REPUBLIC OF MOZAMBIQUE
MINISTRY OF PUBLIC WORKS, HOUSING AND WATER RESOURCES

FUNDO DE INVESTIMENTO E PATRIMÓNIO DO ABASTECIMENTO DE ÁGUA

WATER SERVICES AND INSTITUTIONAL SUPPORT PROJECT II (WASIS II)

IDA Grant. D1100

DESIGN AND SUPERVISION OF DISTRIBUTION CENTER, BEIRA

Contract Nr. FIPAG/WASIS II/CON-24/18

TERMS OF REFERENCE

December 2019

TERMS OF REFERENCE
FOR
DESIGN AND SUPERVISION OF DISTRIBUTION CENTER, BEIRA

Contents

Acronyms

BoQ	–	Bill of quantities
BD	–	Bidding documents
CQS	–	Consultant Qualification Selection
DC	–	Distribution Centre
DLP	–	Defect Liability Period
DN	–	Nominal Diameter
ECO	–	Environmental Control Officer
EDM	–	Mozambique Electricity Company
EMP	–	Environmental management plan
ESHS	–	Environmental Health and Safety
ESMF	–	Environmental and social management framework
FIPAG	–	Water Supply Investment and Assets Fund
GBV	–	Gender Based Violence
GoM	–	Government of Mozambique
GIS	–	Geographic information system
HIV	–	Human Immunodeficiency Virus
IDA	–	International Development Association
MOHRH	–	Ministry of Public Works and Water resources
MITADER	–	Ministry of Environmental and Rural Land Development
O&M	–	Operation and Maintenance
PS	–	Pumping station
RPF	–	Resettlement policy framework
SEA	–	Sexual Exploitation and Abuse
UFW	–	Unaccounted for water
VOs	–	Variation orders
WTP	–	Water treatment plant

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DESIGN AND SUPERVISION OF DISTRIBUTION CENTER, BEIRA

1 BACKGROUND

1.1 General

The Republic of Mozambique has received a credit from the International Development Association toward the cost of the **Water Services and Institutional Support Project (WASIS II)**, and it intends to apply part of the proceeds of this credit to payments under the Contract for **Design Check and Supervision of Distribution Centers, Beira.**

The Government of Mozambique (GoM) is implementing reforms in the urban water supply sector aimed at improving coverage, quality and efficiency of services. The reform program has involved the reorganisation of sector Governance mechanisms, which have facilitated a transition towards decentralised water supply operations and management, including service regulation, investment planning, and private sector participation in operations.

The program for urban water supply also includes investments in rehabilitation and extension of systems. The GoM's implementation agency for the new urban water program is Fundo de Investimento e Património do Abastecimento de Água– FIPAG (Investment Fund and Water Supply Asset Holder).

FIPAG is responsible for the fixed assets of the city water supplies and for the future investment in the systems, including Beira. It has the mandate to ensure that the public receives an adequate and safe water supply that meets Mozambique standards for health and hygiene (the public service obligation), and is empowered to ensure these systems achieve autonomous, efficient and financially sustainable water supply operations.

The WASIS II Project, supported by the World Bank, has its objectives to:

(i) Improve the performance, sustainability and coverage of water supply services in the five cities of Beira, Dondo, Tete, Moatize and Pemba; and
(ii) Strengthen institutional and regulatory capacity for water supply services in the northern, central and southern regions of Mozambique.

1.2 Beira and Dondo Water Supply

The current water supply to Beira and Dondo cities are combined in one system. The source is the river Dingue-Dingue, a branch of the Pungue River, located over 80 km from downtown Beira.

The intake was designed with provision for an abstraction capacity of 90,000 m3/day although the existing pumps, electrical and mechanical fittings are for up to 60,000 m3/day. From the intake, dating 2007, a 12 km DN1000 pipeline transports the raw water to a sedimentation channel, prior to entering the water treatment facility.

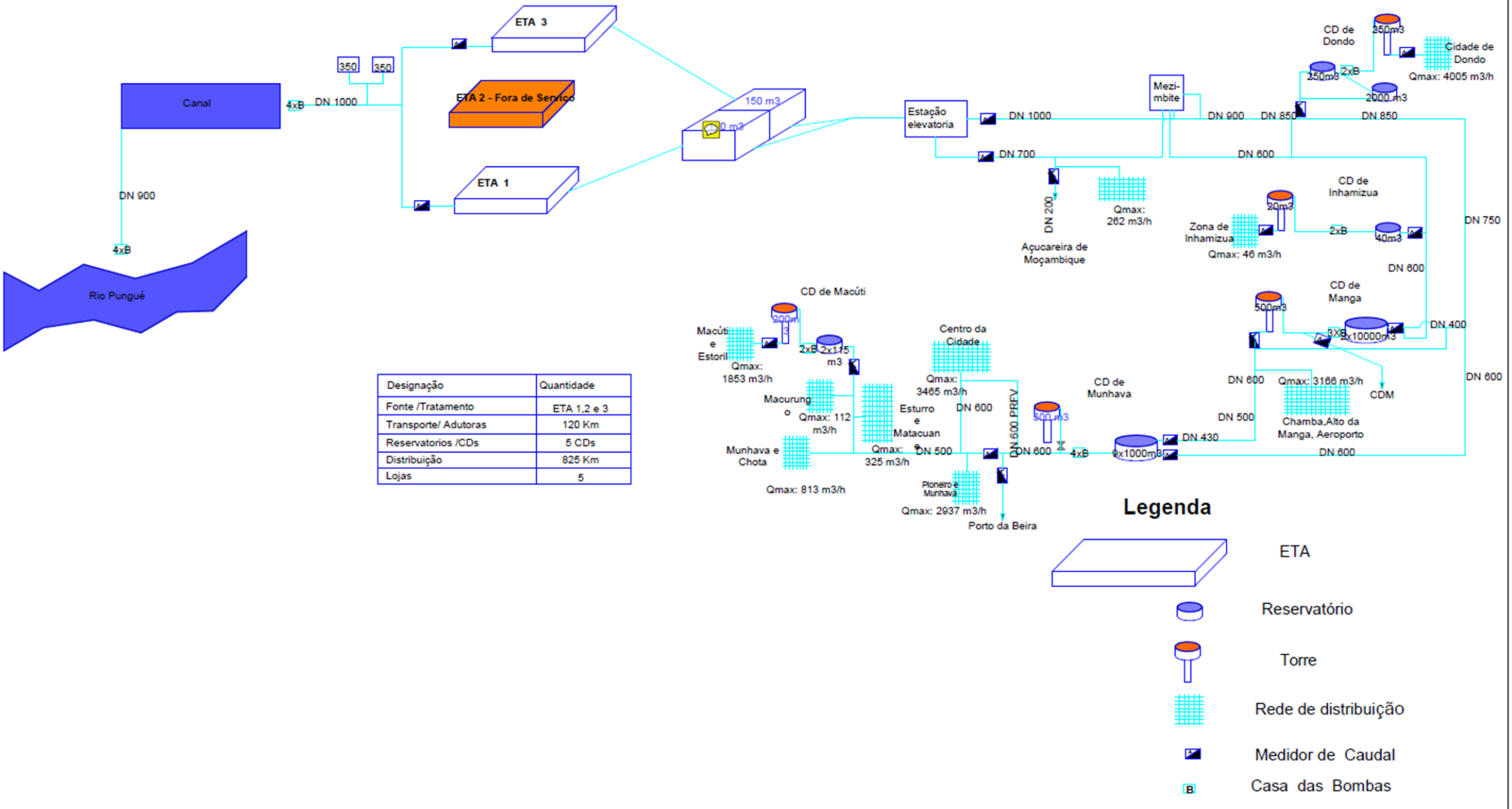
The actual production from the treatment plant is currently around 40,000 m^3/day, with a potential to increase capacity to around 60,000 m^3/day after the rehabilitation of ETA 1 and ETA 3.

