



Terms of References (ToR)

**Provision of Professional Services - Consultancy Services for
Design Works for Baidoa City Drainage - Somalia**

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1 INTRODUCTION:

The core mission of UNOPS is to enhance the operational capabilities of the United Nations system and its collaborators in executing crucial initiatives related to peacebuilding, humanitarian aid, and development that directly impact individuals in vulnerable situations. Operating in some of the world's most demanding environments, our overarching vision is to consistently deliver management services that align with the highest global standards of excellence in quality, efficiency, and cost-effectiveness.

UNOPS is dedicated to providing expertise in sustainable infrastructure, sustainable procurement, and sustainable project management. Our project portfolio encompasses a wide spectrum, ranging from the construction of educational institutions, roads, bridges, and medical facilities, to the procurement of essential commodities and services, in addition to training local personnel. Through collaborations with UN agencies, international financial institutions, governments, and other development stakeholders, UNOPS generates substantial and measurable advancements in on-the-ground outcomes.

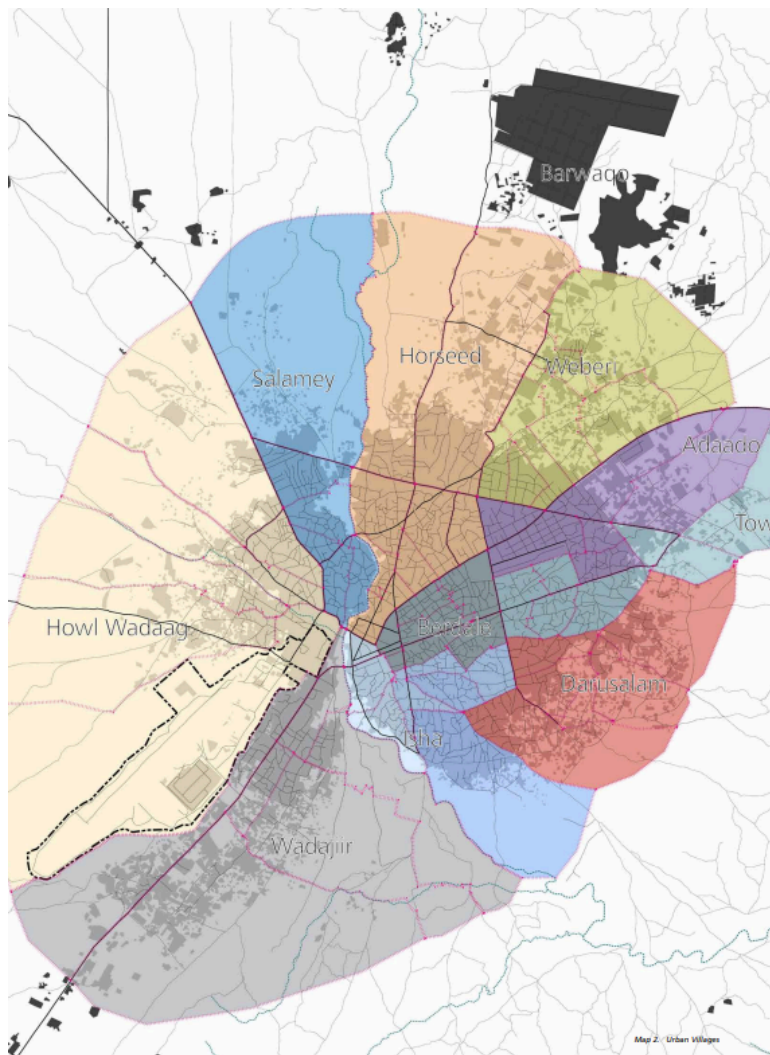
UNOPS has been engaged to provide comprehensive technical expertise and project management support to Somalia Urban Resilience Project II (SURP II) which is a municipal governance and infrastructure development project financed by the World Bank and its partners. The project aims at improving access to urban infrastructure and strengthening municipal governance in Somalia. The Project also aims to strengthen inter-governmental relationships between the federal, state, regional, and municipal levels. It is intended that SURP II will also strengthen the state-citizen relationship and the government's legitimacy in the eyes of its people by providing visible and tangible benefits. The Project is thus as much about urban resilience as it is about peacebuilding and institution building.

SURP II is scaling-up investments within cities where the SURP/SUIPP is currently operational - Mogadishu, Garowe, Kismayo, and Baidoa - and lays the groundwork for expansion to cities in the States of Galmudug and Hirshabelle. The following four components are proposed for a duration of five years:

- (i) Urban Infrastructure and Services.
- (ii) Institutional Strengthening and Analytics.
- (iii) Project Management and Capacity Building; and
- (iv) Contingent Emergency Response.

1.1 Background and Justification

Baidoa, the interim capital of the federal Southwest State, is one of the main nodes in central Somalia, and at the center of what is, in normal times, the breadbasket of the country. As of today, it has the highest record of drought-related displacement: the number of IDPs in town is now estimated at 600,000 people. The cumulative urban population has increased five to six times in the last five years if consideration is taken of the entire community including the host population. These numbers need to be added to an already large number of IDPs settled in town, and an urban population in a dire condition, with an already high pressure on resources, settlements, and livelihood options.



Map of Baidoa Villages.
Source: Baidoa City Strategy 2023, UNHABITAT
Coordinate (3°06'56"N 43°39'07"E)

Baidoa town faces flooding from stormwater generated from catchments North of the town. The drainage infrastructure for the Northern link road will cut off the stormwater, which will significantly reduce the runoff into the town, thus reducing flood risk.

Drainage

The relatively flat topography combined with local climatic conditions and the almost total absence of durable drainage infrastructure produce problematic conditions for effective surface water drainage. There is a limited network of surface drains along the 22 km of newly built roads under Somalia Urban Resilience Project II (SURP II).

Baidoa regularly experiences long dry periods. However, this only causes severe flash floods which repeatedly happen when it rains, with several areas of the city and in particular IDP settlements experiencing severe flooding. Camp Coordination and Camp Management (CCCM) partner in Baidoa conducted an assessment in May 2020 to identify the risk of flooding in IDP sites. Out of the 483 IDP sites in Baidoa, 177 IDP sites (37%) were categorized as high risk, 250 IDP sites (52%) as medium risk and 56 IDP sites (12%) as low risk. The high-risk IDP sites host about 19,368 IDP Households (35% of all IDPs in Baidoa).

In April 2020, 13,582 households in 111 IDP sites were directly affected by flash floods. In the October - November rainy season of 2023 Baidoa experienced El Nino rains which saw unprecedented flooding across the city. Whenever there is flooding, there are reports of destruction of residential properties (especially those of poor-quality construction belonging to low-income and marginalized groups) and disruption of commercial and business activities. In addition, the resulting stagnant water increases risk of spreading water-borne diseases and encourages mosquito breeding areas. Flooding also washes fecal matter from pit latrines, septic tanks, solid waste; and garbage, and leads to contamination of shallow wells, boreholes and surface waters, thus jeopardizing potable water quality and exacerbating the risk of disease. Given the expected impact of climate change, extreme climatic events e.g. heavy rainfall will be increasingly likely in coming years and this suggests that there will be increased incidence of flooding unless major drainage infrastructure works are undertaken.

SURP-II strategically uses transport and associated drainage infrastructure as an entry point to advance the urban resilience agenda. Drainage infrastructure is a key element to a resilient city. The Project supports participatory decision-making processes to identify key urban investments that contribute to fostering social cohesion and supporting infrastructure that benefits both host communities and the displaced.

2 Objectives of the Services:

As the central UN resource for infrastructure, UNOPS has a responsibility to continually review and improve the quality of infrastructure works delivered to its partners. All infrastructure projects delivered by UNOPS should have a special focus on national capacity and sustainability, to contribute to the ability of countries to design, construct and maintain infrastructure, and to integrate and balance social, environmental and economic considerations in accordance with the UNOPS Policy for Sustainable Infrastructure.

The objectives of the proposed services are to provide Baidoa Municipality with a set of technically verified and prioritized infrastructure interventions through the following specific infrastructure technical outputs, that will contribute to the efforts to mitigate persistent flooding in the City.

1. **City Stormwater Drainage:** with the aim to provide Baidoa Municipality with a set of technically verified and prioritized infrastructure interventions to improve stormwater drainage to mitigate persistent flooding in the city. The proposed interventions must be technically sustainable, economically, socially and environmentally cognizant to the extent possible. The final outputs of the study are bidding documents ready for implementation by the municipality in a phased manner as well as the reports from the technical assessment, feasibility studies and design reports. Specifically:
 - City-wide assessment of flood risk and stormwater drainage. The assessment will identify and document the problems in the project area and propose possible options and solutions to address the persistent stormwater drainage challenges.
 - Feasibility study and preliminary designs recommending the most optimum solution to be adopted consisting of a suitable combination of investments. A multi-criteria analysis will be used to prioritize the proposed time bound investments.
 - Detailed engineering design and bidding documentation for investments that are prioritized in packages from the Feasibility Study.
2. **Skill Transfer/Capacity Building of the PIU and Ministry of Public Works contracted staff:** Capacity building activities will be included in the project for a cumulative 12 months for a tentative 18 staff (respectively from the Municipality and Municipalities served by SURP II/Nagaad, as well as from the Federal Government of Somalia and the Federal Member States Ministry of Public Works).

