



Section II: Schedule of Requirements

TERMS OF REFERENCE (TOR)

Data collection for the Detailed Design Studies for Urban Infrastructure works for Hargeisa Municipality, Somaliland.

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1. Background

The United Nations Office for Project Services (UNOPS) intends to carry out feasibility studies and detailed designs for selected infrastructure works in Hargeisa Municipality. The purpose of this Terms of Reference (ToR) is to engage a qualified consultancy firm to undertake a comprehensive data collection including: topographical survey, geotechnical study, hydrological and hydraulic study and a traffic study and socio-economic and environmental baseline data for selected roads in Hargeisa.

2. Project Description

Hargeisa is the capital of Somaliland and serves as the political, administrative, and economic hub of the region. It is located approximately 250 km inland from Berbera Port, at an altitude ranging between 1,200 and 1,400 meters above sea level. The city occupies a series of valleys and ridges formed by dry river channels (toggas), which influence its drainage patterns and settlement layout.

Hargeisa hosts over 1.2 million residents, making it one of the largest and fastest-growing cities in the Horn of Africa. The city functions as a trade and service center linking Berbera Port with surrounding regions. However, rapid urban growth and informal settlement expansion have placed pressure on its basic infrastructure, particularly the road network, stormwater drainage, and flood control systems.

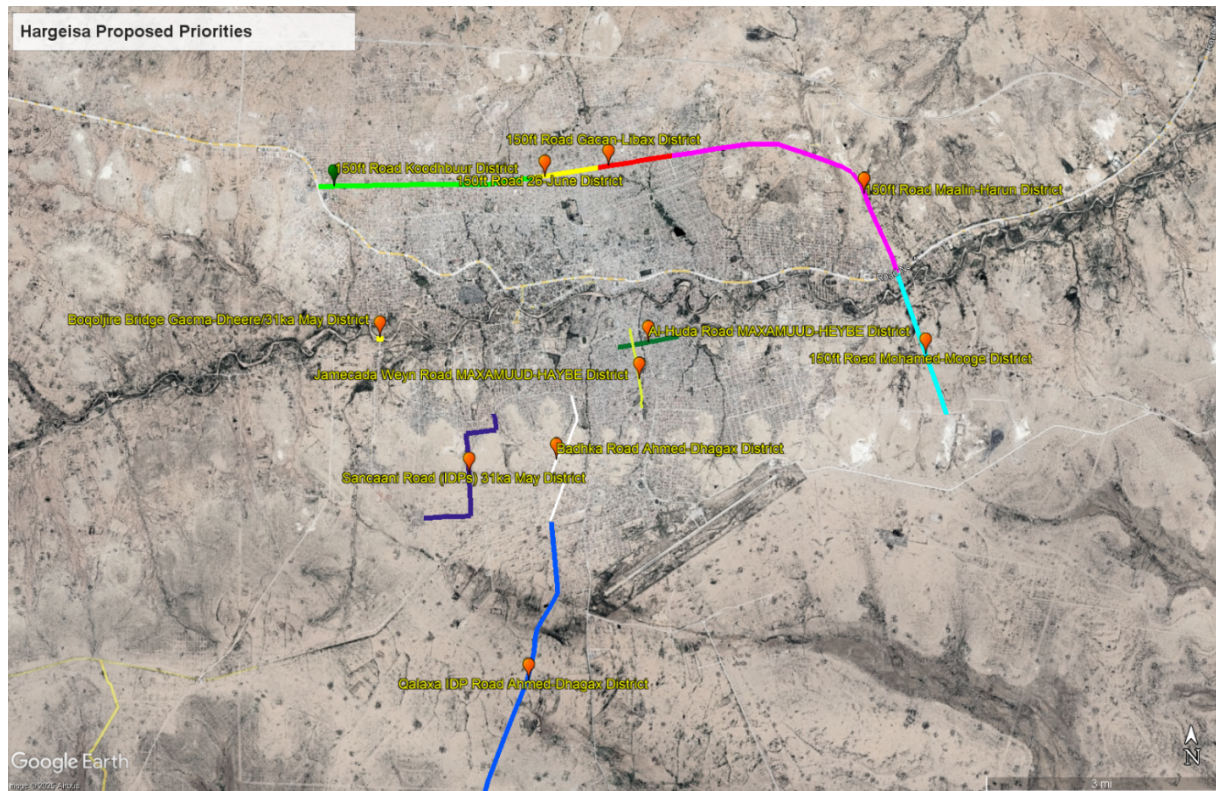
Administratively, Hargeisa is divided into nine districts: Mahamud Haybe, 31 May, 26 June, Koodbuur, Maalin Haruun, Gacan Libaax, Mohamed Mooge, Gacmo Dheere, and Ahmed Dhagah. While each district has unique socio-economic characteristics, they all face similar urban challenges such as poor drainage, unpaved or deteriorated roads, congestion, and inadequate public services.

A total of 45.1 km of roads and 2-cell culverts in the city have been selected for feasibility studies and detailed designs. Out of this, 23.85 km of roads are critical interventions, while an additional 21.3 km of roads are categorized as second-priority investments. The investments focus on roads and culverts that enhance access to vulnerable IDP settlements, mitigate flood risks, and improve economic and livelihood connectivity for vulnerable communities.

The table below shows the list of roads identified for investment:

No.	Name of the Road	Unit	Length (km)	Current Condition	Districts
1	Al-Huda Road with 2 Culverts	Km	1.9	Paved road with numerous potholes	Mahamud Haybe

2	Jameco Weyn Road	Km	1.9	Unpaved - minor repairs done recently	Mahamud Haybe
4	Dabedda Cadaada with 3 Culverts	Km	5.2	Unpaved	Mahamed Mooge
5	150ft Road	Km	11.95	Unpaved	Maalin Haruun, Mahamed Mooge Koodbuur, Gacan Libaax, 26ka June
6	Iidaan Road (IDP Road)	Km	2.0	Unpaved	Macalin Haruun
7	Naasohablood C Road (IDP)	Km	1.8	Unpaved	Macalin Haruun
9	Statehouse Road	Km	1.0	Paved	Gacmo Dheere
11	Sheikh Madar Road	Km	2.3	Unpaved	Gacan Libaax
12	Sancaani Road (IDPs)	Km	3.0	Unpaved	31ka May
13	Faluuja to Sheikh Omar Road	Km	1.45	Unpaved	31ka May
15	Batalaale – Xabaalaha Road (ex Djabouti) with Culvert	Km	3.0	Unpaved	26ka June
16	Qalaxa IDP Road	Km	7.0	Unpaved	Ahmed Dhagax
17	Badhka upto Kaydka Biyaha	Km	2.6	Unpaved	Ahmed Dhagax
	Total Road Kms		45.1		
1	Qunyar Daga (3 culverts)		2 Cell Culverts	Unpaved	Koodbuur