From Mutua, a high lift pumping station brings the water to Mezimbite, the highest point on the transmission line from which it gravitates down to the various distribution centers before reaching Munhava, the main distribution center for Beira. The transportation of the treated water is done via two pipelines, a DN 1,000 mm Glass Reinforced Pipe (GRP) and DN 700 mm concrete pipe, both around 70 kms in length.

The distribution centers of Dondo, Inhamizua, Manga, Munhava, Mutua and Macuti are all equipped with ground reservoirs, pumping station and water tower. The secondary and tertiary distribution network system consists of approximately 910 km of network pipes and 66,292 active domestic connections, supplying industries, shops, schools, hospitals, municipal buildings and public stand posts. At present, the domestic coverage through individual connections and stand pipes is around 57%, leaving around 300,000 people that are not served by the system.

The schematic layout of the Beira Water System is reflected in the sketches on the next page.

Esquema do Sistema de Abastecimento de Água da Beira



Designação	Quantidade
Fonte /Tratamento	ETA 1,2 e 3
Transporte/ Adutoras	120 Km
Reservatorios /CDs	5 CDs
Distribuição	825 Km
Lojas	5

Legenda

- ETA
- Reservatório
- Torre
- Rede de distribuição
- Medidor de Caudal
- Casa das Bombas

FIPAG Região Centro	Área Operacional da Beira
Desenhou : Adelson José Manuel	Colaborou : Carlos Gomes Leite
	Escala : adimensional

1.3 Status of existing Macúti Distribution Center in Beira

The Macuti neighbourhood is supplied by a small DC built in 1960, fed from the Munhava DC. It is composed of two water towers of 100 m^3 each and two ground reservoirs of 230 m^3 in total. It supplies the neighbourhoods of Macuti and Estoril including the Beira Central Hospital and serves a population of 7.865. It only operates for two hours per day. This DC has limited capacity to supply the entire Macuti neighborhood and the pressures in the distribution network is low. There is an urgent need to expand the coverage to new areas including Estoril, Macurrungo, Macuti, Chota and Muave neighbourhoods, to increase the reliability of the services and to increase the hours of distribution from 2 to 14 h.

The population to be served by the Estoril DC and the water demand should be confirmed by the Consultant in consultation with the Contractor currently responsible for the design of the Beira network.

1.4 Status of the existing Distribution Centers in Beira

Nr.	Description	Status
1	Dondo DC	Consists of two ground reservoirs, one with 250m^3 of capacity and other with a capacity of 2000m^3, whose sill is 52.42m high. There is also an elevated tank with 250m^3, whose sill is at level 71.57m and a pumping station that transfers water from the two reservoirs to the elevated tank. The pumping station consists of two pumping groups (1 duty + 1 standby), with the flow rates of 250m^3/h and 350m^3/h and pump head of 25m.
2	Manga DC	Consists of two ground reservoir of 10,000m^3 each, which are at 13.0m of elevation. The water is pumped from this reservoir to an elevated tank of 500 m^3, through a pumping station consisting of 3 pumping groups (Q = 630 m^3/h, H = 33m).
3	Munhava DC	Consists of nine circular ground reservoir constituted of 1,000m^3 each, whose sill is at a level of 6.65 m. From this reservoir, the water is pumped directly to the network through a pumping station consisting of 4 pumping groups (3 duty +1 standby) with total capacity of 700 m3/h each. The DC has also a 500 m^3 elevated tank, whose sill is at 39.5m that worked as an air release system.
4	Macurrungo DC	Consists of four ground reservoirs plastic, with 5.0m^3 each of capacity. There is also an elevated tank with 100m^3, and a pumping station that transfers water from the two reservoirs to the elevated tank. The pumping station consists of two pumping groups (1 duty + 1 standby), with the flow rates of 20m^3/h.

These DCs are in different stages of need of rehabilitation of the mechanical and electrical parts, while the ground level storages at Munhava showed serious cracks in the reservoirs walls and ponding water around the reservoirs indicate a continuous outflow of water. All of these existing DCs should be included in the inspection and evaluation by the Consultant and all required rehabilitation should be addressed in the design. The points below summarize the expected type of interventions to be done under the rehabilitation of the existing DCs:

- Rehabilitation and repairs (waterproofing, plastering and paint) of existing building and reservoirs.
- Replacement of pumps, control panels and pipework's.
- Telemetry system incorporating measurement and transmission of data from water levels, flow rates and water quality (conductivity, residual chlorine, pH).
- Replacement of dosing system for disinfecting waters on entry to the Ground Reservoir.

