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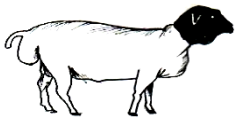

THE LOCAL GOVERNMENT

OF GAROWE

Somalia Urban Resilience Project II (P170922)

Project Implementation Unit

Garowe Municipality

Puntland State of Somalia

SOMALIA URBAN RESILIENCE PROJECT
PHASE II

Terms of Reference for Consultancy Services of Preparartion of Feasibilty Studies, Detailed Engineering Designs And Bidding Documents for Stormwater Drainage in Garowe

2020

1 Background

Somalia Urban Resilience Project II (SURP II) is a municipal governance and infrastructure development project financed by the World Bank and its partners, aimed 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, region and municipal levels. It is intended that the 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 peace building and institution building. SURP II builds on the preparation work carried out under World Bank funded Somalia Urban Investment Planning Project (SUIPP). With the SUIPP funding, the United Nations Office for Project Services (UNOPS) was contracted and prepared the feasibility studies, preliminary design, and detailed engineering designs for roads in Mogadishu, Kismayo, Garowe and Baidoa. While designs and bidding documents for roads in Kismayo and Baidoa are ready, Mogadishu and Garowe have engaged Consultants to review and update previous road designs. The Bank also supported all four municipalities set up and operationalize Project Implementation Units (PIUs), and build fiduciary, safeguards, project management, and monitoring and evaluation capacity of the PIU staff. The Federal Government of Somalia will soon set up a Project Steering Committee to oversee implementation of SURP II and a Project Coordination Unit to provide technical support and guidance to the municipalities as needed.

Garowe city has been experiencing rapid urban growth since the collapse of the central government in 1991, taking advantage also of its status as a political and administrative capital. The population influx in the early 1990's and the return of IDPs returnees who fled conflict have led to continuous population growth in the district. The city is known for its good hierarchy of roads and is characterized by a compact form, with an average density of roughly 80-100 people/ha.

Given the mostly unpaved roads and being the urban area mostly composed of large plots only partially build, Garowe has very limited impervious surfaces. However, urban development is reducing ground permeability and results in increased storm water runoff volume and peak discharge, which is evidenced by chronic flooding and degraded water quality.

As the runoff flows over the land or impervious surfaces (paved streets and building rooftops), it accumulates on the roads causing flooding, interruption of traffic movement, and damage to roads and other pavements. Flooding of stormwater also results in ponding after the rainfall even and some of the ponds take a long time before all the water evaporates. Such ponds become good breeding areas for mosquitos and other parasites.

There is no proper drainage network plan other than the natural streams which conflict with the road infrastructure at some points. This results in directly flood related problems at multiple locations.

Garowe urban area is developed without planned drainage. Developed plans for the city, does not considered the impact of urbanization on drainage flow. City public works and municipality commonly do not have the hydrologic support to cope with this problem and engineering works, where built-up areas leave no space into which flow could be diverted during flood events, as a means of decreasing peak flows. Besides the failure to plan drainage networks adequately, municipality encounters many difficulties in enforcing legislation. These difficulties are due to the following:

- ✓ Low investments in urban drainage facilities;
- ✓ Increase in peak and flood frequency due to inadequate drainage management and design; and due to basin urbanization.
- ✓ Lack of drainage and other sanitary facilities for poor population.
- ✓ Population settlements on river flood plains, with increased flood damage;
- ✓ Degradation of urban areas due to erosion and sedimentation;
- ✓ Water quality impact from wash-load of urban surface and solid waste.
- ✓ large increase in urbanization: most new developments within in the city boundaries do not have the required stormwater and sewer networks. This arises from lack of control and law enforcement;
- ✓ Invasion of public areas: public areas, such as water streams, become occupied by poor and homeless people who settle there;
- ✓ Occupation of flow conveyance areas: during periods when no floods occur, low-lying and other areas that might be reserved for flood-water dispersal are taken for poor-quality dwellings. These areas have high potential risk for damage and loss of life.
- ✓ One of the main causes of flooding in urban drainage in Garowe are the decreased hydraulic capacity of the stormwater drainage due to sand blockages, conduits and trash filling the channels and waterways during floods
- ✓ lack of a reliable garbage collection and disposal. Part of the population in poor neighborhood dumps the trash on streets and in the drainage system;
- ✓ lack of control in construction sites.
- ✓ Problems caused by poor drainage. Removing stormwater and household wastewater (sometimes called “sullage”) is an important environmental health intervention for reducing disease. Poorly drained stormwater forms stagnant pools that provide breeding sites for disease vectors. Because of this, some diseases are more common in the wet season than the dry season. Household wastewater may also contain pathogens that can pollute groundwater sources, increasing the risk of diseases such as lymphatic filariasis. Poor drainage can lead to flooding, resulting in property loss, and

