Ministry of Water and Sanitation **Blantyre Water Board** **Blantyre City Council**

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

Terms of Reference: Consultancy Services for Detailed Designs and Project Supervision of Blantyre Water Supply Network Upgrades

PROCUREMENT REFERENCE: MW-BWB-333054-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 water supply improvements under 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 and sanitation services.

BWB and BCC which are the implementing entities for the MWSP -1 commit themselves to successfully execute the project, which aligns with Malawi's development goals as well as strategic plans for the two institutions. 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 development and rehabilitation of water and sanitation infrastructure for Blantyre City and surrounding areas so that the city has adequate and reliable potable water supply with sufficient pressure and 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 (which is the object of the current ToRs), 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 safely managed sanitation and reduce environmental pollution that has public health impacts. This component is not part of the present ToR.

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. This component is not part of the present ToR.

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 Current Situation

BWB is estimated to service 66,822 individual connections, 813 water kiosks (for communal supply), and a further 3,000 commercial, industrial and institutional connections. The utility manages a reticulation system of about 1407km and 23 reservoirs (of which four clear water tanks) with an estimated capacity of 97,317m^3. The management of the system is divided into three zones, Limbe, Kabula, and Soche.

Generally, the network (schematic in Figure 1) is characterized by large elevation variations leading to, on one side, high operating pressures (in excess of 10 bar in some parts of the network), which, coupled with intermittent supply conditions, result in high water losses. On the other side, parts of the network suffer from low operating pressures at high elevation points or, at times, are driven by the insufficient hydraulic capacity of the network. There are also a number of hydraulic bottlenecks in the network, caused by an inappropriate configuration (e.g. unconnected parallel pipes with most of the consumption supplied by the smaller distribution main) and undersized pipes – all exacerbated by the high leakage level. These operational challenges significantly affect the current quality of service to the customers. Furthermore, the utility finances are under strain due to very high energy costs deriving from the need to pump 800 m from the source to the uppermost parts of the network. The excessive leakage and high production and transmission costs significantly impact BWB's financial performance.

The conventional approach to improving operational efficiency was to undertake extensive pipe replacement based on a very simplistic assessment that leakage depends on the pipes' age and material. However, experience shows that loss reduction requires an integrated approach that takes into consideration the interconnectivity between the key elements contributing to high losses, including addressing the hydraulic bottlenecks, enhancing pressure management, and undertaking leak recovery. Reducing losses will then allow the optimization of production, transition to continuous supply, and free up reservoir capacity.

The project will, therefore, (i) prioritize network upgrades to improve the hydraulic performance of the system, control pressures and leakages, (ii) improve storage capacity and reliability of supply by constructing new storage tanks and construction of solar Photo Voltaic (PV) plants stations (iii) expand the services to new unserved areas, using the water recovered from leakage and the additional production capacity.

As part of this consultancy, BWB plans to carry out a hydraulic study on its reticulation system and is envisaging a three-stage approach to stabilize the network and improve efficiency in water supply. The first stage would focus on priority network interventions to improve the hydraulic performance of the system, control pressures and leakages. A second stage would encompass a physical water loss reduction program through an internal performance-based mechanism. The third phase relates the network expansion to increase coverage. The network expansion will be undertaken through improvements in the efficiency of the existing system, savings from physical water loss reduction activities, construction/upgrading of a treatment plant at Mudi or a combination of these three.

BWB now wishes to engage consultancy services to prepare detailed engineering designs for all the network investments envisaged in the project and to provide engineering supervision to their execution.