A map showing the project roads is shown above

3. Objectives of the Services:

The overall objective of this assignment is to conduct site investigations and data collection to support the feasibility studies and detailed designs for the above listed scope of works, and to generate the data required for the preparation of Environmental and Social (E&S) instruments, including Resettlement Action Plan (RAP), Environmental and Social Management Plan (ESMPs), Stakeholder Engagement Plan (SEP), and the Gender Assessment. In carrying out this assignment, the consultant will also be required to carry out capacity building activities for the Municipality engineers and environmental and social counterpart staff

The specific objectives of the consultancy as per the TOR are:

- A. To carry out the data collection as follows:
 - a. Topographic Survey and Establishment of Survey Controls
 - b. Hydrological, Hydraulic Studies and Drainage Investigations
 - c. Geotechnical Survey, Soil Investigation and Pavement Evaluation
 - d. Traffic Surveys

- e. Socio-economic and Demographic Baseline Data
 - f. Environmental Baseline Data
 - g. Community Consultations and Stakeholder Engagement
- B. To carry out capacity building for Municipality engineers through workshops and on-job training.

4. Scope

4.1. General

The Consultant will perform all work necessary as follows in this TOR, including all technical studies, field investigations and related services. Consultant shall manage all work necessary, as called for in the Terms of Reference, including all technical studies, field investigations, and related services.

In carrying out the work, the Consultant will cooperate fully with the concerned agencies of the Federal Government of Somalia, UNOPS, and UNOPS consultant for road design who will be provided with the necessary support services for the completion of the assignment. Consultant, with the support and assistance of the concerned agencies of the Federal Government of Somalia, will always ensure adequate community consultation and engagement during the study to ensure social concerns are factored into the design.

In doing so, the consultant shall structure and document community engagement in accordance with World Bank's Environmental and Social Standard (ESS10) and the project's Stakeholder Engagement Plan (SEP). At a minimum, this shall include; at least one Community Consultation Meeting (CCM) per administrative district. The consultant shall ensure comprehensive documentation of all consultation activities, including signed attendance lists, meeting minutes and photo records. The consultation and engagement report shall be submitted as a standalone deliverable.

The consultant shall work closely with the UNOPS project team to ensure that any necessary government and other external stakeholders have been consulted, and that their concerns are incorporated into the final design package.

The proposed services shall also comply with UNOPS commitment to ensuring that the implementation of the infrastructure projects does not unfairly burden poor and vulnerable individuals, communities, and governments. Instead, the design solution shall consider mitigation of negative social and environmental impact and maximize positive impact of the same.

4.2. Time Allocation

In line with UNOPS draft work plan under this ToR, the consultant shall allocate an appropriate time for providing the services, commensurate with the complexity of the assignment and in accordance with industry best practice. The consultant shall include all necessary and appropriate clerical and secretarial expenses within their proposal. For this purpose, a timeline of up to **4 months** is initially proposed for the delivery of these services.

4.3. Working Language

This Design Consultancy Contract is signed and executed in English, and all communications, notices, modifications and amendments related to these agreements shall be made in writing in the same language. Moreover, the design documents (drawings, technical specifications, Calculations, reports, bill of quantities, etc.) must be delivered to UNOPS in English language.

The reports are to be submitted in three (3) hard copies together with five (5) soft copies on flash disks. The soft copy data must be in the original editable format of the computer programme/software which created it or any other form that shall be requested by the Client.

4.4. Compliance with Project E&S Guidelines

The consultant shall be required to comply with the Project environmental and social guidelines. The consultant will be required to read and familiarise themselves with the WB's ESF.

To fulfill this requirement, the consultant shall familiarize themselves with the following ESF Standards that are directly relevant to this assignment: ESS1: Assessment and Management of Environmental and Social Risks and Impacts; ESS2: Labour Working Conditions; ESS4: Community Health and Safety; ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement; and ESS10: Stakeholder Engagement and Information Disclosure. The data collected under this ToR will directly underpin the preparation of the following E&S instruments: the RAP, site specific ESMPs, Labour Management Procedures (LMP), SEP, and the Sexual Exploitation and Abuse/Sexual Harassment Prevention and Response Action Plan. The consultant shall therefore, ensure that all data collection activities are sufficiently comprehensive to meet the requirements of each of these instruments, as further elaborated in the relevant sections of this ToR.

The consultant will have to demonstrate how their activities take gender and diversity into account during all phases of the design and apply it to its staff and operations as part of the proposal. Gender and diversity should be considered internally during project design staffing processes.

The consultant should take into account sustainable and resource efficient management of operations that will be beneficial for the environment. This includes, but is not limited to, adhering to international standards, incorporating corporate sustainability policy, and applying an Environmental Management System to the operations.

5. TERMS OF REFERENCE (TOR)

5.1. Topographic Survey

Objective

The objective is to supply topographical and engineering survey data as per the specifications and schedule outlined in this Schedule of Requirements in order to assist the feasibility studies, preliminary and detailed engineering designs for the priority urban roads in Hargeisa.

Activities

Activities include but are not necessarily limited to the following tasks;

Preparatory Works:

- Submit a work plan and resources schedule to UNOPS for progress monitoring
- Agree with the UNOPS PM on the applicable reference system and accuracy of the survey to conform to the national standards
- Communicate and meet with the municipalities to advise of the engagement for the road survey and to share the schedule
- Liaise with the relevant Government institutions to locate the Permanent Bench Marks (PBM) of the subject area and to fulfil other governmental requirements

Field Works

- Vertical and horizontal inter-visible control points shall be established by Static Surveying method at not more than 500m intervals. All control points shall be secured with concrete pillars of 200mm x 200mm cross-section and 300mm depth with a suitable steel rod and approximately 5cm above the ground, and tied to available national/local datum (if available) or established. All control points are to be referenced to a minimum of three permanent reference points. Both control points and reference points are to be located outside the anticipated construction limits, and field sketches and photographic records are to be maintained.
- Topographic survey shall generally extend over a minimum width of 20 meter (where possible) on either side of the road centre line of the existing road or proposed new alignment. Where developments or settlements have resulted in a requirement for adjustments in the alignment or where the existing alignment can be improved upon through

adjustments the width of survey shall be widened appropriately. At road junctions the survey will extend a minimum of 100 meters (where possible) on either side of the existing road centre line.