people may even be forced to move to escape floodwaters. Flooding may also damage water supply infrastructure and contaminate domestic water sources.

Drainage and public health in areas where drainage and sanitation are poor, water runs over the ground during rainstorms, picks up faeces and contaminates water sources. This contributes significantly to the spread of diseases such as typhoid and cholera, and may increase the likelihood of contracting worm infections from soil contaminated by faeces. Flooding itself may displace populations and lead to further health problems

The proposed drainage study and future construction of drainage system in Garowe therefore addresses some of the above challenges and proposes operation and maintenance plans for sustainability of the infrastructure. It also ties into the ongoing Somali Urban Resilience Project (SURP) and planned SURPII, that became effectiveinFebruary2020, and will finance urban roads and associated drainage network in Garowe that were prioritized under SUIPP. The comprehensive drainage network will also help ensure that roads constructed under SURP and existing urban roads financed under JPLG and USAID are well maintained, Moreover, the drainage assessment and feasibility studies will map out existing road drainage constructed under SURP and identify gaps in their connectivity and develop topography specific designs. The study will be a roadmap to mitigate unplanned expansion of the drainage system, frequent localized flooding, road shoulder erosion among others. The proposed activities, together with SURP and SURPII, will help strengthen government effectiveness in providing municipal governance and urban resilience through better planning and (re)construction of critical urban roads and drainage systems in Garowe. Modalities of public-private partnership and community participation in construction and operation and maintenance (O&M) will be considered.

2 Study Objective

The objective of the consulting services is to conduct a feasibility study and detailed engineering designs of the proposed Garowe drainage system and prepares bidding documents for appropriate contract packaging.

3 Scope of Work

This study will build on previous work under SUIPP where feasibility studies of 19Km (from a list of 27km) of urban roads and 2 bridges were undertaken in 2016 in Garowe. With investments drawn from this study, the Municipality has already constructed 4.9Km under SURP and is implementing SURP II where detailed designs are ongoing for another 9Km of urban roads with roadside drains and the Hospital bridge.Between2010-2013 a number of roads have been engineered to earth and gravel surfaces. The 2016 study also established that through UN-Habitat, a survey of roads conditions has been conducted and the results have been documented and recorded on a GIS platform. And, with JPLG assistance, 7.6

Km of roads were in the process of being upgraded to bitumen surface standards in 2016 (not part of the study). Garowe is a fast-growing city and even though the current Garowe city population is estimated at 82,000, this is rapidly increasing resulting in more urbanization and demand for better infrastructure and services. Construction of modern commercial building is starting to be witnessed following the current effort by government to improve road infrastructure. A solution to the earlier highlighted drainage challenges in the city requires an investment plan for drainage that is based on a detailed feasibility study of existing and new drainage network for Garowecity.It is estimated that about 60Km of a combination of trunk and secondary drains, outfall/exit drains, and standalone drains will be designed; either as new, expansion or improvement of existing.

The Consultant shall perform all work necessary as called for in these Terms of Reference including all technical studies, field investigations and related services. In carrying their work, the Consultant shall co-operate fully with the Garowe Municipality Project implementation Unit. The Consultant shall provide the necessary support services related to and necessary for the completion of the assignment. The work shall cover but not be limited to the aspects outlined in these Terms of Reference. The Consultant, with the support and assistance of the PIU staff, shall at all times ensure adequate community consultation and engagement during the study to ensure social concerns are factored in the design.