2 GENERAL SCOPE OF SERVICES

2.1 Overview

The consultant will be required to provide engineering design and supervision services for the construction of a new distribution center in Estoril and rehabilitation of existing DCs in Beira as part of the key water supply investments. The works will be implemented by a construction Contractor. It is expected that the Consultant also do an assessment and give recommendations to FIPAG regarding the need of rehabilitation, abandon or upgrade of especially the existing Macúti Distribution Center.

2.2 Description of works contract

The work contract where the Consultant will be required to design and supervise the construction of a new DC in Beira will comprise the following components:

(i) Construction of a new distribution center in Estoril, including transmission main to supply water to the new DC.
(ii) Rehabilitation of existing DCs in Beira.

This works contract will comprise the construction of a new distribution center, at a position available to FIPAG in Estoril, to be confirmed by the Consultant, as well as the rehabilitation of the existing DCs in Beira and Dondo. These works will be based on an assessment by the Consultant of all existing DC in Beira and Dondo in order to identify all needs for rehabilitation. Proposals in this regard shall be included in the preliminary design report for evaluation by FIPAG in order to decide which rehabilitation work to include in the final report and bidding documents.

The construction works will include civil, mechanical and electrical works required to construct the new DC and to connect it to the existing system. The work will further consist of civil, mechanical and electrical rehabilitation work that could include the replacement of existing pumps, pipes, valves and fittings, etc., as well as power supply and power control boards.

The contract of the works shall be awarded through open International Competitive Procurement using World Bank Standard Procurement Documents. The construction period is approximately 12 months plus a 12 month Defect Liability Period. It is anticipated that the works contract will be signed in June 2022, following the preparation of the design and bidding documentation as well as the procurement of the works and all required approval from the Government of Mozambique and the World Bank.

2.3 Scope of Services

The overall scope of this consultancy assignment in Beira is to carry out, in consultation with FIPAG:

(a) Prepare Engineering Design and prepare bidding documents;
(b) Prepare clarifications to the bidding documents;
(c) Prepare bid evaluation report with FIPAG;
(d) The supervision of the rehabilitation and construction works of DC.

The Consultant's services will be required for the entire design and construction period, including inputs during the Defects Liability Period.

During Supervision the consultant shall act as the **"The Engineer" and "Engineer's Representative" or "Project Manager"** with authorities and responsibilities as defined in the works contracts and specifications. The supervision of the works on site and contract management activities shall be carried out in accordance with Contract Conditions and local legislation including the environmental and social safeguard´s framework.

2.4 Form of Contracts for Consultancy Services

The forms of Contract shall be lump sum for the engineering designs activities and time based for construction supervision and contract management. Two Consultancy Contracts will be awarded which cover the scope services described above, as follows:

Ref	Consultancy Contract Nr	Description	Form of Contract
1	FIPAG/WASIS II/ CON-24A/18	Design of new Distribution Center and rehabilitation of existing DCs, Beira	Lump Sum
2	FIPAG/WASIS II/ CON-24B/18	Supervision of Construction of new Distribution Center and rehabilitation of existing DCs, Beira	Time Based

The execution of the construction supervision and management will be conditioned by the completion of the phase 1 to the satisfaction of the Client.

The Consultant will be selected in accordance with the procedures set out in the World Bank's Guidelines: Selection and Employment of Consultant under IBRD Loans & IDA Credits & Grants by World Bank Borrowers, January 2011 and revised June 2014.

3 CONSULTANT'S DESIGN RESPONSIBILITIES

The Consultant's design responsibility is the design, preparation of bidding documentation as well as assistance during procurement of the works for the construction of a new DC at Estoril and the rehabilitation of the existing distribution centers, all forming part of the Beira water supply system. This responsibility will be discussed in more detail below.

3.1 General

3.1.1 Verification

The Consultant shall acquire, review and examine all the available data, information, records and reports for proper design and execution of works.

The Consultant shall verify design information provided by FIPAG, in the context of the projected yields of the water resources and projected water demands, including confirmation of suitability of the proposed site locations by FIPAG and infrastructure requirements, as well as consultation with other entities (municipalities, Mozambique Electricity Company (EDM) and the statistic institute etc.) regarding the proposed implementation plan to meet the stated objectives. The consultant shall verify investment plans and look for opportunities to optimize the proposed investments where possible, in close consultation with FIPAG.

3.1.2 Approvals and Licenses Related to this Assignment

The Consultant shall obtain all necessary approvals licenses and permissions to carry out their activities and maintain documentary records of such. This should include all necessary permissions from relevant authorities including the Ministry of Public Works Housing and Water Resources (MOPHRH), the municipalities of Beira and Dondo and the roads, telecommunication, electricity authorities, etc.

The designs must be to the approval of FIPAG and in compliance with relevant Mozambique regulations and international engineering standards.

3.1.3 Topographical surveys, inspections and benchmarks

Accurate detailed surveys tied to terrestrial reference points and geo-coordinates for all structures, roads and pipelines, with locations of all existing structures. Permanent benchmark stations with levels accurately related to mean sea level to be established within the site area together with subsidiary stations of sufficient durability at the sites of all main structures.

3.1.4 Geotechnical Surveys

Test pits, in-situ and laboratory testing including penetrometer, and moisture density tests are to be carried out under the direction of a geotechnical engineer as part of the consultant´s team for the new DCs. Copies of all reports and design recommendations are to be provided to FIPAG.

3.1.5 Technical Design

In carrying out the detailed design the Consultant shall:

- Inspect all relevant installations and components relatedto the existing DCs.
- Collate and verify all available data (including that provided by FIPAG), drawings and plans. The consultant shall be responsible for collecting all other data needed to complete the work.
- Provide the latest updated aerial photos which clearly illustrate the current situation and cover all the residential areas, for design base information.
- Consult with FIPAG and other authorities (including roads, telecommunications, municipalities, power supply, etc) as necessary. It is particularly important that the consultants ensure that the new works have a positive impact on the environment and aligns with the longer-term planning of other institutions.
- Carry out inspection, investigations, surveys and designs for all components of the new DC at Estoril including existing infrastructures that needs refurbishment.
- Be responsible for detailed assessment and identification of the rehabilitation works and planning for execution of works for minimal interruptions to water supply operations.
- In conjunction with FIPAG, define the construction works to be carried out to implement the project.
- Ensure optimisation of the available space on the stand of Estoril DC to allow room for additional infrastructure to be added in future, if possible.
- Consider the changes required to the networks in order to feed water to the new DC and supply the intended population from the new DC.
- Take account of the need for continuous supply of water from the system during rehabilitation;
- Take account of the health and safety of the occupiers of the site and buildings.
- Ensure designs comply with environmental and social safeguard policies.
- The design for the new DC as well as the rehabilitation of the other existing DCs must be submitted to the approval of FIPAG and consistent with the relevant Mozambican regulations.
- The Consultant shall be responsible to assess the status of all infrastructures in the Macuti DC and verify the need of decommissioning, rehabilitation or upgrade and also the integration of the new DC into the existing network.

