Republic of Malawi **Blantyre Water Board** **Blantyre City Council**

MALAWI WATER AND SANITATION PROJECT-1 (MWSP-1)

Terms of Reference: Consultancy Services for the Engineering Assessment of the Sewerage System, Preliminary and Detailed Design and Construction Supervision of Priority Sewerage Investments in Blantyre City

PROCUREMENT REFERENCE: MW-BWB-333134-CS-QCBS

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1 Introduction

1.1 Background

The Government of Malawi (GoM) is committed to providing adequate, reliable and sustainable water and sanitation services to the urban, peri-urban, towns and rural population of Malawi to meet the ever-increasing demand for safe water for domestic, institutional, industrial, commercial and agricultural use. One focus area is Blantyre City, which currently faces a number of challenges related to water supply and sanitation services delivery. Some of the challenges include; high population growth, dwindling water resources, climate change, lagging infrastructure development and aging water and sanitation systems with high levels of non-revenue water creating large gaps between supply and demand, leading to unreliable services. The current water and sanitation situation in the city is alarming, which calls for comprehensive measures that will bring about sustainable and reliable improved services.

GoM through Blantyre Water Board (BWB) and Blantyre City Council (BCC) with financial support from the International Development Agency (IDA) of the World Bank intends to implement the Malawi Water and Sanitation Project-1 (MWSP-1). The MWSP-1 seeks to address the immediate and medium-term water and sanitation needs and support a long-term solution to Blantyre City's growing demand for improved water services and safely managed sanitation services. The project aligns with Malawi's development goals as well as strategic plans for the BWB and BCC The project is consistent with the Government's priorities, as it directly aligns with Malawi's commitment to improving urbanization as stipulated in the Malawi 2063.

1.1.1 Project Development Objective and Components for the Malawi Water and Sanitation Project-1 (MWSP-1)

The project development objective (PDO) is to increase access to improved water supply and sanitation services in Blantyre metropolitan area and to enhance the operational and financial efficiency of the Blantyre Water Board. The PDO will be achieved through expansion and rehabilitation of water and sanitation infrastructure for Blantyre City and surrounding areas to ensure adequate and reliable potable water supply with adequate pressure and safely managed improved sanitation services. The project focuses on four components that contribute to the achievement of the PDO.

Component 1: Water supply improvements
Under this component, the project will finance investments to improve water production, stabilize and improve network operational efficiency, reduce water losses, increase energy efficiency, improve water supply service quality, and expand water access to unserved areas, increasing energy efficiency, and boosting water access.

Component 2: Priority sanitation investments

This component involves several interventions to increase access to improved sanitation services and reduce environmental pollution that has public health impacts.

Key interventions under this component include:

i. The rehabilitation and upgrade of 50km of sewer network and connections and treatment works in the priority sewerage catchments, including interceptors to collect leaking sewers into river streams and reduce environmental pollution and methane capture to reduce emissions from the Wastewater Treatment Plant (WWTP).
ii. Technical assistance, equipment and tools to improve solid waste sorting and collection at the source with business development support and integration of private sector and waste pickers, and the construction of a new solid waste recycling plant and landfill in Chigumula with the aim of maximizing waste re-use and minimize emissions from uncontrolled solid waste dumping.
iii. Construction and upgrade of public sanitation facilities for ten schools, five health centers, and five markets to reduce the incidence of open defecation in public places. Public toilet facilities will be enhanced with accessibility features for persons with disability and Menstrual Hygiene Management (MHM) facilities and training to increase girls' retention in schools and support female entrepreneurs in markets. Public toilets in markets will be managed through public-private-partnership contracts with local entrepreneurs to enhance the operations and maintenance (O&M) and support job creation. The project will also finance TA for engineering designs and supervision of sanitation investments, sanitation tariff assessment, and preparation and implementation support for safeguards instruments.

Component 3: Institutional capacity strengthening

This component will finance a set of institutional development activities aimed at enhancing BWB's financial efficiency and governance systems, improving BCC's capacity to manage sanitation services and supporting the water sector investment planning and policy development to enhance the sustainability of urban water services.

Further to Blantyre City Council's project activities will be financing of the development and updating of policies, by-laws, and key guiding institutional documents/plans trainings, equipment; capacity development in sewerage and solid waste management and stakeholder engagement activities.

Under the sector ministry financing, the project will finance a set of policy and planning instruments, including the feasibility assessments and engineering design of priority infrastructure investments for selected Boards, training, and equipment to enhance the sector coordination and technical support to the water boards. The project will also support the development of a sector regulatory function and the establishment of a ring-fenced water tariff framework.

Further, the project will support stakeholder engagements through the sanitation task force to facilitate the sewerage transfer dialogue and ensure the financial sustainability of sewerage services. The project will also support awareness raising and training to improve water resource management and the integration of data monitoring and early warning systems of climate risks such as droughts and floods.

Component 4: Technical Assistance and Project Management Support

This component will finance TA activities designed to support the project implementing unit and the incremental operating costs for project management, including safeguards, communications, and project monitoring and evaluation. The project will also finance relevant training to enhance financial management, procurement, and safeguards capacity for the implementing entities.

1.2 Situational Analysis

Blantyre is the main commercial city of Malawi and according to the 2018 population census, the City of Blantyre had a total population of 853,500 people, with an average growth rate of 2.8% per annum. In addition to serving this population, Blantyre City Council (BCC) provides sanitation services to some areas outside the city boundaries with an estimated population of 547,500. The Local Government Act of 1998, as amended in 2010, and the National Decentralisation Policy of 1998, mandates Blantyre City Council to govern and manage the City of Blantyre. The Local Government Act stipulates a number of services which councils are supposed to provide to their residents and among them is the provision of off-site sanitation services. With regards to general sanitation service provision in Blantyre City, the sewerage infrastructure serves only 16% of the households in the City while 59% and 25% of the households use pit latrines and septic tanks respectively. The sewerage infrastructure, the city has five designated sites (Soche, Blantyre, Limbe, Chirimba and Maone) for treating wastewater. Figure 1 shows the locations of the five WWTPs.