As mentioned earlier, the study involves preparation of feasibility studies. Detailed engineering designs, and bidding documents for Garowe drainage to be financed under SURP II.

Specifically, the study will undertake the following:

3.1 Feasibility study Stage

The Consultant shall refer to the any existing Puntland Drainage Design Manual, and any other drainage design manual agreed with the Client to be used for guiding the design process in this study. A detailed feasibility study will be carried out and a report presenting the following prepared.

(i) Review existing rainfall, temperature, and drainage data and maps, including aerial photographs and satellite imagery. Historic flood data along the length of the project road will be obtained from any existing records and also from local consultation.

(ii) Carry out an analysis of historic flood levels and existing stormwater catchment capacity, including mapping of area prone to inundation.

(iii) Review the existing land use, soil classification and vegetation in the catchment areas, and comment on the any potential future changes to the land use that will affect runoff during the design period.

(iv) Assessment and mapping of the existing, ongoing, and proposed road drainage system in Garowe, including its level of functioning and maintenance.

(v) Identification of major gaps to improve drainage network functioning and reduce flood risk. This will include a review of the sizing, adequacy, and parameters of existing drainage system.

(vi) Hydrologic and hydraulic analysis and modeling for the proposed drainage system. Hydrological analysis will involve study of all parameters of hydrology and calculation of runoff from each catchment that is necessary for designing the drainage system with dimension of drains derived from the ultimate runoff for the defined return period. Collection and review of primary and secondary data to determine the 5 year, 10 year, 25 year, 50 year and 100 year return period and the rainfall intensity and duration curves using appropriate computer applications. Hydrological studies shall be carried out on all drainage structures by use of available maps including open street maps, and field investigation.

(vii) The catchment area, run-off coefficient, hydraulic slope and design flood discharge for the appropriate return period shall be determined for each drainage structure, and the corresponding water level established.

(viii) Undertake capacity analysis and sizing of drainage channels and key hydraulic structures (culverts and bridge crossings)

(ix) Cross-sections and gradients of water courses shall be surveyed 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 nearby water course/way either by exit drains or standalone drains.

(x) Adoption ofmethods for improving drainagessystemsthat will ensure water flows away quickly and smoothly and is disposed-off in a surface watercourse. Drainage installed by one community should not create problems for other communities downstream, nor should it affect ecologically important sites. Environmental and social considerations should be given adequate attention: long-term changes to the environment may lead to greater health problems in the future.

(xi) Identification of at least 3 investment options (including costs) for improved drainage system in the city.

(xii) Prioritization of investment options by cost-benefit analysis and using multi-criteria analysis. The analysis will include non-monetary values, such as social benefits and reduced risk of vulnerable populations. Therefore, the analysis will consider connectivity factors between residential areas including IDP settlements, commercial areas, and key socio-economic and

government facilities. Moreover, the prioritization will consider institutional factors and the capacity to operate and maintain the system. The prioritization will be carried out through a participatory approach with relevant stakeholders and communitieswho will validate the results.

(xiii) Standard drawings of key typical features are to be provided that includes typical x-section of type of drainage system proposed (i.e. open or covered rectangular drains, cross culvers, Fords, Irish bridges,etc) with junction pits, clean out pits, outlets etc for the prioritized trunk and secondary drainage reticulation system for each drainage catchments, taking into consideration current capacity for O&M.

(xiv) Undertake situation analysis and institutional assessment of the existing Operation and Maintenance of roads and drainage and make recommendations for preparing an operation and maintenance plan.

In undertaking the feasibility study, the following steps will be useful: -

(i) Review of primary and secondary data - These will include available data from different nodal agencies, existing reports, as-built records, and O&M practices, town Land Use Plan prepared from the Town Development Plan, existing drainage information and details of flood prone areas, verification of existing storm drainage system, typical cross-sections of storm water channels, roadside drains & culverts and flow directions of channels.

