [Lagarto Bay and Promontory, 2,760 km long] , [Passadeira 1013A, 1.50 km long] and [Road link ES101-EN1S1 connection section , 1, 5 km]. There is already a design for the first two sections that will be reviewed and the detailed design will be drawn up based on this. The last, Road link ES101-EN1S1, all studies must be carried out, similar to the EN1S3 section, and the detailed design drawn up, with everything being included in the same Lot, depending on the economic viability. If nature-based solutions are not found feasible, the Consultant will clearly explain the reasons why, and will preferably propose a grey alternative.

SLOPE STABILIZATION

EN1S2 and **EN1S3** sections are exposed to the risk of mass movement (rockfalls, landslides). For **EN1S3**, the Consultant will analyze the current risk level of the different road segments, considering the existing protection and vegetation conditions, and assess the potential impact of climate change on these hazards, according to the 2 selected scenarios. The Consultant will propose different risk reduction alternatives, including the use of nature-based solutions and improved drainage within the slopes, and describe the expected costs (investment and maintenance), implementation and maintenance complexity and expected level of risk reductions. risk for each road segment. The Consultant will discuss the results with the Client and the World Bank to define mass movement hazard levels that can be considered acceptable, considering risk, cost and sustainability of the proposed solutions.

For **EN1S2**, the Consultant must do the same, but will start working based on the existing study and project documents and will consider changes and deterioration that occurred after the studies carried out both on embankment slopes and especially on excavation slopes.

Regarding **Marginal I**, the Consultant must also do the same, and will start working based on the existing documents, paying special attention to the “Passadeira 1013A” section due to its

specificity in terms of embankment slopes that show strong erosion. For the [Road linkES101 to ENIS1], stabilization will be limited to embankment slopes resulting from earthworks.

COST ESTIMATES

Based on the above analyzes and results, for the two sections, **EN1S2** and **EN1S3**, separately, the Consultant will provide a preliminary estimate of quantities with an accuracy of +/- 10-15% for the rehabilitation of the proposed roads, including the protections. Key quantities will include common excavation, sub-base material, base and paving materials, number and dimensions of drainage structures, major bridges, slope stabilization interventions (excavation and embankment), coastal protection works and other large structures and miscellaneous items (water networks, telecommunications, electricity, etc.). The analysis by the Consultant shall allow for a detailed understanding of the quantities and costs related to climate adaptation.

For **Marginal I**, the same will happen, that is, based on the analyzes and results above, for the three sections together, the Consultant will provide a preliminary estimate of quantities with an accuracy of +/- 10-15% for the rehabilitation/ construction of the proposed roads, including protections, but leaving the quantities and respective prices of each subsection visible on the table. The main quantities will include common excavation, sub-base material, base and paving materials, number and dimensions of drainage structures, large hydraulic passages, slope stabilization interventions (excavation and embankment), coastal protection works and other large structures and miscellaneous items (water networks, telecommunications, electricity, etc.). The analysis by the Consultant shall allow for a detailed understanding of the quantities and costs related to climate adaptation.

ECONOMIC COSTS

The Consultant will examine all available information on vehicle operating costs and road maintenance costs, and produce valid current estimates of these costs for the project road in its current and improved state.

Since the largest element of measurable and quantifiable user benefit to be derived from road improvement results, in practice, from savings in vehicle operating costs, the Consultant will pay particular attention to developing valid current estimates of such costs applicable to the STP as a whole and the project roads in particular. When a computer-based highway investment model (HDM IV) derived from, or based on, any program developed by an international agency or research organization is used, the Consultant will ensure that all individual factor unit costs (such as tires, fuel, wages, parts, maintenance, insurance) that are introduced into the model are derived from direct investigation of local sources of supply.

Furthermore, the Consultant will ensure that the individual parameters of national road characteristics, such as altitude, rise or fall, curvature, etc., which are introduced into the model to determine the different cost components of vehicle operations, will be those that apply to the individual design standards being assessed. Therefore, it is expected that, in cases where design standards have significantly different parameters, as assessed during the study, these differences will be reflected in the operating costs of the vehicles.

The Consultant will detail in the reports all data, assumptions and parameters that were used in developing estimates for the current vehicle operating costs.

For road maintenance costs, the Consultant will ensure that such costs are strictly related to current and forecast volumes as well as current and future weather conditions and will detail in the reports all data, assumptions and parameters that were used to develop estimates current and future road maintenance costs.

In determining the economic costs for all project factors, the Consultant will ensure that all costs are net of all taxes and fees, or any other transfer payments to the Government, and shadow priced where necessary to reflect the true value of scarcity of resources being used.

ECONOMIC ASSESSMENT AND ALTERNATIVE ANALYSIS

For each design standard, the Consultant will perform assessments of the economic viability of the project for the twenty years following completion of road construction. The economic assessment will be made based on at least two design standards, and with the necessary feeder roads. To this end, the economic costs of constructing the design standards being assessed will be compared with the relevant level of economic benefits to users derived from project implementation at different design levels. Agency benefits, such as but not limited to savings in maintenance and reconstruction, and longer road lifespan will also be considered. The design level that results in the largest benefits relative to costs will be determined as the optimal level of design. The alternative selected for implementation needs to also consider availability of financing and can propose an alternative approach to the project lots.

The benefits for the user will be expressed mainly in terms of:

- a) Savings in vehicle operating costs,
- b) Savings in travel times for road users,
- c) Savings on road maintenance expenses,
- d) Reduction in deaths and injuries due to accidents or traffic accidents,
- e) Residual value of the road structure at the end of the assessment period,
- f) Benefits from greater climate resilience,
- g) Any other factor that the Consultant may consider for the analysis.

Taking into account that many indirect economic and social benefits arising from improved road conditions are "intangible" or difficult to quantify precisely, the Consultant will carry out a detailed qualitative analysis of these benefits.

Only benefits demonstrated in quantitative terms should be included in the economic analysis. In all other cases, these benefits will not be included in the economic assessment of the project, but may be used as a secondary justification for project implementation.

Assessments will be expressed in terms of:

- The internal rate of economic profitability,
- Net present value in relation to the current opportunity cost of public funds,
- The cost-benefit ratio and;
- First year rate of return.

The Consultant will also carry out a sensitivity analysis on the results of the design standards finally selected. In addition to the traffic forecast levels, all costs and benefits will be varied up to +/- 10-15% or another level deemed appropriate for the analysis and agreed with the Customer

E. PREPARATION OF DETAILED ENGINEERING PROJECT

Based on the preferred design outcome of the feasibility study and the data to be collected, the Consultant must prepare a detailed engineering design as follows:

Lot 1 - Section EN1S2 / **Guadalupe – Neves** (approximate length of the section is 14.125 km) – *Update of the existing designs.*

Lot 2 - Section EN1S3 / **Neves – Ponta Furada** (The approximate length of the section is 20,900 km.).

Lot 3 – Marginal I – **Lagarto Bay and Promontory** [2,760km], **Passadeira 1013A** [1.50km] and Road Linking **ES101-EN1S1** [1.50km]

In doing so, the Consultant will prepare all necessary documents for approval, tender and rehabilitation/construction of the works. These documents include, among others, detailed drawings, technical specifications, bills of quantities, cost estimates, price descriptions and traffic management plans.

The design must be suitable in all respects for the purpose of bidding for re-measurement contracts using FIDIC's MDB Harmonized Edition 2010 published by FIDIC contract and allow the nominated contractors to construct the works without further input from the designer. Design tasks should not be transferred to civil works contractors.

The Consultant will carry out the project in accordance with international and São Tomé and Príncipe standards and design standards. Before beginning detailed design, the Consultant must establish a set of design criteria and standards to be used and agree them with the Client.

All aspects of the design must be described in a design report. Reports must include design criteria, assumptions, methods, models, codes and standards used to design each element. Calculation summaries must be included in the annexes, together with all collected data.

The Consultant will be fully responsible for the accuracy and completeness of the data, drawings and documents and will provide clarifications, if necessary, during the competition.

DATA COLLECTION

The Consultant will carry out all topographic, geological, geotechnical, hydrological and other surveys that may be necessary to carry out projects for the execution of these national road segments.

The Consultant must prepare a plan for data collection, including all geological, geotechnical investigations and tests. The calendar must specify the number, location, and timing of all surveys. This plan must be included in the Inception Design Report. The Consultant shall review the plan if the Client considers the scope of the investigations to be inadequate.

Data collection should pay particular attention to identifying any other potential risks, such as landslides and rockfalls, and their activity, taking into account the timing and quality of project design.

The Consultant must give the Client a minimum of seven days' written notice whenever carrying out any tests or investigations. In particular, any borehole drilling program must indicate the number, type, location and expected date of boreholes at each location.

All collected data, including topographic models and material testing results, must be included as annexes to the design reports.

Field survey investigations and tests will include, but not be limited to, those described below. These requirements constitute the minimum level of data collection to be carried out by the Consultant, but cannot be considered as limiting the Consultant's obligations.