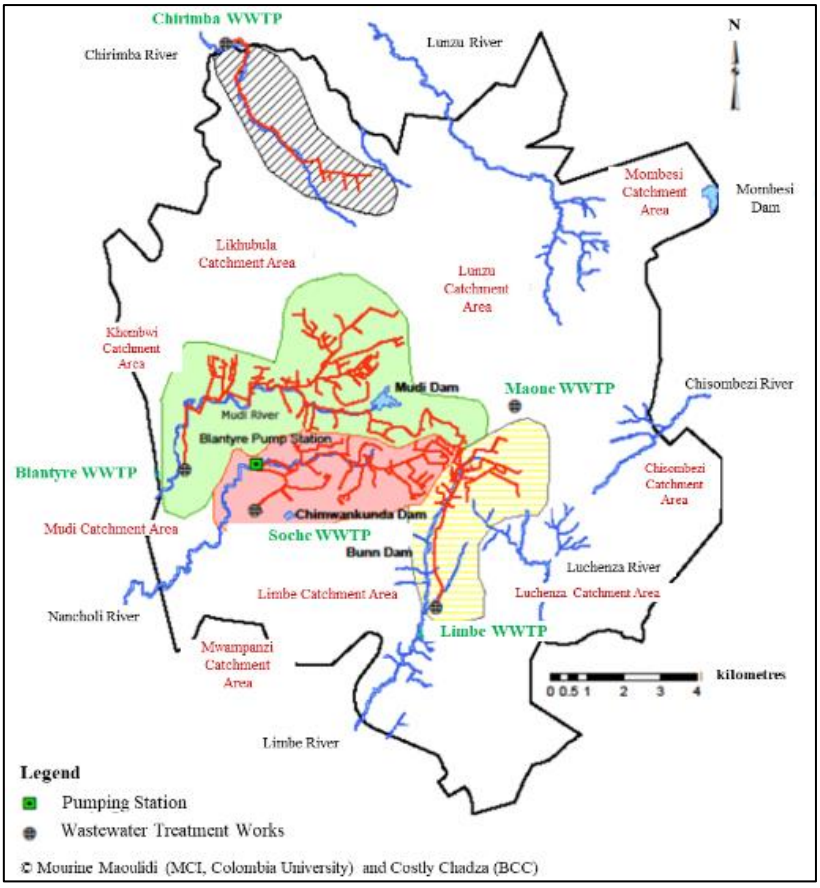

Figure 1: Blantyre Sewer Catchment Areas and Wastewater Treatment Works

The provision of sewerage services by BCC dates back to 1958 when the city saw the commissioning of Soche Wastewater Treatment Plant. Over the years BCC has undergone major sewerage infrastructural developments which, occurred in 1960s, 1970s, and 1990s when Blantyre(Manase), Limbe(Chigumula), Maone and Chirimba Wastewater Treatment Plants got commissioned. The major developments on sewerage infrastructure were in response to the growth of the City of Blantyre and the surrounding areas. Since the 1990s there has been limited or no major investment in sewerage including on O&M. Despite the City growing in terms of sewerage infrastructure, it is only three of the plants, out of the five, that are not only partially functional but are also overloaded.

1.2.1 Performance of the Existing Sewerage Systems

Documented data indicates that the design values for Soche, Blantyre, Chirimba, Maone and Limbe WWTPs are 4,100m^3/day, 14,325 m^3/day, 534 m^3/day, 60 m^3/day and 4,875 m^3/day respectively. However, the 1995 data indicates that Soche, Blantyre and Limbe WWTPs were receiving 6,240 m^3/day, 7,950 m^3/day and 2,850 m^3/day respectively which is well above their design loads. It could be expected that the current wastewater flows for these WWTPs should be higher due to increased population and water consumption. Unfortunately, due to persistent sewer line blockage and vandalism, the current wastewater flows for Soche, Blantyre and Limbe WWTPs are observed to be 5,465 m^3/day, 5,740 m^3/day, and 1,350 m^3/day respectively.

Despite the current flows being lower than the previously recorded data, it is worth noting that the WWTPs that are currently receiving wastewater are producing effluent not meeting the Malawi Standards (MS) effluent discharge limits mainly due to aged and broken down components and equipment that require urgent rehabilitation and expansion. For instance, recorded BOD_5^{20} effluent values for Soche, Blantyre and Limbe indicate discharge values of 130 mg/L, 382 mg/L and 86 mg/L, respectively against MS discharge value of 20 mg/L.

The five WWTPs are served by separate trunk sewers of Mudi (Blantyre WWTW), Limbe (Limbe WWTW), Naperi (Soche WWTW), Nasolo (Blantyre WWTW) and Chirimba (Chirimba WWTW) that have a cumulative trunk sewer network of not less 122.991 km. Table 1 shows the specific trunk sewer network distribution by pipe diameter.

Table 1: Sewer Network Distribution by Pipe Diameter

Pipe Diameter (mm)	Mudi Trunk Sewer (m)	Limbe Trunk Sewer(m)	Naperi Trunk Sewer(m)	Chirimba Trunk Sewer(m)
150	20,311	8,806	11,335	173
200	26,431	9,142	12,610	-
225	-	-	-	984
250	6,011	170	633	-
300	3,594	-	-	1,977
350	944	700	-	-
375	-	-	5,770	2,471
400	-	1,463	-	221
450	-	1,696	-	1,100
500	220	-	-	-
425	-	-	-	147
600	5,903	-	-	178
TOTAL	63,414	21,977	30,348	7,251

It is worth noting that the trunk sewers of Mudi, Limbe, Naperi, Nasolo serve both industries and domestic customers while that of Chirimba only serves Chirimba Industrial Area. However, due to increased numbers of dwelling units within Chirimba, Chatha and Kameza townships there is growing pressure of connecting these townships to Chirimba Trunk Sewer.

Based on sanitation service provision percentages, as indicated above, it is clear that the majority of the city residents use on-site sanitation systems (84%) which when full require emptying, probably due to scarcity of land in the city. The provision of emptying services to onsite sanitation systems by mainly private pit emptiers, has resulted in huge volumes (500 m^3/month) of faecal sludge being disposed of at the current wastewater treatment plants whose designs were not meant to handle pit latrine septage and septic tank sludge.

The overloading of the sewerage system, the high usage of on-site sanitation facilities, and increased generation of solid waste, coupled with uncontrolled waste disposal from malfunctioning wastewater treatment plants, broken sewer lines, indiscriminate disposal of solid waste and unprotected river banks has resulted in heavy pollution of almost all the rivers and streams in the city. The heavy pollution of rivers and streams has led to odour production from decomposed waste and stagnant water, breeding of mosquitoes and other disease vectors, loss of aquatic life and recreation activities and poor general outlook of the City. This is a substantial loss that needs to be reversed for sustainable economic growth of the City.

1.2.2 Existing Sewerage Assessments and Works

Over the years BCC has been doing some rehabilitation works on the sewerage infrastructure. In 2015, BCC secured funds from Environmental Affairs Department to rehabilitate a 1.5 km stretch of Mudi Trunk Sewer. BCC also secured funding in the same year of 2015 from Bill and Melinda Gates Foundation and DFID whose main usage has been on not only rehabilitation of some components of the treatment and assessments of existing wastewater treatment works but also construction of new decentralized faecal sludge treatment plants within Chirimba and Limbe wastewater treatment works.

BCC engaged a consultant in 2017 who assessed the existing situation of the five wastewater treatment plants found in Blantyre. The assessments identified a number of WWTPs' components that require rehabilitation and/or construction in order to improve the maintenance and operational efficiency of the wastewater treatment plants. Unfortunately, the recommendations from the assessment were not implemented due to a number of reasons including funding. Due to the time lapse, there is need for a consultant to review and update the findings of the assessments. The 2017 study only focused on the treatment plants and not the sewer lines. In order for the Council to have a comprehensive understanding of the entire sewerage infrastructure and priority works, there is also need for the consultant to assess and update the existing sewage works and networks, conduct design review, prepare preliminary and detailed designs of both the existing sewage works and networks and new sewer network for the following sites: Kameza, Chirimba and Chatha townships and Maone Industrial Area and supervise the construction of priority sanitation investments.

2 Objectives

2.1 Overall Objective of the Assignment

The overall objective of this consultancy is to assess and conceptualize the Blantyre Sewerage system upgrades to improve the operational and climate efficiency, and reduce environmental pollution, prepare preliminary and detailed engineering designs and bidding documents of the existing sewerage system, localized drainage system where it interacts with the sewerage network and proposed expansions.

2.2 Specific Objectives of the Assignment

The specific objectives of the assignment include the following key tasks:

(i) Assessment and proposed upgrades to improve the operational performance and resilience, and reduce environmental pollution from the existing five wastewater treatment plants (WWTPs) and associated sewer networks for Blantyre City.
(ii) Preparation of preliminary and detailed engineering designs, drawings and specifications for the rehabilitation and expansion of the priority WWTPs and sewer networks, connections upgrade and construction of new connections;
(iii) Preparation of bidding document for the priority sewerage investments; and
(iv) construction supervision of all priority sewerage investments.
(v) Ensuring compliance with and Environmental and Social risk management requirements

3 Scope of the Assignment

The assignment shall be conducted in three phases: Phase 1–assessments and updates, design review, preliminary and detailed engineering design and bidding documentation; Phase 2–construction supervision and Phase 3-defects liability period.