The Design Consultant with UNOPS support, will assist PIU project staff and Ministry of Public Works contracted staff in capacity building through skill transfer with a view to build in-house capacity. The skill transfer/capacity building will be through engaging in day to day contact with the UNOPS experts, on-the-job training, participation in data collection and analysis, design

preparation, design reviews, preparation and implementation of environmental and social safeguards instruments. The specific curriculum will be explained in TORs that will be finalised during the Inception period of the project and delivered with the Inception Report.

3 Scope:

3.1 General

The Design Consultant will perform all work necessary as follows in this TOR, including all technical studies, field investigations and related services. UNOPS will 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 Design Consultant will cooperate fully with the Baidoa Municipality Project Implementation Unit (PIU). UNOPS and the Design consultant will be provided with the necessary support services for the completion of the assignment, as detailed in Annex IV. UNOPS, with the support and assistance of the PIU staff, will always ensure adequate community consultation and engagement during the study to ensure social concerns are factored into the design.

The design 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.

Moreover, as described in the ***“UNOPS Design Planning Manual” (Annex 11.1)***, the design consultant must ensure that the final design addresses all aspect of the UNOPS policies for Sustainable Infrastructure and the Organizational Directive No.40, wherein UNOPS endeavors to design and implement infrastructure project in a manner that respects the principle of social and environmental responsibility and sustainability, including preventing or mitigating adverse impacts on the environment and identifying opportunities for improvement environment performance.

The CAD Design Documentation must comply with the ***“UNOPS CAD Drawing Guidelines” (Annex 11.2)***, UNOPS shall provide the successful consultant with the available templates and might conduct a small orientation session on how to use this guidance.

The proposed design solution 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.

3.2 Time Allocation

In line with UNOPS draft work plan under [Section 6](#) under this ToR, the consultant shall allocate an appropriate time for providing the services, commensurate with the complexity of the design

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 **10 months** is initially proposed for the delivery of these services.

3.3 Location

The consultant shall Provide UNOPS with its representative entity based centrally in Somalia for the entire duration of the services to ensure appropriate and efficient coordination with UNOPS and project stakeholders. The consultant shall ensure that its staff are adequately supported and equipped; in particular, the consultant shall ensure that there is sufficient direct project management support, administrative, financial and translation services to ensure its key staff remain focused on their primary responsibilities in the delivery of the required technical expertise services.

3.4 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.

3.5 Gender & Sustainability

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.

3.6 Scope of Services

The Area of Interest (AOI) includes the entire city of Baidoa as well as the city surroundings that fall within the catchment.

The following activities will be carried out:

- Collection of existing data and reports, and creation of necessary new data for the Area of Interest (AOI). This includes identification of building footprint, business/residential areas, informal settlements, existing drainage, etc. to be overlayed with the flood data.
- Identification of hotspots of urban flood risk, from both pluvial and fluvial dynamics. The analysis should include a thorough review of historic data and recorded flooding events and consider climate change and urban growth scenarios.
- Identify different types of options (structural, non-structural, combined green-grey and nature-based) for urban flood risk reduction and stormwater drainage.
- Selecting, prioritizing and recommending the most appropriate solutions.

The Assessment shall comprise:

- Literature review, Data Collection and Characterization of the Area of Interest - Baidoa;
- Urban Flood Risk and Stormwater Drainage Assessment for Baidoa;
- Identification and Prioritization of Investment Options for Urban Flood Resilience
- Before finalizing each of these tasks, UNOPS and the design consultant, with the support of Project Implementation Unit (PIU) will engage stakeholders in consultations to obtain information and views useful for decision making.

The study will be carried as follows:

- Citywide Assessment of the existing flooding situation and present drainage systems.
- Feasibility study, preliminary engineering designs, feasibility studies, environmental and social studies and prioritization.
- Detailed engineering designs
- Investment packaging and bidding documentation

3.6.01 Phase I - Inception Phase

Following a full data review, an inception report will be presented outlining the firm's approach to the tasks, detailed methodology, updated work plan based on a detailed review of available data, and data collection program. The Inception report should be based on site reconnaissance visits and government and/or municipal agencies and key stakeholder consultations and should include: (i) the detailed methodology to undertake each of the tasks; (ii) a list of data requirements and limitations; (iii) socio-economic (demographics, governance, land use, facilities) and physical conditions/characteristics of the area and an initial description of the causes of the flood issues; (iv) preliminary vulnerability issues; (v) summary of consultations; and (vi) detailed work plan, expanded concerning the one included in the proposal, indicating the final schedule of tasks.

During this period, whilst the procurement for the Design Service Provider is ongoing, the Project Management Team, inclusive of the Project Manager and the Project Management Support Officer will be responsible for drafting the Inception Report/Implementation Plan.

3.6.01.1 Inception Report, detailing the Implementation Plan and Work Schedule.

3.6.01.2 Draft Urban Flood Risk and Stormwater Drainage Assessment and Environmental Assessment for review and comments.

The Assessment report shall succinctly compile the findings of all project components, including:

(i) executive summary of the urban flood risk and stormwater drainage assessment (methodology, results, and main conclusions);

(ii) Maps and databases consisting:

- A digital terrain model for Baidoa
- Hazard heat maps: generalized city-wide flood hazard maps, showing contours of flood extent, flood depth and, if possible, flood velocity for different return periods (1-year flood, 1/5 year flood, 1/10, 1/25, and 1/50 year flood)
- Exposure heat maps: generalized city-wide exposure maps, visualizing areas with a concentration of elements at risk to different flooding scenarios and urban development hotspots
- Vulnerability heat maps: generalized city-wide vulnerability maps, visualizing areas with a concentration of vulnerable population groups to urban flooding
- Damage heat maps: generalized city-wide damage maps, considering the direct/indirect damages and losses and indicated the approximate annualized flood risk for Baidoa.
- Stormwater drainage maps: city-wide maps and documentation of the existing drainage structures

(ii) details of the investment options for urban resilience including design sketches, prioritization methodology, prioritized packages and sequencing, preliminary cost estimates for each priority package; (iv) recommendations for use of the study results;

(v) technical annexes on models, maps, procedures, contacts, consultations, contributing national and local entities in the study, etc. A first draft of the report should be delivered no later than 4 months after contract signing.

3.6.01.3 Urban Flood Risk and Stormwater Drainage Assessment and Environmental Assessment for review and comments.

Outcome 2.3: Environmental and Social Impact Assessment and Mitigation Instruments

Activity 2.3.1 - Assessment of environmental and Social impacts and Risks of the prioritized Trunk drainage lines and associated infrastructure shall be guided by the SURP II Environmental and Social Framework, Resettlement Policy Framework, and other framework instruments. Based on the outcome of the stakeholder consultations and the pre-feasibility study on the prioritized trunk drainage lines and following the preliminary design, Design consultant will manage the preparation of an ESIA and relevant impacts and risk management plans that align with World Bank's Environmental and Social standards such as Environment and Social Management Plan, SEA/SH prevention and Response Plan, Resource Management Plan, Security Management Plan, Stakeholder Engagement Plan. Hence, the following activities will be carried out, in consultation with the UNOPS and the Design consultant contracted Safeguards, Environment and Resettlement Specialist:

Activity 2.3.1a - Carry out inclusive and meaningful stakeholder consultations including vulnerable groups following the SURP-II Stakeholder Engagement Framework (SEF). The outcome of consultations and the list of participants shall be documented in the ESIA.

Activity 2.3.1b - Assess the potential need for land acquisition, and physical and economic displacement. Also, assess the scale and severity of such impacts due to the proposed project and constraints in its management.

Activity 2.3.1c - Identify relevant security risks and management measures, following the ESS2 and ESS4, to minimize security risks to the project workers, contracted workers, and other stakeholders. These measures will include avoiding large public meetings during all consultations.

Activity 2.3.1d - Describe the proposed project in terms of its location, project design, technology, procedures and processes, materials to be used, and project inputs and outputs.

Activity 2.3.1e - Review existing legal, institutional, and policy framework relevant to identified trunk drainage lines, including the World Bank's Environmental and Social Framework as well as existing city bylaws in Puntland: this in addition to a review of relevant national Somali laws and legislation, including the Environmental Management and Coordination Act (at FGS level, of 2020) and the Environmental and Social Impact Assessment Regulations (2021).

Activity 2.3.1f - Assess the risk and impact of existing trunk drainage lines on coastal livelihood areas and sensitive marine ecosystem sites at drainage outfalls such as breeding or nursery grounds for protected or endangered species (e.g. coral reefs, spawning fish, and crustacean sites for marine mammals and turtles).

Activity 2.3.1g - Assess significant cumulative adverse impacts of existing trunk drainage lines on the quality of groundwater and surface water in the city of Baidoa.