Topography

The Consultant will carry out an adequate and appropriate topographic survey for this commission. The inspection must be detailed in order to allow a complete and final conception of the project and allow contractors to define the works. This includes creating a network of permanent brands. The topographic survey of the land necessary for project preparation must be carried out in absolute UTM coordinate system.

The Consultant will ensure that sufficient topography data is available and that all terrain is triangulated and contoured. The selected range must help calculate quantities with the desired accuracy and must be justified by the Consultant. Complete transverse sections extending a suitable distance on both sides of the road center line shall be harvested and elevated along the axis of the existing road at suitable intervals. The selected range must be justified by the consultant. A three-dimensional digital model of the terrain must be prepared from the survey data.

As part of the Project Report, the Consultant must submit a survey report to include field note books, reference locations, definition of coordinates, etc. All survey information must be submitted in digital format using software agreed to by the Customer.

Geotechnical Investigations

The consultant must perform comprehensive geotechnical and material investigations along the roadway as necessary for a good and profitable project. The scope and details of these investigations and tests should be defined in the data collection plan to be submitted with the initial report.

This will include investigating and evaluating the properties of the existing soil below the landfill and the water table, as well as the slopes above the road. Common material properties must be determined (e.g. CBR, Atterberg limits, peak and residual strength and compressibility, moisture-density relationship, natural moisture content and in situ density, classification, RMR, etc.) by carrying out appropriate laboratory and in situ tests in accordance with AASHTO/BS standards.

These investigations shall consist of borings and test pits through existing soil at sufficient intervals along the preferred alignment as required and necessary based on geological investigations and consequently standards and norms. Each investigation must be carried out to an appropriate depth sufficient for the design of the relevant earthworks and structures. In fact, the Consultant must gather necessary and appropriate equipment to carry out geological studies at required depths.

The Consultant shall carry out additional underground investigations on bridges and culverts, which will consist of boreholes and test pits to provide all necessary and required geotechnical data for foundation design in accordance with norms and standards for bridge design.

The Consultant may consider separating the field investigation program into two phases, consisting of:

- first phase of investigation of the soil profile at earthworks sites (cut slopes, embankments) and structures (bridges, tunnels), and
- second phase to investigate the final location of bridge piers and tunnel portals after consultation with the Client.

Investigations, recordings and testing must be carried out in accordance with recognized international good practice, using relevant codes and standards such as BS1377, BS 5930+A2 (2010) and EC 7, which will be subject to Customer approval prior to adoption.

The consultant must also evaluate the geomorphological and hydrogeological characteristics along each road, identify potential critical contexts in terms of erosion, slope failure, landslides, other geological risks and seismic risks.

The consultant must prepare a factual and interpretative report on the geotechnical investigations and tests. These reports must be presented separately to the Client, in addition to being attached to the Interim Project Report.

Quarries and borrow pits

The Consultant will investigate existing *quarries* and *borrow pits* and seek suitable materials for construction of embankments, replacement of unsuitable soil, sub-base, base, concrete and asphalt. The consultant must also thoroughly investigate potential untapped sources of materials near roads. The aim of the material survey will be to minimize transportation distances from *quarries* and *borrow sites* to construction sites.

The Consultant will assess the local capacity to produce material suitable for the different phases of construction and, based on this assessment, will make recommendations for the use of *existing quarries* and/or the opening of *new quarries*. The consultant will propose a *quarry* location and *loan site plan*.

Hydrology

The consultant will examine the blight, erosion, drainage and flooding characteristics along the road and ensure that the survey covers all aspects related to the project, environmental and hydrological issues. This also includes integrating climate change information into hydrological characterization, as well as considering an integrated approach to road and water management to promote the climate resilience of road infrastructure, landscape and communities.

DETAILED PROJECT

The detailed design will include, but not necessarily be limited to:

Geometric design

Results will include horizontal plan at 1:1000 scale and longitudinal profile drawings at 1:1000h/1:100v scale showing roads, pathways, rivers, ground levels/vertical alignment of existing lane, formation and design levels, gradient, etc. and 1:500/1:50 for exchanges. The geometric elements of the sections will be based on computerized techniques. Geometric design

elements for horizontal and vertical alignment will take into account the existing roadway. Basic design rules such as optimal phasing of horizontal and vertical alignment, clearance for drainage structures, etc. will be considered, as well as the results of hydrological studies, geotechnical and environmental constraints and structural aspects. The project will incorporate road safety features in the geometric design, road markings, anti-collision barriers, guardrails, speed humps, rumble strips, etc. The cross sections will be drawn at 25 meter intervals, at a scale of 1:100. Drawings will show cuts and fills, side drains, paving, camber, super elevation, erosion protection, etc. The interchanges, temporary connections to the existing EN1 and the secondary road network will also be designed in consultation with INAE. Particular attention will be required to optimize the geometric design in landslide zones, with cost-effective measures.

Pavement design

For pavement projects, the Consultant must consider three or more alternatives: i) asphalt pavement, ii) concrete pavement, iii) sidewalk pavement, etc. A performance period of 20 years will be taken into account, taking due account of local conditions (e.g. floods, high rainfall, current and future temperature, etc.), in addition to INAE requirements and appropriate analysis of the cycle of life. If insufficient guidance is available, the Consultant should follow the guidelines given in the latest series of American Association of Highway and Transportation Officials (AASHTO) Guides or other internationally practiced standards for the design of highway pavement structures in a similar environment.

Drainage and culverts

The Consultant must ensure adequate surface and subsurface drainage for pavements, taking into account local precipitation and groundwater levels. Drainage includes transverse and longitudinal drainage facilities to ensure safe and rapid disposal of free-draining water from the pavement. In built-up areas, special attention should be paid to adequately designed covered/open channels to drain surface and subsurface waters. The drainage design must include a detailed plan showing the vertical and horizontal placement of drains, conduits, falls, taps, specialized drainage layers, if any, and all other arrangements for all sections, with particular attention to road crossings and built-up areas. AASHTO and other internationally practiced standards for drainage design should be consulted whenever necessary. Drainage must be designed for the worst conditions, would be for the current period of the future, according to the analysis of climate change scenarios.

Coastal protection

The consultant must design the coastal protection works to meet the acceptable level of risk agreed in the feasibility study. The materials to be used must be suitable for the marine environment, the stability analysis must be carried out in future sea conditions (sea level and wave climate) and the structures must have an expected lifespan of at least 30 years.

Slope stabilization

Interventions to stabilize slopes must be integrated into the road design, especially its geometry and drainage system, to reduce the risk of landslides and rockfalls to the risk level defined as acceptable in the feasibility study. Activities that do not involve earthworks will be promoted, seeking to implement stabilization actions with little or no intervention with soil movement and/or using more modern techniques for fixing cover vegetation (for example, anti-erosion

vegetation blankets), associated or not with structural measures (e.g. gabions). If these actions are not possible or applicable, justify the technical reasons and detail the earthworks, the volume of material to be moved and the expected final stability of the slope. The Consultant will describe the types of drainage that will be implemented to control surface and underground waters that contribute to the advancement of the gull, as well as the techniques to be used for soil conservation: earthworks, terracing, contours, among others. Consultants must specify the selection of species adapted to the planting conditions (grasses and indigenous tree-shrub species); origin and estimated quantity; spacing to be used; plantation conformation considering the successional groups of species (climax, secondary and pioneer), as well as the planting and replanting technique. Techniques for protecting and conserving flora and water resources would have to be clearly mentioned.

The route with the sub-sections **EN1S2** and **EN1S3** of **EN1**, despite there being several sections with embankment slope protections built in recently reinforced concrete and there are other sections with older protections, there are also protections made in gabions (their fragility should be noted, as gabion retaining walls are normally used to stabilize static loads, unlike the non-dynamic loads caused by sea waves, especially there are no wave breaking systems, as is the case), there are also several Sections with embankment slopes without any protection and exposed to direct contact with the sea are therefore susceptible to sea erosion. The Consultant must study and find alternative solutions for stabilizing them depending on the specific characteristics and risks (they can discuss them with the client before making a final decision).

Bridge and structure execution project

When designing bridges and related works, the Consultant will suggest adopting load and design standards in accordance with current STP standards and generally accepted international practices. The Consultant will carry out the detailed design of all bridges, works of art and will prepare detailed drawings. The consultant must provide Comparison of Bridge Types by Superstructure, considering factors such as economics, availability of local construction materials and construction methods. The consultant must present justifications for the calculations of the works of art.

Road equipment

Road lighting equipment, traffic signs, road markings, culverts, pedestrian and animal crossings, road equipment and safety devices must be fully designed and indicated on the drawings.

Water, Electricity and Telecommunications Networks

On the itineraries under study, the Consultant will carry out an exhaustive survey of the existing infrastructure in these areas and propose improvement, correction and transmutation works, and/or new facilities, if applicable. All these services must be considered as an integral part of the project, and must therefore be quantified and budgeted by the Consultant.

Temporary Works and Diversions

The Consultant must include in the design any temporary works and/or diversions required during the construction period of each road. All temporary works or diversions must be designed to accommodate the uninterrupted flow of traffic during the period in question.