(ii) Identification of system deficiencies - Hydraulic structures will be sized to convey the maximum anticipated runoff of an area. Suitable hydraulic software will be used to analyze hydraulic capacity of the drains. Deficiencies within the storm drainage system will be identified for undersized drains, the drainage area upstream of the structure will be evaluated to determine whether growth capacity for the town zone has been attained.

(iii) Flood risk mapping - Using the hydrology analysis and the identified system deficiencies, a flood risk map will be prepared showing flood-prone areas. Any existing rainwater catchments (e.g ponds) will be mapped showing the flood risk zones as well as areas around the roads reported to have experienced flooding before.

(iv) Preparation of drainage feasibility report – the feasibility study report will be based on recommended system improvements identified during field investigations and hydraulic analysis. The feasibility study will identify improvement of existing drainage facilities, and need of additional drainage facilities to minimize cross connection problems in the town to meet the growth-related needs, and include a prioritized listing of each of the projects. Improvement projects will be considered in areas with little or no anticipated future

development. Growth related projects will be considered resulting from the increased runoff associated with future development. The following key elements will be included in the feasibility study:

(v) Identification of all required improvement projects - This will be done by first identifying the existing problems, their location, and impacts. The problems identification will be through interview feedback, observation, and analysis results (hydrologic and hydraulic).

(vi) List all possible solutions - based on planned intervention by Garowe Municipality (GM), perceived workable solutions by the respondents (both key informants and the community), judging suitability of the listed solutions in technical terms, i.e, how well they address the existing problem, technically guiding GM and the community in a consultative process to finally settle on a list of projects.

(vii) Prioritization of projects - Using the list of all possible solutions, cost benefit analysis and a multi-criteria analysis will be used to score and rank the project. The projects will be scored based on their impact on the predetermined technical and socio-economic areas. The projects will then be ranked based on total scoring.

(viii) Feasibility stage construction cost estimates - The feasibility study will give three options built from the list of projects. The options will not only consider effectiveness in solving the existing problems but will also consider cost elements. These costs will include capital investment for construction, as well as operating and maintenance costs.

(ix) Preparation of feasibility level drawings – standard drawings with cross sections.

3.2 Preliminary Engineering Designs Stage

The Consultant shall review the existing feasibility study (including technical feasibility, environmental and social feasibility as well as economic viability) and produce detailed designs, engineering drawings, and bidding documents for the selected drainage networks. The preliminary design report will provide technical details of the drainage system and will specifically be required to include the following: -

(i) A map of the entire drainage network within the urban areas clearly showing on the same map, areas which are well known by the communities and officials for being flooded as well as the selected drainage networks in each area of the city.

(ii) A summary table of the drainage elements (lengths, dimensions, lined or unlined) and conditions of the existing drains.

(iii) In designing the infrastructure, the consultants will anticipate theeffects of climate change and as far as possible design climate resilient infrastructure.

(iv) Determine the carrying capacity of existing drains and also for the design of new drains by computing the design flows having considered design parameters such as frequency of storm

/ return period, depth–duration of storm, time of concentration, the coefficient of runoff, and surface imperviousness.

(v) The drainage preliminary designs will be guided by the following:

a. Flood Zones - Identification and mapping of areas within the town that are subject to flooding during severe storm events. They may either be low lying areas or wetland/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.

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

c. Hydrology Model - a suitable hydrology model will be used to predicts the volume of flow generated at any point of the catchment basin based on the available rainfall data.

d. Hydraulic Models - suitable applications for hydraulic analysis will be used to evaluate the adequacy of the existing and 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.

e. 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, the discharge. The adequacies of the size of existing drains will be determined. These will be tentative sizes of the drains as exact sizes will have to be calculated during detail designing.

(vi) Carry out analysis of availability of materials for construction of the drainage system.Testing of samples of materials from identified quarries will be done to determine suitability for use in construction. The centerline of the trunk sewers will be staked out and at appropriate intervals core samples collected, tested and a report on material testing prepared.

(vii) 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.

(viii) Prepare construction cost estimated with detailed bills of quantities for selected drainage system including any rehabilitation or expansion required to improve the functionality of the existing.