Activity 2.3.1h - Carry out alternatives analysis of existing trunk drainage lines based on key E&S risks identified at the feasibility stage and associated ancillary facilities, such as alignment, technology, design, and operation - including the "without project" scenario - quantify the environmental and social risks to the extent possible, and attach economic values where feasible, and in terms of their potential environmental and social risks, the feasibility of mitigating these impacts, their capital and recurrent costs, and their suitability under local conditions.

Activity 2.3.1i - Assess the impact of identified trunk drainage lines on groundwater and surface water resources and receiving habitat from an increased conveyance for Storm-water from the respective catchments and changes in hydraulic efficiency of stormwater collection systems that increase the velocity of flow and the implication of increased potential for the channels to transport sediment and garbage into the receiving outfall discharge points in the wadi.

Activity 2.3.1l - Establish the environmental and social risks associated with the identified trunk drainage lines to suggest mitigation measures for the negative impacts, while enhancing the positive outcomes and generating baseline data for monitoring and evaluation of how well the proposed mitigation measures are being implemented during the project operation period;

Activity 2.3.1m - Assess the risk incidence and impact on community health and safety along the identified drainage lines such as respiratory illnesses, pulmonary disease, and various water-borne diseases, including how these would be minimized and could be used as a benchmark for health and safety improvement indicators;

Activity 2.3.1n - Analyze and describe the occupational health and safety concerns brought about by the construction of identified trunk drainage lines during all the phases of the project and propose feasible recommendations on corrective and remedial measures to be implemented under the environmental and social management plan (ESMP);

Activity 2.3.1o - Raise stakeholder awareness on the impact of the trunk drainage project on the environment and livelihoods, to make the residents of project-affected areas in Baidoa understand the implication of the project in their environment.

Activity 2.3.1p - Develop an ESIA report in conformity with the World Bank's Environmental and Social Framework.

Activity 2.3.1q - Develop an Environmental and Social Management Plan to guide in decision-making by the Municipality of Baidoa and for future auditing.

3.6.01.4 ESIA Report and Environmental and Social Management Plan.

Outcome 2.4: Preliminary Designs: Design Consultant will assess the feasibility of the investment options proposed in the flood risk assessment and stormwater drainage study before proceeding with the preliminary designs. The assessment will verify that the proposed investments provide a comprehensive drainage plan for the six catchments. If alternative options for addressing stormwater in the six zones are identified, these will be discussed with the PIU and, if agreed, included in the scope of the preliminary designs.

Based on the recommendations of the Assessment report, the Design consultant will undertake a detailed feasibility study and prepare preliminary designs for the prioritized investments. The feasibility study report will contain an evaluation of the project's technical, economic, social, and environmental viability further building on the flood risk and stormwater drainage assessment report. The consultant shall further define the investment options, benefits, and impacts, prepare preliminary drawings with cost estimates, and make recommendations on the preferred options and priority investment packages. The feasibility study recommendations will be subjected to stakeholder consultations. The PIU will ensure that the consultation process will not delay the timeline for the preparation of preliminary engineering designs.

In consultation with the PIU, and UNOPS, Design consultant will establish applicable design manuals and guidelines agreed with the PIU (the client representative) to use as guiding the feasibility study and the engineering design process.

Activity 2.4.1 Data Collection: A review will be made of all existing relevant data, and by implementing a thorough Data Collection through a Desk Review of existing information. This task entails the characterization of Baidoa and the AOI through the collection and evaluation of baseline data on a range of environmental, socio-economic and other context conditions. A desktop survey of the AOI will be conducted to review existing documentation and products from previous initiatives to ensure that the assessment is based on the most up-to-date information and is efficiently implemented. All data requirements and any limitations will be identified. Necessary field data collection campaigns will be undertaken to gather remaining data required for the study.

(i) Collection of all relevant data related to the physical environment and flood hazards by reviewing existing reports and historical information on floods, including previous models – identifying hotspots, extent, and depth of flooding events with dates, damage/costs reported for any events, or preliminary flood modeling. A thorough data review will be undertaken for critical data such as (a) geology and geomorphology, soils, vegetation cover and land use; (b) rainfall and surface hydrology; (c) digital terrain models: topography, bathymetry, existing flood defenses and drainage; and (d) climatological data (rainfall, temperature,

and climate change projections), etc. Further information for some of these factors is provided below. The data collected should be reviewed to determine availability and quality (gaps & limitations) to define the most adequate modeling approach for drainage analysis.

DTM (digital terrain model – i.e. bare earth surface) is fundamental to the quality of the flood hazard data and subsequent mapping and risk analysis. The consultant is required to commission or develop a Digital Terrain Model (DTM) with adequate resolution and coverage to provide the basis for a city-wide modeling grid. It will be the role of the Consultant to use all available terrain data to produce the best possible DTM for flood modeling.

Rainfall - Identify potential local donor data sets from nearby locations that would have similar characteristics. In the absence of better data, use global rainfall statistics to define IDF (intensity, depth, frequency) curves to derive appropriate rainfall model inputs. Daily (24 hourly manual readings) can be used, however for urban flooding, the response time is invariably much shorter than 24 hours, and the critical storm maybe 3 to 6 hours. A statistical means of deriving short-duration event rainfall profiles will be required. Potential climate change projections on precipitation change should be considered to the extent possible. In this regard consideration to obtain short-duration rainfall data to update IDF curves. Annual maximum and exceedance data is to be used to update IDF curves to capture climatic variation rainfall intensities.

Geomorphology, Drainage and Land Use – data on the soil type, geomorphology and land use is key to the hydrological and hydraulic modeling in drainage analysis. It can be derived as part of a project using satellite or higher-resolution imagery, but local mapping input is essential to ensure sensible assumptions. The Consultant will analyze the prevalent land uses and geomorphology of the sub-catchment, identify the relevant physical and environmental basin characteristics, including its hydraulic infrastructure, water resources of the donor basins, as well as the existing drainage networks and flood conveyance (including typical cross-sections of stormwater channels, roadside drains and culverts and flow directions of channels).

(ii) Exposure and vulnerability data and mapping to identify the population and critical assets at risk: An overview of exposure and vulnerability data will be developed for elements and assets at risk. The design consultant may propose a methodology for the collection of exposure and vulnerability data, including but not limited to the use of drones and/or remote sensing. Where possible, the collection of exposure data should be complemented by local communities: engage with local actors and community initiatives (e.g. local OpenStreetMap community), NGOs or development partners with a local presence in the respective cities to assist in the collection and validation of exposure data; consult residents and households in particularly affected areas to identify local needs for risk reduction and drainage solutions.

Data should include, but not be limited to the following:

- *Physical infrastructure data:* building stock (residential, commercial, industrial, and public), transport and technical infrastructure (roads, drainage lines, and networks including power, communication, sewerage and water supply).
- *Social services data:* critical facilities such as (a) emergency shelters, (b) emergency services such as police stations, hospitals, and fire stations, (c) other critical facilities such as schools or public buildings.
- *Population, urban and economic development:* Spatial distribution of residential population, general location of vulnerable population groups including forcibly displaced people living in IDP or refugee camps, to the extent possible in consideration of future population growth scenarios. Identification of pressures from natural and anthropogenic sources, and consideration of ecological, cultural and economic values where relevant. Identification of planned development activities and urban development hotspots, i.e. areas in the city that will expect urban growth, densification, or urbanization (e.g. of IDP camps) in the next 10-15 years, as derived from urban growth models or existing urban development plans and/or interviews with nodal agencies.

(iii) Regulatory framework assessment, identification, and mapping of stakeholders: Design consultant should assess existing policies, laws, and regulations governing water and sanitation, disaster risk management, environmental protection and conservation, climate change adaptation, land use and urban planning, identifying gaps and inconsistencies as well as potential convergence points between the different frameworks and opportunities how gaps could be bridged to facilitate the use of resilience solutions for climate change adaptation and disaster risk management.

The work should involve the key stakeholders from national government and local authorities, development partners, communities and special interest groups, to understand concerns and needs, conflicts of interest and levels of influence, as it relates to urban flood risk and stormwater drainage priorities.

The design consultant with UNOPS support shall also assess the responsibilities and capacities of government agencies and institutions that have relevant mandates for the implementation of resilience approaches for urban flood risk and stormwater drainage management, including exchanges with key representatives from these institutions.

Activity 2.4.2 Problem Identification: Field surveys, including a topographic survey for the entire project area and its command area, as well as the necessary surveys will be conducted to establish the specific alignment and to determine the accurate centerline of the proposed trunk drainage.

Activity 2.4.2a Topographical Surveys: For the entire project area and its command area. With the necessary surveys and ground reconnaissance for information and data to improve the accuracy of the DTM, the centerline shall be set out, cross-sectioned, and benchmarks established. The design consultant will be

responsible for the accuracy of all survey data and established benchmarks. All topographical surveys undertaken by the design consultant will be to the generally accepted international standards for such work, and, after agreement with the PIU Coordinator, will become recorded in standard forms both hard and soft copies and will become the property of the Municipality after the work.