3.1.6 Environmental and Social Assessment and Management Plan

The project was categorized by MITADER with category C, which is not necessary to prepare specific ESIA, however, the consultant shall prepare and submit for FIPAG review and approval the environmental and social management plan, with view to identify and manage the negative and positive environmental and social impacts of the project in the context of the project area. With consideration to technical issues and according to the specific locations of new works and methodologies to avoid or minimize environmental and social impacts. The environmental and social management plans should be in compliance with the WASIS II environmental and social management framework (ESMF), including appendices 3 and 4, and resettlement policy framework (RPF). Also, should prepare for review and approval, an abbreviated resettlement action plans (ARAP), in compliance with World Bank policies and procedures.

Additionally, the Consultant shall prepare and submit for FIPAG review and approval, a grievance redress mechanism in compliance with FIPAG WASIS II safeguards (ESMF and RPF) and a gender based violence specific mechanism to be used during the construction phase. The gender based violence should include the following risks areas but not limited to:

a) Sexual Exploitation and Abuse (SEA);
b) Workplace Sexual Harassment;
c) Human Trafficking;
d) Non Sexual Exploitation Abuse;

3.1.7 Occupational Health and Safety Plan

Utilizing appropriate specialists, the consultant should prepare the occupational health and safety plan to be applied to the construction and operational phases in compliance with all regulations and standard legally required hygiene, at work. With consideration to technical issues and according to the specific locations of new works and methodologies.

3.1.8 Bill of Quantities and Tender documentation

This documentation shall include the following:

- Quantify from the approved design drawings leading to and including detailed bills of quantities (BoQ) to an agreed standard method of measurement together with confidential cost estimates.
- Appropriate detailed technical specifications for all materials and workmanship requirements of the project to comply with quoted international standards.
- Drawings and other design information are to be in sufficient detail for tendering purposes and the construction of the works. Drawings are to be of a standard and range to be used for tendering and 'working drawings' for the construction phase including reinforcement placing drawings and bending schedules.
- Contractual clauses in accordance with the World Bank's procurement procedures.
- Cost estimated of the works;
- Priced bill of quantities.

All the above to be coordinated as bidding documentation.

3.1.9 Technical support for the bidding process

The Consultant is required to prepare the Bid Evaluation Report in coordination with FIPAG and recommendations in line with the World Bank standards and report layout as used by FIPAG, all completed to the satisfaction of the funding agency and FIPAG. The Consultant shall provide other technical support, including their response on technical requests for clarifications during the bidding/ procurement process as requested by FIPAG.

3.1.10 Design Backup

Subsequent to the completion of the final design documents and bidding documents and until the completion of the project implementation period, the Consultant will provide to FIPAG, a quick response design backup service. This will include answers to design queries, additional drawings and schedules as and where necessary for clarity or rectification of errors.

3.2 Design of the construction and rehabilitation of distribution centers (DCs) in Beira

Rehabilitation of existing DCs in Beira

The Consultant should evaluate in detail the status, operation and role of each of the existing DCs through site visits by specialist staff and through detail discussions with the operating staff to identify all needs for rehabilitation. This shall but not limited, used as information for the basis to make recommendations in the preliminary design report (which is the concept design with all proposed alternatives) on what is required to rehabilitate each of the existing DCs to optimize their performance and fulfill their intended role in the Beira and Dondo water system. The Client's comments on the draft design report will be based on a review of the proposed rehabilitations as well as instructions on which rehabilitations to include in the final design and tender documents.

Construction of new Distribution Centers at Estoril

It will also be required to plan and design one new DC, expected to be constructed on FIPAG's available land of 1800 m^2 in Estoril. However, the final suitability of this location will be decided based on the Consultant's assessment and recommendation. Technical recommendations should consider the location of this DC as much as possible.

If the available FIPAG land is proven to be suitable, the Consultant is required to optimize the available space and, considering future needs, present three alternatives in the preliminary design report for the most suitable arrangement for the Estoril DC for FIPAG's approval before the start of the design.

The Consultant will be required to confirm the design information provided by FIPAG regarding the proposed circular reservoir of 2,000 m^3 plus a water tower of 250 m^3 to improve the storage capacity and at the correct height for water pressure control, including facilities for the required chlorination. The system shall further include a pump station and the transmission main to connect the DC to the Munhava supply DC. The design shall be done in the context of the projected yields and distribution of the water resources and the projected water demands, including confirmation of suitability of the proposed site. The DC must also be equipped with a standby generator.

Structural design calculations, including foundations design, shall be certified by a registered Mozambican Engineer for the approval by the relevant authorities in Mozambique.

Ground Reservoir

Detailed structural design shall be done, including reinforcement and appropriate foundation solution, to Mozambican design standards, for a capacity confirmed by the Consultant of the ground reservoir at the new DC. The design must also include all necessary pipe work and fittings, chambers, drainage and access ways. The design must be to the approval of FIPAG and the relevant Mozambique regulations.

Water Tower

Detailed structural design shall be done, including appropriate foundation solution, to Mozambican design standards, for a water tower capacity confirmed by the Consultant. The shape of the water tower shall be approved by the Client before the start of design.

The height of the water tower is to be determined from the Consultant's hydraulic analysis and approved by FIPAG. The design must also include all necessary pipe work and fittings, chambers, drainage and access ways. A bypass of the tower and a proper space and connection to feed water trucks should be included.

Chlorination

The DC shall also provide for all requirements regarding chlorination, including dray and wet storage, mixing and dosing.