For these cases, the Consultant must include carrying out surveys of the affected parties, quantifying and budgeting for public consultations.

BIDDING DOCUMENTS

The Consultant shall prepare the Tender Specifications for civil works in accordance with the World Bank Procurement Policies and Rules and the Standard Bidding Documents. The Bill of Quantities that is part of the Tender Specifications must contain the respective items for carrying out the measures of the Environmental and Social Management Plan (ESMP). The draft Specifications must be presented together with a draft Design Report.

The Consultant must then prepare the Final Specifications incorporating all comments from the Client and the World Bank.

F. CARRYING OUT THE EX-POST ASSESSMENT OF THE REHABILITATION OF EN1, SECTION S1 [EN1S1]

For the ex-post assessment of the rehabilitation of the EN1-S1 section, São Tomé – Guadalupe, including socio-economic assessment and preparation of maintenance plans, the Consultant must carry out the following:

- Assess the current condition of the road and bridges and identify the actual benefits and costs derived compared to the planned benefits and costs;
- Develop a standard ex-post evaluation methodology for road projects in the country, including a cost-benefit analysis, and apply it to the project;
- Measure the impact of the Project on (but not limited to) the following:
 - The transport sector: a) changes in travel times for different road users, b) changes in vehicle operating costs, c) road safety situation in terms of deaths and injuries for pedestrians, cyclists, and users of different types of vehicles, changes in greenhouse gas and local pollutant emissions;
 - Other benefits, for example, a) transport volume; b) changes in travel patterns; and, (c) facilitating safe access to other infrastructure facilities (e.g. schools, hospitals, churches and other economic centers), d) facilitating access to jobs, e) transportation reliability, and f) other impacts on communities;
 - Agricultural and industrial activities in the confluence zones (e.g. through transport of goods, promotion of existing/creation of new production/processing activities and services); It is
 - Climate resilience, such as (but not limited to) reduced maintenance or reconstruction costs, longer lifespan of infrastructure, reduced traffic interruptions. Cost-benefit analysis including costs and benefits that can be monetized according to internationally accepted economic appraisal methodologies.

- Based on the findings, recommend policies, strategies, approaches on effective modalities to improve the implementation of road projects;
- recommend actions to sustain the project
- benefits (general O&M, reconstruction/rehabilitation or expansion);

G. CARRYING OUT THE ROAD SAFETY AUDITS ON EN1S2, SAO TOMÉ - GUADALUPE - NEVES AND MARGINAL I

A road safety audit of the previously prepared designs on ENS2 and Marginal I, as well as the new designs for EN1S3 will be carried out, including detailed recommendations on additional road safety measures and/or design changes necessary to address road safety engineering issues and meet international best practices for safe road design for all road users aligned with the Safe System approach. Furthermore, the audit process will be repeated after the detailed designs have been updated or finalized, in order to verify that the recommendations have been taken into account and to identify remaining risks. To this end, the Consultant must:

- Carry out a road safety audit of the existing designs, in accordance with internationally applied audit processes, which requires the audit be done by team members that were not directly involved in the preparation of the engineering designs;
- Inspect the existing road (day and night) to examine the road and roadside conditions; and consider design local elements and conditions (speeds, nighttime visibility, adjacent land uses, glare, etc.) that may increase the probability and/or severity of a road crash when the road is improved;
- Observe how road users are interacting with each other and the road during on-site inspections, and determine whether the needs of all road users are being met appropriately and safely.
- Develop specific and detailed road design requirements that are accurately referenced to locations along the road, and that must be applied when updating the engineering design (to be prepared by the contractor). The road safety requirements for the project must describe in detail all appropriate and necessary road safety elements to be incorporated into the project, which must also be aligned with the safe system approach to road safety, aiming to minimize severe and fatal road traffic injuries.. These design requirements must be presented for each specific section of the road;
- Use the audit as an opportunity to build capacity of a team of at least three INAE technicians, through specific theoretical and practical sessions.

H. DURATION OF ACTIVITY AND TEAM COMPOSITION

The duration of this assignment is **6 months**, including the time required for the Client to review and approve the reports (fifteen calendar days for each report). – See the Schedules below.

Consultants must, at a minimum, but not limited to, provide the expertise described below and present the Curriculum Vitae for each Key Personnel Specialist. It is desirable that the proposed team (including key and non-core experts) has joint work experience and has carried out similar missions together as a team.

1. **Team Leader:** The Team Leader must be a qualified and competent civil engineer, with at least a recognized degree in Civil Engineering and a minimum of 20 years of active international professional experience, with at least 10 years in highway design and projects of modernization in mountainous areas at Team Leader level. He must have proven ability to manage and administer a project of this nature, and extensive experience in planning, designing and administering highway contracts. Fluency in written and spoken English and Portuguese is extremely essential.
2. **Senior Transport Economist:** The Senior Transport Economist must be a qualified and competent person, with a degree in Transport Economics or equivalent and with a minimum of 15 years of active international professional experience, with at least 5 years of economic evaluation studies on projects of modernization and construction of roads.
3. **Senior Highway Engineer:** The Senior Highway Engineer must be a qualified and competent civil engineer with a degree in Civil Engineering and a minimum of 12 years of active international professional experience, with at least 10 years as a Highway Design Engineer on projects in areas of “morphology” similar to that of the project. Fluency in written and spoken Portuguese and English is essential.
4. **Senior Geotechnical Engineer:** The *Senior Geotechnical Engineer* must be a qualified and competent civil engineer, licensed in Geotechnical Civil Engineering and with a minimum of 12 years of active international professional experience, with at least 10 years as a Geotechnical Engineer in road projects in areas with “morphological” characteristics similar to that of the project. Fluency in written and spoken Portuguese and English is essential.
5. **Senior Geological Engineer:** The *Senior Geological Engineer* must be a qualified and competent civil engineer with a relevant degree and a minimum of 12 years of active international professional experience, with at least 10 years as a Geological Engineer on road projects in mountainous areas. Fluency in written and spoken Portuguese and English is essential.
6. **Senior Hydrological/Drainage Engineer:** The *Hydrological/Drainage Engineer* must be a qualified and competent civil engineer and a minimum of 12 years of active international professional experience, with at least 10 years of proven experience in highway projects. Fluency in written and spoken Portuguese and English is essential.
7. **Senior Road Safety Engineer:** The *Senior Engineer of Road Safety* must be a qualified and competent civil engineer, licensed in Civil Engineering and with a minimum of 10

years of active international professional experience, with at least 5 years as a Road Safety Engineer on road design projects of a similar nature. Fluency in written and spoken Portuguese and English is essential.

8. **Senior Bridge Engineer:** The *Bridge Engineer Senior Bridges* must be a qualified and competent civil engineer, master's degree in civil engineering and a minimum of 15 years of active international professional experience, with at least 10 years as a Highway Bridge Engineer on bridge projects in mountainous areas. Fluency in written and spoken Portuguese and English is essential.
9. **Procurement Specialist:** The *Procurement Specialist* must be qualified and competent in procurement/contract execution and a minimum of 10 years of active international professional experience, with at least 5 years in procurement/implementation of Contracts. Fluency in written and spoken Portuguese and English is essential. Experience in procurement/execution of contracts within the World Bank's procurement procedures would be an asset.

In addition to key personnel, the consultant is expected to propose the following experts with the following experience and qualifications:

10. **Environmental Specialist and Ecologist (preferably local).** The Environmental Specialist must be a competent and qualified person, licensed in environmental sciences and with at least 5 years of professional experience, of which at least 3 years in carrying out environmental/hydrological assessments for projects related to the road sector. This specialist must also have experience in designing and implementing nature-based solutions in infrastructure projects. Fluency in written and spoken Portuguese and English is essential.
11. **Specialist with experience in Resettlement and GBV (preferably local)** The *specialist Social* must be a qualified and competent person with at least 7 years of professional experience, of which at least 5 years have been in the development of Resettlement Action Plans (RAP) for roads or other similar projects in the detailed design preparation phase based on World Bank Environmental and Social Policies and Standards and relevant local legislation. Must demonstrate experience in carrying out actions that lead to the identification, prevention and mitigation of GBV in projects developed in the road sector.
12. **Social Specialist for Social Issues and Gender-Based Violence (GBV).** The above represents the minimum team requirements that the Consultant must mobilize during the commission. In addition to the minimum required team of key and non-key experts mentioned above, the Consultant must evaluate and provide a support team with the necessary local experts (e.g. Resident Project Coordinator, Topography Specialist, Seismologist, Highway, Geotechnical, Hydrological/Drainage, Bridge and Tunnel Engineers, Economist, etc.), technical and administrative staff. The services provided by the Consultant will be carried out in STP.

Environmental Specialist and Ecologist (preferably local). The Environmental Specialist must be a competent and qualified person, licensed in environmental sciences and with at least 5 years of professional experience, of which at least 3 years in carrying out environmental/hydrological assessments for projects related to the road sector. This specialist

must also have experience in designing and implementing nature-based solutions in infrastructure projects. Fluency in written and spoken Portuguese and English is essential.