Activity 2.4.2b Engineering Investigations/Field Surveys: As part of the Field Surveys, further detailed site-specific analysis to determine specific vulnerabilities, risks, and mitigation actions that would result in the city's climate resilience to flooding should be conducted, and the following actions should be taken into account:

- Concreted beacons shall be firmly sited, and referenced and shall be as agreed with the PIU Project Coordinator and following the existing Municipality survey policies/acts.
- The geometric characteristics of the center line shall be computed and defined. Staking-out data will also be given for points at regular intervals along the curves and the longer tangent alignments. Vertical alignments will be defined and computed. Design consultant shall be responsible for the accuracy of the setting out data up to the pre-construction stage.
- Identify, parallelly, through consulting available information in regards to utilities that fall within the right of way or the approved construction of Urban Trunk drainage and identify the point where utilities could be placed. Copies of the book of drawings indicating the location of these services and their UTM coordinates shall be submitted together with preliminary and detailed design reports. The consultant may use appropriate technologies to achieve this including the use of Ground Penetrating Radar (GPR).

Activity 2.4.2c: Urban Flood Risk and Stormwater Drainage Analysis for Baidoa: An urban flood risk and stormwater drainage analysis will be conducted for Baidoa, specifically looking at the hazards of pluvial and fluvial floods. The assessment should consider the three elements of risk to identify general hotspots of:

- Hazard: Providing estimation on location, extent, magnitude (severity) and frequency of the hazard events;
- Exposure: Providing estimation on the presence, attributes and values of assets that may be impacted by a hazard;
- Vulnerability: Providing estimation on how an identified asset reacts to the effects of the hazard.
- Damage: Providing an estimation on the direct and indirect damages and losses from flooding.

Based on the data on exposure and vulnerability, design consultant will identify at general resolution ("heat maps") which areas and elements of risk are most affected by different flood return periods.

The design consultant will estimate the potential direct and indirect damages and losses for the different flood return periods. This includes direct flood-related impacts to physical assets (buildings, roads) as well as indirect consequences e.g. related to business or traffic interruption. Based on the integration of the various

return periods, the Design consultant will estimate the annualized flood risk for Baidoa.

The design consultant will give a general indication of expected future changes in urban flood risk, considering (1) the likely effects of climate change on precipitation and (2) urban growth scenarios as identified. Given the long timeframe of investments in flood risk reduction and stormwater drainage, the estimation of possible future levels and hotspots of urban flood risk shall help inform the location of potential future urban resilience investments. The methodology for assessing flood risk change is dependent on the availability of data and should be defined in the inception report.

The analysis must consider the existing road and stormwater drainage system in Baidoa and determine their contributions and limitations to flood hazard and urban flood risk reduction. The design consultant will take into account the hydraulic capacity and functionality of the drains, identify deficiencies in the drainage system, and determine which capacities are needed to meet future needs arising from both urban development scenarios and potential climate-related increases in precipitation. This part of the assessment is essential to identify general types of stormwater drainage options.

Activity 2.4.3 Technical And Financial Feasibility: Soil and Material Investigations will be carried out, followed by a general study of the soil orders and classification and materials along the route, as well as the development of the following activities:

Activity 2.4.3a - *Boring (or any similar methods)* will be carried out along the proposed alignment to determine the subsurface condition.

Activity 2.4.3b - *Investigation for sources of construction materials for drainage structures* will be carried out, and sites of suitable materials surveyed and shown in the engineering plans. Analysis and testing shall be carried out as required on the construction materials, following the adopted Road Design Manual. Soil and materials borrow areas will be prepared showing the exact locations of all construction materials available with an indication of their quantities.

Environmental considerations will need to be considered during the feasibility study to then feed the Environmental and Social Impact Assessment (ESIA) and related mitigation measures.

At this stage, there will also need to be an assessment of whether the proposed trunk drainage lines construction and operation will give rise to physical and economic displacement.

An estimation of the full costs of the alternative solutions should be estimated at this stage. As a result of this Feasibility, an alternative should be selected.

The design consultant will identify potential types of investments for flood risk reduction and stormwater drainage that could be applied to enhance the urban flood resilience of Baidoa.

(i) Define general principles for stormwater drainage City of Baidoa

Based on the flood hazard and risk analysis and system understanding, the design consultant will define general principles concerning how drainage in the city can be improved to handle current and future drainage needs. Key questions to be answered are:

- What are realistic/feasible drainage criteria for the city? (e.g. what should be a rainfall event (duration/intensity) that does not result in flooding and for what return periods some localized flooding be acceptable?). The proposed return period design is to be explained in terms of technical and economic viability.
- Can the city mainly be drained by gravity now and into the future? (Certain low-lying areas may or may not be possible to drain by gravity anymore or very difficult in the future.)
- What is the potential impact of urban expansion/climate change on the drainage system? Is there a need to reserve space in certain locations for drainage corridors to cope with the urbanization trend?
- What is the potential for rainwater harvesting to complement other sources of water in the City?
- What is the maintenance organization/capacity for the existing drainage system and possible extensions?

(ii) Identify types of possible measures for urban flood resilience in Baidoa

Based on the urban flood risk and stormwater drainage analysis and the principles outlined above, general recommendations should be made for the areas of the city most at risk and should include ways to reduce flood risk and improve stormwater drainage in the city. The 'long list' of potential types of measures to enhance urban flood resilience should consider a broad range of approaches beyond traditional structural measures (pipes, storm drains, detention ponds) to also include non-structural measures (e.g. related to flood-adapted land use) as well as sustainable drainage and green infrastructure solutions (e.g. minimization of impervious surfaces, increase water retention and storage capacities). In this regard, drainage guidelines for future development are to be established by identifying surface runoff volume/l/sq meter for different user types with their parameters calibrated and verified in the main model.

(iii) Carry out a general estimation of the cost-effectiveness and benefit streams

Based on the findings from the urban flood risk and stormwater drainage analysis, The design consultant will provide a general estimation of the costs and potential flood reduction benefits as well as co-benefits (recreation, biodiversity, etc.) for the various types of measures. The breadth of the analysis should go beyond traditional cost-benefit analysis for traditional engineered drainage infrastructure and consider, to the extent possible, additional environmental and socio-economic benefits (co-benefits), such as the increase in livability (access to public spaces, leisure, etc.).

Activity 2.4.4 - Hydraulic Modeling: to assess the Environmental and Community Impacts, Hydraulic Modeling will be studied, with the following criteria:

- *Hydrology Model* - a suitable hydrology model will be used to predict the volume of flow generated at any point of the catchment basin based on the available rainfall data. This will apply to all solutions.
- *Hydraulic Models* - suitable applications for hydraulic analysis will be used to evaluate the adequacy of the existing and the new storm drainage system (trunk and secondary drains only) and determine runoff flow rates and design options (size, type, material) for new and inadequately sized channels. Channels and storm drains will be simulated using the flow data generated in the hydrology model and node locations will be determined.
- Adequacy of drains and drainage system – Calculate the discharge for each section of the drainage system based on basin characteristics, coefficient of runoff, intensity of rainfall corresponding to the time of concentration, and the discharge to inform the subsequent design.

The hydrological and hydraulic modeling and analysis for the flood hazard assessment should consider the interaction of precipitation (flash flooding) and river flooding thereby factoring in the joint probabilities of the drainage system, rainfall and flash flood. Heat maps for flood hazards will be produced with water depths, velocity and direction of flows for a range of flood events (1-year, 2-year, 5-year, 10-year, 25-year, and 50-year flood). The flood hazard assessment will be conducted based on the Digital Terrain Model in combination with land use and geomorphologic analysis and making use of any existing or newly developed rainfall-runoff models.

Conduct detailed multi-criteria analysis (MCA) to prioritize the investments and rank realistic investment packages in consultation with the PIU and key stakeholders. The MCA criteria and weightings for evaluation will be decided in consultation with the PIU from among the following; technical, social impact, economic, environmental/climate adaptation, financial, sustainability, development impact, including synergy effect across investments, Government visibility, current and future scenarios, relevance for government city planning (as feasible).

Activity 2.4.5 - Design Concept: A preliminary design report including design basis, standard drawings and base map, hydraulic design, and estimation and costing for the alternative selected. Finalizing the investment options and the long list of investments to enhance urban flood resilience under the Flood Assessment, considering specific nature-based solutions that are applicable in the context of Baidoa. These will have to include but will not be limited to Legal and Regulatory Compliance considerations, Cost Estimates and Implementation Plans, Recommendations, and Conclusions.

Starting from the project layout resulting from the feasibility stage, the preliminary design will focus on the first six priority Packages selected for the entire drainage system, in agreement with the prioritization of the interventions identified and the available

funding, also furnishing preliminary quantities and cost estimates for the proposed drainage sections. The estimates shall include price escalation and contingencies. All cost estimates shall be expressed in terms of United States dollars (USD).

The design consultant will submit the preliminary design report for review and approval by the PIU Project Coordinator. The preliminary design report will provide technical details of the drainage system and will specifically entail the following:

Activity 2.4.5a - Design climate-resilient infrastructure as far as possible, (structural, non-structural, combined green-grey, and nature-based). Effects of climate change will be anticipated and as far as possible climate-resilient infrastructure will be designed.

- Flood Zones - Identify and map areas within the town that are subject to flooding during severe storm events. They may either be low-lying areas or wetlands/ponds. Since the terrain of Garowe City is generally flat, a heavy storm may exceed the capacity of the town's storm drainage system. Such an event may result in localized flooding and stagnation of water in low areas.