- Topographic Survey should show all features within the corridor including roadway width, any roadside permanent structure, fence lines, utilities including location of underground utilities (where applicable), trees above 300 mm in girth, cross drainage structure, bridges, culverts etc.
- Survey shall include longitudinal profile along existing centre line and cross section at 20meter interval (or at a lesser interval where the road cross section subject to significant changes), extended over a minimum of 20 meters on either side of the centre line (where possible) of the existing road or alternative road alignment (as directed by UNOPS PM).
- Typical cross section of the waterways and established drainage lines / natural depressions located within 25m of the road centreline on both sides of the road (where applicable). On waterways crossing the alignment, the survey shall be carried out for at least 50m on both the upstream and downstream. The points picked will include the invert and bank levels.
- During the survey, relevant data regarding features and information useful in determining the project design, shall be obtained through personal inquiries and observation and carefully recorded including field sketches and photographic records. This information may include, but not limited to; high flood levels, rocky areas, cultivated land and any other useful information deemed necessary.
- Survey operation shall be sufficiently comprehensive to secure all relevant field information necessary for preparation of the detailed design, resettlement, identification of utilities and trees etc. as may be required for preparation and implementation of the project.
- The survey will determine the extents of the road reserve and construct road reserve marker posts at intervals of 100m on both the right and left hand side of the road. The posts shall be concrete posts of 1m height and 0.1m x 0.1m cross-section. They shall be painted white and the chainage indicated for easy identification.

Cadastral mapping and RAP:

Where applicable and as shall be directed by the UNOPS PM, the consultant shall take measurements and map out properties or pieces of land that may need to be acquired for road construction.

In addition to these cadastral measurements, the consultant shall collect all data necessary to serve as a prerequisite for the preparation of a RAP. These tasks shall be carried out concurrently with the topographic survey for all road corridors and shall include: (i) assisting municipal authority to formally establish and declare the cut-off date, (ii) conducting a census of all Project Affected Persons (PAPs) within the defined Right-of-Way (RoW), (iii) preparing a full inventory of all

affected assets within the RoW, (iv) identifying and profiling vulnerable PAPs, and (v) conducting an inventory of all roadside businesses, including informal vendors within the RoW.

Upon completion, the PAP census, asset inventory, and vulnerability register shall be submitted to UNOPS as an integrated geo-referenced database, alongside the narrative survey report.

Equipment and Accuracy:

- In carrying out the topographic survey, it is expected that the consultants will use equipment and procedures, which will result in the expeditious development of accurate computer-based survey maps suitable for use in the final design.
- Equipment and instruments for survey shall be of high precision and have the required valid calibration certificates. Total Stations shall be of minimum accuracy of 1.5mm measuring distance and angular accuracy of 2". Auto levels shall be a minimum magnification of 32X and Real-time Kinetic GPS (RTK GPS) with horizontal precision of $\pm 8\text{mm} + 1\text{ppm}$ and vertical precision of $\pm 15\text{mm} + 1\text{ppm}$.
- Vertical control points shall be established with the help of Automatic level in the entire length by Double spirit levelling method. Levelling work shall start from the nearest available Bench Mark and be cross-checked with other Bench Marks on route or nearby or by fly levelling in opposite direction. The closing error for carrying out Bench Mark shall be not more than $\pm 10\sqrt{k}\text{ mm}$, where k is distance of Km.

Reporting:

- The output of Topographic Survey will be in the form of computer files containing horizontal points. Vertical elevation and description of all points needed to develop a full topographic map covering the width of the survey band.
- The data collected at site shall be coded so that they may be processed conveniently using appropriate road design software to generate a digital terrain model. The data thus collected in the field shall be directly downloaded to the computer and processed in AutoCAD or similar software. This will generate the X, Y, Z, co-ordinates of the points picked-up as well as their connectivity.
- The output of the activity will be plan and profile sheets terrain model at 1:2000 horizontal scale and 1:200 vertical scale showing setting out of all information on all existing plan features, right of way limits, existing ground line, connecting roads, drainage structure locations, utility network (telephone, electricity poles/lines, water lines etc.) within the surveyed area.
- Filed observations, records of input received from the locals, field sketches and photographic records

Deliverables:

The following information shall be included in the Final Survey Report; Control Point Monograph, GPS Monograph, BM Monograph, List of GPS Points and Benchmarks, Differential Levelling Data, Traverse Computation Results and Field Feature Codes used, in addition to other information proposed by the service provider.

The survey data shall be submitted both in soft copy and electronically including the data downloaded from the Geodetic/Real Time Kinetic GPS equipment, total station, levels, etc and also the processed data in spreadsheet format (*.csv and *.xls)

Performance management

The basis for the performance management of the Contract will be the timely delivery of the service to the specification agreed to.

On completion of the survey exercise and submission of the deliverables, a joint verification exercise shall be carried together with UNOPS to check the accuracy and correctness of the submitted data. The exercise will involve joint setting out of sections as selected by the UNOPS.

Qualifications and Experience of the Surveyor(s)

- Minimum BSc in Surveying Technology, Land Surveying/Civil Engineering or Advanced Diploma in Surveying Technology, Land Surveying/Civil Engineering
- Minimum 8 years of experience in topographic surveying works with BSc or 5 years with Advanced Diploma
- Experience in undertaking surveying of at least 2 road projects within last 3 years, with a similar level of duties and responsibilities expected to be performed under this proposed engagement
- Proficient in using latest surveying equipment such as Geodetic/Real Time Kinetic GPS, Total Station, automatic level and ability to upload/download data and generate topographic maps and Contours
- Ability to communicate in English, both verbal and written

A copy of the CV of the proposed surveyor(s) shall be submitted.

5.2. Hydrological, Hydraulic Studies and Drainage Investigations

Objectives

Determination of soils drainage, flow patterns and characteristics of all the water crossings, sizing of structures and side drainages.