I. WORKING LANGUAGE

Portuguese and English are defined as working languages, meaning that all reports to be presented by the Consultant will be in these two languages.

J. DELIVERABLES

The Consultant will prepare and submit to INAE the following:

I - Report for Section EN1S2 / Guadalupe - Neves

I-1. Update of the Environmental and Social Impact Assessment for EN1S2:

- a) A complementary ESIA and RAP report recently carried out in the framework of this project, based on the request made *Prf. #1*: **14 weeks** after the start of the mission

I-2. Feasibility Study Update for EN1S2:

- a) Traffic inspection plan **1 week** after the start of the mission
- b) Traffic Analysis Report **3 Weeks** After Assignment Starts
- c) Draft feasibility study report **6 weeks** after mission start
- d) Final feasibility study report **8 weeks** after mission start

I-3. Detailed Engineering Design /Tender Documents and Resettlement Action Plan for EN1S2

- a) **Initial Design Report:** This report will be presented at the end **4 weeks** after the start of the task and will summarize the initial findings. The consultant must establish a set of design criteria and standards to be used and agree them with the client. This report must also include the quality management plan, the traffic management plan and the analysis of the connection with the previous and next sections.
- b) **Interim Project Report:** This report will be presented at the end of **8 weeks** and will detail all work carried out during the *reporting period for the EN1 S2* section Detailed Project. It will present proposals that cover alternative alignment analysis methodologies for **section EN1S2**, preliminary conclusions based on substantially completed analyses, survey results, and will also identify real and expected difficulties and delays in the work, their causes and proposed solutions to resolve them. The Interim Design Report must include the results of field surveys, studies, investigations and instrumental tests.
- c) **Project Design Report:** This report will be submitted at the end of **10 weeks** and will showcase the services performed during the assignment and will include detailed project

analysis, findings, results and recommendations, and will also contain all supporting material. It will include a concise executive summary, in which project design standards and cost estimates broken down into local currencies will be clearly presented.

d) Draft Bidding Documents must also be submitted together with the draft **Project Report**.

The **Project Report draft** must include, but not be limited to: i) pavement design report, ii) road safety report and vertical and horizontal signs, iii) detailed designs, including drainage systems and bridges, iv) projects of stabilization of excavation and embankment slopes, v) drawings, vi) technical specifications, vii) summaries, viii) explanatory notes, ix) bill of quantities project, x) cost estimates and xi) RAP project.

e) Final Project Report: This report will be submitted at the end of **14 weeks** and will incorporate any revisions deemed necessary arising from comments received from the Department of Highways following discussions and agreements in the course of the assessment of the draft report and will be submitted to the Client for approval. It must contain all findings, analyses, results and all supporting material. The Final Report must include, among others, the pavement design report, detailed designs, final drawings, specifications, summaries, explanatory notes, final bill of quantities, cost estimates and final RAP.

I - REPORT FOR SECTION EN1S2																			
GUADALUPE - NEVES																			
Code	Activities	Implementation																	
		Document Delivery	Customer Reviews	Month 1				Month 2				Month 3				Month 4			
		Week	Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
I-1	Atualização da Avaliação de Impacto Ambiental e Social para S2																		
a)	A complementary ESIA and RAP report recently carried out in the framework of this project	14	2																
I-2	Feasibility Study Update for EN1S2																		
a)	Traffic inspection plan	1	1																
b)	Traffic Analysis Report	3	2																
c)	Draft feasibility study report	6	1																
d)	Final feasibility study report	8																	
I-3	Detailed Engineering Design /Tender Documents and Resettlement Action Plan for EN1S2																		
a)	Initial Design Report	4	2																
b)	Interim Project Report	8	2																
c)	Project Design Report	10	3																
d)	Draft Bidding Documents	10	3																
e)	Final Project Report	14																	
	Comment Period / Customer Approval																		

II - Report for Section EN1S3 / Neves - Santa Catarina - Ponta Furada

II-1 Environmental and Social Impact Assessment:

- a) A draft ESIA report **7 weeks** into the mission
- b) A final ESIA report **10 weeks** after the start of the mission

II-2. Feasibility Study for EN1S3:

- a) Traffic inspection plan **1 week** after the start of the mission
- b) Traffic Analysis Report **4 Weeks** After Assignment Starts
- c) Draft feasibility study report **8 weeks** after mission start
- d) Final feasibility study report **11 weeks** after mission start

II-3. Detailed Engineering Design /Tender Documents and Resettlement Action Plan for EN1S3

- a) **Initial Design Report:** This report will be presented at the end of **8 weeks** after the start of the task and will summarize the initial findings. The consultant must establish a set of design criteria and standards to be used and agree them with the client. This report must also include the quality management plan, the traffic management plan and the analysis of the connection with the previous and next sections.
- b) **Interim Project Report:** This report will be presented at the end of **16 weeks** and will detail all work carried out during the reporting period for the detailed design. They will present proposals covering alternative alignment analysis methodologies for this **section**, preliminary conclusions based on substantially completed analyses, survey results, and will also identify real and expected difficulties and delays in the work, their causes and proposed solutions to resolve them. The Interim Design Report must include the results of field surveys, studies, investigations and instrumental tests.
- c) **Project Design Report:** This report will be submitted at the end of **19 weeks** and will showcase the services performed during the assignment and will include detailed project analysis, findings, results and recommendations, and will also contain all supporting material. It will include a concise executive summary, in which project design standards and cost estimates broken down into local currencies will be clearly presented.
- d) **Draft Bidding Documents** must also be submitted together with the draft **Project Report**. The Project Report draft must include, but not be limited to, i) pavement design report, ii) road safety report and vertical and horizontal signs, iii) detailed designs, including drainage systems and bridges, iv) projects of stabilization of excavation slopes and embankment, v) drawings, vi) technical specifications, vii) summaries, viii) explanatory notes, ix) bill of quantities project, x) cost estimates and xi) RAP project.
- e) **Final Project Report:** This report will be submitted at the end of **24 weeks** and will incorporate all revisions deemed necessary arising from comments received from the Department of Highways following discussions and agreements in the course of the evaluation of the draft report and will be submitted to the Client for approval. It must contain all findings, analyses, results and all supporting material. The Final Report must include, among others, the pavement design report, detailed designs, final drawings, specifications, summaries, explanatory notes, final bill of quantities, cost estimates and final RAP.

II - REPORT FOR SECTION EN153																							
NEVES - SANTA CATARINA - PONTA FURADA																							
Code	Activities	Implementation																					
		Document Delivery	Customer Reviews	Month 1				Month 2				Month 3				Month 4				Month 5			
		Week	Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
I-1	Environmental and Social Impact Assessment																						
a)	A draft ESIA report	16	2																				
b)	A final ESIA report	21																					
I-2	Feasibility Study for EN153																						
a)	Traffic inspection plan	1	1																				
b)	Traffic Analysis Report	4	2																				
c)	Draft feasibility study report	8	2																				
d)	Final feasibility study report	11																					
I-3	Detailed Engineering Design /Tender Documents and Resettlement Action Plan for EN153																						
a)	Initial Design Report	8	2																				
b)	Interim Project Report	16	3																				
c)	Project Design Report	20	3																				
d)	Draft Bidding Documents	20	3																				
e)	Final Project Report	24																					
	Comment Period / Customer Approval																						

The Consultant will prepare and submit to INAE the following:

III - Report for Marginal I [Lagarto Bay - Promontory and Passadeira] [Road linking ES101-EN1S1]

III-1. Update of the Environmental and Social Impact Assessment for [Lagarto Bay-Promontory and Passadeira] and Environmental and Social Impact Assessment for the [Road linking ES101-EN1S1 Connection]:

- a) A complementary ESIA and RAP report recently carried out in the framework of this project, based on the request made *Prf. #1*: **14 weeks** after the start of the mission

III-2. Update of the Feasibility Study for [Lagarto Bay-Promontory and Passadeira] and Feasibility Study for [Road link ES101-EN1S1] / integrated in the same document]:

- a) Traffic inspection plan **1 week** after the start of the mission
- b) Traffic Analysis Report **3 Weeks** After Assignment Starts
- c) Draft feasibility study report **6 weeks** after mission start
- d) Final feasibility study report **8 weeks** after mission start

III-3. Detailed Engineering Design /Tender Documents and Resettlement Action Plan for [Lagarto Bay-Promontory and Passadeira] and [Road link ES101-EN1]

- a) **Initial Design Report:** This report will be presented at the end 4 weeks after the start of the task and will summarize the initial findings. The consultant must establish a set of design criteria and standards to be used and agree them with the client. This report must also include the quality management plan, the traffic management plan and the analysis of the connection with the previous and next sections.
- b) **Interim Project Report:** This report will be presented at the end of 8 weeks and will detail all work carried out during the *reporting period for the Detailed Project of Marginal I [Lagarto Bay- Promontory, Passadeira, and Road link ES101-EN1S1]*. It will present proposals covering alternative alignment analysis methodologies, preliminary conclusions based on substantially completed analyses, survey results, and will also identify real and expected difficulties and delays in the work, their causes and proposed solutions to resolve them. The Interim Design Report must include the results of field surveys, studies, investigations and instrumental tests.
- c) **Project Design Report:** This report will be submitted at the end of the 10 weeks and will display the services performed during the assignment and will include detailed project analysis, findings, results and recommendations, and will also contain all supporting material. It will include a concise executive summary, in which project design standards and cost estimates broken down into local currencies will be clearly presented.
- d) **Draft Bidding Documents** must also be submitted together with the draft **Project Report**. The **Project Report draft** must include, but not be limited to: i) pavement design report, ii) road safety report and vertical and horizontal signs, iii) detailed designs, including drainage systems, water networks, electricity , telecommunications and bridges, iv) excavation and embankment slope stabilization projects, v) drawings, vi) technical specifications, vii)

summaries, viii) explanatory notes, ix) draft bill of quantities, x) cost estimates and xi) RAP project.