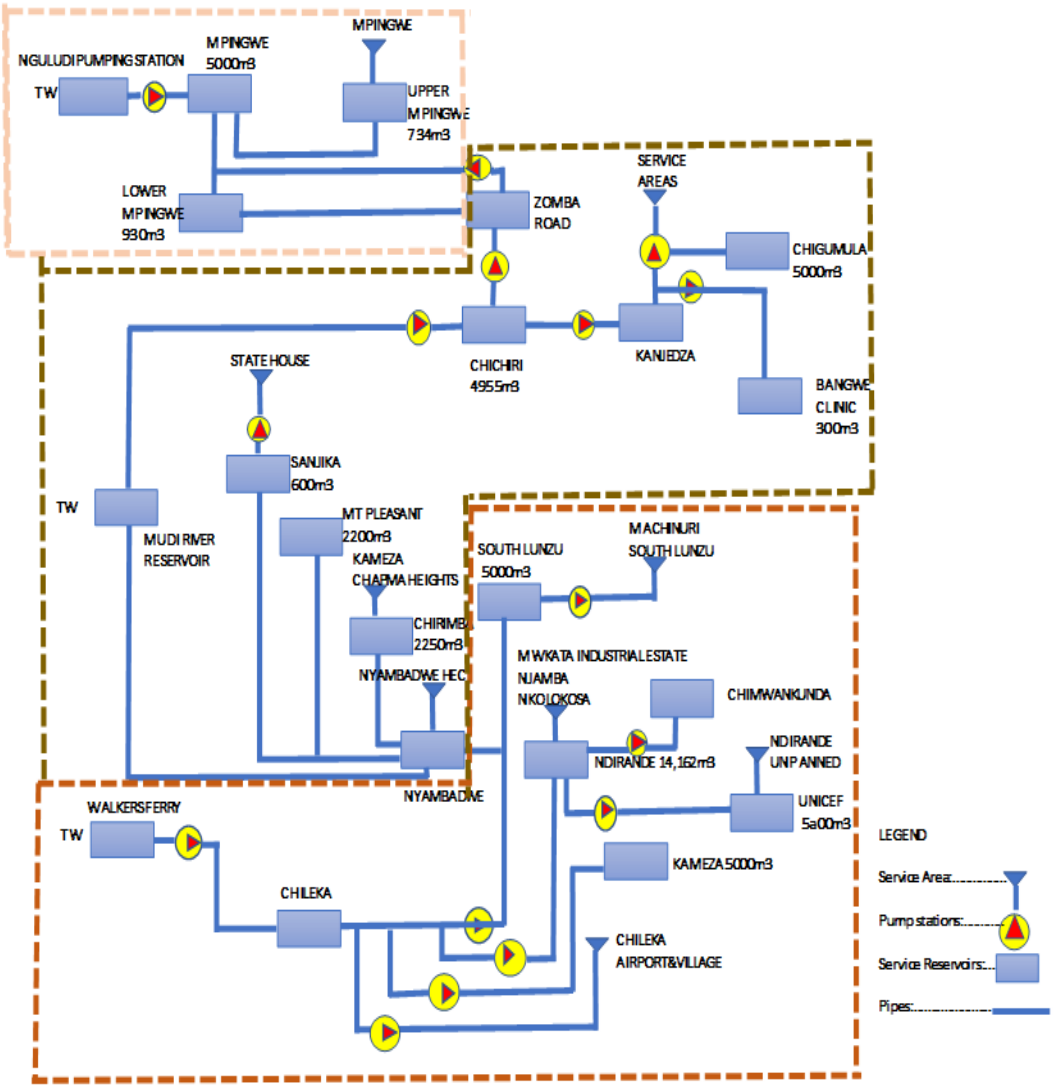

Fig 1 – Schematic of Blantyre Water Board's Existing Water Supply System

1.3 Detailed Description of Planned Interventions under Water Supply Improvements

1.3.1 Priority transmission and distribution network upgrades. (Rehabilitation and Upgrade of Distribution and Transmission Network, Construction of additional storage tanks and Solar PV plants)

The main objective of these interventions is to eliminate the hydraulic bottlenecks to ensure that the water produced reaches the service reservoirs, achieves a more even distribution of the pressure throughout the network, and reaches the customer. A preliminary assessment of the network interventions was done using the existing hydraulic model developed in 2016. Despite not being fully calibrated and inappropriate allocation of the demand, the model allows for an initial estimate of the interventions to stabilize the network. The consultant is expected to update and calibrate the model, with the field data collected by BWB and complemented by the consultant's own assessment and data collection. Alternatively, the consultant can propose a new hydraulic model,

with features and performance satisfactory to BWB. The estimated network upgrades, based on the preliminary assessment, include:

i. Upgrading of around 270km of distribution pipes in priority supply areas in the Soche and Kabula zones,

ii. Construction/upgrade of new reservoirs at South Lunzu, Chichiri, Ndirande, Chilomoni and Nyambadwe to ensure a minimum 18 hours of storage. Table 1, presents the current estimated hours of storage and simulated hours of storage with reduced leakage. The consultant is expected to update the hydraulic simulations with the updated model.

Table 1 – Estimated performance of the main reservoirs.

RESERVOIR	CURRENT CAPACITY m^3	HOURS STORAGE CURRENT	AVERAGE m^3/h	HOURS STORAGE WITH REDUCED LEAKAGE	ADDED STORAGE REQUIREMENT FOT 5 HOURS m^3
Chichiri_Total	4958.00	5.15	817.64	6.06	0
Chileka	4459.98	1.11	3877.57	**1.15**	14928
Chirimba	2250.00	10.15	89.52	25.13	0
Unicef_tank	500.00	24.23	12.11	41.28	0
overhead_Sanjika	600.00	750.00	0.47	1280.15	0
Res._KANJEDZA	9092.00	20.85	359.11	25.32	0
Res._Mount_Pleasant	2500.00	17.73	53.10	47.08	0
res._Sanjika	600.00	28.23	24.06	24.94	0
Res._BCA_Hill	252.00	5.83	14.03	17.96	0
Res._Lower-Mpingwe	900.00	42.28	15.92	56.52	0
Res._Upper-Mpingwe	14162.00	359.48	22.56	627.87	0
Res_Ndirande	5749.00	3.66	1114.98	5.16	0
South_Lunzu	13500.00	94.10	22.56	598.52	0
Total_reservoir_Nyambadwe	4500.00	2.69	1266.16	**3.55**	1831
Zomba_reservoir_total	9000.00	93.92	63.69	141.31	0
RES_MUDI	2379.00	2.29	937.29	**2.54**	2307
CMD_TANK	4310.27	144.71	12.80	336.76	0
CG_TANK	4310.27	23.48	168.92	25.52	0

iii. Construction and upgrade of approximately 20km of transmission mains,

iv. Upgrade of eight pumping stations (Mudi, Chichiri, Nyambadwe, Soche, Chigumula, Zomba Road, Kameza and Kanjedza Forest) including installation of Solar PV plants to reduce electricity costs

The Proposed interventions will be assessed and confirmed by the consultant

1.3.2 Network Expansion

This sub-component will finance the expansion of the distribution to increase coverage of improved water supply services. Investments will include the construction of approximately 40 km of distribution pipelines, the connection of approximately 19,700 new household connections and construction of 60 communal water points (smart kiosks). The consultant is expected to assess the viability of the proposed network expansion based on the available water from production upgrades through improvements in the efficiency of existing treatment plants and pumping stations, savings from physical water loss reduction activities, construction of a new treatment plant, or a combination of these three. The proposed network expansion areas include Njuli, Chileka, Chikuli, Mpemba, and Matindi. These areas form part of the metropolitan Blantyre and are registering significant development, but currently lack water supply services.

2 Objectives

2.1 Overall Objective of the Assignment

The overall objective of this consultancy is to prepare detailed engineering designs and bidding documents for water supply investments as well as construction supervision of the works.

2.2 Specific Objectives of the Assignment

The scope of the assignment includes the following key tasks:

(i) preparation of detailed designs, drawings, and specifications for the priority network rehabilitation and upgrades (including storage reservoirs), which will be identified through the hydraulic study;
(ii) hydraulic analysis and preparation of detailed designs, drawings, and specifications for network expansion investments;
(iii) preparation of detailed designs, drawings, and specifications for the construction of Solar PV plants in pumping stations;
(iv) preparation of tender document for both the priority network upgrades and network expansion works; and
(v) construction supervision of all network interventions.
(vi) Ensuring compliance with and Environmental and Social risk management requirements

3 Scope of the Assignment

The assignment shall be conducted in two phases: Phase 1–detailed design and tender documentation; and Phase 2–construction supervision and DMA establishment. 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 required design during construction. Phase 2 shall be undertaken on a time-based contract with a duration of 48 months (i.e. 36 months construction period and 12 months defects liability period). Both phases will be procured together – i.e. the consultant is required to quote for both phases. Phase 2 of the contract shall come into effect after successful completion of phase 1 and upon Client's notice to the consultant instructing commencement of Phase 2 services, based on the performance during Phase I.