Consultant will provide a complete description of the hydrological features of the area, including information about soil drainage along the alignments, such as sub-soils drain ability, drainage impedance, flooding of flat areas, etc., characteristics of required water crossings. Sufficient information shall be obtained by consultant based upon the guidelines provided in the agreed Road Design Manuals and supplemented by other relevant sources of information to justify and

provide the basis for the preliminary engineering design of all drainage systems and structures and for preliminary costing purposes. Consultant will be fully responsible for obtaining all the data and information necessary to carry out hydrological and drainage investigations and designs.

Activities

The hydrological investigation will be carried out to provide the required information for design of drainage structures and channels. To this end it is necessary to fully describe the hydrological features of the study area and calculate the volume of runoff at each of the drainage crossings and channels.

a) Data collection

The following data shall be collected

- Mapping
 - Topographical maps
 - Soil maps
 - Geological maps
 - Aerial imagery
- Meteorological data
 - Patterns of rainfall (daily, monthly, annual variability both temporarily and spatially)
 - Rainfall storm data (intensity, frequency, duration data for storms up to 24 hours)
- Catchment characteristics
 - Land use (forest, plantation, other)
 - Soil type (well drained, poorly drained)
 - Physical characteristics (1: 100,000 maps)
- River channel characteristics
 - Dimensions/slopes
 - Roughness
 - Capacity
 - Historic flood levels (based on channel cross section profiles)
- Existing Drainage Structures
 - Type and dimensions
 - Hydraulic capacity
 - Evidence of stress (over-topping)
 - Material tests on existing structures and computation of durability index
- Local Knowledge
 - Design criteria
 - Locally used prediction methods
 - Local publications

Once the required data is collected the Hydrologist shall determine the volume of runoff and check the adequacy of the existing drainage structures in terms of capacity and structural soundness. The following are some of the studies to be conducted at this stage

Study of existing hydrological data to assess catchment characteristics and peak runoffs.

Determination of catchment areas

Determination of design year flood flows

Complete inventory and condition survey of all existing culverts and other drainage structures

b) General approach to flood modeling

The following flood models should be considered in computation of floods:

- Richards Method (East and Southern Africa)
- UK Flood Studies Report Method (East and Southern Africa)
- TRRL East African Flood Model (East Africa)
- Rational Method (East and Southern African)

The choice of the appropriate model will be guided by the degree of relevant data availability and the findings of the fieldwork. All flood modeling work shall be preceded by detailed fieldwork during which a close examination shall be made of watercourse hydraulic capacities, using slope area methods.

c) Analysis

Following the data collection exercise, the Hydrologist shall:

- Provide a comprehensive catchment description covering climate, geology, drainage and land use
- Select the most appropriate method of flood determination
- Derive locally applicable rainfall frequency duration curves
- Derive locally applicable runoff factors.
- Analyze available flood data using standard statistical techniques
- Develop generalized flood curves based on published data from the FRIEND project publications (and other publications)
- Prepare flood predictions.

d) Sizing of drainage structures and Side Drains

Once the analysis is completed then the Hydrologist shall determine the sizes of each of the drainage structures and drainage channels.

Outfalls

The consultant shall identify outfalls for drainage of stormwater from the project roads. These outfalls shall be sufficient to discharge stormwater collected along the roadside drains to natural channels. The locations of the outfalls shall have minimal environmental and social impact.

Should the impacts be unavoidable, the consultant shall identify them and propose mitigation measures.

In assessing outfall locations, the consultant shall simultaneously collect the environmental baseline data required to support the Environmental and Social Impact Assessment (ESIA) and site-specific ESMPs. Environmental and social sensitivities within 200 m of each proposal outfall, including schools, mosques, health facilities, water points, and IDP settlements shall be recorded and geo-referenced.

Drainage Structures

Consultant will provide a complete inventory and condition survey of all existing structures within the alignment. The information shall include the type of structure, whether a bridge, a box culvert, Armco culverts, timber bridge or masonry bridge.

Sufficient details on the condition survey on the existing drainage structures shall be provided; including crack width and distribution, condition of bridge bearings and any other structural deterioration. UNOPS will carry out flood estimates to ascertain the capacity of the existing structures and advise whether there is a need for any replacement.

Consultant will carry out materials tests on the existing structures that will enable the PIU to decide on whether or not to replace the structure with a new one. The details required to facilitate the decision-making on the existing structures shall be submitted at the Preliminary design stage.

Consultant will undertake all soil investigations and tests and identify the type and sources of construction materials necessary for the preliminary design, detailed design, and construction phases of the project. These sources should be considered when selecting final alignments.

Reporting

The Consultant shall provide a detailed hydrological report comprising the survey findings (inventories, photographs, sketches etc.), analysis, assumptions, proposals and reference materials/standards.

Technical Manpower, Plant & Equipment

The Hydrologist at his or her own costs will arrange all support staff, equipment / machines, transportations, tools and auxiliary material required for execution of all the items of work.

Minimum Expected Deliverables:

1. To clarify the current conditions of river channels and riparian areas, which are subject to the proposed road network.

2. To estimate the flood discharges of the rivers in various return periods through statistical approach at crossings along proposed road alignment.
3. To recommend betterment of drainage systems along the proposed alignment, where deterioration of present drainage conditions due to implementation of the project is predicted, if any.

Qualification Requirements for the Hydrologist/Drainage Engineer

The Consultant must meet the following requirements.

- Holder of B.Sc. Civil Engineering, hydrology or related studies from a reputable university.
- Must have a minimum of 10 years' practical post-graduation experience in flood modelling, GIS analysis, design of hydraulic structures and climate change vulnerability and adaptation assessments.
- Must have successfully served in a similar role on at least 2 completed road design or road construction supervision assignments of comparable magnitude, preferably in tropical countries.
- Fluency in both written and spoken English is essential.

5.3. Geotechnical Survey, Soil Investigation and Pavement Evaluation

Consultant will carry out an evaluation of the existing pavement, if any, and determine appropriate intervention measures. The Evaluation shall include but not be limited to the following as appropriate:

- Visual inspection and assessment, recording and quantifying defects.
- Subgrade strength analysis may include Dynamic Cone Penetrator tests (DCP).
- Existing pavement structure analysis. This will include trenching sampling and testing.