Phase 1 shall be undertaken on a lump-sum contract with a duration of Ten (10) months. The consultant shall take full responsibility of the designs and shall make any necessary reviews/changes for the required design during construction. **Phase 2** shall be a time-based contract and will subject to satisfactory performance of which the criteria shall include (i) quality of deliverables (ii) timely submission of deliverables, (iii) compliance with contractual obligations including deployment of agreed staff and (iv) responsiveness of the consultant and shall be undertaken on a time-based contract with a duration of 24 months. This Phase of the contract shall come into effect after completion of phase 1 and upon Client's notice to the consultant instructing commencement of Phase 2 services. Both phases will be procured together – i.e., the consultant is required to quote for both phases.

3.1 Detailed Description of Tasks

3.1.1 Phase 1 – Engineering Assessment, Preliminary and Detailed Engineering Design and Bidding documentation.

3.1.1.1 Engineering Assessment

Specific activities to be undertaken under this task shall include, but not necessarily limited to the following:

a. Preliminary Assessment and compilation of existing documentation and assessments.

Obtain, review and analyse all relevant documents (see annex 1), including previous plans and reports. The collected data shall include the extent of the existing sewerage

and drainage systems, GIS maps at appropriate scales, hydrological, hydrogeological, geotechnical, topographical, land use and other data relevant to the completion of characterization of the sewerage and drainage infrastructure plans etc. This analysis should involve a collection and analysis of satellite imagery and aerial photographs amongst other data sources and will involve ground truthing and field verification, field monitoring of the current operation (flows in a few key points, rainfall, levels etc.). Conduct preliminary site investigations (including geotechnical investigations) of the selected sewer upgrade and expansion areas, as well as CCTV inspections of sewers up to 20km for critical network sections.

b. Growth and demand forecast.

Review demographic, land use, socioeconomic profile of Blantyre City (including demographic trends, housing types and densities, population growth patterns and spatial trends) to determine the demand projections and trends for off-site sanitation services. Identify key industries and institutions significant to the economic development of the city and locate them on the maps with consideration to special requirements for the provision of sewerage sanitation services. The assessment of industries/institutions will further categorize them as either those with or without trade effluent pre-treatment plants and make recommendations that will include means for measuring wastewater volumes, and pre-treatment of trade effluent.

c. Assessing the performance of the existing systems.

Sewerage network: Assess and update the existing five main sewage networks and survey the whole 123 km of the sewer network to update the GIS including detailing, department of surveys sheet reference number, road name, manhole number, line reference number, length between manholes, pipe diameters, gradients, capacities, velocities, pipe material, inlet and outlet invert levels of manholes, surface levels of manholes, depth from cover to invert at each manhole, calculated design flow and connections. Assess the condition and performance of the existing sewerage system (primary, secondary and tertiary), including hydraulic characteristics and capacity, structural and physical condition, efficiency of pumping stations, coverage and key network bottlenecks leading to frequent blockages, bursts and leakages, as well as associated drainage canals affecting or being affected by the existing sewers. In order to identify and design areas that require rehabilitation/upgrading/expansion, the Consultant shall number both existing and new manholes, detailing pipe length and their corresponding diameters. The Consultant shall also provide details on number, length, sizes and locations of the connecting lateral line, and number of households connected to both public and private lateral sewer lines; and water supply meter numbers

Wastewater Treatment plants: Review the existing WWTPs assessments and assess the condition and performance of the wastewater treatment plants. This will entail physical condition and functionality assessment of structural components and equipment, leading to identification of processes structures, components and equipment requiring

rehabilitation, upgrade and/or modifications to improve treatment efficiency and capacity of the treatment works to handle projected volumes of wastewater and faecal sludge. Identify the main polluted streams requiring river restoration from sewage pollution.

d. Identification of pollution hot spots.

Assess the key environmental and physical features, including classification and demarcation of sewer catchment areas. This should include the specific identification of pollution hot spots (type and locations), requiring restoration.

e. Updating and Preparation of GIS based detailed sewer ledger/network database.

Prepare and develop an up-to-date GIS based detailed sewer ledger for both existing and new sewer networks, that indicates pipe sizes, manhole locations and sizes, pipe length, plot/property numbers and names of property owners and associated drawings

f. Sewage Works and Sewer Network Survey

Conduct all necessary engineering and topographic surveys for rehabilitation and/or construction of all the wastewater treatment works and networks, site specific staff houses and offices, existing and new sewer installation works.

Conduct necessary surveys and any additional investigations required for defining a set of priority interventions on existing wastewater treatment works and sewerage network upgrade and expansion interventions, including new areas of Chatha, Kameza, and Chirimba townships and Maone Industrial Area and safe disposal and re-use of treatment by-products. This shall include:

(i) detailed household surveys of the proposed catchments and expansion areas – to understand existing sewerage sanitation practices; ascertain demand and willingness to pay for both sewerage tariff and connections to the proposed sewerage network;

(ii) topographic survey of each area in sufficient detail to provide all information required including catchment hydrological data for conceptual and detailed design of sewerage and drainage systems.

g. Preliminary Design

(i) Develop a framework and a methodology for prioritization of immediate and future sewerage improvement projects, based on multiple factors – to be discussed and agreed with BCC and BWB; and using this framework, identify priority investments in adequate detail, in terms of scope of work and feasibility; estimate the cost of the identified projects based on preliminary engineering design; and conduct economic and financial analysis of the identified priority projects.

(ii) Recommend the most feasible set of sub-projects and alternatives to sewerage and drainage improvements in the Blantyre City. Develop an

implementation plan for the sewerage investments by stages, with short and medium-term actions, and provide costs corresponding to each element and stage;

(iii) Asses the feasibility of the proposed sewerage upgrade and expansion investments to enhance service coverage and quality, reduce environmental pollution and greenhouse gas emissions. The feasibility assessments shall cover technical, environmental and social and economic feasibility.

h. Propose institutional development interventions to enhance O&M

The purpose of this task is to enhance sewerage service delivery, activities will include:

(i) Carrying out capacity and skills gap analysis and identification of training and capacity development needs, logistical, tools and equipment needs

(ii) Assessing the performance of existing institutional arrangements for sewerage infrastructure management, and identify key issues and constraints.

(iii) Mapping the key stakeholders involved in off-site sanitation services delivery in Blantyre and conduct consultations with all stakeholders to validate findings of the institutional assessment

(iv) Proposing the organizational structure for planning, operation and maintenance of sewerage systems, customer services and recommend the required reform actions. These should include the transitional roadmap for sewerage services transfer in accordance with the Water Works Act.

3.1.1.2 Detailed Engineering Design

(i) Prepare detailed ultimate design flows for all five WWTPs and associated sewer networks detailing dry weather flows to each WWTPs indicating cumulative contributions from different housing types (low, medium and high densities, industrial (light and heavy), civic, commercial and infiltration etc.)

(ii) Prepare detailed designs of all upgrades, remedial and replacement works necessary to both restore and improve the degree of service to required levels and rectify sections of defective WWTPs and sewers which due to structural collapse or inadequate to meet the ultimate design flows, or other reasons are currently discharging untreated sewage into the environment.