3.1 Phase 1 – Detailed Design and Tender Documentation

The network investments to be designed are categorized into four parts, based on the level of prior preparatory work undertaken by BWB.

a. *Priority distribution network investments*. The preliminary set of proposed investments has been identified. However, the consultant is expected to undertake a detailed hydraulic

study, including model update (or design) and calibration to confirm and optimize the priority interventions to address the hydraulic bottlenecks and create a pressure management and control system. The consultant will then carry out a detailed hydraulic design, conduct a survey of pipeline routes, prepare detailed engineering designs, drawings, engineer's cost estimates, specifications, and bidding documents. These investments constitute the most urgent package of works which need to be tendered quickly. For this reason, the consultant shall be expected to complete detailed designs and bidding documents within eight months of commencing the assignment.

b. *Priority transmission network investments and associated facilities (storage reservoirs and Solar PV plants for pumping stations).* The consultant is expected to assess the current transmission network capacity and propose priority interventions to increase water availability. Detailed designs and preliminary assessments for the storage reservoirs and solar PV plants have been done respectively. However, further hydraulic analyses will be needed to confirm pipe sizes and the required capacity of pumps and reservoirs. Thereafter, the consultant shall conduct necessary surveys and prepare detailed designs, drawings, engineer's cost estimates, specifications and bidding documents.

c. *Network expansion investments.* Expansion areas have been identified and preliminary estimates of investment requirements have been made. However, further assessments are needed to firm up the exact scope of these investments, considering existing production constraints and planned future investments in production capacity.

3.1.1 Priority Distribution Network Investments

The Consultant shall prepare detailed designs and bidding documents for urgent network rehabilitation and upgrading works involving replacement of approximately 270 km of existing distribution pipelines with larger diameter pipelines, based on the calibrated hydraulic model. An indicative list of distribution pipelines, based on previous assessments is provided in the following table:

Table 1: Indicative List of distribution pipelines to be replaced

Zone	Distribution Zone	Length (km)
Soche	Ginnery Corner	21.73
	Mt Pleasant	10.55
	Sunny Side, CI, Manyowe	10.92
	Chimwakhunda	15.54
	Nancholi, Baluti, Manase	7.53
	Mandala-Mt Pleasant	11.09
	Chitawira	9.83
	Makata Industrial	5.68
	Mpemba	20.54
	Nkolokosa	5.18
	Zingwangwa	7.97
Kabula	Lunzu to Matindi	7.31

	Blantyre Central	8.99
	HHI to Sanjika	5.56
	Nyambadwe total	25.58
	Namiwawa	17.17
	Ndirande total	28.03
	Chirimba total	17.03
	Sigelege	4.75
	Chapita Heights	1.13
	Mbayani-Chemusa	11.67
	Kameza	12.39
	Sub-Total	**266.18**

Additionally, the works will involve establishment of pressure and leakage control system (involving installation of pressure reducing valves, valves, flow meters and pipe upgrade, based on the results of a calibrated hydraulic model). Specific activities shall include, but not necessarily limited to:

a. Conduct a hydraulic analysis of the distribution network to confirm pipe sizes. This shall include reviewing/updating/designing and calibration of the hydraulic model of the distribution system and optimizing the configuration, considering the planned additional production capacity of planned projects and the water demand in expansion areas;
b. Review existing studies, preliminary designs, data and maps and identify gaps (if any) in the available information;
c. Conduct necessary surveys and any additional studies required to verify the existing preliminary designs;
d. Conduct detailed site investigations (including geotechnical investigations) of proposed pipeline routes and propose workable alternatives where the site conditions may have significantly changed;
e. Conduct geotechnical investigations to determine bearing capacities of the soils for the pipeline routes;
f. Conduct all other necessary engineering and topographic surveys for the pipeline works;
g. Prepare detailed designs (civil/structural and electro-mechanical) including construction drawings, technical specifications, bill of quantities, and engineer's cost estimates for the pipelines works and associated fittings (bends, flow measurement, boundary values, pressure reducing valves etc) and crossings;
h. Prepare detailed construction plan and implementation program for the works
i. Assist BWB in obtaining approvals where necessary from local authorities, utility bodies, land offices and other approving authorities;
j. Advise on procurement packaging of the works and prepare bid documents in accordance with World Bank requirements;
k. Assist BWB in the tendering process, including assistance in preparing tender notices, arranging pre-bid meetings, responding to queries from bidders, evaluation of bids and contract negotiations.

3.1.2 Priority Transmission Network Investments

The Consultant shall prepare detailed designs and bidding documents for priority transmission network upgrades involving approximately 20.5km of new transmission mains (diameters ranging from 700-800mm), five new storage reservoirs at South Lunzu (5000m^3), Chichiri (5000m^3), Chilomoni(5,000m^3), Ndirande (20,000m^3), and Nyamabdwe (10,000m^3), and installation of solar PV plants of varying capacities in eight pumping stations as provided in table 2. The exact scope of the network components will be determined, after the hydraulic analysis by the consultant and confirmed with BWB.