Pumping Stations

Detailed structural design is required, including reinforcement and appropriate foundation solution to Mozambican design standards, for a pumping station. The design must be to the approval of FIPAG and the relevant Mozambique regulations.

The design shall also include the detailed mechanical and electrical design of the new pump station with sufficient capacity. The design of the pumps and pumping system is to be determined from the Consultant's hydraulic analysis and approved by FIPAG. Positive suction for the pumps should be considered and the design shall ensure that no cavitation will be experience during operation. The pipework design shall provide for a bypass in order to supply water to either the tower or directly into the network.

No foot valves are allowed to be included in the design.

Design must include all electrical supply and ancillary equipment to run the stations. The design should include all works required to allow the power connection to the grid line under the responsibility of EDM, and it should form part of the works contract. This should include the review and replacement and, if necessary, of a new transformer as well as the extension of the grid line to the transformer, to be approved by EDM. The reliability of the power supply should also be investigated, as well as if a standby generator is required to ensure better reliability and longer hours or water supply.

Interface connection

Detailed design of the transmission main to connect the Estoril DC for supply from the Munhava DC, as well as the connection of the distribution network presently under construction, shall form part of this contract. The interface required with the contractor constructing the distribution network from the DC shall be obtain from the network design under the works contract for the network expansion which is being implemented by SUGEC.

Operational offices

The Consultant shall plan and design the operational building, considering that the build should be fully equipped with a service counter as per the needs of FIPAG Beira. The building shall be placed in such a way that the front with the public entrances are in line with the security fence of the DC. The public will therefore be able to enter the building without entering the security area of the DC. The preliminary design of the building should be submitted for discussion and approval of FIPAG before the final design is done.

House for technicians

Housing and working facilities with independent access for FIPAG will be provided on the premises. Layouts and the designs for one double story house with 3-bedrooms should be prepared by the Consultant. The preliminary design report, containing the layout and other details should be submitted for discussion and approval of FIPAG before the final design is done.

Ancillary Works

The Consultant will be required to include all ancillary work required for the safe and effective operation of the DC. This will include water plumbing and electricity supply where required, sanitation and storm water drainage, connections from DCs to the network, access roads sufficient for wet weather use, security fences and access gates, etc.

3.3 Additional Aspects Regarding the Design Responsibility

- The buildings should be equipped with dark grey aluminum windows and doors.
- Special space and access should be provided for delivery trucks in such a way to avoid interference with other access to the yard.
- The Consultant shall attend the 1st Site Meeting for Works Contract with the Contractor on site and the Consultant should produce minutes of these meetings.
- Where glass guards in stairs / verandas are needed, it should be dark grey colour.
- Pipes in the pumping station shall be preferably in ductile iron.
- The Design shall take in to consideration the operation and maintenance of the entire system.

4 CONSULTANT'S SUPERVISION RESPONSIBILITIES

4.1 General

To carry out the duties of "The Engineer" and "Engineer's Representative" or "Project Manager" as specified in the Conditions of Contract and Specifications. The Consultant shall also carry out the duties of the Environmental Control Officer, as specified in the Environmental Management Plan (EMP).

The Consultant is requested to supervise the implementation of the Environmental and Social Management Plan (ESMP) by the Contractor and advise FIPAG of any deviation from the all project safeguard instruments. Any deviation should be immediately informed to FIPAG. The consultant has no write to authorize any deviation.

Additionally, the consultant shall propose specific penalties in case of any deviation on the implementation of the ESMP and other relevant safeguard including the code of conduct

4.2 Regular Responsibilities

- The Consultant shall be responsible for the day-to-day supervision and contract management (including quality, time and costs control processes and procedures) for the civil works contracts listed above. This will include supervision of the construction and equipment installations, commissioning and hand-over of the Schemes, including defects liability period, in accordance with the Conditions of Contract, specifications, drawings, and revision of the ESMP, and applicable codes of conduct established by the contractor.
- The Consultant shall ensure that the Contractor orders materials and equipment to be used on the works timely including approving of specifications before and after the materials are received.
- As provided for in the works contract for the inspection and testing of equipment and material at the manufacturer's venue, the indicated representative(s) of the Engineer shall accompany the FIPAG team during the inspection and shall have the main responsibility to ensure that the correct test procedures are followed, confirm the range of acceptable and unacceptable results (before the start of the tests), interpret the test result and write the Inspection Report for submission to the Employer.
- The Consultant shall be responsible for preparing the inspection report of materials and equipment to be used on the works.

- The Consultant should ensure that the various contracts / works of the WASIS II Project and projects/studies funded by others are integrated and well-coordinated, including the introduction and operation of managing system / contract interfaces.
- The Consultant should plan and ensure the minimum disruption of the normal operation of the system and plan and get permission for any interruptions from FIPAG Operations in Beira and Dondo. Notification of interruptions must be given to the affected people if required.
- The Consultant shall be responsible for the supervision of the implementation of the ESMP during the construction phase.
- The Consultant shall be responsible for instructing and monitoring the Contractor regarding compliance with health and safety precautions and actions to comply with all the environmental and social requirements during construction, as specified in the ESMP and applicable codes of conduct.
- The Consultant shall maintain all necessary engineering and environmental records pertaining to civil engineering works of this nature, including but not limited to rainfall and other climatic conditions, contractor's manpower levels, minutes of meetings, photographic records, financial reconciliations, Environmental Method Statements etc.
- The Consultant shall monitor the contractor's work progress including especially the timely procurement of material/equipment in accordance with the contractual program and will arrange, chair and take minutes of regular progress meetings.
- The Consultant shall review all payment applications and approve all eligible payments for the Employer's action and will maintain and submit to the Employer reconciliations of payments and cost predictions to the end of the scheme.
- The Consultant shall manage all engineering and environmental variations orders (VOs) to the Contract by identifying the need for variation as soon as possible and agree, as far as possible, with the Contractor on the time and cost implications before issuing the VO instruction. It is further required that the Consultant inform FIPAG and submit all documentation including a motivation of the VO to FIPAG for their 'no-objection' before the VO is issued.
- With regard to cost management, the Consultant shall monitor and ensure that the works are completed, commissioned and handed over to the Employer within the contract amount, but also monitor and pursue that invoice payment will be processed and paid out within the times allowed in the conditions of contract. In this regard a cash flow proposal shall be compiled and handed in by the contractor and the Consultant, on a monthly basis, compare actual expenditure against proposed expenditure and highlight any abnormal deviations between the two. Furthermore, the Consultant shall constantly monitor the cost of claim, variation order (VOs) and major quantity deviations against the amount provided in the contract as contingencies. Any abnormalities or possible overspending shall be brought to the Employers attention.
- The Consultant shall, in advance, inform FIPAG of any potential VO that can lead to cumulative contract amount exceeding any percentage of the agreed contract amount. The Consultant shall in any circumstances issue any VO leading to an amount higher than the above the contract amount without prior approval by FIPAG.
- The Consultant should report all actual or threatening conflict or difference of opinion between them and the Contractor to FIPAG in all events where it could have a negative impact on the completion of the project.
- Where construction work was not done in accordance with the specifications or standards, the consultant shall be responsible to approve/reject the repairs and repair methodology done or proposed by the Contractor and obtain specialist inputs on the repair methodology if required.
- The Consultant shall manage all claims submitted by the Contractor and make recommendations to FIPAG on the preferred resolution of the claim.
- The Consultant shall ensure that the Contractor's guarantees, sureties and insurances are valid at all times during construction and that their validity are timely extended if required.