- e) Final Project Report: This report will be submitted at the end of **13 weeks** and will incorporate all revisions deemed necessary arising from comments received from the Department of Highways following discussions and agreements in the course of the evaluation of the draft report and will be submitted to the Client for approval. It must contain all findings, analyses, results and all supporting material. The Final Report must include, among others, the pavement design report, detailed designs, final drawings, specifications, summaries, explanatory notes, final bill of quantities, cost estimates and final RAP.

III - REPORT FOR MARGINAL I																			
[Baia Lagarto-Promontório e Passadeira] and [Ligação Baia Lagarta-EN1S1]																			
Code	Activities	Implementation																	
		Document Delivery	Customer Reviews	Month 1				Month 2				Month 3				Month 4			
		Week	Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
I-1	Atualização da Avaliação de Impacto Ambiental e Social para Marginal I																		
a)	A complementary ESIA and RAP report recently carried out in the framework of this project	14	2																
III-2	Feasibility Study Update for Marginal I																		
a)	Traffic inspection plan	1	1																
b)	Traffic Analysis Report	3	2																
c)	Draft feasibility study report	6	1																
d)	Final feasibility study report	8																	
III-3	Detailed Engineering Design /Tender Documents and Resettlement Action Plan for Marginal I																		
a)	Initial Design Report	4	2																
b)	Interim Project Report	8	2																
c)	Project Design Report	10	3																
d)	Draft Bidding Documents	10	3																
e)	Final Project Report	14																	
	Comment Period / Customer Approval																		

IV - Ex-post Assessment Report of the rehabilitation of EN1S1/ São Tomé - Guadalupe

IV-1. Report with the ex- post Socio-economic assessment

IV-2. Maintenance plans

IV - EX-POST ASSESSMENT REPORT OF THE REHABILITATION OF EN1S1																			
SÃO TOMÉ - GUADALUPE																			
Code	Activities	Implementation																	
		Document Delivery	Customer Reviews	Month 1				Month 2				Month 3				Month 4			
		Week	Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Report with the ex- post Socio-economic assessment	3	2																
2	Maintenance plans	6																	
	Comment Period / Customer Approval																		

V - Road Safety Audit Report

V-1. A Report for EN1S2/ – Guadalupe – Neves

V-1. B Final audit report for EN1S2 after design updates, including a matrix of comments describing how the findings of report **V-1. A** were addressed.

V-2. A Report for roads composing the Marginal I lot

V-2. B Final audit report for road composing Marginal I lot after design updates, including a matrix of comments describing how the findings of report **V-2. A** were addressed.

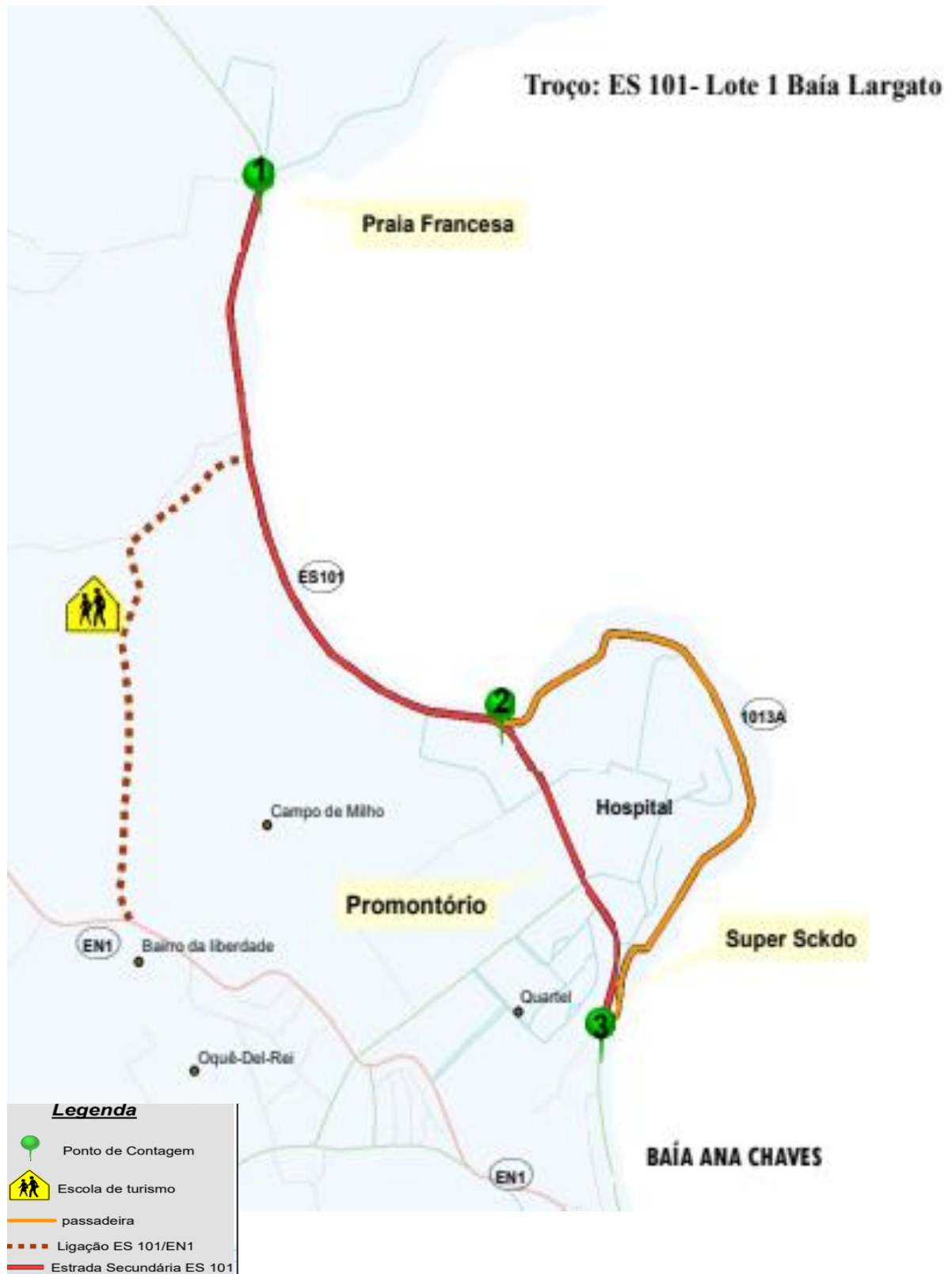
V - ROAD SAFETY AUDIT REPORT																			
[SÃO TOMÉ - GUADALUPE] e [MARGINAL I]																			
Code	Activities	Implementation																	
		Document Delivery	Customer Reviews	Month 1				Month 2				Month 3				Month 4			
		Week	Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1.A	Report for EN1S2 – Guadalupe – Neves	3	2																
1.B	Final audit report for EN1S2 after design updates	6																	
2.A	Report for roads composing the Marginal I lot	3	2																
2.B	Final audit report for road composing Marginal I lot after design updates	6																	
Comment Period / Customer Approval																			

GENERAL SCHEDULE

SCHEDULE FOR DELIVERY OF FINAL REPORTS																										
Code	Activities	Implementation																								
		Document Delivery	Month 1				Month 2				Month 3				Month 4				Month 5				Month 6			
		Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	EN1S2 - GUADALUPE - NEVES	14																								
2	EN1S3 - NEVES - SANTA CATARINA - PONTA FURADA	24																								
3	MARGINAL I [Lagarto Bay - Promontory and Passadeira] [Road linking ES101-EN1S1]	14																								
4	AVALIAÇÃO EX-POST EN1S1 / SÃO TOMÉ - GUADALUPE	6																								
5	AUDITORIA DE SEGURANÇA RODOVIÁRIA [SÃO TOMÉ - GUADALUPE] e [MARGINAL I]	6																								

ANNEX 1

Map: ES101[0+000 – 2+760] Baía Lagarto; ES101-EN1S1 Connection and Treadmill (1013A)



ANNEX 2

PREPARATION OF THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR EN1-S3

The ESIA mentioned in B1 above, shall include:

I - For the section EN1- S3 /Neves – Ponta Furada/

- Identify sensitive receptors of environmental, social and cultural heritage along the sections of RN1 between *Neves, Diogo Vaz, Santa Catarina and Ponta Furada*, point out risks to the natural and social environment and cultural assets associated with the works foreseen in this section, and describe its nature and scope.
- Integrate environmental (including climate), social (including Gender-Based Violence, Sexual Exploitation and Abuse, and Sexual Harassment) and cultural heritage perspectives in selecting the ideal project.
- Provide a detailed set of mitigation measures designed to avoid or lessen the expected negative impacts of construction on the natural, social and cultural environment, and develop an environmental and social management matrix, including mitigation and monitoring plans;
- Assist the client, as requested, during public consultations on the draft ESIA report and through the process of obtaining an environmental license from the Ministry of Infrastructure, Natural Resources and the Environment.