Activity 2.4.5b - *Include the following in the drainage preliminary designs:*

- Design Criteria - The design of the stormwater facilities will be planned to withstand a particular storm return period based on the adopted design manual while maintaining full flow in the channels.

Activity 2.4.5c - *Carry out an analysis of the availability of materials* for the construction of the drainage system.

Activity 2.4.5d - *Prepare preliminary drawings* for the selected drainage system complete with standard drawings, as well as profiles and cross sections of the trunk and secondary drains.

Activity 2.4.5f - *Prepare construction cost estimates*

Activity 2.4.5g - *Undertake situation analysis of the existing Operation and Maintenance of road drainage and drainage and prepare a maintenance plan for drains.* The situation analysis will also include institutional analysis and capacity assessment for the development, operation, and maintenance of the current system and new investments.

3.6.01.5 Feasibility and Preliminary Design Report, including MCA.

Outcome 2.5: Detailed Engineering Designs:

Activity 2.5.1 - After the review and approval of the preliminary design, and ESIA by the PIU, and UNOPS, the design consultant will proceed with the **detailed engineering design** of the trunk drainage lines, complete with cost estimates based on standards agreed upon with the PIU. These shall be as required by the Municipality of Baidoa to call for bids and in such further detail as may be required for the construction work to be carried out

by contractors. This activity will include the Design Review implemented by a third party who will be procured according to UNOPS Rules and Regulations. The detailed engineering design work shall include but not be limited to:

- The adequacy of the size of existing drains will be informed by information provided by the PIU. They will be tentative sizes of the drains as exact sizes will be calculated during detail designing.
- Provide the book of report and drawings for the preliminary engineering design report for urban drainage in Baidoa to ensure the completeness and suitability of proposed alignment, plot drainage connectivity, and structural work including all waterway dimensions.
- Detailed bills of quantities for selected drainage systems including any rehabilitation or expansion required to improve the functionality of the existing.
- Detailed design on the first batch of six (6) priority Packages of the entire drainage system envisioned, in agreement with the prioritization of the interventions identified and the available funding as per the preliminary design. In addition to this, outfall/exit drains, and stand-alone drains either as new, expansion or improvement of existing ones. All these will be designed as per international technical standards such as AASHTO-HEC, ACI, ASTM, etc.
- Detailed hydrological study for the proposed Catchment. The design consultant will manage the analysis of the design for different return periods (5, 10 and 25 years) with necessary observations in their report.
- Hydraulic analysis on all drainage structures by use of available data, maps, and field investigation.
- Determination of the run-off coefficient, hydraulic slope and design flood discharge for the appropriate return period for each drainage structure, and the corresponding water level established in the catchment area.
- Survey alignments, cross-sections, and gradients of water courses to determine the design of proper drainage and erosion control of the roadway and the protection of slopes. All storm water from each road catchment shall be drained to a trunk drainage and ultimately outfall to a natural water course.
- Road reinstatement design and cost estimation. The width of the road reinstatement shall be width of the open excavation trench or road link. The design consultant will provide road reinstatement methodology, design and drawing including cross section, layout and profile, detailed cost estimation, specifications, and road safety measures for the given scope of work.
- The design consultant will prepare the following engineering drawings for each contract package, using a format and title sheets as agreed with the PIU Project Coordinator, the originals becoming the property of the Municipality:
 - Plan and Profile, scales, 1: 2,500 and 1:250 showing natural ground levels; Drainage Invert Levels, Drainage section size, Slope, Material of construction, horizontal and vertical details; running chainages; cross-section chainages; description and reference to all Roads and contour lines superimposed on plans; any other relevant information approved by the PIU Project Coordinator.

- Typical cross-sections, scales 1:25 showing: all details of Trunk drainage cross-sections.
- Cross-section, scale 1:50 showing natural ground levels superimposed with the Drainage at selected locations to be agreed upon.
- Depending on the finding of the survey, culverts might be proposed for some sections and typical designs might be needed. Depending on the results, typical culverts showing details of all types of culverts and other drainage structures with opening less than 12 m², their inlets and outlets, and any necessary protection work.
- Soil plan: an alignment soils plan shall be produced showing the characteristics of soils for various sections of the route.
- Ancillary works: A plan for all other ancillary works including roadside drainage connection, and plot side drain connection shall be prepared.
- The design consultant shall collect all the necessary survey plans and trunk drainage corridors surrender from relevant authorities and overlay with topographical maps and organize for digital road corridor information. This will be at an appropriate scale indicating the boundary details, physical features, and structures.

The detailed designs will follow the structure of the preliminary design report. The detailed designs will refine the hydrology study and hydraulic analysis, storm design flows and sizing of drains, type and material for the drains, and all other aspects and parameters of the drainage study, carry out detailed topographic/engineering surveys, material, and core testing, and finalize to greater details the drawings, bills of quantities, specifications, and cost estimates. At the detailed design stage, The design consultant will consult with the UNOPS, PIU and key stakeholders to determine the number of work packages depending on expected funding, convenience in construction, etc. For each package, drawings, bills of quantities, specifications, will be prepared. The standard and specifications for the works and the operations and maintenance plan for roads and drainage system will also be prepared.

Based on the outcome of the stakeholder consultations and final detailed design of the selected trunk drainage lines, the Design consultant will verify and update the ESIA and relevant impacts and risk management plans that align with World Bank Environmental and Social standards. The design consultant, with support of UNOPS will ensure that the following activities are carried out:

- Stakeholder consultations on the final detailed designs, especially with the Project Affected Persons directly. Pay specific attention to the length and cross sections and Corridor of impact.
- Verification and update of ESIA and ESMP.
- Update of Stakeholder Engagement Plan based on consultations on final designs and proposed activities during construction and operation phase.
- Update of LMP, SEA/SH prevention and Response Plan, Security Management Plan including cost estimates based on final designs as required.

Construction Quantities: The calculated quantities for the items of construction will be based on the final design drawings. The earthwork quantities will be derived from calculations based on the field cross-sections taken along centerline and is in accordance with accepted methods of

measurement, which will be agreed upon with the PIU Project Coordinator. A detailed Bills of Quantities including contingencies shall be prepared.

Cost Estimates: The design consultant will manage the estimation of likely ruling bill rates (based on prevailing market prices) applicable to the proposed time of construction, showing the rationale and justification. To make a fair and reasonable estimate of the cost of the drainage construction, the design consultant will agree with the PIU on a list of unitary prices of the main based on previous projects implemented in Baidoa. The estimated financial costs resulting from this analysis shall be accurate to within +/- 10% (ten percent). A detailed priced bills of quantities will be prepared. To assist in evaluating the required construction period and forward budget needs, The design consultant will ensure the preparation of a construction schedule for the proposed construction contract showing the anticipated annual expenditure. Due account shall be taken of the climatic and other conditions of the area which may have an influence on the construction schedule. The cost estimates should include costs for ESMP implementation and reinstatement of roadside properties and assets.

3.6.02 Phase II - Detailed Engineering Designs:

3.6.02.1 Draft Detailed Designs, including drawings, technical specifications, and a bill of quantities, and construction estimates.

3.6.02.2 Final Detailed Engineering Designs, including drawings, technical specifications, bill of quantities, bidding documents, and construction estimates.

Outcome 2.5: Bidding documents based on the World Bank's procurement templates for the investment packages agreed with the PIU.

Activity 3.1 Bidding Documents Preparation: UNOPS will ensure the preparation of the following bidding and contract documents. The bidding documents will be based on the appropriate World Bank Standard Bidding Documents version to be provided by the Project Coordinator:

- Complete Bidding Document complete with Bidding Data Sheet, Evaluation Criteria, list of equipment and staff, work programme, etc. based on agreed World Bank Standard Bidding Document (SBD).
- General Conditions of Contract, and Special Conditions of Contract.
- Bidding Drawings.
- Standard and Special Specifications for the execution of the work.
- Bills of Quantities and Engineers Cost Estimate – Separate Bills of Quantities will be prepared for construction of different drainage packages,
- Bidding drawings shall be submitted in A3 size (photo-reduced from the original digital version developed in A1 size). All other documents shall be submitted in A4 size. In

addition, UNOPS will submit the engineering investigation, analysis, design materials report and other relevant information.

- Environmental and Social Management Plan to guide contractor ESMP.

3.6.03 Phase III - Bidding Documents Preparation

3.6.03.1 Bid Documents.

3.6.04 Cross-Cutting

Environmental and Social Safeguard Considerations - The design consultant will identify potential positive and negative environmental/social impacts that could result during pre-construction, construction and operation phases of the project, and they be discussed with the client and documented for the client's attention during decision on project activities feasibility. Although the design consultant is not required to carry out a detailed environmental and social impact assessments, the design consultant is expected to report on the severity of the expected impacts along with possible mitigation measures, as well as options to maximize to nature based solutions, to assist the PIU's preparation of the site specific Environmental and Social Management Plans (ESMPs) and Resettlement Actions Plans (RAPs) during subsequent stages of the project.