(ix) Undertake situation analysis of the existing Operation and Maintenance of roads and drainage and prepare a maintenance plan for roads and drains. The situation analysis will also include

institutional analysis and capacity assessment for development, operation and maintenance of the current system and new investments.

(x) Carry out a preliminary environmental and social impact assessment (PESIA) of the priority investment option in line with Somalia Urban Resilient Project II (SURP II) Environment and Social Frameworks. The preliminary ESIA will briefly characterize the existing environmental condition in the study area, identify possible social and resettlement impacts the project implementation will generate, assess their (impact) significance, propose possible mitigation measures, prepare an environmental and social management plan (ESMP), and estimate the total cost of implementing the ESMP. In the event there will be involuntary resettlement impact, a preliminary resettlement action plan will be prepared.

3.3 Detailed Engineering Design Stage

Once the preliminary designs are reviewed by the Client and key stakeholders and the Consultants have addressed comments and revised the preliminary design report, the study will proceed to the detailed engineering design stage. 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 Consultants will consult with the Client 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, and bidding documents will be prepared. The standard and particular specifications for the works and the operations and maintenance plan for roads and drainage system will also be prepared.

3.3.1 Construction Quantities

The calculated quantities for the items of construction shall be based on the final design drawings. The earthwork quantities shall be derived from calculations based on the field cross-sections taken along centerline and is in accordance with accepted methods of measurement, which shall be agreed with the Project Coordinator. A detailed Bills of Quantities including contingencies shall be prepared.

3.3.2 Cost Estimates

The Consultant shall estimate likely ruling bill rates applicable to the proposed time of construction, showing how these were arrived at. In order to make a fair and reasonable estimate of the cost of the drainage construction, the Consultant shall prepare a unit price analysis of each item using basic costs elements (labour, materials, equipment, tools, overheads, on-site costs, profit etc.), and showing

separately the cost of all taxation (direct or indirect). The estimated financial costs resulting from this analysis shall be accurate to within +/- 10% (ten percent), and shall be compared with the costs of previous projects or similar works executed in the area and adjusted accordingly. The rates of previous projects may be obtained from the PIU Project Coordinator

In order to assist in evaluating the required construction period and forward budget needs, the Consultant shall prepare 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.

3.4 Bidding and Contract Documents

The Consultant shall prepare the following bidding and contract documents for the project. The bidding documents will be based on the appropriate World Bank Standard Bidding Documents version to be provided by the Project Coordinator.

1. 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);
2. General Conditions of Contract, and Special Conditions of Contract;
3. Bidding Drawings;
4. Standard and Special Specifications for the execution of the work;
5. Bills of Quantities and Engineers Cost Estimate - Separate Bills of Quantities will be prepared for construction of different drainagepackages,.
6. Bidding drawings shall be submitted in A3 size (photo-reduced from the original A1 size). All other documents shall be submitted in A4 size. In addition, the Consultant shall submit the engineering investigation, analysis, design materials report and other relevant information.

4 Deliverables/Specific Outputs Expected from Consultants

The consultant is expected to deliver the following: -

i. Inception Report
ii. Feasibility study report
iii. Preliminary Design report with bidding documents and preliminary cost estimates
iv. Detailed engineering design reports with final cost estimates and bidding documents including drawings and technical specifications and other technical data specified in this TOR.

The consultant shall provide monthly progress reports on the performance of the assignment highlighting achievements of the work plan of activities.

All deliverables will be presented to the Client for review and comment, then revision by the Consultant followed by final approval. The review and comment process by the Client should be turned around within 10 working days; if no written response is received within 10 days it is considered that approval has been given and the Consultant can proceed accordingly. The Consultant should be prepared to attend meetings with the Client to discuss the assignment at any stage and make overhead presentations when called upon.

Payments will be dependent upon the final approval of the deliverables.

The deliverables and estimated timeline are outlined below. The consultant is expected to achieve this timeline.