The requirements of the STP environmental assessment system are defined in the laws: *[Law No. 10/1999], [Decree No. 37/1999], [Decree No. 35/1999], [Decree No. 36/1999]* and other laws in force that must be articulated for this purpose. World Bank Environmental and Social Standards triggered by the São Tomé and Príncipe Sector Development and Coastal Protection Project (P178353) include ESS1 (Assessment and Management of Environmental and Social Risks and Impacts), ESS2 (Labor and Working Conditions), ESS3 (Resource Efficiency, Pollution Prevention and Management); ESS4 (Community Health and Safety); ESS5 Land Acquisition, Restrictions on Land Use and Involuntary Resettlement; ESS6 Biodiversity Conservation and Sustainable Management of Living Natural Resources; ESS8 Cultural Heritage, ESS10 (Stakeholder Involvement and Disclosure of Information) , and further guidance is available on the Bank's website (www.worldbank.org) . The consultant will be responsible for carrying out studies and preparing the necessary documents to obtain approval from all entities, namely: Ministry of Infrastructure and Natural Resources (MIRN), Ministry of Environment (MMA) and the World Bank. During the approval process, comments from these entities need to be addressed in final versions of deliverables before they can be approved.

The Client will provide the Consultant with all available data and existing information relevant to the services to be provided by the Consultant under these Terms of Reference.

Surveys, investigations and other studies and additional work must be prepared by the consultant to enrich their data in order to optimize the feasibility study preparation.

Environmental and Social Risks

The environmental risk rating of the proposed project is classified as Substantial due to likely environmental risks and impacts (road traffic and OHS incidents, pollution, erosion, etc.). Although the anticipated environmental impacts and risks are primarily confined along the EN1 between Neves and Santa Catarina, they are expected to be site-specific, reversible, temporary and will occur during the construction and operation phases. Main environmental risks and impacts are mainly related to: i) concerns about the occupational health and safety of contractors, as well as health and safety risks; ii) loss of vegetation, erosion and soil degradation due to deforestation for roads, sidewalks, drainage and slope stabilization works; iii) pollution of soil and surface water from construction works and camping sites; iv) dust, noise and pollutant emissions from construction vehicles, generators and other machines that lead to impacts on water and air quality that could pose environmental and public health risks, v) generation of hazards from fuel, lubricants, tared waste and not dangerous; and vi) working conditions.

Furthermore, proposed interventions, mainly under components 1 for road rehabilitation and coastal protection, may generate indirect, induced and cumulative impacts, including: (i) changes in environmental conditions, such as the increased contribution of pollutant emissions in a river basin ; (ii) litter and blockages in road drainage systems; (iii) agricultural expansion in difficult-to-access areas; (iv) increased pressure on natural resources and ecosystem services (provision) in remote areas; (v) traffic incidents and accidents, including people, wildlife and vehicles; (vi) vandalism and theft of road signs, etc.

Social risks and impacts are considered Moderate and will be primarily confined along the Neves-Ponta Furada Road, and are expected to occur primarily during construction phases, and to be primarily site-specific, reversible and temporary. The main social risks and impacts are related to: i) INAE's limited knowledge and experience on social risks and impact management within the scope of the ESF; ii) potential impacts of involuntary resettlement, resulting in physical damage and/or economic displacement due to road rehabilitation in component 1, especially in Neves where there is a high presence of informal vendors along the road and houses were built on the EN1 road reducing the reach of the road; iii) labor influx problems such as GBV/SEA/SH, teenage pregnancy, early marriage and STDs, among others, resulting from construction works and related local and international workers; iv) occupational health and safety issues for contractors, as well as community health and safety risks.

Prf. #1: Based on the final design, the Consultant should review all existing environmental and social instruments, such as ESIA and RAP among others, of all the road segments that are part of the project (EN1S2, Marginal I, Road Link between ES101 and EN1) and produce an updated report, addressing any gaps and omissions and presenting appropriate solutions in accordance with World Bank ESF and STP rules.

The scope of work will cover environmental, health and safety and social issues that require attention (*in addition to conventional aspects that often occur during the rehabilitation of large linear infrastructures*), including:

- Challenges associated with identifying and formally approving areas for temporary storage and final disposal of construction waste and excess materials, and procedures associated with agreeing these areas with national authorities;
- Soil degradation and erosion resulting from cutting slopes and borrowing construction materials;
- Water table and flow;
- Placement of the contractor's construction site;

- Works on waterways.

This list should not be considered exhaustive and should be provided for general guidance only. The ESIA process will include activities that are common to most ESIA studies conducted in accordance with international standards. These will be carried out as follows:

1. Overview of the legal and institutional framework

The consultant is recommended to build on these existing analyses, drawing on readily available writing and focusing on recent changes to the legal and/or institutional framework that may have occurred since the publication of the most recent ESIA report on national roads. ***It will be important that, for each piece of legislation and each institution covered in the synthesis, their direct links and implications for the rehabilitation of the National Road are specified.***

2. Baseline data collection

The consultant will collect baseline data describing the existing biophysical and social environment in the area likely to be affected by the proposed project. The data must be sufficiently robust, detailed and recent to allow accurate identification of impacts and adequate planning for their mitigation. Data on the physical, biological and human (socio-economic and socio-cultural) environment should be collected and should cover individual topics in these domains with an appropriate level of detail. These shall include, but not necessarily be limited to, the following:

(i) - Physical environment: landscape, topography, geology and geographic hazards, soil types and pollution, climate, air quality, hydrology: surface water bodies, groundwater levels, water pollution, noise.

(ii) - Biological environment: Flora and fauna, rare and/or endangered species (Red List species), natural/critical habitats and ecosystems, protected areas, bird and animal migrations and other important aspects.

(iii) - Existing infrastructures: Transport and communications (railways and motorways, overhead electrical lines; water, sewage and gas pipelines; irrigation pipelines/channels; large underground cables; large storage facilities, etc.).

(iv) - Land tenure and use: Main types of land use: residential, agricultural, resort, industrial, protected or production forests; Main types of land ownership and management: state property, community management (e.g. pastures), private property, allocated to a special use (*plots around important infrastructures*), etc.; estimation of land occupation and physical relocation needs for the purposes of the project; plots of land within the Right of Way (RoW) required for the modernization of the East-West highway currently registered with the State Forest Fund.

(v) - Cultural heritage: Known historical and cultural monuments, areas with a higher than average probability of fortuitous events.

(vi) - Social aspects : Stakeholders in the project: individuals and/or groups who may have an interest in the project or who may affect or be affected by it, individuals, groups (*especially highly vulnerable or disadvantaged groups*) or local communities who may be affected by the project positively or negatively and directly or indirectly within a geographic area of the project; population/demography, communities in general, minority communities, disadvantaged people, employment and socioeconomics, public health, gender.

(vii) - Road safety aspects: Road crashes by type of road user and by severity (fatal, with injuries), number of fatal victims by age, gender and mode of transport in the last 6 years, critical road sections for different road users.

The above information must be obtained through documentary studies and field work. If the available information is insufficient, out of date or of uncertain reliability, the consultant must

carry out field investigations. The consultant must describe the proposed fieldwork in detail in the initial report, identifying the exact purpose, timing, scope, and methodology. The same information should then be included in the ESIA report, in the “Methodology” section.

3. Impacts and mitigation

Internationally accepted best practices must be used throughout the ESIA study, particularly in the process of identifying impacts and assessing their significance. Detailed ESIA studies and/or the approach adopted in projects may reveal different impacts. The consultant must therefore prepare a specific matrix for this project, reflecting the results of the ESIA and describing the proposed mitigation measures in more detail.

Prevention of impacts is preferable to mitigation by both the World Bank Environmental and Social Standards and client policy, so the consultant must liaise closely with the team conducting the detailed design to ensure that actions to avoid or mitigating impacts are incorporated into the project, when appropriate. The consultant must also ensure that the project team is informed in a timely manner of mitigation measures that must be included in construction contracts.

(i) - Environmental risks and impacts: Identify and categorize by significance the environmental risks and impacts that the project may cause in the construction and operation phases, as well as the environmental aspects that may influence the project (for example, geological activity, level of groundwater, climate change pattern, etc.).