4.3 Consultant´s responsibilities towards environmental, social, health and safety (ESHS)

4.3.1 Ensure that the contractor's ESHS performance is in accordance with good international industry practice and delivers the Contractor's ESHS obligations

The ESHS related services include but are not limited to:

- Review and approve ESHS provisions of method statements, implementation plans, GBV/SEA prevention and response action plan, drawings, proposals, schedules and all relevant Contractor's documents;
- Review and consider the ESHS risks and impacts of any design change proposals and advise if there are implications for compliance with, ESMP, consent/permits and other relevant project requirements;
- 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 and applicable codes of conduct, with and without contractor and/or client relevant representatives, as necessary, but not less than once per month;
- 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 and applicable codes of conduct;
- Check that the contractor's actual reporting (content and timeliness) is in accordance with the Contractor's contractual obligations;
- 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;
- Ensure any GBV/SEA instances and complaints that come to the attention of the consultant are registered in the grievance redress mechanism.

4.3.2 Environmental and Social Policy

<u>For supervising civil works contracts:</u>

The policy shall include a statement that, for the purpose of the policy and/or code of conduct, the term "child" / "children" means any person(s) under the age of 18 years.

The policy should, as far as possible, be brief but specific and explicit, and measurable, to enable reporting of compliance with the policy and reporting requirement. As a minimum, the policy is set out to the commitments to:

- Apply good international industry practice to protect and conserve the natural environment and to minimize unavoidable impacts;
- Provide and maintain a healthy and safe work environment and safe systems of work;
- Protect the health and safety of local communities and users, with particular concern for those who are disabled, elderly, or otherwise vulnerable;
- Ensure that terms of employment and working conditions of all workers engaged in the Works meet the requirements of the ILO labor conventions to which the host country is a signatory;
- 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;
- 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;

- Work co-operatively, including with end users of the Works, relevant authorities, contractors and local communities;
- Engage with and listen to affected persons and organizations and be responsive to their concerns, with special regard for vulnerable, disabled, and elderly people;
- Provide an environment that fosters the exchange of information, views, and ideas that is free of any fear of retaliation, and protects whistleblowers;
- Minimize the risk of HIV transmission and to mitigate the effects of HIV/AIDS associated with the execution of the Works.

The policy should be signed by the senior manager of the Consultant. This is to signal the intent that it will be applied rigorously.

4.3.3 Code of Conduct

A minimum requirement for the Code of Conduct should be set out by the Consultant, taking into consideration the issues, impacts, and mitigation measures identified, for example, in:

- Project reports e.g. ESIA/ESMP;
- Any particular GBV/SEA requirements;
- Consent/permit conditions (regulatory authority conditions attached to any permits or approvals for the project);
- Required standards including World Bank Group EHS Guidelines;
- Relevant international conventions, standards or treaties, etc., national, legal and/or regulatory requirements and standards (where these represent higher standards than the WBG EHS Guidelines);
- Relevant standards e.g. Workers' Accommodation: Process and Standards (IFC and EBRD);
- Relevant sector standards e.g. workers' accommodation;
- Grievance Redress Mechanisms.

The types of issues identified could include. risks associated with: labor influx, spread of communicable diseases, sexual harassment, gender-based violence, illicit behavior and crime, and maintaining a safe environment etc.

A satisfactory code of conduct will contain obligations on all Consultant's Experts that are suitable to address the following issues, as a minimum.
Additional obligations may be added to respond to particular concerns of the region, the location and the project sector or to specific project requirements. 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 include:

- Compliance with applicable laws, rules, and regulations;
- 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);
- The use of illegal substances;
- 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);

- 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);
- 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);
- 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;
- 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);
- 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);
- Sanitation requirements (for example, to ensure workers use specified sanitary facilities provided by their employer and not open areas);
- 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);
- Respecting reasonable work instructions (including regarding environmental and social norms);
- Protection and proper use of property (for example, to prohibit theft, carelessness or waste);
- Duty to report violations of this Code;
- Non-retaliation against personnel who report violations of the Code, if that report is made in good faith.

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

- Received a copy of the code;
- Had the code explained to them;
- Acknowledged that adherence to this Code of Conduct is a condition of employment; and
- 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 Project Manager's office. It shall be provided in appropriate languages.

4.4 Responsibilities at Completion and Commissioning

- The Consultant shall ensure that the construction drawings are reviewed before the submission to the Client.
- The Consultant shall supervise and approve the commissioning before completion certificates are issued.
- Before and during the defects liability period the Consultant shall be responsible for the issuance of defects lists and the supervision of remedial works by the Contractor.
- The Consultant shall ensure the provision of and take delivery of all "as-built" drawings, specifications, and certificates of testing relating to the completed projects and hand them to FIPAG.
- On satisfactory completion of the scheme, the Consultant shall issue all necessary documents of completion.