(iii) Prepare detailed designs of pipe bridges which are damaged, require replacement or in a serious state of disrepair, these being critical to the satisfactory operation of the sewerage system

(iv) Prepare detailed structural designs for all the sewers that will be laid in trenches detailing suitable minimum base width, pipe bedding, and trench backfilling and reinstatement in accordance the proposed surface usage and loading

(v) Prepare detailed designs and technical specifications of chosen construction materials (sewers, manholes, manholes cover, pipe bedding, concrete, and reinforcement etc. indicating proven record for durability

(vi) Prepare detailed designs for permanent monitoring of sewer line to allow problems to be identified immediately

(vii) Prepare detailed designs for the modifications and improvements of Naperi pumping station and all the five sewage works for all the proposed works that are aimed at maximising the potential of each works and where practicable, improve the quality of effluent to the standard whereby it can be used for unrestricted irrigation

(viii) Prepare detailed designs of all the proposed works aimed at improving the capability of the existing sewage works to accept and treat septage from the growing number of septic tanks, as well as the contents of the pumpable pit latrines

(ix) Prepare detailed designs of the proposed new sewer network for the townships of Kameza, Chirimba and Chatha and Maone Industrial Area which is anticipated to serve not less than 1,000 new connections including construction drawings, technical specifications, bill of quantities, and engineer's cost estimates for the same

(x) Prepare detailed designs for the mechanical, electrical and civil refurbishments and extensions, which are necessary to achieve the proposed process improvements

(xi) Prepare detailed designs for the improvement and upgrading of site offices, laboratory, storerooms and staff houses

(xii) Design the WWTPs upgrades to enable gas capture and re-use system which will take into consideration the following, among others:

a. Site-specific sewage works gas risk assessments.
b. Sewage works gas management and monitoring systems.
c. Biogas harvest for use at the facility.
d. Eliminate greenhouse gas emissions

(xiii) Prepare detailed designs (civil/structural and electro-mechanical), including construction drawings, technical specifications, bill of quantities, and engineer's cost estimates for the priority sewerage system upgrades, and expansion including drainage system and river restoration works where the two interact and WWTPs including site specific staff houses and offices.

(xiv) Devise and design and prepare cost estimates for mechanisms for reducing greenhouse gas emissions such as biogas harvesting and reuse and/or energy generation;

3.1.1.3 Bidding documentAssistance

(i) Advise on procurement packaging of the sewerage network expansion/rehabilitation and WWTPs rehabilitation and upgrading works

(ii) Prepare detailed bidding documents in accordance with World Bank Procurement Regulations, including standard World Bank bidding documents/ request for bids, prepared construction drawings, bills of quantities, specifications and works requirements, and implementation plan for the priority sanitation and drainage works.

(iii) The consultant shall prepare tender invitation notices and assist the Client with the invitation of bids, assist during pre-tender meetings and site visits, assist the client provide clarifications or responses to bid queries during the bid period, all in accordance with the Bank's procurement rules of procedures.

(iv) Similarly, and in accordance with the same rules of procedure, the consultant shall assist the client with evaluation of bids. Thereafter, the consultant will assist with preparation of contract, contract negotiations and award.

3.1.2 Phase 2- Construction Supervision

In close collaboration with BWB's Project Implementation Unit (PIU), the consultant shall supervise the works execution on a day-to-day basis in accordance with the signed works contracts. The consultant shall make sure, amongst others, that

(i) The works are carried out in accordance with the Conditions of Contract for Construction;

(ii) The quality of materials and workmanship conforms with the specification of the construction contract; and

(iii) Construction plant and personnel provided and used by the contractors are adequate to construct the works and in line with contract provisions.

(iv) works are delivered on time and with the required quality.

Specific tasks shall include, but not necessarily limited to the following:

3.1.2.1 Contract Administration

(i) Assist the Client in all aspects of contract administration and management of the construction works for the priority sanitation investments;

(ii) Prepare contract management manual which shall set out an organization chart, full contact details for each organization involved in the execution of the works, together with detailed procedures for the issuance of correspondences, information request, shop drawings, engineers instruction, variation orders management, contract sum adjustments, extension of time, standard monthly reporting by the contractor, minutes of monthly meetings, site inspection, standard forms to be used and project filing system;

(iii) Examining the contractor's detailed work program and guiding the contractors in preparation of a supervision schedule/work plan for each package;

(iv) Review and recommend approval of Contractor ESMP

(v) Supervising implementation of ES instruments

(vi) Prepare detailed site reports, certified by the Site Engineer, during the continuation of the Contract. The reports shall include on site/off site activities, weather conditions, ground and traffic conditions, number of staff on site, records of visitors to the site, construction materials delivered, plants or equipment used or idling at site, daily works recording, quality inspections, encumbrances causing delays, photographic and video recording of important activities at site etc;

(vii) Maintain daily site diaries, and daily reports to verify contractor's daily records of labour, plant and equipment, weather conditions, progress, instructions and delays;

(viii) Maintain a photographic record of the progress of the work;

(ix) Issue field instructions in writing as required and ensuring that the construction drawings are revised to suit actual site conditions encountered and to minimizing disruption to the progress of the works;

(x) Organize and chair site meetings. As soon as practical after the meeting, prepare and distribute minutes for agreement and signing.

(xi) Report to the Client regularly on progress and advise the Client of any potential problem areas likely to affect progress and propose solutions to avert the problem.

(xii) Evaluate and comment on the Contractor's Site personal experience and qualifications and recommend to Employer to justify approval or rejection by the Employer.

(xiii) Preparation of Variation Orders and Extensions of times, estimation of the cost of the variations and extensions of times, negotiation of prices with the Contractor, and issuing of the Variation Orders and Extensions of times, after obtaining approval of the Employer as required by the Condition of Construction Contract.

(xiv) Negotiate with the Contractor the prices of new works and new items revealed required during the construction period and not included in the original Tender, after obtaining approval of the Employer and as required by the Condition of Construction Contract.

(xv) Issuing of written Orders to perform work, which will be paid from provisional Sums, after the Employer's written approval.

(xvi) Issuing Day work Orders subject to the limitations on such orders contained in the Contract Documents.
(xvii) Evaluation and documentation of claims, submitted by the Contractor.
(xviii) Services with regard to disputes in accordance with the General Conditions of the Construction Contract Documents including assisting the Employer in dealing with the settlement of all disputes and differences that may arise between the Employer and the Contractor.
(xix) Prepare a snag list for the uncompleted works.
(xx) Examine and recommend to the Employer the acceptance or the rejection of any part of the permanent Works.
(xxi) Monitoring the Contractor's work in access roads, quarries, borrow areas and disposal areas and supervise their reinstatement.
(xxii) Issuing the Taking-Over Certificate on satisfactory completion of all tests and take-over of the works by the Employer.

3.1.2.2 **Quality assurance**

(i) Establish a quality assurance system, including verification of source material, specifications and quality, and certification;
(ii) Carry out necessary quality control activities and certifying that the quality of works and materials conforms to the specifications;
(iii) Examine and approve the contractors' proposed changes to design (if any) and drawings for compliance with the specifications.
(iv) Assist the Client with factory tests/pre-shipment inspection for major equipment as required;
(v) Examining the construction methods proposed by the contractor including environmental, safety, personnel and public issues. The consultant must ensure that the construction methods as proposed by the contractor for carrying out the works comply with the World Bank’s environmental and social framework and guidelines.
(vi) Check survey points for the works and main setting out done by the contractor and ensuring that any errors found are promptly notified to the contractor and necessary remedial action is taken.
(vii) Undertake site supervision of construction, installation, testing and commissioning;
(viii) Undertaking resident supervision of the works by a qualified Resident Engineer in the respective discipline with sufficient experience who shall perform his duties with due diligence, efficiency and in accordance with the best engineering profession and consulting standards;
(ix) Direct locations or times for field testing in accordance with the specification and witness all such tests that will be performed by the Contractor in the laboratory to be established by the Contractor. Ensure all tests are conducted in accordance with the approved standards.

(x) From time to time, if deemed necessary, carry out independent tests using the Consultant's personnel and the Contractor's laboratory and equipment;
(xi) Check that testing equipment conforms to and is operated in accordance with relevant standard and that calibration certificates, where applicable, are current.