Table 2: Capacities of the Solar PV Plants

No	**Upgrades and Solar PV for Blantyre Pumping Stations**	Energy to be produced (kW)
1	Mudi	850kW
2	Chichiri	650kW
3	Nyambadwe	300kW
4	Soche	200kW
5	Chigumula	260kW
6	Zomba Road	250kW
7	Kameza	400kW
8	Kanjedza Forest	50kW
	Grand Total	3000kW

Specific activities shall include, but not necessarily limited to:

a. Review existing studies, data and maps and identify gaps (if any) in the available information on these investments;
b. Conduct additional hydraulic analysis of the transmission network, including the upgrade and calibration of the hydraulic model to confirm pipe sizes and the required capacity of pumps and reservoirs. This shall include reviewing/updating the existing hydraulic model of the transmission system and optimizing the configuration, considering the planned additional production capacity of all planned projects and the water demand in expansion areas;
c. Conduct studies that shall assess and confirm solar resource and energy yield as well as land availability in each of the proposed solar PV project site.
d. Conduct detailed site investigations (including geotechnical investigations) of proposed pipeline routes, reservoir and solar PV station sites and propose workable alternatives where the site conditions may have significantly changed;
e. Conduct geotechnical investigations to determine bearing capacities of the soils for solar PV station structures, service reservoirs and pipeline routes;
f. Conduct all necessary engineering and topographic surveys for the works;

g. Prepare detailed designs (civil/structural and electro-mechanical), including construction drawings, technical specifications, bill of quantities, and engineer's cost estimates for the pipeline works, storage reservoirs and solar PV stations;
h. Prepare detailed construction plan and implementation program for the works
i. Assist BWB in obtaining approvals where necessary from local authorities, utility bodies, land offices and other approving authorities;
j. Advise on procurement packaging of the transmission network investments and prepare bid documents in accordance with World Bank requirements; and
k. Assist BWB in the tendering process, including assistance in preparing tender notices, arranging pre-bid meetings, responding to queries from bidders, evaluation of bids and contract negotiations.

3.1.3 Network Expansion Investments

The Consultant shall conduct hydraulic analysis and prepare detailed designs and bidding documents for distribution network expansion in Njuli, Chileka, Chikuli, Mpemba, and Matindi Investments shall include approximately 40km of new distribution pipelines, a total of approximately 19,700 new household connections and construction of 60 communal water points (smart kiosks). Specific activities shall include, but not necessarily limited to:

a. Review existing studies, data and maps and identify gaps (if any) in the available information on these investments;
b. Conduct necessary surveys and any additional studies required of the proposed expansion areas to confirm key data (such as demand projections) and to decide on an optimal configuration of the network to supply these areas;
c. Conduct hydraulic analysis to confirm pipe sizes and the required capacity of reservoirs. This shall include reviewing reviewing/updating the existing hydraulic model and optimizing the configuration of the network to supply the expansion areas, considering existing and planned production capacity expansion;
d. Conduct detailed site investigations (including geotechnical investigations) of proposed pipeline routes and communal water point sites;
e. Conduct geotechnical investigations to determine bearing capacities of the soils for the communal water point sites and pipeline routes;
f. Conduct all necessary engineering and topographic surveys for the works;
g. Prepare detailed designs (civil/structural and electro-mechanical), including construction drawings, technical specifications, bill of quantities, and engineer's cost estimates for the pipeline works and communal water points works;
h. Prepare detailed construction plan and implementation program for the works;
i. Assist BWB in obtaining approvals where necessary from local authorities, utility bodies, land offices and other approving authorities;
j. Advise on procurement packaging of the network expansion investments and prepare bid documents in accordance with World Bank requirements; and

k. Assist BWB in the tendering process, including assistance in preparing tender notices, arranging pre-bid meetings, responding to queries from bidders, evaluation of bids and pre-contract discussions.

3.2 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 contract. The consultant shall make sure, amongst others, that:

(i) the works are carried out in accordance with the construction contract;
(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.
(iv) Contractors are compliant to environmental, safety, health and social requirements.

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

3.2.1 Contract administration

a. Assist BWB in all aspects of contract administration and management of the construction works for the network interventions;
b. Prepare contract management manual which 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, engineers 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;
c. Examining the contractor's detailed work program and guiding the contractors in preparation of a supervision schedule/work plan for each package;
d. Review and recommend approval of Contractor ESMP
e. Supervising implementation of ES instruments
f. Ensure that conditions/ recommendations made by all statutory and approval authorities are met without incurring loss of time and money on the project;
g. 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.;
h. Maintain daily site diaries, and daily reports to verify contractor's daily records of labour, plant and equipment, weather conditions, progress, instructions and delays.
i. Maintain a photographic record of the progress of the work.

j. 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.
k. Organize and chair site meetings. As soon as practical after the meeting, prepare and distribute minutes for agreement and signing.
l. 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.

3.2.2 DMA establishment and commissioning

a. Establish and verify network pressure Zones depending on supply reservoirs, including verification and redesign with the hydraulic model, where commissioning fails until DMA is operational
b. Demarcate and test DMAs and Identify Pressure reducing zones, DMA meter installation locations, Data logger locations and Boundary valves
c. Mapping all functioning DMAs on GIS
d. Create Meter reading walk routes confined to a DMA

3.2.3 Quality assurance

a. Establish a quality assurance system, including verification of source material and certification;
b. Carry out necessary quality control activities and certifying that the quality of works and materials conforms to the specifications;
c. Examine and approve the contractors' proposed changes to design (if any) and drawings for compliance with the specifications;
d. Assist client to carry out factory tests/pre-shipment inspection for major equipment as and when required;
e. 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 safeguards policy and guidelines.
f. 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.
g. Undertake site supervision of construction, installation, testing and commissioning;
h. 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;
i. 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.