The availability of suitable conventional road construction materials and the appropriate and economic use of the same is viewed as key factors influencing the choice of alignment, pavement and wearing surface design. The possibility for specific problems arising from the use of proposed materials which may be particular to the area under study shall be assessed, quantified and appropriate countermeasures shall be recommended. Consultant will identify possible material sites near and along the project road.

Objectives of the Studies

Perform detailed materials testing for in-situ subgrade, borrow materials, rock, fine sand and water for construction.

Methodology

The Geotechnical Engineer shall conduct a review of all existing relevant data, followed by a detailed study of the soils and materials along the routes.

a) In-situ subgrade soils

The Geotechnical Engineer shall carry out detailed soil investigations along the alignment as are required to identify the varying soil types with samples being taken at intervals of approximately 500 m or at such other intervals considered necessary to determine the changes in soil types.

At least one sample will be taken per 500 m of alignment with more frequent samples where there are major changes in soil types like soft soil formation, recent landfills, slide-prone sites, etc. To this end, pits will be dug to a depth estimated to be at least 0.5 m below the expected formation level of the embankment. In all cases, the depth of the pit will not be less than 1.5 m unless rock or other material impossible to excavate by hand is encountered.

The position of each pit will be accurately recorded using hand-held GPS equipment to ensure that the pits coincide with the centreline of the proposed alignment. In each trial pit, all layers, including top soil, will be accurately described and logged by the Geotechnical Engineer, and the thickness of each layer will be recorded. All layers of more than 300 mm in thickness (excluding topsoil) will be sampled over the full depth of the layer. The log of each trial pit will be accurately drawn and included in the Geotechnical Survey Report for the project.

The following tests shall be conducted on selected samples collected:

- Grading to 0.075 mm sieve (AASHTO T27)
- Atterberg Limits (AASHTO T89, T90)
- Density-Moisture Content relationship using a 2.5 kg rammer (AASHTO T99)
- CBR and swell after 4 days' soak on a dynamically compacted specimen at 95 % MDD (AASHTO T 193)
- Shrinkage limits (BS 1377).

If necessary, excavations will be carried out along the alignment to establish rock levels.

b) Investigations at bridge and box culvert sites

At the possible/potential bridge sites, test pits or borings will be dug/drilled at four separate points at each junction and twenty other points in order to establish the profile of materials. Samples will be collected and taken for laboratory testing to establish allowable foundation bearing pressures and tolerable scouring depths assessed by the structural and hydraulic engineers.

Sites of big box culverts shall also be studied using boreholes or dynamic penetration tests at least at the two ends (inlet and outlet). Borehole investigations shall be accompanied by dynamic

sounding tests like standard penetration tests. The depth of the boreholes shall be established depending on a number of factors like span length, geology of the site and other relevant factors.

c) Borrow material for construction

A series of trial pits will be excavated at promising borrow pit locations to determine the extent of the various deposits based on available indicators and representative samples will be taken from each source.

The samples will be subjected to a basic testing programme to demonstrate that the materials are suitable for the use intended. The objective will be to assess the quantities of suitable material available and the corresponding overburden ratio. Trial pits will be excavated on a 30m grid for each prospective borrow area. In every trial pit all layers including topsoil and overburden will be accurately described and their thickness measured. The log of each trial pit will be accurately prepared.

A site plan of each proposed borrow pit will be prepared showing the position of each trial pit, the characteristic features of the site and the means of access. The location of the borrow area will be determined using a hand-held GPS and the survey chainages.

The following tests shall be applied to samples collected from the borrow pits sites:

- Grading to 0.075 mm sieve (AASHTO T27)
- Atterberg Limits (AASHTO T89, T90)
- Density-Moisture Content relationship using a 4.5 kg rammer (AASHTO T180)
- CBR and swell after 4 days' soak on a dynamically compacted specimen at 90,95 and 100% MDD (AASHTO T 193)
- Shrinkage limits (BS 1377)

For every 10,000 m3 of material to be probed, the following tests will be performed to assess the material suitability for stabilization:

- UCS at seven days' cure and 7 days' soak on specimens molded to 95% Mod AASHTO compaction and with 2%, 4% and 6% lime and/or cement content
- Atterberg limits (to be determined after the addition of the cement/lime stabilizer)
- Moisture content (stabilized samples)

d) Hard rock sources

The survey for potential rock sources was carried out to determine the extent and quality of the rock found in the probable rock sources.

The following tests will be performed on each sample:

- Los Angeles Abrasion (AASHTO T96)
- Aggregate Crushing Value (BS 812, Part 110)
- Sodium Sulfate Soundness (AASHTO T104)
- PI of LAA fines (AASHTO T89)

- Bitumen affinity and absorption (AASHTO T182).
- Specific Gravity (AASHTO T85).

e) Fine aggregate and water for construction.

Sources of sand and water for construction shall be examined in detail and the extent of the material established. If necessary, further samples shall be taken and the following tests conducted:

- Grading (AASHTO T27)
- Sand Equivalent (AASHTO T 176)
- Organic impurities (AASHTO T21).

Reporting

Detailed report on activities including adopted methodology and standards. The detailed report shall consist of the following minimum deliverables:

- Subsurface soil conditions along the project roads
- Types and classification of soils
- Risk factors
- Construction recommendations
- Design recommendations
- Soil composition and layers
- Drainage
- Axle loading capacity
-

All test results for the alignment and borrow material, including coordinates, and photographs

Technical Manpower, Plant & Equipment

The Consultant at his or her own costs will arrange all support staff, equipment / machines, transportations, tools laboratory testing services and auxiliary material required for execution of all the items of work.

Qualification Requirements for the Geotechnical/Materials Engineer

The Consultant must meet the following requirements.

- Holder of B.Sc. Civil Engineering from a reputable university.
- Must have at least 12 years post graduate experience.
- Must have conducted at least 3No. geotechnical studies for highway/road design projects
- Experience with analytical pavement evaluation methods is mandatory.
- Experience on road projects in East Africa will be an advantage.
- Fluency in both written and spoken English is essential.