5 OUTPUTS

The required outputs are summarized in the tentative table below and detailed afterwards:

Ref.	*Design Stage*			
	Output Documents	**Target date from start date (SD)**	**Format**	**Nr.**
1	Inception report	30 days after SD (SD + 1 month)	CD with PDF, MS Word, MS Excel.	1
			Hard copy	1
2	Preliminary design report	90 days after SD (SD + 3 months)	CD with PDF, MS Word, MS Excel and Drawings.	2
			Hard copy	3
3	Detailed design report	150 days after SD (SD + 5 months)	CD with PDF, MS Word, MS Excel and Drawings.	2
			Hard copy	3
4	Bidding documents including drawings	180 days after SD (SD + 6 months)	CD with PDF, MS Word, MS Excel and Drawings.	1
			Hard copy	1
5	Bid evaluation report	420 days after SD (SD + 14 months)	CD with PDF, MS Word, MS Excel and Drawings.	1

Ref.	*Supervision stage*			
	Output Documents	**Target date from start date (SD)**	**Format**	**Nr.**
1	Quality assurance plan	Within 2 months from site handover	Hard copy	1
2	Monthly supervision progress report	Monthly by 7th of the next month	Hard copy	1
3	Inspection report of materials	Within 7 days after the inspection	Hard copy	1
4	Environmental, Social Health and Safety Monthly Report including GBV/SEA	Monthly by 7th of the next month	Hard copy	1
5	Completion report	Within 4 weeks from handover	Hard copy	1
6	Final report	Within 4 weeks from end of DLP.	Hard copy	1

5.1 DESIGN – Specific Outputs

- **Inception Report(s)**

The Report should confirm the status of the Beira and Dondo water system with special attention to the distribution centers, identifying any changes in circumstances, potential problems which might affect the progress of the assignment.

The Consultant shall reflect his understanding of the services to be rendered, the methods to be followed, the staff to be allocated and the time required to complete the service. Description should address the "design components".

The report should also include a preliminary implementation program and recommendations on design principles and criteria to be presented to FIPAG before the submission of the preliminary design report, including a tentative table of contents to be followed. The report shall be presented and discussed at FIPAG office in Maputo before the submission of the report.

The Consultant shall submit an **Inception Report** in **1** hard copy and an electronic copy on CD.

- **Preliminary design report** with auditable calculations and copies of test data and survey reports. Preliminary Design Report shall include a table of contents and cover but not limited to:

a) Assumptions and Design Criteria for the construction of the Distribution Centre

A summary of all assumptions and design criteria to be used in the design of the new Estoril DC regarding issues including design horizon stated in section 3.2.2, people per household, types of users, water consumption per type of user, UFW percentages, minimum and maximum operating pressures, peak factors, storage requirements, pumping and standby approach, standardization, etc.

- Alternatives and recommendations for the new DC: Placement, size and height of ground reservoir and elevated tower, pumping station, Alterations to the primary network, etc.
- Alternatives /recommendations on chlorination needs and capacity.
- Proposed electricity supply, the need for a standby generator, control boxes and weather protection of pump controls.
- Alternatives and recommendations regarding control, monitoring and telemetry.

b) Design of rehabilitation of existing Distribution Centers

- Findings regarding evaluation of existing DCs through the examination and investigation the DCs structures and pipework and identify works and equipment for control of water operations and minimization of water losses at the sites.
- Options and recommendations for rehabilitation and/or extension of the existing DCs (civil and electromechanical components) based on guidelines provided by FIPAG, from own observations based on a scientific point of view, as well as detail discussions with operating staff. Design considerations regarding pressure zones and need/recommendations for district metering / NRV management shall be considered as part of the rehabilitation of the existing DCs.
- Alternatives /recommendations on chlorination needs and capacity.
- The need for a standby generator, control boxes and weather protection of pump controls.
- Alternatives and recommendations regarding control, monitoring and telemetry.

The report shall include the following for each component:

- An overview of the criteria to be used in the design.
- The environmental and social impact assessment of the proposed works and prepare mitigation measures and management plan in accordance with Project guidelines.
- The results of various analyses and surveys and its conclusion.

- Population growth and water demand for the Estoril DC supply area.
- A presentation of the preliminary design to the relevant stakeholders.
- A tentative work plan for the implementation of the works.
- Cost estimates for the various recommended components of the proposed work.

The report shall be prepared for 20 years design horizon (2039) for the DC. Due to the source limitation to satisfy the 2039 demand immediately, the Consultant will have to develop the design in order to allow construction of the distribution center in two phases. The first phase shall satisfy the horizon up to 2029 while the second phase shall satisfy the 2039 horizon. This shortfall will be handled through the limiting of the hours of operation of the DC. This will enable a more realistic sizing of the DCs for the future phase of investments in line with the source and network development.

A workshop with FIPAG staff and other relevant stakeholders shall be well prepared, arranged and presented by the Consultant, in Beira, to discuss the assumptions, design norms and recommendations of the preliminary report. All arrangements shall be at the Consultant's cost. These technical presentations shall highlight rehabilitation needs, design issues, technical difficulties and proposed solutions as well as cost and program implications. The presentation should include MS PowerPoint slides, colored drawings in 3D views and formal handouts, as necessary.

The preliminary design report (approved version) is required within **3 months** from commencement date of the contract.

The Consultant shall provide three hard copies of the final reports will be delivered to the Client together with two complete electronic versions on a CD, one in the PDF format for possible reproduction to interested parties or the public and one in the MS Word for text and MS Excel for tabular and financial data plus updated aerial photos covering all residential areas. The drawings and maps shall be submitted in electronic format compatible with AutoCAD and ArcGIS in 3 hard copies A1 size, respectively.

- **Detailed design report** with auditable calculations:

Design reports shall be based on feedback received on the preliminary design report and shall cover (but not be restricted to):

- The clear definition of the accepted design criteria.
- The results of various analyses and surveys and its conclusion, as accepted,
- Detail drawings, maps, schemes, specifications, etc.
- A tentative work plan for the implementation of the works, avoiding interruption of water supply.
- Cost estimates.
- A presentation of the detailed project at FIPAG head office in Maputo.

Details for the installation of the various fittings are to be provided as required, for approval. Every typical detail prepared by the Consultant should have a unique code number. In the detailed drawings to be prepared by the Consultant, reference should be made to these code numbers to indicate the application of this specific fitting at the indicated location. Typical schematic and other details should be provided.