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

3.2.4 Schedule and Cost Management

a. 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 BWB in a timely manner, and recommend actions to be taken;
b. Assess and incorporate confidential delay contingencies, should delays become unavoidable and advise BWB regarding the target practical completion dates for the project components;
c. Undertake cost management for BWB. 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;
d. 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.
e. Review and effect any design changes during construction with prior approval from the client.
f. Prepare actual and forecast monthly/yearly cash flows to assist BWB's cash flow management for the works;
g. Check contractor's invoice and issue progress payment certificates;
h. Check and make recommendation for any variation orders if required;
i. Check and recommend any extension of time required to be given to the contractor.
j. Recommend substantial completion certificate to the contractor for each contract;
k. Recommend final acceptance certificate for each contractor after expiration of defect liability period;

3.2.5 As-Built Drawings and O&M Manuals

a. Ensure that the contractors maintain at the site a complete set of 'as-built' drawings for the contract as the work proceeds.
b. On completion of the construction of each structure, the consultant shall assist BWB to transfer all records changes to BWB's GIS and hydraulic model. Any updating of the GIS and hydraulic model shall be in accordance with the existing model.

c. Ensure the contractors provide all manufacturers operation manuals, instructions and technical details for the installations. The consultant shall review any detailed operation and maintenance manuals prepared by the contractor and shall be responsible for ensuring the manuals are complete and submitted to BWB. The O&M manuals shall include at least

   i. reference to all relevant design and other reports, specifications etc. to provide a complete bibliography on the structures and plant such that the operation and maintenance staff can understand the basis of their functions;
   ii. details of any problems encountered during construction which may have a bearing on the future safe operation and decommissioning of the facilities;
   iii. full operating instructions for all systems; drawings, diagrams, charts, notices etc. to facilitate understanding of safe operation and maintenance including trouble shooting guide of electro-mechanical equipment; and
   iv. maintenance schedule and consumables required to give reliable operation of the facilities.

3.2.5.1 **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/SH 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
a) 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,
b) Ensure that contractor immediate notifications on ESOHS aspects are shared with the Client immediately;
c) Immediately inform and share with the Client any notification related to ESOHS incidents and undertaking root cause analysis provided to the Consultant by the Contractor, and as required of the Contractor as part of the Progress Reporting;

d) Share with the Client in a timely manner the Contractor's ESOHS metrics, as required of the Contractor as part of the Progress Reports.
e) Review and input, in a timely manner, the Contractor's ESOHS documentation (including regular reports and incident reports).
f) 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 mechanism.
g) 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.
h) Ensure appropriate representation at relevant meetings including site meetings, and progress meetings to discuss and agree appropriate actions to ensure compliance with ESOHS obligations.
i) Ensure that contractor activities are aligned with the Stakeholder Engagement Plan (SEP) and Labour Management Procedures (LMP):

(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

3.2.6 Progress Reporting

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

a. Comprehensive monthly report to BWB which includes the current expected completion date, the current forecast and cost, achievements during the month, status against original works program, current expenditures against expected cash flow, an analysis of any cost changes or variations, 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.
b. 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.
c. 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 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.
d. Other reports as required (such as ESHS reports, technical reports etc.)

4 Deliverables and Timeframe

4.1 Phase 1 Deliverables and Timeframe

Phase 1 of the consultancy assignment is expected to be conducted over a period of Ten (10) months. Table 3 below provides a summary of the expected deliverables and timeframe. For each deliverable, the consultant shall prepare and submit to the Client one [1] electronic copy, preferably in MS Word, on CD Rom/ Pen-drive and five (5) hard copies of the reports.

Table 3: Summary of the Expected Deliverables – Phase 1

Report No.	Report Description	Due date (No. of months from commencement date)
1	Inception Report	1
2	Report on Hydraulic Modelling reviews including updating the hydraulic model and Solar PV Assessments/preliminary designs	6
3	Design Criteria	6
	Priority Transmission Network Interventions	
4	Draft Detailed Design Report and Bidding documents for Priority Transmission Network Interventions	9
5	Final Detailed Design Report and Bidding documents for Priority Transmission Network Interventions	10
	Priority Distribution Network Interventions	
6	Draft Detailed Design Report and Bidding documents for Priority Distribution Network Interventions	9
7	Final Detailed Design Report and Bidding documents for Priority Distribution Network Interventions	10
	Distribution Network Expansion	
8	Draft Detailed Design Report and Bidding documents for Distribution Network Expansion	11
9	Final Detailed Design Report and Bidding documents for Distribution Network Expansion	12

4.1.1 Inception Report

Within two weeks of commencement of the assignment, the Consultant shall submit to the Client, five (5) hard copies and one [1] electronic copy on Flash Pen. The report shall outline the 'Consultant's organization and programme of work, methodology, approach and schedule of man-power to take account of the contract negotiations and 'consultant's initial findings after reviewing work already performed by BWB. The role and consultations to be made with stakeholders shall be included in the report.

4.1.2 Report on Hydraulic Modelling reviews including an updated hydraulic model and Solar PV Assessments/preliminary designs

The Report on hydraulic modelling reviews as well as a working updated hydraulic and Solar PV plants, (preliminary designs/assessments) shall be submitted within one and half [2] months of commencement of the assignment in five [5] hard copies and one [1] electronic copy on CD Rom/Flash Pen. The report shall contain confirmation of findings from previous hydraulic analyses of the entire network, review of the existing hydraulic model and updating the same and field

assessment works for Solar PV plants including confirmation proposed sites for facilities. The report shall come up with recommendations on each category of the proposed sub-projects based on the findings.

4.1.3 Design Criteria

Standard and particular design parameters for water supply facilities and components as well as different kinds of equipment used, operational parameters for the different components and design lifetime of structures and equipment. The Design Criteria shall be submitted within Six months [6] months of commencement of the assignment in five [5] hard copies and one [1] electronic copy on Flash Pen.

4.1.4 Draft Detailed Design Reports and Bidding documents

The Consultant shall submit to the Client five (5) hard copies and one [1] electronic copy on by Flash Pen of the Draft Design Reports and Bidding documents.

4.1.5 Final Detailed Design Reports and Bidding documents

The Client will review and submit comments on the draft Detailed Design Reports and Bidding documents. The Consultant shall submit to the Client five (5) hard copies and one [1] electronic copy on CD Rom/ Flash Pen of the final Design Reports and Bidding documents incorporating the 'Client's comments. The reports shall include a Preliminary Confidential Engineers Cost Estimate. The drawings shall be in five (5) hard copies on A3 paper and one (1) electronic copy on CD/ Flash pen preferably in PDF format.