5.4. Traffic Analysis

Consultant will determine the type and volume of the existing traffic for the road by analyzing all existing statistical data, and by conducting and analyzing such traffic counts and origin-destination studies as are required to determine the nature of the traffic and the present volume of freight and passenger movements on the road. Other field investigations shall be undertaken by UNOPS as required. Traffic studies will include:

- Traffic composition, occupancy, and classified volume counts
- Origin – destination studies
- Forecasts of annual average daily traffic are composed of normal, generated, and diverted flows, by appropriate vehicle types.
- Axle load surveys

Traffic surveys, including axle load survey, shall be done and, where considered appropriate, Consultant will divide the road into sections and conduct the relevant traffic analyses and studies accordingly. Detailed proposals for the traffic surveys shall be shared and communicated with the UNOPS Project Manager. Traffic surveys shall generally be carried out following the guidelines and recommendations of the TRL Overseas Road Note 40: A guide to axle load surveys and traffic counts for determining traffic loading on pavements, TRL Ltd, Crowthorne, Berkshire, UK 2004 or equivalent guidelines.

Consultant shall identify, describe, and estimate 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 needs for road transport. Such needs will result inter alia from:

- population growth and changes in rural-urban population distribution.
- national and regional economic growth.
- development of agriculture, industry, commerce, and tourism within the project area.
- development of social services facilities and schools.
- Other factors identified by UNOPS.

Based on the analysis, the Consultant shall make:

- Detailed annual traffic forecasts for ten years after the completion of the road; and
- More general projections of future traffic for the following 10 years.

Although greater emphasis is given to accurate forecasting in the earlier part of the project's life, all traffic forecasts shall be given at three growth rates, namely low, medium, and high. The consultant shall select one of the three levels of forecasts for use in the final evaluation of the project, indicating the reasons for the selection, and shall also use the other two levels in the sensitivity analysis.

In developing the final traffic forecasts, The consultant shall give particular attention to the future mix of vehicles in the traffic population. Due attention should therefore be given to changes in

vehicle sizes and types that will arise when improvements are made in the conditions of the road. Consultant shall collect accident data for the entire length of the project road from police stations. Consultant should analyze the data and identify locations prone to accidents and recommend mitigation measures.

In addition to the above, the traffic study shall include the following:

Traffic studies include:

- a) Existing volume traffic counts
- b) Non-motorised traffic count
- c) Origin – destination studies
- d) Axle load surveys
- e) Accident studies

Traffic Surveys

- a) Traffic surveys shall generally be of **one-week** duration comprising day counts with at least **two-night counts** (one during a weekday and a weekend day). Where considered appropriate the road should be divided into sections for the count and subsequent analysis.

Note: Counts to be carried out in intervals of **15 minutes**

- b) Identify and describe existing and potential traffic generating factors in the immediate areas served by the roads, or in areas likely to be influenced by its future improvements, based on the economic development of the region, and future needs for road transport. Such needs will result inter alia from:
 - population growth and changes in rural urban population distribution;
 - national and regional economic growth;
 - development of agriculture, industry, commerce and tourism within the project area;
 - development of social services facilities and schools;
 - other factors identified
- c) The motorized traffic to be categorized in to the following vehicle categories:
 - Motorcycle
 - Tuk tuk (3-wheeled motorized cycles)
 - Saloon car
 - Four-wheel drive (FWD) and vans
 - Minibus (14-seater)

- Minibus (25 – 30-seater)
- Large bus – typically with seat capacity > 40
- Light goods vehicle (LGV), 3 – 6 ton
- Medium truck (MGV), with 2 axles, typically 7 – 10 ton
- Heavy truck (3 axles), typically 12 – 15-ton capacity,
- Heavy truck (4 – 6 axles) and
- Others (Tractors, etc.)

d) The NMT are classified as:

- Pedestrians
- Cyclists
- Push carts

Note: Counts to be carried out in intervals of **1hr** for at least **7 days**

Deliverables

- Traffic survey plan detailing the traffic survey stations, methodology for training and recruitment of enumerators and the analysis methods to be considered.
- Classified traffic survey data - scanned copies of the filled in data sheets as well as spreadsheets
- Axle load data and analysis
- Traffic survey report giving details of the analysis and outcome which shall include recommendations for traffic volumes for geometric and junction designs as well axle loading for pavement design.

Qualifications for the Traffic Engineer

- Holder of B.Sc. Civil Engineering from a reputable university.
- Must have at least 12 years post graduate experience.
- Must have conducted at least 3No. traffic studies for highway/road design projects
- Experience in economic evaluation for road projects is mandatory.
- Experience on road projects in East Africa will be an advantage.
- Fluency in both written and spoken English is essential

5.5. Capacity Building

The Consultant will be required to engage Municipality engineers, surveyors and technicians when carrying out activities. It is expected that at least 3-4 engineers will be attached for each component of this assignment.

In addition to engaging engineering staff, the Municipality's environment and social affairs officers shall be designated as counterpart staff and embedded within the consultant's E&S data collection team for the duration of field activities. The consultant shall document all E&S specific

capacity building activities and include a summary in the Knowledge Transfer Report submitted at contract completion.

The capacity building will entail the following activities:

- A meeting/workshop before the commencement of site activities to outline the theory, execution plan and expected outcome of the specific study.
- On-job training throughout both site and off-site activities
- Closing meeting/workshop on conclusion of the data collection and analysis and receive feedback on the capacity building component.

The consultant will be expected to keep a good record of the capacity building activities including meeting minutes or a transcription of the workshops/meetings.

The Municipality will provide the meeting venue and organise for all logistics, materials and costs associated with capacity building activities.

6. Deliverables

The consultant shall provide the following deliverables

- An inception report within **two weeks** of signing the contract. The inception report shall outline specific methodologies, workplan and timelines.
- Topographical Survey Report and survey data
- Hydrology and Drainage report
- Geotechnical investigation and pavement recommendations report including: factual test results
- Traffic studies report
- Capacity building records

In addition to the above, the following E&S data collection outputs shall be delivered as standalone reports and datasets. They are required to support the preparation of E&S instruments under the World Bank ESF, and shall be submitted alongside the corresponding engineering deliverables:

- Socio-economic Baseline Report
- PAP Census and Asset Inventory Database
- Environmental Baseline Report
- Consultation and Engagement Report
- Gender Assessment and GBV/SEA-SH Risk Report

7. Timeline

The consultancy assignment is expected to be completed in two stages. Stage 1 will consist of data collection and analysis for the first priority roads - 23.84km. This first stage is expected to be completed within **6 weeks** of contract signing. The second phase, for the remainder of the full scope, the consultant will conclude data collection and analysis within **6 weeks**. The table below gives more detail on expected timelines for this assignment.