3.1.2.3 **Schedule and Cost Management**

(i) Monitor the progress of the contract and prepare monthly progress reports on both schedule and cost performance of the contracts using Earned Value Techniques or other tools as appropriate. Flag any issues to the Client in a timely manner, and recommend actions to be taken;
(ii) Assess and incorporate confidential delay contingencies, should delays become unavoidable and advise the Client regarding the target practical completion dates for the Project components;
(iii) Undertake cost management for the Client. The Consultant shall follow several bases in monitoring the cost such as details of breakdown of work items as in the Contract, variation and escalation contingencies within the budget, status of sub-packages, anticipated variations, running forecast cost at completion for each item;
(iv) Monitor the Contract costs relative to the Contract budget and programmed expenditure considering actual quantities and update quantity estimates, costs of variation orders, costs of potential claims and any other costs.
(v) Review and effect any design changes during construction.
(vi) Prepare actual and forecast monthly/yearly cash flows to assist the Client's cash flow management for the works;
(vii) Check contractor's invoice and issue progress payment certificates;
(viii) Check and make recommendation for any variation orders if required;
(ix) Check and recommend any extension of time required to be given to the contractor;
(x) Recommend substantial completion certificate to the contractor for the contract;
(xi) Recommend final acceptance certificate for the contractor after expiration of defect liability period;

3.1.2.4 **As-Built Drawings and O&M Manuals**

(i) Ensure that the contractors prepare as-built drawings, and maintain, at the site, a complete set of the same for the contract as the work proceeds; The consultant shall be responsible for approval of the as-built drawings. On completion of the construction of each structure, the consultant shall assist the Client to transfer all recorded changes in the Clients' Database.
(ii) Ensure the contractors provides all manufacturers operation and maintenance manuals, instructions and technical details for the installations. In addition to this ensure the contractor prepares O&M manuals for the systems to an

acceptable standard. The consultant shall be responsible for approval of the manuals

3.1.2.5 **Environmental, Social, Health and Safety (ESHS) Monitoring**

The Consultant shall ensure that the Contractor's ESHS performance is in accordance with World Bank standards and guidelines and delivers the Contractor's ESHS obligations. The ESHS related services shall include but not limited to:

(i) Supervise environmental and social matters in accordance with the stipulation of the Environmental and Social safeguards instruments. Any additional and unexpected environmental and social incidences should be noted and necessary adjustments recommended and amended accordingly;

(ii) Review and approve the Contractor's Environment and Social Management Plan (C-ESMP), including all updates and revisions (not less than once every 6 months);

(iii) Ensure implementation of measures proposed in the Environmental and Social Management Plans (ESMPs) and Environmental, Social, Occupational Health and Safety (ESOHS) requirements including:

a) Ensure that the contractor has an adequate Contractor Environmental Social Management Plan (C-ESMP), that its schedule, budget and work plan integrates ESOHS requirements and review and approve the Contractor's Environment and Social Management Plan (C-ESMP), including all updates and revisions.

b) Monitor and supervise the implementation of the Contractor Environmental Social Management Plan (C-ESMP) to ensure that the Contractor is implementing the mitigation measures, attaining the monitoring indicators established in the site ESMP and to verify the Contractor's compliance with ESOHS requirements including its GBV/SEA obligations, with and without contractor and/or client relevant representatives, as necessary, but not less than once per month.

c) Undertake audits and inspections of Contractor's accident logs, grievance logs, monitoring findings and other ESOHS related documentation, as necessary, to confirm the Contractor's compliance with ESOHS requirements.

d) Undertake audits, supervisions and/or inspections of any sites where the Contractor is undertaking activities related to the Works, to verify the Contractor's compliance with ESOHS requirements including its GBV/SEA obligations, with and without contractor and/or client relevant representatives, as necessary, but not less than once per month

e) Ensure that the contractor complies with all national labour, Environment, Social, Occupational Health and Safety rules and requirements of the contract documents as per the local legal and regulatory requirements, and project requirements;

f) Ensure that all contractor's staff are properly equipped with personal protective equipment;
g) Ensure that the contractor carries sufficient training of their personnel to ensure a safe working environment;
h) Monitor the contractor's implementation of their traffic management plan to ensure safety of road users including pedestrians and non-motorized traffic during the works
i) Provide immediate notification to the Client should any incident in the following categories occur while carrying out the Services. Full details of such incidents shall be provided to the Client within the stipulated timeframe in the ESOHS:
    I. confirmed or likely violation of any law or international agreement;
    II. any fatality or serious (lost time) injury;
    III. significant adverse effects or damage to private property (e.g. vehicle accident); or
    IV. any allegation of gender-based violence (GBV), sexual exploitation or abuse (SEA), sexual harassment or sexual misbehavior, rape, sexual assault, child abuse or defilement, or other violations involving children,
j) Ensure that contractor immediate notifications on ESOHS aspects are shared with the Client immediately;
k) Immediately inform and share with the Client any notification related to ESOHS incidents provided to the Consultant by the Contractor, and as required of the Contractor as part of the Progress Reporting;
l) Share with the Client in a timely manner the Contractor's ESOHS metrics, as required of the Contractor as part of the Progress Reports.
m) Review and input, in a timely manner, the Contractor's ESOHS documentation (including regular reports and incident reports).
n) Verify that the contractor establishes and maintains a grievance redress mechanism including types of grievances to be recorded and how to protect confidentiality e.g. of those reporting allegations of GBV/SEA/SH ensuring any GBV/SEA/SH instances and complaints that come to the attention of the consultant are registered in the grievance redress mechanism.
o) Confirm compliance and remedial action/s and their timeframe for implementation in the event of a noncompliance with the Contractor's ESOHS obligations and ensure that any pending ESOHS non-compliances have been addressed and closed by the contractor.
p) Ensure appropriate representation at relevant meetings including site meetings, and progress meetings to discuss and agree appropriate actions to ensure compliance with ESOHS obligations.

(iv) Review and approve ESHS provisions of method statements, implementation plans, Gender-Based Violence/Sexual Exploitation and Abuse (GBV/SEA)

prevention and response action plan, drawings, proposals, schedules and all relevant Contractor's documents;

(v) Review and consider the ESHS risks and impacts of any design change proposals and advise if there are implications for compliance with ESIA, ESMP, consent/permits and other relevant project requirements;

(vi) Undertake audits, supervisions and/or inspections of any sites where the Contractor is undertaking activities related to the Works, to verify the Contractor's compliance with ESHS requirements including its GBV/SEA obligations, with and without contractor and/or client relevant representatives, as necessary, but not less than once per month;

(vii) Ensure operationalization of Grievance mechanism

(viii) Undertake audits and inspections of Contractor's accident logs, community liaison records, monitoring findings and other ESHS related documentation, as necessary, to confirm the Contractor's compliance with ESHS requirements;

(ix) Agree remedial action/s and their timeframe for implementation in the event of a noncompliance with the Contractor's ESHS obligations;

(x) Ensure appropriate representation at relevant meetings including site meetings, and progress meetings to discuss and agree appropriate actions to ensure compliance with ESHS obligations;

(xi) Check that the Contractor's actual reporting (content and timeliness) is in accordance with the Contractor's contractual obligations;

(xii) Ensure that all environmental and pollution control measures are implemented in accordance with the contract and are maintained for the duration of the works;

(xiii) Review and critique, in a timely manner, the Contractor's ESHS documentation (including regular reports and incident reports) regarding the accuracy and efficacy of the documentation;

(xiv) Undertake liaison, from time to time and as necessary, with project stakeholders to identify and discuss any actual or potential ESHS issues;

(xv) Supervise the Contractor's contractual obligation on HIV/AIDS, COVID-19 and Cholera prevention, as well as safety and health. Check that works are being carried out in a safe manner and report all breaches of safety requirement. Monitor the corrective action taken to ensure unsafe practice does not continue;

(xvi) ESS capacity assessment and building for contractor

3.1.2.6 **Progress Reporting**

The consultant shall prepare several reports to document progress of the works. These include, but not limited to the following:

(i) Comprehensive monthly report to the Client which shall among others include the current expected completion date, the current forecast and cost, achievements during the month, completion status against program, personnel deployed by both the Contractor and the Consultant, equipment on site and status, progress on procurement of key materials and equipment forming part of

the works, provision of other required services including power supply connection, safeguards monitoring and compliance, current expenditures against expected cash flow, an analysis of any cost changes or variations, planned work in the next reporting period, target progress achievement and cash flow requirements, report on any significant problem areas and the action being undertaken to resolve them. The reports shall include a summary program showing the status, together with the trend graphs of key activities and a photographic and video record of work on site. The reports shall incorporate individual reports prepared by others as required;

(ii) Comprehensive annual report covering the same subjects as the monthly reports, but in a comprehensive format related to technical and financial matters including consultant's work plan for the next twelve months;

(iii) Prepare a comprehensive final Project Completion Report (PCR) at the end of the assignment. This report must be submitted immediately after completion of contracts and shall summarize the methods of construction, construction supervision performed, lessons learnt, and recommendations for future projects of similar nature to be undertaken by the Employer. The report should also contain summary of all reports in terms of project implementation, targets versus achievements, lessons and experience gained in project implementation, problems encountered and resolved;

(iv) Other reports as required (such as ESHS reports, technical reports etc).

3.1.3 Phase 3 – Defects Liability

(i) Inspect the permanent Works during and on expiry of the defects liability period and inform the Contractor in writing about any repair, maintenance and/ or replacement required for the Works, and upon the Contractor's completion of the required repair, maintenance and/ or the replacement, proceed with the procedures of issuing the Defects Liability Certificate.

(ii) Issuing the Defects Liability Certificate.

(iii) Approval of the removal of Contractor's Equipment, Temporary Works and Materials.

4 Duration of the Assignment

4.1 Deliverables and Timeframes

The proposed duration for the Phase 1 of this assignment shall be a maximum of 10 months. Phase 2 of the consultancy services shall be 24 months construction supervision period while Phase 3 shall be of 12 months defects liability supervision period. The works for the various sites will run concurrently. Table 2 provides a summary of the expected deliverables and timeframe.

The Consultant shall draw up their own proposal for a work schedule, but shall make due allowance for time required by the Council/PIU to assess and approve documents submitted by

the Consultant, before subsequent project tasks can be commenced with. The following schedule is to be used as a guide:

Table 2 – Schedule of the Deliverables

Item No.	Deliverable	Due date
Phase 1: Assessments, Review, Update, Design and Tender Phase (10 Months)		
1	Inception Report	1 month after commencement
2	Engineering Assessment Report	4 Months after commencement
3	Preliminary Design Report for Priority Sewerage Works	6 Months after commencement
4	Draft Detailed Design Report and Bidding documents for Priority Sewerage Works	8 Months after commencement
5	Final Detailed Design Report and Bidding documents for Priority Sewerage Investments.	10months after commencement
Phase 2: Construction Supervision Phase, Site Handover (24 Months)		
6	Supervision and contract management manual	2 weeks after commencement of phase 2
7	Monthly Supervision Reports	Every 5th day of the following month
8	Memorandums with proposed actions to be undertaken to address any issues arising during the implementation of the contract	As required
9	Certificates on quality of works	As required
10	Cash flow projections versus actual disbursements	As required
11	Memorandums on the contractor's Interim Certificates payments and claims	As required
12	ESHS Reports	Every 5th day of the following month
13	Operation and Maintenance Manuals	1 month after final acceptance
14	As-Built Drawings	1 month before practical completion
15	Final construction report (for each works package)	3 months after practical completion
Defects Liability Period (12 Months)		
16	Quarterly Inspection Reports	Every 4th Month after commencement of phase 3
17	Project Completion Report	3 months before the end of the Defects Liability Period

4.2 Format of Reports or Deliverables

4.2.1 Inception Report

The Consultant shall prepare an Inception Report one [1] month after commencement date. This report shall be prepared and submitted in five [5] hard and one [1] electronic copies to the Employer and shall include at least the following:

(i) The Engineer's state of mobilization
(ii) Any changes to the composition of the Engineer's team

(iii) Proposed methodology for carrying out the services, including quality, cost control, and ensuring compliance with environmental, H&S, PHPSA Plan and other requirements
(iv) Proposed site communication procedures and recordkeeping
(v) Detailed program of works, showing time, duration and personnel, as well as inter-relationship between activities
(vi) Risk register that will be updated in the subsequent monthly progress report. The register should highlight what is required for the attention of the client and may affect the successful delivery of the assignment
(vii) Format of Monthly Progress Reports
(viii) Understanding of the ToR and scope of work, any proposals to improve the TORs, indication of adequacy or inadequacy of the ToR
(ix) Outputs implementation, costs and performance of the system,
(x) Preliminary findings from initial assessments (desk or documentation review and field)

4.2.2 Engineering Assessment Report

Prepare a feasibility report and presentation, setting out the consultants' view of the existing off-site sanitation and drainage situation and the key issues to be addressed to develop an effective approach for sanitation planning, challenges and constraints including an assessment of the magnitude of the impacts and their prioritization.

A presentation, summarizing the existing situation analysis findings, should also be prepared and should then be presented and discussed at a workshop attended by representatives of all stakeholder groups. The workshop and meetings with representatives of individual organizations and groups should be used to check information and obtain views on the key issues and the possible options for addressing them. Following the workshop, a final version of the 'Existing Sewerage and Drainage Situation Report' shall be prepared.

4.2.3 Data Organisation

Compile and organize all data and information collected in an accessible format to facilitate the analysis and a preliminary set of interventions for sewerage and drainage improvements and expansion, including

(i) a framework and a methodology for prioritization of sanitation improvement projects to improve access to services and restore polluted river streams, based on technical, socioeconomic and environmental feasibility, and climate resilience; and
(ii) using this framework, identify priority sewerage and drainage investments in adequate detail, in terms of scope of work and feasibility;
(iii) Assessing potential impacts associated with climate change – including effects of river level rise, storm surge and other potential impacts as relevant using different climate change modelling scenarios,
(iv) estimating the cost of the identified projects based on preliminary engineering assessments; and

(v) conducting economic and financial analysis of the identified priority projects.

4.2.4 Monthly Progress Reports

The Monthly Progress Reports to the Client during construction phase should include:

(i) Brief description of the Works;
(ii) Description of activities completed and in progress;
(iii) Progress compared with construction programme and estimated completion date including approved extension;
(iv) Financial report with payments to date compared to programme disbursements;
(v) Schedule and cost performance
(vi) Quality control;
(vii) Contractor's personnel and constructional plant;
(viii) Consultant personnel;
(ix) Weather conditions;
(x) Environmental, Health and Safety matters;
(xi) Labour matters and grievances;
(xii) Environmental management and pollution control;
(xiii) challenges, issues, risks, updated risk register, and level of effort expected from the consultant's team in the following month; and
(xiv) Photographic records.
(xv) Plant and equipment deployment
(xvi) progress on procurement,
(xvii) planned work or activities in the next reporting period

4.2.5 Environmental, Social, Health and Safety (ESHS) Reports

The Consultant shall provide immediate notification to the Client should any incident in the following categories occur while carrying out the Services. Full details of such incidents shall be provided to the Client within the timeframe agreed with the Client. Such reports may include issues such as confirmed or likely violation of any law or international agreement, non-compliance with ESMP; any fatality or serious (lost time) injury; (significant adverse effects or damage to private property (e.g. vehicle accident); or any allegation of GBV, SEA, sexual harassment or sexual misbehavior, rape, sexual assault, child abuse or defilement, or other violations involving children etc.