4.1.6 Bidding documents

A complete set of Bidding documents shall comprise of:

- Volume I – Bidding Document (Bidding Procedures, Works Requirements, Conditions of Contract and Contract Forms);
- Volume II – Bills of Quantities
- Volume III – Specifications
- Volume IV – Tender Drawings

The Consultant shall submit separate Bidding documents and Final Tender Drawings for each package. This shall be in five (5) hard copies and one [1] electronic copy on CD Rom/ Flash Pen for the Bidding Documents per package. For each package, the bidding documents shall also include a Final Confidential Engineers Cost Estimate and an Excel version of the Bills of Quantities. All tender drawings shall be on A3 paper and electronic preferably in PDF format and in AutoCAD format.

4.1.7 Monthly Progress Report

The Consultant shall submit monthly progress reports in five [5] hard copies indicating progress against program or schedule of activities.

4.1.8 Payment Schedule for Phase I

Payments for Phase 1 of the assignment shall be based on approved deliverables. Table 4 shows the expected payment schedule (subject to negotiation with winning bidder).

Table 4: Phase I Payment Schedule

	Deliverable	Proportion of payment (%)
1	Inception Report	10%
2	Report on Hydraulic Model reviews including updating the hydraulic model and Solar PV Assessments/preliminary designs	5%
3	Final Detailed Design Report and Bidding documents for Priority Transmission Network Interventions	30%
4	Final Detailed Design Report and Bidding documents for Priority Distribution Network Interventions	30%
5	Final Detailed Design Report and Bidding documents for Distribution Network Expansion	25%
		100%

4.2 Phase 2 Deliverables and Timeframe

Phase 2 of the consultancy assignment is expected to be conducted over a period of 48 months (this includes 12 months defects liability period). Table 5 below provides a summary of the expected deliverables during this period. For each deliverable, the consultant shall prepare and submit to the Client one [1] electronic copy, preferably in MS Word, on CD Rom/ Flash Pen and five (5) hard copies of the reports

The Consultant will be required to prepare reports during the implementation of the project. All reports and documents will be in English language and all quantities expressed in metric units. The Consultant shall prepare and submit to the Client the following reports:

Table 5: Summary of the Expected Deliverables – Phase II

No.	Description	Due date (No. of months from commencement date)
1	Inception report	1 month from commencement
2	Monthly progress reports	Monthly
3	Contract management manual	1.5 month from commencement

4	Memorandums with proposed actions to be undertaken to address any issues arising during the implementation of the contract	As required
5	Certificates on quality of works	As required
6	Cash flow projections versus actual disbursements	As required
7	Memorandums on the 'contractor's Interim Certificates payments and claims	As required
8	ES Reports	Monthly
9	Operation and Maintenance Manuals	1 month after project completion
10	As-Built Drawings	1 month after practical completion
11	Final construction report (for each works package) _	3 months after practical completion
12	Project Completion Report	3 months before the end of the Defects Liability Period

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:

- The 'Engineer's state of mobilization
- Any changes to the composition of the 'Engineer's team
- Proposed methodology for carrying out the services, including quality, cost control, and ensuring compliance with environmental, health, safety and social plans and other requirements
- Proposed site communication procedures and recordkeeping
- Detailed program of work, showing time, duration and personnel, as well as inter-relationship between activities
- Format of Monthly Progress Reports

4.2.2 Monthly Progress Reports

The Consultant shall submit five [5] hard copies and one [1] electronic copy of Monthly Progress Reports to the Client during construction phase. The Monthly Progress Reports to the Client during construction phase should include:

- Brief description of the Works;
- Description of activities completed and in progress;
- Progress compared with construction programme and estimated completion date including approved extension;
- Financial report with payments to date compared to programme disbursements;
- Schedule and cost performance
- Quality control;
- 'Contractor's personnel and constructional plant;

- Consultant personnel;
- Weather conditions;
- Environmental, Health and Safety matters;
- Labour matters and grievances;
- Environmental management and pollution control; and
- Photographic records.

4.2.3 Environmental and Social (ES) 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:

a. Immediately notify the Client of any allegation, incident or accident, which has or is likely to have a significant adverse effect on the environment, the affected communities, the public, 'Client's Personnel, 'Contractor's Personnel or Experts. In case of SEA/SH-GBV, while maintaining confidentiality as appropriate, the type of allegation (sexual exploitation, sexual abuse or sexual harassment), gender and age of the person who experienced the alleged incident should be included in the information. The Consultant shall provide full details of such incidents or accidents to the Client within the timeframe agreed with the Client;
b. Immediately inform and share with the Client notifications on ES incidents or accidents provided to the Consultant by the Contractor, and as required of the Contractor as part of the Progress Reporting;

Share with the Client in a timely manner the 'Contractor's ES metrics, as required of the Contractor as part of the Progress Reports"."

4.2.4 Contract Management Manual

Within Forty-Five [45] 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.

4.2.5 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.

4.2.6 Final Construction Report

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. 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.

4.2.7 Project Completion Report

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 'Client's Personnel and Training

The Board, will second two Civil Engineers, one Electrical Engineer and one GIS Technician to the Consultant. The Consultant shall provide on the job training to these personnel so that they provide useful contribution as part of the Consultant. Failure of the Board to provide such staff shall not relieve the Consultant of his responsibility to fulfil the whole or part of this assignment.

6 Reporting

The Consultant shall report to the Project Implementation Unit Manager of Blantyre Water Board on contractual issues and Blantyre Water 'Board's assigned Contract Manager on daily operational issues.

7 Local Consultants

The Client encourages capacity building and encourages International Consultants to work with a local consultant as part of capacity building.

8 Facilities to be provided by the Client

8.1 Office Space

Office space shall be provided by the Client during Phase I of the assignment and to be provided for under the works contract during Phase II.

8.2 Office Equipment

The Consultant will be self-reliant on office equipment.

8.3 Vehicles

The consultant should include in the financial proposal two (2) No. brand new 4 x 4 twin-cab vehicles as specified by the client for consultancy use and all operating costs (fuels, lubricants etc.) under Phase I. Operating costs for the vehicles under Phase II shall be provided for under the Works Contract. All vehicles and equipment procured under the contract shall remain the property of the client upon completion/expiry of the contract.