Please NOTE that the deliverable timelines below may be adjusted to accommodate the 4 months of this assignment.

	Deliverable	Period after signing the Contract	
		Phase I	Phase II
1	Inception Report and mobilisation plan	2 weeks	

2	Topographical Survey data and report	5 weeks	8 weeks
3	Hydrology and Drainage Report	6 weeks	11 weeks
4	Geotechnical Investigations and pavement recommendations report	6 weeks	11 weeks
5	Traffic Studies report	6 weeks	11 weeks
6	Capacity building records	12 weeks	12 weeks
7	Socio-economic Baseline Report and PAP Census Database	5 weeks	8 weeks
8	Environmental Baseline Report, Consultation and Engagement Report, Gender and GBV/SEA-SH Risk Report, and Vulnerability Register.	6 weeks	11 weeks

8. Payment Schedule

Payments to the Consultant shall be scheduled as follows:

- 20% of the total contract value upon submission and approval of the inception report and mobilisation plan
- 40% of the total contract value on completion and approval for Phase I deliverables
- 40% of the contract value on completion and approval for Phase II deliverables

9. Consultant Qualifications

- Registered in Somalia. Registration in Somaliland will be an added advantage.
- Valid registration from the Ministry of Public works/Chambers of Commerce.
- Availability to Undertake the works immediately upon signing the contract.
- Any ongoing contracts with UNOPS should at least be completed half way through. This will be verified by submission of Interim Completion Certificates or Interim Payment Certificates from the clients
-
- Minimum Personnel requirements (Refer to education requirements in the following sections):
 - a. Team Leader/Civil Engineer - Minimum 12 years experience
 - b. Engineering Surveyor - Minimum 8 Years Experience.
 - c. Hydrologist / Drainage Engineer - Minimum 10 Years Experience
 - d. Geotechnical / Materials Engineer - Minimum 12 years Experience,

- e. Traffic Engineer - 12 Years Experience
- f. Environmental and Social Expert - minimum 8 years experience
- The Firm should have at least 7 years of relevant professional experience in roads infrastructure projects.
- Demonstrated expertise in data collection and analysis, geotechnical studies, and hydraulic design.
- Strong analytical, report writing, and communication skills.
- Familiarity with local context and regulatory requirements will be an added advantage.

10. Reporting and Communication

The consultant will report directly to the Project Manager of the UNOPS. Regular communication will be maintained through:

- Bi-weekly progress meetings (virtual or in-person as appropriate).
- Immediate notification of any critical issues or risks identified during the assignment.
- Submission of all draft and final reports in both soft and hard copy formats

11. Evaluation Criteria

Proposals will be evaluated based on the following criteria:

- Understanding of the assignment and proposed methodology
- Relevant technical expertise and experience
- Quality and feasibility of the proposed work plan and timeline
- Qualifications and experience of key personnel
- Cost-effectiveness and value for money

Evaluation Criteria

Quotations shall be evaluated to determine the lowest priced most technically acceptable offer. The Eligibility/ Qualification and Technical shall be evaluated against the **PASS/FAIL** Criteria. Evaluation shall be conducted as follows:

NOTE: For joint ventures, consortia, or associations submitting bids, all bid documents and the offer submission itself must be in the name of the lead partner. If awarded the contract, UNOPS shall execute the agreement with that lead partner. The offer should be submitted to UNOPS by the lead partner of the JV.

NOTE: Refer to Section III-Returnable Quotation Forms for Form A- Form F and fill in your responses as per the instructions on each form.

These will form the basis of the evaluation criteria.

12. Technical compliance of the offered services

NOTE:

Partial quotations shall not be allowed (i.e Bidders should quote for all the services (100%).

Technical compliance of the offered services		Documents to establish compliance with the criteria
1.3	Quotations shall be evaluated to determine the lowest priced most technically acceptable offer. The Eligibility/ Qualification and Technical shall be evaluated against the PASS/FAIL Criteria. Evaluation shall be conducted as follows: <u>NOTE: For joint ventures, consortia, or associations submitting bids, all bid documents and the offer submission itself must be in the name of the lead partner. If awarded the contract, UNOPS shall execute the agreement with that lead partner. The offer should be submitted to UNOPS by the lead partner of the JV.</u> Eligibility and formal criteria - Bidders are eligible as defined in Instructions to Bidders, Article 3, including each member of the Joint Venture, consortium, or association and/or Subcontractor (as applicable). (Form A) - Completeness of the Quotation. All required Returnable Bidding Forms and other documentation requested under the Document Checklist section have been provided and are complete, signed and stamped (Fully filled Returnable Forms A,B,C,D,E,F) - Bidder accepts UNOPS General Conditions of Contract (Form A) - (Check and clarify). - The bidder shall be a registered organization under the relevant government regulations to provide services in Somaliland - Include Certificate of Company registration. If registration is in Somalia, provide evidence of past experience work in Somaliland (Check & Clarify). If JV, the partners should submit a registration certificate from their country if not Somalia (Form E). <i>NOTE: AT LEAST one Joint venture member must be registered with Somaliland and must have a Certificate or License from the relevant Ministry. If a bidder</i>	[Form A and Form E for A Joint Venture Form where applicable Returnable Bidding Forms Submit Valid Business Registration Certificate and License

has registration in Somalia, they **MUST** still provide a Registration certificate from Somaliland or form a JV with a company that is registered in Somaliland. The other partner in the JV should submit a Registration Certificate from their country of origin. (Check & Clarify).

Qualification criteria

- Bid Validity: Quotation shall be valid for the period of 120 days from date of bid closing.
- Experience: The bidder should have successfully completed **at least two (2)** or more similar contracts within the last **Five (5) years** which will include counting backwards from the deadline of this tender, in calendar years i.e. (August 2021-September 2026, depending on the tender). The previous contracts should be a minimum of USD **50,000 each**. Attach supporting documents such as copies of Purchase Orders/ Contracts, or Confirmation of completion of services from current or previous clients. *Similar experience means in delivering services similar in scope and complexity to those outlined in this Schedule II: Schedule of Requirements i.e Data collection, Topographical Surveys, Geotechnical investigation, Traffic studies and Hydrological studies, Technical Analysis, Hydraulics Reconfirmation, Implementation Assessment for the Rehabilitation for works Projects* (Check and Clarify) (FORM D)

NOTE: AT LEAST one joint venture member must have successfully delivered similar Services contracts within the five years preceding the proposal opening.