4.2.6 Contract Management Manual

Within Thirty [30] days of signing the contract, the Consultant shall prepare a Contract Management Manual which will lay out procedures to be followed during the execution of the works. The manual shall be set out an organization chart, full contact details for each organization involved in the execution of the works, together with detailed procedures for the issuance of correspondences, information request, shop drawings, engineer's instruction, variation orders management, contract sum adjustments, extension of time, standard monthly reporting by the contractor, minutes of monthly meeting, site inspection, standard forms to be used and project filing system. The Manual will also serve as a basis for on-the-job training of the Employer's Representative staff during the implementation of the works contract.

4.2.7 O&M manuals

Within one [1] month of practical completion, the Consultant shall prepare necessary and detailed institutional arrangements including manuals for operation, servicing and maintenance of the works.

4.2.8 Final Construction Report

The report shall cover all main aspects of the works, construction methods, design changes, actual conditions, quality control, problems encountered, as-built construction programme compared with original, disbursement schedule and other major aspects during construction of works. The Consultant shall submit five (5) hard copies and two [2] electronic copies of Final Construction Report to the Client within three [3] months of practical completion of each of the works packages.

4.2.9 Project Completion Report (PCR)

Prepare a comprehensive final Project Completion Report (PCR) at the end of the assignment. This report must be submitted immediately after completion of contracts and shall summarize the methods of construction, construction supervision performed, lessons learnt, and recommendations for future projects of similar nature to be under taken by the Employer. The report should also contain summary of all reports in terms of project implementation, targets versus achievements, lessons and experience gained in project implementation, problems encountered and resolved. The PCR shall cover the relevant information on the Project pertaining to the Consultant's observation and work carried out during Defects Liability Period. The Consultant shall submit five (5) hard copies and two [2] electronic copies of Project Completion Report to the Client within three [3] months before the end of Defects Liability Period and shall cover the relevant information on the Project pertaining to the Consultant's observation and work carried out carried out during Defects Liability Period.

5 Staffing Requirements

5.1 Key Professionals

The following are the minimum qualifications and time input for Consultant's key personnel required to carry out the services for Phase 1 and Phase 2:

Table 3: Estimated inputs of the Key professionals

No.	Expert	Minimum Number of Required Staff	Man-months
Phase 1: Assessments, Review, Update, Design and Tender Phase			
1	Team Leader	1	10
2	Sanitary/wastewater process Engineer	1	10
3	Hydraulic and stormwater Engineer	1	8
4	GIS Specialist/ Surveyor	1	8
5	Civil/structural Engineer	1	6
6	Electromechanical Engineer	1	6

7	Environmental, Health and Safety officer	1		6
8	Social Development Expert	1		6
Total				**60**
Phase 2 : Construction Supervision Phase, Site Handover and Defects Liability Period				
No	**Expert**	**Minimum Number of Required Staff**	**Supervision**	**Defects Liability**
8	Team Leader/Resident engineer	1	24	3
9	Assistant Resident engineer	2	48	1
10	Electrical Engineer	1	6	1
11	Mechanical Engineer	1	6	1
12	Inspectors (4No.)- (24 Man-Months each inspector)	4	96	0
13	Environmental, Health and Safety expert	1	24	0
14	Social development expert	1	24	0
Sub Total			**227**	**6**
Total				**231**

In addition to above listed positions of professionals, the Consultant shall consider other experts and support professionals with adequate qualifications and experience in relevant fields, and include in the technical and financial proposal. During technical evaluation process, these staff will not be evaluated individually. However, they will be considered collectively along with other support staff, if any, under "Organization and Staffing" criteria of evaluation.

5.2 Qualifications and Key Personnel Requirements

The key professionals for the consultant should have individual experience in related fields that shall include minimum two similar assignments carried out in a similar setting.

Table 4. Qualification and Experience of Key Professional Staffs

The following is the minimum qualification and number of Key Experts for phase II:

Phase 1: Feasibility, Design and Tender Phase				
	Designation	**Minimum Academic Qualification**	**General Experience**	**Specific Experience**
1	Team Leader	MSc (or higher) in Civil Engineering or Sanitary Engineering or its equivalent	15 years	At least 10 years of experience in the design of sewerage and drainage systems, analyzing institutional structures and systems related to sanitation. Required previous experience with sewerage and drainage design in Southern Africa region or related urban services. Practical experience as Team Leader for minimum of 2 similar assignments i.e. design of sewerage and drainage systems. Must be registered with a recognized Engineering Institution. Proficiency in listening and speaking of English. Demonstrable experience with FIDIC Conditions and projects funded by international financing institutions such as the World Bank
2	Sanitary/Wastewater Process Engineer	MSc (or higher) in Civil Engineering or Sanitary/Wastewater Process Engineering or its equivalent	10 years	At least 8 years experience of specific experience of design of sewerage and drainage systems, including wastewater treatment processes. Must be registered with a recognized Engineering Institution. Proficiency in listening and speaking of English. Demonstrable experience with

Phase 1: Feasibility, Design and Tender Phase				
	Designation	**Minimum Academic Qualification**	**General Experience**	**Specific Experience**
3	Hydraulic and stormwater Engineer	MSc (or higher) in hydraulic or Water Resources Engineering or its equivalent	10 years	FIDIC Conditions and projects funded by international financing institutions such as the World Bank At least 8 years of experience in urban drainage sector, including planning and conceptual design of drainage improvements, and hydraulic modeling. Specific experience and ability to carry out urban hydrological assessments, modelling and engineering design. At least 8 years' experience in construction, calibration and application of network models for designing water and wastewater networks. Must be registered with a recognized Engineering Institution. Proficiency in listening and speaking of English. Demonstrable experience with FIDIC Conditions and projects funded by international financing institutions such as the World Bank .
4	Civil/structural Engineer	MSc (or higher) in Structural Engineering or its equivalent	15 years	At least 10 years experience in the design of sewerage and drainage systems, analyzing institutional structures. Practical experience and ability to carry out structural mechanics, structural dynamics and structural failure analysis (static and dynamic) of reinforced concrete, composite structures, timber, masonry and structural steel designs. Must be registered with a recognized Engineering

Phase 1: Feasibility, Design and Tender Phase				
	Designation	**Minimum Academic Qualification**	**General Experience**	**Specific Experience**
				Institution. Proficiency in listening and speaking of English. Demonstrable experience with FIDIC Conditions and projects funded by international financing institutions such as the World Bank
5	Electromechanical Engineer	MSc in Elechtromechanical engineering	15 years	At least 10 years working experience in supervising the construction of pumping stations (including equipment, electrical installation, automation, instrumentation and control). Working experience in a similar position in at least 3 similar projects, in the past ten years. Proficiency in listening and speaking of English. Demonstrable experience with FIDIC Conditions and projects funded by international financing institutions such as the World Bank
6	GIS Specialist/ Surveyor	BSc in Land Surveying or equivalent, expertise in GIS and preferably a postgraduate training in GIS.	10 years	At least 5 years of relevant experience in large integrated sewerage and/or projects. Proficiency in listening and speaking of English. Demonstrable experience with FIDIC Conditions and projects funded by international financing institutions such as the World Bank
7	Environmental, Health and Safety Officer	BSc in Environmental Management, Environmental Engineering,	10 years	At least 5 years post qualification professional working experience in wastewater projects. Working Experience in provision of Environment, Health and Safety [ESHS] oversight on infrastructure projects; in at least

Phase 1: Feasibility, Design and Tender Phase				
	Designation	**Minimum Academic Qualification**	**General Experience**	**Specific Experience**
				Three Similar Projects size, complexity and financial magnitude. Familiarity with World Environmental and Social Framework and guidelines (Environmental, Health and Safety and Compensation and Resettlement) and Environmental and Social National Regulatory Framework. At least two years working experience in Sub-Saharan African Countries
8	Social Development Expert	BSc in Social Science, Social Work, Sociology or its equivalent	10 years	At least 5 years post qualification professional working experience in wastewater projects. Working Experience in provision of Social (including sexual exploitation and abuse (SEA) and gender-based violence (GBV)), Health and Safety [ESHS] oversight on infrastructure projects; in at least Three Similar Projects size, complexity and financial magnitude. Familiarity with World Bank Environmental and Social Framework and guidelines (Social, Compensation and Resettlement) and Social National Regulatory Framework. At least two years working experience in Sub-Saharan African Countries