9 Obligation of the Consultant

The Consultant will 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.

10 Team Composition & Qualification Requirements for the Key Experts

The Consultant shall provide a team of experts all of whom shall be adequately qualified and experienced in their respective fields and be eligible for registration with the relevant professional bodies in Malawi. It is expected that the consultant specialists will have as many as possible of the following Credentials:

a) Relevant general management or technical education and background;

b) A thorough understanding of the systems, procedures guiding the implementation, management and administration of loan projects supported by the IDA;

c) Practical working experience in the management and administration of projects supported by the IDA at the design level;

d) A thorough working experience of the management and administration of externally assisted projects in similar conditions;

e) Fluent in English (Speaking and Writing).

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

Key Expert	Qualification and Experience
Team Leader /	Shall have at least a 'Master's Degree in Civil/Environmental/Water Supply and Sanitation Engineering or equivalent and at least 15 years cumulative experience in designing, construction management, supervision of large integrated water supply projects and implementation of water loss reduction programs. S/he should have experience in preparation of bidding documents for projects financed by multilateral development banks. The Specialist should have experience in projects funded by World Bank in capacity of Team Leader/Deputy Team leader of at least two projects.
Hydraulic/ Network Modelling Engineer	Shall have at least a 'Bachelor's Degree in Civil/ Hydraulic Engineering and at least 15 years of relevant experience. The Specialist should have experience in construction, calibration and application of network models for designing water distribution networks of large integrated water supply projects by using latest modelling software including EPANET. The Network Modelling Engineer should have experience

Key Expert	Qualification and Experience
	in designing and implementation of water loss reduction programs, including permanent leakage and pressure control systems.
Civil Engineer	Shall have at least a 'Bachelor's Degree in Civil Engineering and 15 years general experience with 10 years of relevant experience in pipeline and reinforced concrete structures design and construction supervision. The Engineer should have experience in preparation of bidding documents for projects financed by multilateral development banks.
Structural Engineer	Shall have at least a 'Bachelor's Degree in Civil/ Structural Engineering particularly reinforced concrete and steel designs or its equivalent and at least 15 years of relevant experience. The Engineer should have 10 'years' experience in designing, detailing and construction management of water retaining structures, pipe lines, pumping stations etc.
Electrical/Renewable Energy Engineer	Shall have at least a 'Bachelor's Degree Renewable Energy engineering or equivalent with at least 15 'years' experience in designing, construction management, supervision and quality assurance of solar PV power plants and systems.
Electro-mechanical Engineer	Shall have at least a 'Bachelor's Degree (Electrical or Mechanical Engineering) with at least 15 'years' experience in designing, construction management, supervision and quality assurance of mechanical and electrical equipment and systems in large integrated water supply projects, pipelines, water treatment plants, and pumping stations.
Environmental, Health and Safety Expert	Shall have at least a 'Bachelor's Degree in Environmental Sciences, Social Sciences or equivalent. The expert should have at least five (5) 'years' experience in provision of Environmentoversight on infrastructure projects. The expert should have capabilities to recognize and to deliver good international industry practice with respect to Environment, Health and Safety (ESHS).
Social Development Specialist	Shall have at least a ' Bachelor's s Degree or equivalent in Demography, Sociology, Economics or other relevant field and at least 10 'years' experience in large integrated water supply projects. S/he should have proven knowledge and experience in community mobilization and gender advocacy, Social (including sexual exploitation and abuse (SEA) and gender-based violence (GBV)) oversight on infrastructure projects. S/he should have experience in working in sub-Saharan region.

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

Key Expert	Qualification and Experience
Team Leader / Resident Engineer	Shall have at least a 'Master's Degree in Civil/Environmental/Water Supply and Sanitation Engineering or equivalent and at least 15 years cumulative experience in construction management, supervision of large integrated water supply projects and implementation of water loss reduction programs. The Specialist should have experience in projects funded by World Bank in capacity of Team Leader/Deputy Team leader of at least two projects.
Civil Engineer(2)	Shall have at least a 'Bachelor's Degree in Civil Engineering and 15 years general experience with 10 years of relevant experience in pipeline and reinforced concrete structures construction supervision.
Structural Engineer	Shall have at least a 'Bachelor's Degree in Civil/ Structural Engineering particularly reinforced concrete and steel designs or its equivalent and at least 15 years of relevant experience. The Engineer should have 10 'years' experience in construction supervision of water retaining structures, pipe lines, pumping stations etc.
Electro-mechanical Engineer	Shall have at least a 'Bachelor's Degree (Electrical or Mechanical Engineering) with at least 15 'years' experience in construction management, supervision and quality assurance of mechanical and electrical equipment and systems in large integrated water supply projects, pipelines, water treatment plants, and pumping stations.
Environmental, Health and Safety Expert	Shall have at least a 'Bachelor's Degree in Environmental Sciences, Social Sciences or equivalent. The expert should have at least five (5) 'years' experience in provision of Environment, Health and Safety [ESHS] oversight on infrastructure projects. The expert should have capabilities to recognize and to deliver good international industry practice with respect to Environment, Health and Safety (ESHS).
Social Development Specialist	Shall have at least a ' Bachelor's Degree or equivalent in Demography, Sociology, Economics or other relevant field and at least 10 'years' experience in large integrated water supply projects. S/he should have proven knowledge and experience in community mobilization and gender advocacy, Social (including sexual exploitation and abuse (SEA) and gender-based violence (GBV)) oversight on infrastructure projects, Including experience implemented world bank or multi lateral funded projects.. S/he should have experience in working in sub-Saharan region.
Inspector of Works (3 No)	Shall have at least a 'Bachelor's Degree in Civil Engineering with at least two (2) years of relevant experience in pipeline and concrete works of similar magnitude and complexity, or a Diploma in Civil Engineering with at least eight (8) years of relevant experience in pipeline and concrete works of similar magnitude or other Technician qualifications in Civil Engineering with at least fifteen (15) years of relevant experience in pipeline and concrete works of similar magnitude and complexity.