4.1 Time Schedule for Assignment

Milestone	Activity duration, Weeks
Inception report	2 weeks
Feasibility Study Report	8 weeks
Preliminary Design Report with Cost Estimates	6 weeks
Draft Detailed Engineering Design Report, Drawings, Bills of Quantities, Engineer's Cost Estimates, Bidding documents and O&M Plan	8 weeks
Final Detailed Engineering Design Report, Drawings, Bills of Quantities, Engineer's Cost Estimates, Bidding documents, and O&M Plan	4 weeks

4.2 Reports

The Consultant shall prepare and submit to the PIU Project Coordinator the following reports. All reports shall be in English and prepared on A4 metric size paper in 4 hard copies and one electronic copy submitted as an email file attachment or shared in a cloud account.

a) Inception Report

This shall summarize initial findings and give proposals covering methodologies of the preliminary engineering studies, and the detailed work plan for the contract of the preliminary design. It will also include preliminary site visit findings and recommendations.

b) Progress Reports

These shall be submitted monthly and shall detail all work performed during the reporting period and utilization of the study personnel. These shall contain preliminary conclusions (covering such topics as drainage studies and design standards), based on the analyses substantially completed, and shall also identify actual and anticipated difficulties and delays in the work, their causes and the remedies proposed to solve them.

c) Preliminary Design Report

This shall incorporate all revisions deemed necessary arising from comments received from the PIU Project Coordinator (and also any comments from the World Bank and other key stakeholders) following discussions and agreement between the Project Coordinator and the Consultants from time to time. It shall include a concise executive summary in which the project design finding and recommendationsas well as cost estimates shall be shown clearly.

d) Draft Detailed Engineering Design Report

This shall detail the findings, analyses, results and recommendations of thedetailed engineering design work, and shall contain all supporting material.

The following draft documents shall be submitted to the PIU Project Coordinator for his approval, prior to the production of final design report:

i. Draft Final Engineering Report
ii. Draft Final Materials Report
iii. Draft Final Book of drawings (A3)
iv. Draft Tender Document
v. Draft Engineer's Estimate

All Draft documents shall be clearly marked as such, preferably in red on the cover of each document and on each separate drawing. The date of submission shall also be printed on the cover.

e) Final Detailed Engineering Design Report

This shall incorporate all revisions deemed necessary on the draft detailed engineering design report arising from comments received from the PIU Project Coordinator (and also any comments from the World Bank and other key stakeholders) following discussions and agreement between him and the Consultant.

Preparation of the final documentation shall include the following reports and drawings, which shall be submitted to the PIU Project Coordinator: -

i. Final Engineering Report.
ii. Factual Materials Report for Tender purpose without opinions or interpretation of Results.
iii. Materials Report.
iv. Hydrologic report
v. Final Book of Drawings (A3 size)

5 Estimated Staffing Levels and Qualifications for Key Staff

The Consultant firm, or firms in the case of a joint venture, must specialize in carrying out feasibility studies and designs of roads and urban stormwater drainage works. The consulting firm(s) should have a minimum of 10 years' experience in the roads and drainage sector and completed at least two (2) assignments of similar nature and comparable magnitude within the last 7 years. The firms should have experience working in Africa with some experience working in volatile environment with challenges of fragility, conflict and violence.

The composition and indicative minimum levels of effort required are listed below. However, the Consultant should make their own estimates of resources required to complete the assignment satisfactorily. The team shall comprise qualified professional staff with good experience.

The Consultant shall provide the following staff required for the performance of the duties described above. The profiles of the key experts to be provided by the Consultant for this assignment are as follows:

Key expert 1: Team Leader/Urban Development Engineer (Full time)

- Qualifications and skills - Must possess University Degree BSc (Civil Engineering) or equivalent and be register with a recognized professional body.
- General professional experience - A minimum of 15 years' practical post-qualification experience inplanning, designing and implementing infrastructure projects.
- Specific professional experience -
  - Shall have least 10 years specific experience in roads and urban drainage construction with experience in managing multi-disciplinary teams.
  - Shall have held similar position in at least one assignment of at least similar scope to this job.
  - Previous experience in road and drainage projects in East Africa will be an advantage.