The following is the minimum qualification and number of Key Experts for phase II:

Phase 2: Construction Supervision Phase, Site Handover and Defects Liability Period				
1	Resident engineer	MSc (or higher) in Civil Engineering or Sanitary Engineering or its equivalent	15 years	At least 15 years' experience in construction supervision, 10 years of which should as Resident Engineer in construction management and operation and maintenance of sewerage/wastewater infrastructure. Practical, hands-on experience in operating or managing sewer networks and others similar installations, is highly desirable. Should have fully completed (in all respects) at least 2 urban comprehensive sewerage projects as Resident Engineer involving planning, process design, detail engineering design, construction supervision, monitoring and commissioning. The Resident Engineer should have demonstrable working experience on works. Must be registered with a recognized Engineering Institution. Proficiency in listening and speaking of English. Demonstrable experience with FIDIC Conditions and projects funded by international financing institutions such as the World Bank

2	Assistant Resident engineer	BSc in civil engineering	10 years	At least 10 years of professional experience working as Inspector of civil engineering works, water and wastewater Inspector or other equivalent type of projects. Working experience in a similar position in at least 2 similar projects, in the past ten years. Proficiency in listening and speaking of English. Demonstrable experience with FIDIC Conditions and projects funded by international financing institutions such as the World Bank
3	Electrical Engineer	BSc in Electrical Engineering or its equivalent	15 years	At least 10 years working experience in supervising the construction of pumping stations (including equipment, electrical installation, automation, instrumentation and control). Working experience in a similar position in at least 3 similar projects, in the past ten years. Proficiency in listening and speaking of English. Demonstrable experience with FIDIC Conditions and projects funded by international financing institutions such as the World Bank
4	Mechanical Engineer	BSc in Mechanical Engineering or its equivalent	15 years	At least 10 years working experience in supervising the construction of pumping stations (including equipment, automation, instrumentation and control). Working experience in a similar position in at least 3 similar projects, in the past ten years. Proficiency in listening and speaking of English. Demonstrable experience with FIDIC Conditions and projects funded by

				international financing institutions such as the World Bank
5	Inspectors (4 No. Civil, 1No. Electrical & 1No. Mechanical .)	Diploma in Civil/Electromechanical Engineering with at least eight or Technician qualifications in Civil/ Electromechanical Engineering with at least	10 years 10 years	At least 7 years of relevant experience in sewerage infrastructure and concrete works of similar magnitude Proficiency in listening and speaking of English. Demonstrable experience with FIDIC Conditions and projects funded by international financing institutions such as the World Bank
6	Environmental, Health and Safety Officer	BSc in Environmental Management, Environmental Engineering,	10 years	At least 5 years post qualification professional working experience in wastewater projects. Working Experience in provision of Environment, Health and Safety [ESHS] oversight on infrastructure projects; in at least Three Similar Projects size, complexity and financial magnitude. Familiarity with World Environmental and Social Framework and guidelines (Environmental, Health and Safety) and Environmental and Social National Regulatory Framework. At least two years working experience in Sub-Saharan African Countries Experience on World Bank funded projects and World Bank safeguards instruments

7	Social Development Expert	BSc in Social Science, Social Work, Sociology or its equivalent	10 years	At least 5 years post qualification professional working experience in wastewater projects. Working Experience in provision of Social (including sexual exploitation and abuse (SEA) and gender-based violence (GBV)), Health and Safety [ESHS] oversight on infrastructure projects; in at least Three Similar Projects size, complexity and financial magnitude. Familiarity with World Bank Environmental and Social Framework and guidelines (Social, Compensation and Resettlement) and Social National Regulatory Framework. At least two years working experience in Sub-Saharan African Countries

6 Contract Management

6.1 Obligation of the Consultant

(i) The Consultant shall be responsible for the payment of local taxes and duties for all goods and services including levies during execution of the project. The Consultant is, therefore, expected to liaise with tax authorities, National Construction Industry Council (NCIC) and Blantyre City and District Councils in this respect.

(ii) The Consultant is expected to be fully self- sufficient in terms of accommodation, office supplies, office equipment, communication, transport, VISAs or permits , insurance and living expenses of the staff. The Consultant's proposal should include the cost of procuring 1 No. Brand New Twin cab 4 x 4 pickup vehicles, for use during the assignment, as provisional sums whose estimated market value has been predetermined by the client as part of Request for Proposal documents. The consultant will be instructed to procure this and/or any other property, under the direction and supervision of the client All items, including vehicles, bought under this assignment or contract that will become property of the client after the project. The cost of running the vehicles will be borne by the Consultant.

(iii) The data, documentation and assets from the consultancy will remain the property and in the custody of the Client at the end of the consultancy.

(iv) The Consultant shall be available, at all times, for subsequent discussions of the assignment with the Client. The Consultant shall be responsible for the payment of local taxes and duties for all goods and services including applicable levies, during execution of the project.

6.2 Obligation of the Client

The Client shall, wherever possible:

(i) Assist the Consultant in obtaining information and data to enable the Consultant execute the services described herein effectively. However, the Consultant shall be solely responsible for executing the ground levels surveys, analysis and interpretation of all data and from his findings, making appropriate conclusion and recommendations;

(ii) Ensure that data is accurate and available for ease of supervision of the works;

(iii) Provide copies of available study reports and other relevant documents;

(iv) Ensure that the Consultant has access to all available information required for timely execution of the assignment;

(v) Assist the consultant to obtain necessary immigration, VISAs, registration with any board or agency, and residence work permits for the approved expatriate personnel and their dependants. However, the consultant remains responsible for this

6.3 Reporting Arrangements Reviews and Schedule of Deliverables

Blantyre Water Board, with support from Blantyre City Council, will be the implementing agency for the execution of this assignment. The Consultant will be reporting to the PIU Manager on contractual matters and to the BCC Project Support Team Coordinator on daily operational issues. The Consultant will be required to submit all the reports to Project Implementation Unit, with copies to BCC as per the specified timelines.

7 Payment Schedule

The following is the proposed payment schedule for the project:

No	Deliverable	% Of payment
Phase 1: Assessments, Review, Update, Design and Tender Phase		
1	Inception Report	10%
2	Engineering Assessment Report	20%
3	Draft Detailed Design Report and Bidding documents for Priority Sewerage Works	25%
4	Final Detailed Design Report and Bidding documents for Priority Sewerage Investments.	45%
Total		**100%**
Phase 2&3: Construction Supervision Phase, Site Handover and Defects Liability Period		
5	Monthly Supervision Reports	
6	Contract management manual	
7	Operation and Maintenance Manuals	
8	As-built drawings and Project completion report	
9	Final construction report (for each works package)	
10	Project Completion Report	
Total		

ANNEX 1: LIST OF DOCUMENTS TO BE REVIEWED BY THE CONSULTANT

ITEM NO	DOCUMENT	YEAR
1	Blantyre Sewage Scheme: Sewerage and Sewage Disposal Works Extensions Engineering Reports	1975
2	Study and Preliminary Design for the Improvement of Mudi and Limbe Sewer System and Limbe Sewage Disposal Works	1980
3	Blantyre City Sanitation Master Plan	1995
4	Business Model Development on Toilet Emptying and Desludging Activities	2016
5	Blantyre City Wastewater Treatment Plants Assessment Report	2017
6	Situational Analysis Study for the Development of City Sanitation Masterplan Draft Report	2021
7	BCC Sewer network system ledger	