The Level of Effort of professional staff to be provided by the Consultant is estimated at 313-person months for both phases of the assignment. Details are provided in Table 6 below.

Table 6: Person months for both phases of the assignment

Expert	**Person – Months**				**Total**
	Detailed Design	**Procurement of a Contractor**	**Construction Supervision**	**Defects Liability Period**	
Team Leader/Resident Engineer	10	1	36	2	49
Hydraulic/Network Modelling Engineer	5		0		5
Civil Engineer	8		72	2	82
Structural Engineer	5		10	1	16
Electrical/Renewable Energy Engineer	5		0	0	5
Electromechanical Engineer	2		6	1	9
Environmental, Health and Safety Expert	1		18		19
Social Development Specialist	1		18		19
Inspector of Works (3No)	0		96		96
Total	**36**	**1**	**276**	**7**	**299**

The estimated staff-months are indicative only. The consultant may propose an alternative level of effort, if it is supported by sufficient documentation in their proposal to show that it can successfully meet the 'assignment's objectives. The Team Leader/ Resident Engineer shall be full time on the assignment.

11 Environmental and Social Policy

The Consultant shall adhere to the 'Client's Environmental and Social Policy and the World Bank Environmental and Social Framework. The 'Works' policy goal is to integrate environmental protection, occupational and community health and safety, gender, equality, child protection, vulnerable people (including those with disabilities), sexual harassment, gender-based violence (GBV), sexual exploitation and abuse (SEA), HIV/AIDS awareness and prevention and wide stakeholder engagement in the planning processes, programs, and activities of the parties involved in the execution of the Works. The policy is sets out to the following commitments:

1. Apply good international industry practice to protect and conserve the natural environment and to minimize unavoidable impacts;

2. Provide and maintain a healthy and safe work environment and safe systems of work;
3. Protect the health and safety of local communities and users, with particular concern for those who are disabled, elderly, or otherwise vulnerable;
4. Ensure that terms of employment and working conditions of all workers engaged in the Works meet the requirements of the International Labour Organisation (ILO) conventions to which the host country is a signatory;
5. Be intolerant of and enforce disciplinary measures for illegal activities. To be intolerant of, and enforce disciplinary measures for GBV, inhumane treatment, sexual activity with children, and sexual harassment;
6. Incorporate a gender perspective and provide an enabling environment where women and men have equal opportunity to participate in, and benefit from, planning and development of the Works;
7. Work co-operatively, including with end users of the Works, relevant authorities, contractors and local communities;
8. Engage with and listen to affected persons and organizations and be responsive to their concerns, with special regard for vulnerable, disabled, and elderly people;
9. Provide an environment that fosters the exchange of information, views, and ideas that is free of any fear of retaliation, and protects whistleblowers;
10. Minimize the risk of HIV transmission and to mitigate the effects of HIV/AIDS associated with the execution of the Works;

For the purpose of the policy the term ""child"" / ""children"" means any person(s) under the age of 18 years.

12 Code of Conduct

The Consultant shall submit the Code of Conduct that will apply to the 'Consultant's Key Experts and Non-Key Experts, to ensure compliance with good Environmental, Social, Health and Safety (ESHS) practice. In addition, the Consultant shall submit an outline of how this Code of Conduct will be implemented. The successful Consultant shall be required to implement the agreed Code of Conduct upon contract award.

A satisfactory code of conduct will contain obligations on all 'Consultant's Experts that are suitable to address the following issues, as a minimum. The code of conduct shall contain a statement that the term ""child"" / ""children"" means any person(s) under the age of 18 years.

The issues to be addressed shall include:

1. Compliance with applicable laws, rules, and regulations
2. Compliance with applicable health and safety requirements to protect the local community (including vulnerable and disadvantaged groups), the 'Consultant's Experts, the 'Client's personnel, and the 'Contractor's personnel, including sub-contractors and day workers

(including wearing prescribed personal protective equipment, preventing avoidable accidents and a duty to report conditions or practices that pose a safety hazard or threaten the environment)

3. The use of illegal substances
4. Non-Discrimination in dealing with the local community (including vulnerable and disadvantaged groups), the 'Consultant's Experts, the 'Client's personnel, and the 'Contractor's personnel, including sub-contractors and day workers (for example, on the basis of family status, ethnicity, race, gender, religion, language, marital status, age, disability (physical and mental), sexual orientation, gender identity, political conviction or social, civic, or health status)
5. Interactions with the local community(ies), members of the local community (ies), and any affected person(s) (for example to convey an attitude of respect, including to their culture and traditions)
6. Sexual harassment (for example to prohibit use of language or behavior, in particular towards women and/or children, that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate)
7. Violence, including sexual and/or gender-based violence (for example acts that inflict physical, mental or sexual harm or suffering, threats of such acts, coercion, and deprivation of liberty
8. Exploitation including sexual exploitation and abuse (for example the prohibition of the exchange of money, employment, goods, or services for sex, including sexual favors or other forms of humiliating, degrading behavior, exploitative behavior or abuse of power)
9. Protection of children (including prohibitions against sexual activity or abuse, or otherwise unacceptable behavior towards children, limiting interactions with children, and ensuring their safety in project areas)
10. Sanitation requirements (for example, to ensure workers use specified sanitary facilities provided by their employer and not open areas)
11. Avoidance of conflicts of interest (such that benefits, contracts, or employment, or any sort of preferential treatment or favors, are not provided to any person with whom there is a financial, family, or personal connection)
12. Respecting reasonable work instructions (including regarding environmental and social norms)
13. Protection and proper use of property (for example, to prohibit theft, carelessness or waste)
14. Duty to report violations of this Code
15. Non-retaliation against personnel who report violations of the Code, if that report is made in good faith

The Code of Conduct shall be written in plain language and signed by each Expert to indicate that they have:

1. received a copy of the code;
2. had the code explained to them;
3. acknowledged that adherence to this Code of Conduct is a condition of employment; and
4. understood that violations of the Code can result in serious consequences, up to and including dismissal, or referral to legal authorities.

A copy of the code shall be displayed in the 'Engineer's office. It shall be provided in appropriate languages.