The Project Manager or team leader / Urban Development Engineer will be responsible for the day to day management of the Project and for preparation of the feasibility studies and detailed designs of the stormwater drainage system. The person will provide overall direction to all specialists making up the team, ensure the timely delivery and quality of all required outputs.

Key expert 2: Drainage Engineer (Full time)

- Qualifications and skills - Must possess University Degree BSc (Civil Engineering) or equivalent and be a registered engineer with a recognized professional body.
- General professional experience - A minimum of 10 years practical post-qualification demonstrated experience in the planning, design and implementation of urban flood mitigation and drainage schemes and road drainage networks in developing nations involving local and trunk drainage systems.
- Specific professional experience

- at least 7 years' demonstrated experience in the planning, design and implementation of urban flood mitigation and drainage schemes and road drainage networks in developing nations involving standalone and trunk drainage systems.
- Should be familiar with latest Computer Aided Design applications for drainage.
- Shall have held similar position in at least one assignment of similar scope.

The Drainage Engineer shall report to the Project Manager or Team leader /Urban Development Engineer and will be responsible for the assessment of the existing drainage system, the improvements needed and the design of the drainage components of the project.

Key expert 3: Roads Engineer (part time)

- Qualifications and skills - Must possess University Degree BSc (Civil Engineering) or equivalent and be a registered engineer with a recognized professional body.
- General professional experience - A minimum of 10 years practical post-qualification demonstrated experience in the planning, design and implementation of urban roads and drainage infrastructure in developing nations involving local and trunk drainage systems.
- Specific professional experience
  - at least 7 years' demonstrated experience in the planning, design and implementation of urban roads and road drainage networks in developing nations involving asphalt roads, roadside drains and exit drains.
  - Should be familiar with latest Computer Aided Design applications for roads.
  - Shall have held similar position in at least one assignment of similar scope.

The Road Engineer shall report to the Project Manager or Team Leader /Urban Development Engineer and will be responsible for the assessment of the existing roads and assist the drainage engineer is determining the sizing of drains, the improvements needed and the design of the road drainage components of the project.

Key expert 4: Geotechnical / Materials Engineer (Part time)

- Qualifications and skills - Must possess University Degree BSc (Civil Engineering) or equivalent and be registered with a recognized professional body.
- General professional experience - a minimum of 12 years' practical post-qualification experience in road or drainage projects
- Specific professional experience - Must have relevant experienced in soils and materials sampling and testing for large road construction contracts. Experience with analytical pavement evaluation methods is desirable. Previous experience on road projects in East Africa will be an advantage.

Key expert 5: Hydrologist (Full time)

- Qualifications and skills - The Hydrologist shall have postgraduate degree in either Hydrology, Drainage, Water engineering or equivalent qualification.
- General professional experience - The person should have 8 years' experience in hydrological data analysis and modeling, water resources planning and management or watershed management or equivalent.
- Specific professional experience -He /She should have adequate knowledge of report writing and computer operations. The person will perform hydrologic analysis for various schemes required for the study and prepare the design hydrologic maps.

Key expert 6: Environmentalist/Resettlement Specialist (short term input)

- Qualifications and skills - shall possess University Degree in Environmental sciences or equivalent and be licensed by a recognized authority.
- General professional experience - shall have broad experience in Environmental Assessment, Resettlement and Social Assessment with a minimum of 10 years general experience.
- Specific professional experience
  - Shall have a minimum of 7 years' experience in the environmental assessments and the preparation of environmental impact assessments for small urban infrastructure projects in developing nations.
  - Shall have held similar position in at least one assignment of similar scope and nature.
  - Shall have previous experience in World Bank safeguard policies and safeguard instruments.
  - Previous experience on road or drainage projects in East Africa will be an added advantage.

The Environmentalist will be responsible for assisting in design and implement a Best Management Practices for minimizing environmental adverse impacts of current sanitation and drainage practices in Garowe and the need to improve environmental conditions and standards. The Environmentalist shall report to Project Manager / Urban Development Engineer and Drainage Engineer.