For each identified risk, provide a set of mitigation measures explaining how these measures will help to avoid, reduce or compensate for negative impacts, how much the application of these measures may cost and whether there is a favorable legal/institutional structure in the country for the application of these measures. In case of legal/institutional insufficiencies, recommend ways to fill the gaps.

(ii) - Social risks and impacts: Identify all potential social risks and impacts and provide management measures to avoid/reduce/minimize risks and impacts. Risks and impacts should be subdivided by project phase (*i.e. construction and operation*) and special attention should be paid to impacts that may disproportionately affect vulnerable subgroups of the population (*i.e. people with disabilities, elderly people, children, single-parent families, women, etc.*).

The area under consideration in determining social risks and impacts should include all zones where the project intersects with human use and settlement, including residential, commercial, industrial, etc. Among others, these zones include existing areas of human concentration; the right of way; the areas necessary for the storage of materials, traffic diversions, asphalt plants, etc.; transport routes between any quarries and dumps; and relevant functional units, even if only partially affected (e.g. protected areas, wetlands, agricultural plots, commercial establishments, etc.).

(iii) - Develop a risk matrix: Prepare an impact mitigation plan with estimated costs, if possible. The objective is to identify and measure the level of risk and not to carry out a detailed analysis of each impact. Identify possible social risks not related to the project, but that could generate conflicts during project implementation (*i.e.: unmet demands from communities asking for improvements in public services, health or education, among others*).

4. Analysis of Alternatives

The ESIA should include comparison of viable project alternatives (*in terms of location, technology, design and operation*), including the “no project” scenario. For each alternative, the following must be discussed: the potential impacts; mitigation feasibility; capital and recurring costs; adaptation to local conditions; and residual impacts on the natural and social environment

and cultural heritage. Comparisons should be quantified to the extent possible, and the analysis should explain the role played by ESIA findings in selecting the preferred alternative as well as identifying the exact alignment of lanes.

5. Environmental and Social Management Matrix

The ESIA report must include an environmental and social management matrix made up of two separate frameworks: a Mitigation Plan and a Monitoring Plan - established in accordance with the World Bank's Environmental and Social Standards (ESS) which set out the guidelines for the identification, assessment, mitigation and management of potential risks and impacts associated with projects financed by the World Bank.

The Environmental and Social Mitigation Plan, to be produced in table format, must :

- clearly identify what specific potential impacts various types of work may have on sensitive receptors;
- provide concrete prescribed actions to manage these impacts, including the location and timing of these actions;
- provide cost estimates for key discrete mitigation measures (those that are unlikely to be part of a construction company's corporate policy and will not necessarily be included in overall contract pricing);
- provide measurable criteria to identify the adequacy of the mitigation measures being applied and their effectiveness;
- specify responsibility for implementing each mitigation activity.

The Environmental and Social Monitoring Plan, to be produced in table format, must:

- Have a list of all mitigation measures prescribed by types of construction activities;
- provide selected criteria for monitoring the implementation of mitigation measures;
- specify methods for measuring the results of applied mitigation measures (visual, instrumental, survey, etc.);
- identify the location and timing/frequency of monitoring mitigation measures by prescribed criteria;
- provide cost estimates of monitoring mitigation measures in accordance with prescribed criteria;
- specify responsibility for monitoring each monitoring criterion.

It is essential that Mitigation and Monitoring Plans are practical and easy-to-use documents. The Environmental and Social Mitigation Plan must be included in the notices, so that it is available to interested bidders and their requirements are reflected in the proposals presented. Subsequently, the Environmental and Social Mitigation Plan must be duly budgeted by the Contractor and attached to the contract between the client and the works provider, and adherence to it will become a mandatory term of the contract.

6. Disclosure and Consultation with Stakeholders

Stakeholder dissemination and consultation on the draft ESIA report, conducted in accordance with national legislation and World Bank policies, is intended to inform stakeholders about the project, its potential impacts and mitigation, and the involve them in a partnership in the development and implementation of project solutions and mitigation measures.

As project proponent, the Client must:

- Disclose drafts of this TOR, as well as drafts of the ESIA report in Portuguese and English through the INAE website (*when available*) , the **tela non website** and other means of communication, as relevant, with due consideration of convenient access to documents published by communities affected by the project;
- Organize consultation meetings with the participation of communities, highlighting the inclusion of vulnerable or marginalized groups, through advertising, invitations to participants, organization of the venue and provision of presentation equipment;
- Chair each meeting and give an introductory presentation, and chair and participate in discussions as appropriate.

The Consultant must:

- Prepare and deliver a Power Point MS presentation in Portuguese at each meeting describing your work;
- Produce summaries of your work in Portuguese to be distributed at each meeting;
- Produce a written record of each meeting in Portuguese and English, noting attendance, stakeholder affiliations, points raised in the discussion and responses given;
- Incorporate an account of the consultation process in the ESIA report, identifying how each point was addressed in the ESIA report and/or engineering design and providing valid reasons why any points were not addressed.

The Consultant is expected to assist the Client with the above procedures as requested. The Consultant's work may entail various types of consultations, interviews, thematic group meetings and other interactions with project beneficiary communities on the environmental and social aspects of the project, informing the Client of such meetings in advance. Small meetings and ad hoc on-site discussions will not require Customer involvement, however, all meetings must be documented and included in the ESIA report.

ARRANGEMENTS FOR THE ENVIRONMENTAL AND SOCIAL INSTRUMENTS

The Consultant shall contact the Client, the Ministry of Infrastructure and Natural Resources and Ministry of the Environment, the World Bank to the extent necessary, as described above. The Client will facilitate initial contacts with each agency and must be invited to all subsequent meetings with the Ministry and the Bank to have the opportunity to participate.

Liaison with the *engineering team* is particularly important to ensure that environmental and social issues play the necessary role in influencing the project and that the ESIA contains accurate and adequately detailed information about projects. It is important, therefore, that the environmental and *engineering teams* establish a good working relationship. The Consultant should also communicate with consultants carrying out other studies/surveys that are relevant to the work of ESIA - in particular - specialists working on involuntary resettlement related to this project (including the development of the Resettlement Policy Framework (RPF), since any issue related to works in [*Guadalupe-Neves-Ponta Furada*], [*Marginal I (Baia Lagarto, the Promontory, Passadeira and ES101-ENIS1 road link)*]) and the general characteristics of the proposed mitigation/compensation will have to be included in the ESIA Report.

Communication with MIRN and MMA is also important both to assist the process of requesting an Environmental License, and to understand the requirements of the São Tomé and Príncipe Environmental Impact Study system *[EIA STP]*, so these contacts also must be prioritized.

PRODUCTS RELATED TO ESIA

The reports of the ESIA, prepared for EN1S3 and revised for EN1S2 and Marginal I **[Baía Lagarto, the Promontory, Passadeira and ES101-EN1S1 road link]**, in preliminary version and final, they must be prepared so that they are acceptable and presented to the World Bank and MIRN and MMA as meeting the requirements of their respective systems. World Bank requirements are set out in the World Bank Environmental and Social Standards (ESS) and the requirements applicable to ESIA reporting under STP legislation. The Consultant should hold discussions with both agencies at the outset of the ESIA study to develop an approach to reporting that is acceptable to both parties, and the Client will participate in these discussions as appropriate. It is essential that reports are clear about which of the World Bank's NAS are triggered by works on road sections, as well as whether these works are subject to State Ecological Expertise and environmental licensing under the STP law.

Reports must be structured to correspond to the ESIA model in accordance with Environmental and Social Standard 1 for substantial risk projects.

ESIA table of minimum contents

1. Executive Summary

- Concisely discusses significant findings and recommended actions.

2. Legal and institutional framework

- Analyzes the legal and institutional framework of the project, within which the environmental and social assessment is carried out, including the issues defined in ESS1, paragraph 26.46
- Compare the existing environmental and social framework of the Borrower and the ESSs and identify gaps between them.

3. Project description

- Concisely describes the proposed project and its geographic, environmental, social and temporal context, including any external investments that may be required (e.g. dedicated pipelines, access roads, power supply, water supply, housing and storage facilities raw materials and products), as well as the project's main suppliers.
- Through consideration of project details, indicates the need for any plan to meet the requirements of ESS1 to ESS10.
- Includes a map with sufficient detail, showing the project location and the area that may be affected by the project's direct, indirect and cumulative impacts.

4. Baseline data

- Defines in detail the baseline data that is relevant to decisions about project location, design, operation, or mitigation measures. This should include a discussion of the accuracy, reliability,

and sources of the data, as well as information about dates around project identification, planning, and implementation.

- Identifies and estimates the extent and quality of available data, key data gaps, and uncertainties associated with forecasts.
- Based on current information, assess the scope of the area to be studied and describe the relevant physical, biological and socioeconomic conditions, including any changes anticipated before the project began.
- Takes into account current and proposed development activities within the project area but are not directly linked to the project.

5. Environmental and social risks and impacts

- Takes into account all relevant environmental and social risks and impacts of the project (including the possible existence of resettlement). This will include the environmental and social risks and impacts specifically identified in ESSs 2 to 8, and any other risks and impacts environmental and social issues arising from the specific nature and context of the project, including the risks and impacts identified in ESS1, paragraph 28.