Cross-Cutting: Sustainability Aspects - In the design development, due attention will be given to sustainability aspects of the road ensuring that project completed infrastructure can be sustained over the designed life in order to serve the project objectives. In this regard, the design consultant will consider stakeholder participation and national ownership throughout the design development (and subsequent phases). Selection of appropriate design standards, construction methodologies, utilization of locally available materials and construction practices, materials and skills availability for future maintenance etc. Local capacity to maintain the newly built infrastructure by the Municipality, and requirements shall be identified to support the Municipality in building its capacity for infrastructure maintenance (e.g., maintenance plans).

Cross-Cutting: Knowledge Sharing and Transfer - the design consultant will exploit all opportunities to the extent possible for sharing knowledge with the PIU and its engineers, in order to provide a learning opportunity through on-the-job training under the SURP II programme. These learning opportunities may arise in one or more of the following projects under SURP II managed by UNOPS: "Feasibility study, preliminary design, environmental and social impact assessment, detailed engineering design, and preparation of bidding document for mogadishu trunk drainage and rehabilitation of eight (8) roads within Mogadishu city" and

“Preparation of Feasibility Studies, Detailed Engineering Designs and Bid Documents for Urban Infrastructure Works in Dhuusamareeb and Beledweyne Municipalities”.

3.6.05 Environmental and Social Risk Management

- 1 **The Financing Agreement and the Environmental and Social Commitment Plan (“ESCP”):** The Government has executed the Financing Agreement with the Bank and has agreed to comply with the ESSs obligations as set out in the Financing Agreement, including the ESCP, in a manner and timeframe acceptable to the Bank. The Financing Agreement and ESCP identify the material measures and actions to be implemented by the Government to manage E&S risks and impacts of the Project and specifies the E&S instruments that shall be adopted and implemented under the Project.
- 2 **E&S Obligations:** The UN Partner shall Deliver the Outputs in accordance with the following E&S Obligations derived from the Financing Agreement and ESCP and the E&S instruments which the Parties have agreed are relevant to the UN Partner’s Delivery of Outputs, all in accordance with the Bank’s ESSs:

E&S Obligations	Timeframe
REGULAR REPORTING Prepare and submit to the Government regular monitoring reports on the environmental, social, health, and safety (ESHS) performance of the Delivery of Outputs.	Submit quarterly reports throughout the Delivery of Outputs.
INCIDENTS AND ACCIDENTS Promptly notify the Government of any incident or accident related to the Delivery of Outputs which has, or is likely to have, a significant adverse effect on the environment, the affected communities, the public or workers, including, inter alia, cases of sexual exploitation and abuse (SEA), sexual harassment (SH), and accidents that result in death or serious or multiple injury. Provide sufficient detail regarding the scope, severity, and possible causes of the incident or accident, indicating immediate measures taken or that are planned to be taken to address it, and any information provided by any Consultant or Contractor, as appropriate. Subsequently, at the Government’s or the Bank’s request, share any Consultant or	Notify the Government no later than 48 hours after learning of the incident or accident. Provide subsequent report to the Government within 10 days of the initial notification. The initial notification and subsequent report on SEA/SH incidents shall be shared with the Bank’s corporate Grievance Redress Service within the above-referred timeframes.

E&S Obligations	Timeframe
Contractor notification and report and prepare a report on the incident or accident and propose any measures to address it and prevent its recurrence.	
CONSULTANTS' AND CONTRACTORS' REGULAR REPORTS Require Consultants and Contractors to provide regular monitoring reports on ESHS performance in accordance with the metrics specified in the respective bidding documents and contracts, and submit such reports to the Government.	Submit the regular reports to the Government upon request.
ENVIRONMENTAL AND SOCIAL INSTRUMENTS 1. Deliver the Outputs in accordance with the Environmental and Social Impact Assessment (ESIA), and corresponding Environmental and Social Management Plan (ESMP) for the Project, consistent with the relevant ESSs. 2. Deliver the Outputs in accordance with the Environmental and Social Management Framework (ESMF) for the Project, consistent with the relevant ESSs.	. 1. Throughout the Delivery of Outputs. 2. Throughout the Delivery of Outputs.
MANAGEMENT OF CONSULTANTS AND CONTRACTORS	Incorporate into the bidding documents and contracts prior to launching the bidding process and contract signature respectively and implement throughout the Delivery of Outputs. Supervise Consultants and Contractors throughout the Delivery of Outputs.

E&S Obligations	Timeframe
<p>Incorporate the relevant E&S obligations of this Agreement, the ESMF, other E&S instruments, the LMP, the SEA/SH Action Plan, the Security Management Plan and code of conduct into the ESHS specifications of the bidding documents and respective contracts with Consultants and Contractors. At the Bank's request, share with the Government and/or Bank the contracts with Consultants and Contractors. Thereafter ensure that the Consultants and Contractors comply and cause subcontractors and primary suppliers to comply with the ESHS specifications of their respective contracts.</p>	
<p>LABOR MANAGEMENT PROCEDURES AND GRIEVANCE MECHANISM FOR PROJECT WORKERS</p> <p>Implement the labor management procedures (LMP), including, inter alia, provisions on working conditions, management of workers relationships, occupational health and safety, code of conduct (including relating to SEA and SH), forced labor, child labor, grievance arrangements for Project workers engaged in the Delivery of Outputs, and applicable requirements for Consultants and Contractors.</p> <p>Establish and operate a grievance mechanism for Project workers engaged in the Delivery of Outputs, as described in the LMP and consistent with the ESSs.</p>	<p>Implement the LMP throughout the Delivery of Outputs.</p> <p>Establish grievance mechanism prior to engaging Project workers for the Delivery of Outputs and thereafter maintain and operate it throughout the Delivery of Outputs.</p>
<p>SEA AND SH RISKS</p> <p>Deliver the Outputs in accordance with the SEA/SH Action Plan, to assess and manage the risks of SEA and SH.</p>	<p>Throughout the Delivery of Outputs.</p>
<p>SECURITY MANAGEMENT</p> <p>Any activities will be in compliance with the Security Management Plan.</p>	<p>Throughout the Delivery of Outputs.</p>
<p>STAKEHOLDER ENGAGEMENT PLAN</p>	

E&S Obligations	Timeframe
Implement the relevant aspects of the Stakeholder Engagement Plan (SEP) for the Project, which shall include measures to, inter alia, provide stakeholders with timely, relevant, understandable, and accessible information, and consult with them in a culturally appropriate manner, which is free of manipulation, interference, coercion, discrimination and intimidation.	Throughout the Delivery of Outputs.

2.1 UNOPS Internal Design Review Process

Design review is an internal assurance process performed by UNOPS headquarter for infrastructure works to mitigate organizational and life/safety risks by ensuring design compliance with established codes and standards.

UNOPS will assign a Technical advisor (Third party Design reviewer) to provide staged reviews during the development of the design by the Consultant. The Technical Advisor will provide reviews and recommendations at key points of the design process, managed and facilitated by the UNOPS project team. Recommendations and comments should be taken on board as the design progresses. The comments and recommendations and Designer responses should be logged. The key review points would typically be:

- Inception phase/Design Brief / Basis of Design
- Concept / Basic Design
- Detailed Design

A record of the comments log will be submitted to IPMG Design Review at UNOPS HQ upon completion of the Design Process for assurance of the design review process.

It is crucial to point out that a full responsible response by the design consultant to the comments raised by the reviewers will reduce the review rounds and accelerate the design certification process. Thus; the consultant shall respond responsibly and in time to these raised comments once received.

Design Liability shall rest with the design consultant. Design reviewer's liability shall be limited to evaluating the compliance of the design against the minimum requirements set out in the design planning manual and shall not include any liability for the design itself, which shall remain with the Consultant.

The Design review process is performed against:

- Fulfillment of the submission, in terms of the required documentations and reports
- All sections, functional statements and technical objectives described by the **"UNOPS Design Planning Manual"**, mainly the ones related to life safety & Functionality.
- Design obtained codes and standards (national and international in case of the absence of national codes)
- Rationalism

3 Design Package Deliverables:

The design consultant by this contract is responsible of preparing, developing and submitting the following:

3.1 Design Packages:

Inception Phase:

- Inception Report
- Environment & Social Impact Assessment Report (ESIA).
- Design Brief
- Preliminary designs and plans (surveys, drainage system concept /layout, general/ location maps , ... etc).

Detailed Engineering Design Phase

- Detailed Design for all disciplines

Tender Document Preparation Phase

- Tendering Package based on the World Bank's procurement templates for the investment packages agreed with UNOPS and the PIU.

3.2 Design Documentation

Design Brief Document

Complete as outlined at (**Annex 11.3**)

Set of Technical Drawings

3.2.01.1 Set of Civil Drawings

- **Site plan** : This shall illustrate the overall site, including topography, existing structures, property boundaries, and key natural features. The site plan shall show the locations of proposed drainage elements, such as channels, pipes, and basins..... etc.
- **Grading plan** : This shall display the slope and contour of the land and indicate how surface water will flow across the site.