Key expert 7: Socio-Economist (short term input)

- Qualifications and skills - shall possess University Degree in economic studies or equivalent and be licensed by a recognized authority.
- General professional experience - shall have broad experience in social economic analysis with a minimum of 10 years general experience.
- Specific professional experience
  - Shall have a minimum of 7 years' experience in the social economic assessment for small urban infrastructure projects in developing nations.
  - Shall have held similar position in at least one assignment of similar scope and nature.
  - Previous experience on road or drainage projects in East Africa will be an added advantage.

The socio-economist shall carry out a cost /benefit analysis of the Drainage infrastructure using multi-criteria analysis in relation to the proposed new development drainage network. The person will consider the costs, including risks and benefits now, and whether, in view of the growth of Garowe City they will increase in the future (and if so, which are the greatest risks). Investment options (at least 3) are to be proposed, showing clearly risks and opportunities, costs and benefits of each, and include a time scale for implementation.

Key expert 8: CAD / Mapping GIS Operator (Full time)

- Qualifications and skills - shall have a degree and formal qualifications in graphical information system (GIS) databases and computer-aided design (CAD)
- General professional experience – at least 7 years' experience in development of GIS databases and CAD drafting.
- Specific professional experience
  - at least 5 years' demonstrated experience in the development of GIS databases and AutoCAD drawingsfor infrastructure project such as roads, drainage, water and sanitation systems during the planning and design process.
  - Shall have held similar position in at least one assignment of similar nature.

The CAD / Mapping GIS Operator will report to the Project Manager or Team leader / Urban Development Engineer and Drainage Engineer and will be responsible for establishing the GIS and CAD bases for the project and production and quality control of the project design drawings.

5.1 Estimated Staff Inputs for Key Staff

	Position	Input in Months
1.	Project Manager or Team leader /Urban Development Engineer	6
2.	Drainage Engineer	6
3.	Roads Engineer	2
4.	Geotechnical / Materials Engineer	2
5.	Hydrologist	1
6.	Environmentalist/Resettlement Specialist	3
7.	Socio-Economist	1
8.	CAD / Mapping GIS Operator	6
9.	Total staff input, staff-months	27

6 Commencement of Services and Work Schedule

The Consultant shall commence the study when instructed to do so in accordance with the terms of the consultancy contract.The period of this study is estimated to be 7months and is expected to start in July/August 2020.

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

7 Payment Schedule

The contract will be a lump sum contract and payments will be in tranches as follows:

No.	Deliverables	% Payment
1	Submission and approval of Inception Report	20%
2	Submission and approval of Feasibility studies report	30%
3	Submission and approval of Preliminary Engineering Design report	20%
4	Submission and approval of Detail engineering design and O&M Plan	20%
5	Submission and approval of Final Design report for the drainage and bidding document with cost estimates and O&M Plan.	10%

8 Equipment, Logistics and Facilities for the Consultants

The Consultant shall include in their financial proposal equipment, logistical requirements and facilities related to the project such as drivers, fuel and maintenance, necessary transport and/or allowances for site staff, security arrangements, telephones, clerical staff and translators, etc.

Any items financed by the Project and procured under the Consultant's contract shall revert to the Client at the end of the assignment.

9 Services and Data to be Provided by the Client

The following services and facilities will be provided by the Client without cost to the Consultant.

a) Data: The Client will provide the Consultant with access to all available data, information, maps, drawings and internal documents relevant to the consulting services. Specifically, the Client will provide the Feasibility Study for Urban Roads in Garowe (November 2016). All reference material will be provided to the Consultant and shall be returned at the completion of the assignment or earlier, as may be requested.
b) Access: The Client will arrange for access by the Consultant to the Government offices in connection with performing its duties.
c) Security: The Client will continuously monitor the security situations and advise the Consultant as to any issues which might require their special attention and possible alternative working modalities.
d) Operational Resources: Consultant will meet all operational costs associated with the assignment.
e) Any other requirement that may be identified and agreed with the Client during contract award negotiations.

10 Reporting Arrangement

The Consultants will report to the SURP PIU Coordinator at Garowe Municipality on the day to day performance of their duties. The PIU Coordinator, having satisfied himself that a report has met requirements of the TOR, will approve the report and any payments due to the Consultant.