6. Mitigation measures

- Identifies mitigation measures and significant residual negative impacts that cannot be mitigated and, to the extent possible, assesses the acceptability of these residual negative impacts.
- Identifies differentiated measures so that adverse impacts do not fall disproportionately on the disadvantaged or vulnerable.
- Evaluates the feasibility of mitigating environmental and social impacts; the capital and recurrent costs of the proposed mitigation measures and their appropriateness to local conditions, the institutional, training and monitoring requirements for the proposed mitigation measures.
- Specifies issues that do not require further attention, providing the basis for such determination.

7. Analysis of alternatives

- Systematically compares viable alternatives for the proposed project site, technology, design, and operation — including the “no project” situation — in terms of their potential environmental and social impacts;
- Evaluates the feasibility of alternatives for mitigating environmental and social impacts; the capital and recurring costs of alternative mitigation measures, and their suitability under local conditions; the institutional, training and monitoring requirements for alternative mitigation measures.
- For each of the alternatives, quantify the environmental and social impacts to the extent possible, and assign economic values whenever possible.

8. Institutional Arrangements for ESIA Implementation

Identifies all those responsible for implementing the ESIA and assesses the UIP's existing institutional capacity for socio-environmental management

9. Institutional Capacity Building and Training

Identify institutions that will benefit from training (UIP, DGE, construction inspectors, contractors and subcontractors) and propose training topics related to environmental, health and safety, social, and GBV management.

10. Appendices

- List of individuals or organizations that prepared or contributed to environmental issues and social assessment.
- References—define the written materials, published and unpublished, that were used.
- Record of meetings, consultations and surveys with interested parties, including those with affected people and other interested parties.

Terms of Reference for preparing the Environmental and Social Management Plan (ESMP)

RESETTLEMENT ACTION PLANS (RAP)

In the initial phase of the detailed engineering project, after selecting the final alignment (horizontal and vertical), the Consultant must prepare the Plan for Section EN1S3, based on the Environmental and Social 5 of the World Bank Environmental and Social Framework (ESF) and Project Resettlement Policy Framework - *prepared by the Consultant* - and in all relevant national legislation and procedures specified by these documents as well as Bank guidelines on involuntary resettlement. Field tasks and surveys must include measurements, evaluations and social surveys (survey of people targeted by resettlement actions) in accordance with the definition of required land occupation.

Preliminary Data Collection

The Consultant must study and describe the area of influence of the Project, and for this purpose must carry out the following activities described below and among others relevant to the preparation of the instrument:

- a) Study the area of implementation of the Project, in order to identify, with a high level of confidence, the number of affected producers and the respective dimensions of the agricultural areas, including the type of crops, street vendors, fishermen and *palaiês* -women fish sellers;
- b) Carry out and submit the census of PAPs, as well as the inventory of loss of assets and/or affected assets;
- c) After the Census define the cut-off date
- d) Design and describe forms of compensation as well as restoration of livelihoods;
- e) Conduct public consultations and evidence the inclusion of results in the PARs;

- f) Create conditions for the dissemination and implementation of the Grievance Resolution Mechanism;
- g) Create the resettlement committee to supervise and monitor the resettlement and compensation process;
- h) Approve the timeline and budget of the resettlement/compensation process and identify the responsibilities of each actor;
- i) Design a monitoring plan, which includes performance and satisfaction indicators, as well as the definition of responsibilities for the monitoring of PARs;
- j) Signing of the agreements between the tenderer and the PAPs;
- k) Prepare maps of the location of agricultural areas, street vendors, fishermen and *women* fish sellers to be affected and identify with a high degree of certainty the communities that have constituted the vicinity of those affected;
- l) Describe the characteristics of the land in the affected areas in terms of size, location and type of use to which they are subject
- m) Describe the characteristics of the sales outlets (*stalls and stalls*) affected in terms of size, location, type of use to which they are subject and type of products sold;
- n) Identify and describe the type of assets belonging to each of the affected families, as well as their estimated value;
- o) Consult and coordinate with the different local structures and organizations with a view to preparing and facilitating the compensation process.

Socio-Economic Survey

A socio-economic study will be carried out in order to determine the well-being of the affected communities and the characterization of the resettlement areas. The study should reflect at least the following:

- a) Sociological research with data collection in the field on population censuses, production systems, organization of families and basic information on the way and standards of life of the affected populations;
- b) Inventory, in the field, of the assets of the affected people in collaboration with them and with community leaders, district councils, district police;
- c) Record of meetings or consultations held between the Proponent and the leaders of the affected communities, as part of the community consultation process.

Resettlement Action Plan

The Report to be produced by the Consultant/company shall consider the following:

- a) The potential impact of resettlement, including the various alternatives to consider;
- b) The identification in the Community of the person responsible for the resettlement and his/her capacity, who will work in coordination with the Committee of Affected Persons, with a view to carrying out this activity with the communities;
- c) Present the legal basis, including Decrees or diplomas, and existing legal mechanisms for the resolution of disputes;

- d) Resettlement and livelihood restoration measures;
- e) The Implementation Plan, including costs, as well as the monitoring and evaluation.

Expected Outcomes

At the end of the consultancy, the following results are expected, among others,:

- a) PAP's identified and categorized;
- b) Census of PAPs carried out and submitted, as well as the inventory of loss of assets and/or affected assets;
- c) Completion of the Resettlement Action Plans as well as the detailed compensations;
- d) Set the cut-off date;
- e) Forms of compensation/resettlement, as well as restoration of livelihoods, were designed and described;
- f) The public consultations were carried out and the inclusion of the results in the PARs was evidenced;
- g) Created the conditions for disclosure and implementation of the Grievance Resolution Mechanism;
- h) Create the resettlement committee to supervise and monitor the resettlement and compensation process;
- i) Assistance to the resettlement process and compensation, referring to the provision of transportation of PAP's, goods and materials from stalls and tents, and houses to be destroyed, was described;
- j) Approved the schedule and budget of the resettlement/compensation process and identified the responsibilities of each actor;
- k) Monitoring plans are designed, which include performance and satisfaction indicators, and responsibilities for monitoring PARs are defined;
- l) Agreements signed between the tenderer and the PEFs.

In PARs, the Consultant will calculate all compensation for the **replacement value**.

PAR Content Proposal:

In PARs, the Consultant will calculate all compensation at **replacement value**.

All PARs must be prepared in accordance with the following scheme:

1. Project Description

- a) Project overview, including its objective and components*
- b) Detailed description of the project's road components*
- c) Objectives and Results of the project*

2. Potential impact of the Project

- a) Scope of project impacts*
- b) Impact on soil*
- c) Impact on buildings and structures*
- d) Impact on harvest and perennial plants*
- e) Impacts on companies/businesses*
- f) Impacts on livelihoods and living conditions*

g) Other impacts

3. Socioeconomic study of the project area

a) National context

b) Local context

c) Socio-economic analysis of people affected by the project

c.1) demographic profile

c.2) homestead

c.3) income and expenses

c.4) Basic services

c.5) attitude towards the project and expectations

c.6) vulnerable subgroups of the population

4. Legal framework

a) Legislation in São Tomé and Príncipe relating to the Acquisition and Involuntary Resettlement of Land;

b) World Bank Environmental and Social Standard 5 relating to land acquisition, land use restrictions and involuntary resettlement;

c) Differences between the legislation in force in the STP and the World Bank Environmental and Social Standard, and the measures that will be taken to bridge these gaps and ensure that the highest level of protection is granted to the people affected by the project

5. Resentencing of people targeted for Involuntary Resettlement (affected parties)

6. Participatory Public Consultation

7. Institutional (Organizational) Arrangements and Responsibilities

8. Resettlement activities

a) Preparation of the final RAP

b) Implementation of RAP

9. Assessment methods. Assessment of losses and compensation

a) Assess the value of the building and structures

b) Calculation of the market price of land using the sales comparison method

c) Method of calculating compensation for perennial plants

d) Calculation of annual compensation for installations

e) Compensation of companies/businesses

f) Compensation for means of subsistence

10. Project integration

a) Identification of interest holders

b) Dissemination of information, public debates, participation and consultations

11. Complaint Resolution Mechanism

12. Monitoring and evaluation

13. PAR implementation timeline (including timeline)

14. Resettlement costs and budget

Attachments:

Annex 1 Assessment methodology
Annex 2 Legalization procedure
Annex 3 Information leaflet
Annex 4 Minutes of the public consultation
Annex 5 Signed terms of commitment

Note to Consultant: *All Resettlement Action Plans must be developed in accordance with the World Bank Environmental and Social Standard 5 on **Involuntary Resettlement** (<https://policies.worldbank.org/sites/ppf3/PPFDocuments/090224b0822f89db.pdf>) and are annexes. For additional information, see the **Involuntary Resettlement Sourcebook** (<http://documents.worldbank.org/curated/en/206671468782373680/pdf/301180v110PAPE1ettlument0sourcebook.pdf>).*