- **Drainage area map** : this shall Identify the contributing drainage area or watershed for the project and show the contribution of different areas to the overall drainage system.
- **Hydrological Study** : this shall Provide data and analysis of rainfall patterns, runoff, and flow rates in the drainage area.
- **Hydraulic design drawings** : this shall detail the design of the drainage system, including the sizing and layout of pipes, culverts, and other hydraulic structures. Includes profiles showing elevations along the drainage path. profile for all pipes and for difficult locations with scale H:1:500 V1:250 .
- **Road reinstatements drawings** : this shall provide a plan showing existing original / an improved condition to ensure safety and maintain the quality of the road network. final road surface, Road Markings and Signage.
- **Cross-Sectional Drawings** :this shall Illustrate the cross-sections of the drainage channels, pipes, and structures. Shows dimensions, materials, and slopes.
- **Stormwater Management Plan**: this shall outline the strategies for managing stormwater, including the detention and retention basins, swales, and other control measures.
- **Erosion and sediment control plan** : this shall address the measures to prevent soil erosion and control sediment during construction. Specifies erosion control practices and devices.
- **Pipe Network Layout** : this shall provide a plan showing the layout of the drainage pipe network. Includes pipe sizes, materials, and flow directions.
- **Details of Drainage Structures** : this shall offer detailed drawings of specific drainage structures such as manholes, catch basins, and outfalls and shall include construction details and specifications.
- **Construction sequence drawings** : this shall illustrate the sequence of construction for the drainage system, including any temporary measures during construction.
- **Utility coordination drawings** : this shall show the coordination of the drainage system with existing utilities, such as water lines and gas pipes.
- **Maintenance and operation plan** : this shall outline a plan for the ongoing maintenance and operation of the drainage system.

3.2.01.2 Set of structural Drawings

- Cover Sheet - Structural
- List of Drawings
- Structural General Notes
- Existing Site Situation
- Excavation Plan

- Footings Plan
- Footings' Details
- Slabs Layout Plans
- Slabs Details
- walls Details
- Structural Details

3.2.01.3 Set of Mechanical & electrical Drawings(If applicable)

Mechanical Drawings:

- **Site Plan:** Overview of the pump station location within the drainage system. Indication of access points, utilities, and surrounding features.
- **Pump Station Layout:** Detailed plan showing the layout of the pump station components, including pumps, motors, pipes, valves, and control panels.
- **Elevation Drawings:** Views of the pump station from different angles to illustrate the height and arrangement of components.
- **Cross-sectional drawings** showing internal details of the pump station. Depicts pump and motor placement, piping, and other structural elements.
- **Foundation and Structural Details:**Details of the foundation design for pumps, motors, and other equipment.Structural drawings indicating the support structure for the entire pump station.
- **Pump Details:**Drawings providing specifications for each pump, including type, size, capacity, and performance characteristics.
- **Motor Details:** Specifications for motors, including type, power rating, voltage, and connection details.
- **Piping and Valve Layout:**Plan and elevation drawings of the piping network within the pump station.Location of check valves, gate valves, and other necessary components.
- **Instrumentation and Control Diagrams:**Diagrams illustrating the instrumentation and control devices used in the pump station

Electrical Drawings:

- **Electrical Single Line Diagram (SLD):**Overview of the electrical components in the drainage system, including pumps, motors, and control systems.
- **Instrumentation and Control Diagrams:**Details of instrumentation and control devices used in the drainage system, such as level sensors and flow meters.
- **Power Distribution Layout:**Layout of electrical cables, conduits, and distribution routes for powering pumps, sensors, and other electrical components.
- **Motor Control Center (MCC) Drawings:**Layout and details of the MCC, including motor starters, disconnect switches, and control wiring.

- **Lighting Layout:**Details of lighting fixtures within the drainage system area, including emergency lighting arrangements.
- **Safety and Emergency Shutdown Systems:**Details of safety systems and emergency shutdown procedures for electrical components.
- **Cathodic Protection Drawings:**If applicable, drawings outlining cathodic protection measures for metal components in the drainage system to prevent corrosion.
- **Grounding and Earthing Diagrams:**Drawings illustrating the grounding and earthing systems for electrical components.
- **Electrical Panel Schedules**

Design Reports and Calculations

The final submission shall include following design reports and calculations:

- ❖ Soil Investigation report
- ❖ Topographic Survey
- ❖ Structural Design Report including structural modeling and calculations
- ❖ Hydraulic Modeling
- ❖ Mechanical Design Calculations Report
- ❖ Electrical Design Calculations Report

3.3 Construction Documentation

In addition to the set of drawings specified above, the design consultant must submit the following documentations in accordance to the final approved design.

Bill of Quantities with Estimations

As described in **3.6.02**, filled with cost estimates

Set of Technical Specifications

4 sets of the obtained technical specifications for:

- ❖ Civil works

- ❖ Hydrology & hydraulic works
- ❖ Mechanical & electrical works

4 Commencement and Duration of Services:

The design consultant shall commence the services within one week following the signature of the contract for consultant's services for works between UNOPS and the design consultant.

The duration of the design services contract is expected to be 10 months commencing from month 1 to month 10 of the project, from which the design activities must be accomplished and completed within **10 months**. The following "times for completion" are contractual milestones which are applicable to the design stage of the contract for consultant services for works:

Phase	Activity	Time for Completion	Timeline
1. Inception Phase	<ul style="list-style-type: none"> ▪ Site Visits ▪ Topographic Survey ▪ Data Collection ▪ Soil Investigation ▪ Hydraulic Modeling ▪ Design Concept ▪ ESIA ▪ Design Brief / Preliminary design. 	4 Month	4 Months
	Phase Approval	Parallel to phase 2	4 Months

2. Detailed Design Phase	<ul style="list-style-type: none"> ▪ Complete Set of engineering drawings ▪ Bill of Quantities ▪ Design Reports ▪ Technical Specifications ▪ Implementation Plan 	4 Months	8 Months
	Phase Approval	Overlapped activity	8 Months
3. Design Review	<ul style="list-style-type: none"> ▪ Design Review and certification of the design by UNOPS HQ 	Parallel to Approvals Phase 2 and 1 additional month	9 Months
4. Tender Documents Preparations	<ul style="list-style-type: none"> ▪ Tendering Package based on the World Bank's procurement templates for the investment packages agreed with UNOPS and the PIU. 	Parallel to design review process	10 Months

4.1 Design Phases Approvals

The design consultant is required to obtain official approval from the UNOPS and the PIU on each of the previously detailed design phases prior to initiation of the next phase.

4.2 Design Review and Progress Meetings

The design consultant is required to attend regular design review and progress meetings with UNOPS and PIU during the design development stage of the project; these meetings may also involve the other project stakeholders and are expected to be more frequent during the early phases of the design stage.

The design consultant will be required to submit minutes of the meetings within one day from the date of the meeting for approval by UNOPS and PIU.

The exact location, date, and time of each meeting will be established by the UNOPS and communicated to the design consultant in advance.

4.3 Consulting Service Staffing Input

The design consulting services shall be carried out by experienced and competent professionally qualified personnel. The Consultant's staff should have extensive experience in survey and design/ design management of similar infrastructure projects. The design consultant's staff must have a verifiable engineering qualification and professional background in their area of drainage and engineering discipline. The Consultant should propose the staff with a breakdown of their time involvement in the different design stages.

4.4 Cost of Payment of Consultant's Services

Payment to the Consultant shall be made on the basis of one final invoice submitted by the Consultant to UNOPS in accordance with actual progress of the consultancy works as certified by UNOPS.

5 Sustainable Infrastructure:

The design consultant must ensure that the final design package addresses all aspects of the UNOPS policy for Sustainable infrastructure, wherein UNOPS has committed to design and implement infrastructure projects in a manner that respect the principle of social and environmental responsibility, including preventing or mitigating adverse impacts on the environment and identifying opportunities for improved environmental performance.

The design consultant must ensure that the identified design solution meets the functional statements of Section C of ***“UNOPS Design Planning Manual”*** and is compliant with UNOPS Policy for Sustainable Infrastructure. If the design consultant identifies the possibility of negative social or environmental impacts, it must raise this risk with the UNOPS Project Manager.

6 Design Standards:

UNOPS implements infrastructure projects in a broad range of countries, and whilst each country has a building code/regulations and an authority that reviews or approves building designs, there are still countries where there are no national building codes. In a context where there are no national building codes, UNOPS minimum requirements as outlined in the ***UNOPS Design Planning Manual*** will serve as a guideline.

However, the manual as such is not intended to supersede existing building codes and guidelines. The design consultant must be aware of the existing standards in Somalia and ensure that any design solution identifies matches or exceeds country standards. Where national building codes do not meet UNOPS stipulated minimum design provisions, the UNOPS Design manual becomes the default standard for the design consultant to follow.

The UNOPS Design Manual and any national or international codes in application in Somalia must be jointly applied, and compliance with the more stringent standard is required.

7 Occupational Health & Safety Design Considerations:

UNOPS priority for building design is life safety. Therefore, the final design solution must consider the combination of many critical elements that impact life safety

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 Design Consultant shall be responsible to ensure:

- How their design will affect the health and safety of those who will interact with the structure throughout its life.
- That health and safety risks arising from the design during construction are eliminated or minimized.