Technical criteria

- Technical Proposal: Services offered in the bid are technically acceptable and do not contain any material deviation (s) from the minimum required as included in Section II: Schedule of Requirements. The bidder's proposal must be organised to follow the format of this Technical Quotation Form. Where the bidder is presented with a requirement or asked to use a specific approach, it must not only state its acceptance, but also describe, where appropriate, how it intends to comply. Where a descriptive response is requested, failure to provide the same will be viewed as non-responsive.
- Qualification and experience of Key personnel - The team should include qualified with the following Minimum Personnel requirements:

Submit CV and copy of certificates

Copies of Purchase Orders/ Contracts, and Confirmation of completion of services (where applicable to strengthen the position of the submitted contracts/POs)

	1. Team Leader/Civil Engineer - Minimum 12 years experience 2. Engineering Surveyor - Minimum 8 Years Experience. 3. Hydrologist / Drainage Engineer - Minimum 10 Years Experience 4. Geotechnical / Materials Engineer - Minimum 12 years Experience, 5. Traffic Engineer - 12 Years Experience 6. Environmental and Social (E&S) Expert- Minimum 8 years Experience, • The Firm should have at least 7 years of relevant professional experience in roads infrastructure projects. • Demonstrated expertise in data collection and analysis, geotechnical studies, and hydraulic design. • Strong analytical, report writing, and communication skills. • Familiarity with local context and regulatory requirements will be an added advantage. • Proven track record in sustainability assessment and stakeholder management. NOTE 1: <i>At least one of the joint venture members must meet the Technical criteria requirements</i> NOTE 2: <i>All Joint Ventures must independently meet all the remaining Eligibility criteria (where applicable)</i> Financial Capacity: Bidder should provide Two (2) past contracts/Purchase Orders showing evidence of completion of \$50,000 EACH <u>NOTE:</u> As a minimum requirement, <i>AT LEAST one joint venture member must satisfy the Financial capability criterion.</i> Check and clarify. Any equivalent currency unlike USD will be converted to USD based on the standard UN Operational Rates of Exchange (UNORE) for the month of August in which the bids will undergo evaluation. Bidders are advised to familiarize themselves with the UNORE	Technical Proposal & Form D - Based on previous experience) Submit CV and copy of certificates Contracts/Purchase Orders
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13. Special Conditions

- a. Any work, services or outputs not found to be as per specifications either by UNOPS will be rejected. Payments shall be upon satisfactory performance of the works.
- b. The consultant shall provide everything deemed necessary for the proper execution and completion of the works including all working areas, temporary works and their maintenance to the acceptance of UNOPS.
- c. The work will be carried out strictly according to the directions, requirements and specifications of UNOPS, all terms, conditions and technical specifications as applicable to UNOPS, and as per UNOPS specifications and contract. Contract conditions will be applicable in full to this work, as far as they are relevant to the items of work covered by this work. The consultant is deemed to have read the UNOPS conditions for goods and services provided in the RFQ.
- d. The consultant shall take due care and protect private property from damage and to minimize any such damage as possible. It is the responsibility of the consultant to negotiate access with authorities as well as private entities where such is required.
- e. The contract period and rates shall be deemed to include for the rainy season and adverse weather that may be experienced during the course of the survey period. No claim shall be accepted by UNOPS, for any extra cost or extension of time due to this factor.
- f. Measurements and verification will be done by UNOPS. UNOPS Engineers will release payments for fieldwork only after certification.
- g. In case at any point of time, if in the opinion of UNOPS the progress achieved by the consultant is not satisfactory or not compatible with the completion schedule, UNOPS shall remove part or full of the balance works from the Consultant for which no compensation will be accepted.
- h. If part or full of an item is not executed as mutually agreed upon based on sound reasons, payment against that item/ milestone shall be proportionally reduced.

14. Insurance

- a. The consultant shall be required to maintain and effect insurance coverage for its staff, equipment and materials and any matter in connection therewith for the whole duration of survey period.
- b. All compensations for all types of accidents relating to or arising from the consultant's vehicles, equipment staff etc. shall be borne by the consultant, who shall be responsible for the same. The consultant will have to indemnify UNOPS, against all claims and costs arising from labor disputes, accidents and loss of

assets etc. In no case will UNOPS be responsible for any such costs/claims incurred by the consultant during execution and post execution stage

15. Laws and Regulations

- a. The consultant will be responsible for observing and obeying all labour laws, regulations and statutes and in case of your failure to observe the same, UNOPS, shall deduct any expenditure that may be incurred by it for setting right the short-coming including arrear payment of wages to workers any fines and penalties, expenses incurred on settlement etc. You will identify UNOPS, against all such claims.
- b. All incidental charges, royalties etc. for execution of work will be borne by the consultant. Coordination towards sorting of all local problems will be done mutually by both parties.

16. Payment of Consultant's Services

Following the completion and approval of the above tasks, the consultant shall request for payment by issuance of an invoice, unless there are technical or system problems payment shall be made within 30 days from the receipt of the correct invoice.

17. Occupational Health & Safety Design Considerations

UNOPS priority for building design is life safety. Therefore, the consultant shall comply with all UNOPS rules and regulations during the implementation and data collection.

UNOPS endeavors to design and implement infrastructure projects in a manner that ensures that reasonable measures are taken to prevent personal injuries, illnesses and damage to property. The Consultant shall be responsible to ensure:

- Safety of all his staff, Labors.
- Safety of the intended equipment, all equipment shall be operating in safe condition to ensure safety of operators and laborers.
- That health and safety risks arising during the data collection activities, consultants shall ensure that these risks are eliminated or minimized.

Furthermore, consultant shall comply with Environmental and Social Risk Management plan as in Annex No.11.1

In addition to these general obligations, and with specific reference to E&S data collection fieldwork, the consultant shall ensure that all field staff, including enumerators, surveyors, and environmental technicians are briefed on community entry protocols, respectful engagement with IDP communities, and the project CoC prior to deployment. All activities undertaken by the Consultant must be in compliance with the WB ESF.