Furthermore, consultant is responsible for full compliance with project “Environmental and Social Risk Management” ESS rules and regulations as shown in **Annex 10.4**

8 Approach Methodology during Implementation:

8.1 Contract Duration

The “Time for Completion” as per the contract shall be **10 months**. By this time, all professional services required through this ToR should be finalized and completed to the satisfaction of UNOPS and PIU.

8.2 Reporting

Reporting during implementation shall be on a regular basis and different from the project output as described in section 3 – Scope of Services.

The progress reports should be submitted to UNOPS as per the details provided on the table below:

Report Type	Description	Frequency
Monthly Progress Report	<ol style="list-style-type: none">1. Summary2. Project Progress<ol style="list-style-type: none">a. Deliverables and Milestones achievedb. Issues and Risksc. Lessons Learned3. Detailed implementation plan for 4 weeks ahead.4. Annexes (if relevant)	Monthly
Final Narrative Report (10 days after contract)	<ol style="list-style-type: none">1. A detailed narrative of the activities conducted sequence of events through the life of the project;2. An accumulative project achievement summary in tabular form summing up results from the weekly Reports. All tasks shall be listed and mapped;	Upon completion of the contract deliverables.

completion)	3. Lessons Learned 4. Comments, explanations or suggestions, which may be relevant or necessary.	
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8.3 Work Plan

The consultant will be expected to produce a fully detailed programme for the 11 months contract duration on an MS Project or equivalent Gantt chart schedule format, building in all components with appropriate lead times, precursor events and dependencies. This schedule should be submitted with the proposal, and then revised for approval within the appointment.

8.4 Success Criteria

KPI	
Quality	<ul style="list-style-type: none"> ▪ Delivery of services and deliverables which comply with and exceed local codes and standards, international best practice, and UNOPS HSSE Policy and guidance ▪ Responsive to follow up questions and reviews, to solve unforeseen issues
Time	<ul style="list-style-type: none"> ▪ Delivery of services and deliverables within the agreed timeframe ▪ Raise early warning flags in advance of expected delays taking place
Cost	<ul style="list-style-type: none"> ▪ Delivery of services within the agreed budget ▪ Delivery of services which provide best value for money
Communications	<ul style="list-style-type: none"> ▪ Delivery of outputs which are clearly communicated to the intended recipients

	<ul style="list-style-type: none"> ▪ Responsive to requests, complaints, questions, clarifications etc.
Sustainability	<ul style="list-style-type: none"> ▪ Considers measures to reduce the impact on the local environment both during construction and when in use ▪ Considers toolkits which reduce the project's entire lifecycle costs ▪ Considers impact of project on social issues, promoting equality and fairness to end users and affected communities ▪ Provide results that support longer term sustainability and longevity through local partners and institutions;
Gender	<ul style="list-style-type: none"> ▪ Contributes to gender equality during the project lifespan ▪ Contributes to sustainable development goals and agenda for Gender Mainstreaming in the project
Satisfaction	<ul style="list-style-type: none"> ▪ Contribute to project outcomes to the satisfaction of project partners, end users

9 Qualification & Experience

9.1 Firm Qualifications

The design consultant shall be registered in the field of Engineering Consultancy and hold relevant company certifications from related engineering bodies in the country of registration.

The Design Firm should provide details of in house / external consulting disciplines that they propose to use and details of their qualifications.

The firm shall have a minimum of 15 years of experience, and has proven experience in the field of Sewer Drainage networks participated in not less than 3 similar projects. Please refer to (Section II_ Evaluation Method and Criteria).

9.2 Proposed Project Team

The following are deemed to be the minimum qualifications required for the project design team:

Description of Staff Role	Minimum Qualification and Professional Experience
Key Personnel	
<u>Design Manager (DM)</u> Will be accountable and responsible for the Design solutions evolution and management and successful delivery of all design stages and final design solutions and shall have thorough knowledge of all design elements. The DM will be the main contact person with the UNOPS Project team, and the stakeholders. The DM will be responsible to coordinate closely with all the involved engineering	Essentials <ul style="list-style-type: none">▪ Degree in Engineering▪ Min 15 years' experience in managing design projects of similar size and nature;▪ Proven knowledge in the service utilities sector operations and requirements.▪ The Design Manager must be fluent in English

<p>disciplines to ensure harmonization between all design components and disciplines.</p> <p>Attend any required internal / external technical / management meetings as per UNOPS project team Requests.</p>	
<p><u>Senior Sewer and hydraulic engineer</u></p> <p>Full Time – and will be accountable and responsible for the developing design solutions and management of the stakeholders functional needs.</p> <p>Shall be responsible for successful delivery of design concepts and detailed design components.</p> <p>The engineer shall also coordinate closely with the key engineering personnel in the development of the design solution to ensure that all engineering needs are captured and integrated in the design.</p> <p>Attend any required internal / external technical / management meetings as per UNOPS project team Requests.</p>	<p>Essentials</p> <ul style="list-style-type: none"> ▪ Degree in sewage and hydraulic engineering ▪ Min 15 years’ experience in Designing and of similar size and nature; ▪ Professional knowledge of applied Design codes, especially ones applied to drainage systems. ▪ Fluent in English language ▪ Experience of site inspection, testing and commissioning;
<p><u>Civil Engineer - Structural</u></p> <p>Full Time - and will be responsible to deliver the required design services for structural and civil design works under this contract.</p> <p>Attend any required internal / external technical / management meetings as per UNOPS project team Requests.</p>	<p>Essentials</p> <ul style="list-style-type: none"> ▪ Degree in Civil Engineer - Structural. ▪ Min 10 years’ experience in design of civil engineering works ▪ Professional knowledge of applied Design codes, ▪ Experience of site inspection, testing and commissioning;

<p><u>Civil Engineer - Road Engineering</u></p> <p>Will be responsible to deliver the required design services for road design works under this contract</p>	<p>Essentials</p> <ul style="list-style-type: none"> ▪ Degree in Civil Engineer - Road engineering ▪ Min 10 years' experience in design of civil engineering works (Roads) ▪ Professional knowledge of national and international standards applicable in roads engineering design. ▪ Experience of site inspection, testing and commissioning;
<p><u>Mechanical Engineer</u></p> <p>Full Time - and will be responsible to deliver the required design services for Mechanical design works under this contract</p> <p>Attend any required internal / external technical / management meetings as per UNOPS project team Requests.</p>	<p>Essentials</p> <ul style="list-style-type: none"> ▪ Degree in Mechanical Engineering. ▪ Min 10 years' experience in Mechanical design ▪ Professional knowledge of national and international standards applicable in mechanical engineering design. ▪ Experience of site inspection, testing and commissioning;
<p><u>Electrical Engineer</u></p> <p>Full Time - and will be responsible to deliver the required design services for Electrical design works under this contract</p> <p>Attend any required internal / external technical / management meetings as per UNOPS project team Requests.</p>	<p>Essentials</p> <ul style="list-style-type: none"> ▪ Degree in Electrical Engineering. ▪ Min 10 years' experience in electrical design. ▪ Professional knowledge of national and international standards applicable in electrical engineering design. ▪ Experience of site inspection, testing and commissioning;

<p><u>Environmental Engineer</u></p> <p>Will be responsible to address environmental impact assessment and ensure compliance with environmental regulations. May also contribute to the design to minimize ecological impact.</p>	<p>Essentials</p> <ul style="list-style-type: none"> ▪ Degree in Environmental Engineering ▪ Min 10 years' experience in Environment & Social assessment ▪ Professional knowledge of international standards.
<p><u>Quantity Surveyor</u></p> <p>Will be responsible for developing the quantities calculations under this contract</p> <p>Attend any required internal / external technical / management meetings as per UNOPS project team Requests.</p>	<p>Essentials</p> <ul style="list-style-type: none"> ▪ Degree in Survey Engineering, additional Architectural / Mechanical engineering background is an assist. ▪ Min 7 years' experience in Medical Systems design and health care facilities planning. ▪ Professional knowledge of international standards. ▪ Experience of site inspection, testing and commissioning;
<p><u>CAD Operators, GIS Experts, support team</u></p> <p>Full Time - and will be responsible to provide support to the design developments as needed.</p> <p>The Number of this team shall be proposed by the Design Consultancy service in a manner to achieve the aimed delivery durations.</p>	<p>Essentials</p> <ul style="list-style-type: none"> ▪ As needed.
<p><u>Topographic Survey and Soil Investigation experts</u></p>	<p>As assigned by the design consultant, the profile for those consultant should be shared with UNOP for approval prior to commence the work</p>

10 Annexes:

10.1 UNOPS Design Planning Manual

The “UNOPS Design Planning Manual” cloud be found at the following link:

[Utilities Manual](#)

10.2 UNOPS CAD Drawing Guidelines

The “UNOPS CAD Drawing Guidelines” cloud be found at the following link:

[UNOPS CAD Drawing Guidelines](#)

10.3 Design Brief Document Outline

The “Design Brief Document” outline cloud be found at the following link:

[Design Brief Document Outline](#)

10.4 Environmental and Social Risk Management

The “ESS requirement document” outline cloud be found at the following link:

[Project ESS Document](#)