The design must be based on the specifications, international standards and actual site data obtained from detailed site surveys. The draft detail designs report submitted for client's comments or approval must be accompanied by certification by a registered engineer in the relevant discipline. The client or its representative may ask for corrections and changes in the design based on the actual site conditions or other evident parameters. The consultant will be liable for the correction of any such proposed changes to the draft detail design report free of additional cost.

The draft and final detailed designs including drawings are required to be submitted for approval within **4 and 5 months** of commencement date respectively.

The Consultant shall provide 3 hard copies of the final reports will be delivered to the client together with two complete electronic versions on a CD plus one in the PDF format for possible reproduction to interested parties or the public and one in the MS Word for text and MS Excel for tabular and financial data plus updated aerial photos covering all residential areas. The drawings and maps shall be submitted in electronic format compatible with AutoCAD and ArcGIS and in 3 hard copies A1 size, respectively.

- **Bidding documents (BD)** in hard copy and electronic format in MS Word, Excel, AutoCAD, files:
  - Contractual conditions, bill of quantities, project specifications; all compatible with the conditions of contract.
  - The un-priced bill of quantities of the bidding document must be made available to all bidders in an excel format and it shall be required that bidders submit a CD with the filled BoQ together with the hard copy of their bidding documents that should include the same BoQ in printed format. This will be used by the Consultant for checking the calculations for correctness and to evaluate pricing trends and major deviations
  - Technical specifications, compatible with current practice in Mozambique and the specific requirements of FIPAG.
  - EMP. This report shall follow the FIPAG generic EMP and the ESMF and RPF guidelines prepared for the project.
  - RAP, in compliance with national legislation and World Bank policies and procedures.
  - Drawings to working drawing standard and range:
  - In hardcopy (2 copies) and also electronic format for use in tender documentation.
  - Project drawings to working drawings standard. All setting out, architectural, structural and service drawings, schedules and details necessary for the construction of the project are to be provided to the approval of FIPAG.
  - Preamble and bill of quantities.
  - A cost estimate for the works by pricing the bill of quantities per item.

The bidding document is required within **6 months** of commencement date of the contract (approved version).

- **Bid evaluation report** on the tenders received for the implementation, in accordance with World Bank requirements following FIPAG's layout and format. The Consultant evaluation team shall be composed by 2 experienced people to be approved by FIPAG 2 months before the preparation of the bidding documents together with one FIPAG representative. The Consultant team should have at least 5 years' experience in preparing evaluation reports for World Bank financing projects.

  The evaluation report should be prepared at FIPAG head office in Maputo within 7 working days, which means that the consultant should be in Mozambique exclusively for that purpose.

5.2 SUPERVISION– Specific Outputs

- The Consultant shall submit a quality assurance plan/quality management system for the service consisting of a document, constructed by the project team in accordance with ISO 9001 or similar, meant to ensure the final products are of the utmost quality.
- The convening of an initial meeting with the Contractor and the production of an outline program for the implementation and completion of the schemes. The outline program is required to demonstrate the feasibility of completing the works on time and will not relieve the

Contractor of his obligation to prepare and submit a detailed contractual program in terms of the conditions of contract.

- Agendas for the monthly progress meetings to be circulated to all participants no later than 4 days before the scheduled meeting. The agenda should also contain the important points discussed during the supervisor/contractor's weekly meetings, the important issues from the Contractor's monthly report as well as the unresolved issues standing over from the previous monthly meeting.
- The submission of monthly progress reports to FIPAG in a format and with content agreed with FIPAG, no later than the 7th day of the following month.
- The issuance of all certificates for payment to FIPAG including any necessary variation orders, pre- approved by FIPAG.
- The management of any claims arising from the works and the recommendation of the preferred resolution of the claim to FIPAG. This should include a cumulative summary of the financial and time impact of these claims and variations on the contract.
- The management and recording of all events that could result in the Contractor's request for extension of time.
- The issuance of certificates of substantial completion at the start and certificates of completion at the end of the defect liability period.
- The receipt, checking and handing over of all "as-built" drawings, specifications and certificates of testing relating to the completed works.
- The submission of general operation guidelines.
- The completion of hand-over certificates signed by the water operator, FIPAG, contractor and the consultant.

The Consultant shall submit the following Reports (3 hard copies plus one electronic copy in an agreed format) during the Supervision stage:

(a) Quality assurance plan

The quality assurance plan (QAP) shall be submitted to FIPAG **2 months** after the commencement of the construction supervision phase shall include all quality related elements of the contract to be controlled as well as the clear description of when and how QA shall take place, who should inspect/test, who should review and who should approve each element.

This QA plan shall start with the detail regarding the testing of material and equipment to be provided by their manufacturers, including their inspection and verification of all specifications against technical requirements. The QAP shall provide for the approval off all material on site, including the correctness of their size, materials and finishes as well as their unloading and storage in accordance with requirements.

The next element is to ensure that all works are done in accordance with specifications, including soil compaction, concrete mix design, slump tests, cube tests, reinforcing, spacing and cover. The quality control should include the submission and approval of shop drawings for both temporary and permanent works.

The final element of the QAP, is the testing of the completed works for elements like pressure resistance, water tightness and functionality. This should include all mechanical, electrical and telemetric works as applicable and all other final inspection and handover requirements.

(b) Inspection Report

The inspection report shall start with a summary of the works contract, stating all equipment and material that requires and will be inspected and tested, followed by the inspection and testing program. This will be followed with detail of the inspection and testing procedures per item to be inspected and tested. For each item there will be a reference to the required ISO (or similar) standards, the applicable specifications as per the contract, a summary of the applicable ISO (or similar) testing methodology with the required test results values and the acceptable tolerances. (This part of the inspection report shall be prepared and shared with the FIPAF team before departure). The remainder of the report shall be finalized and submitted within 7 days after the teams return. It shall add a description of the actual test procedures followed and the results recorded. The consultant shall then address his findings regarding the procedures and acceptability of the results. In the event of failed tests, the way forward shall be described. That can include adjustments on site and retest, up to total rejection of the material and equipment.

(c) Monthly progress report

A brief, concise report format for monthly progress reports will be prepared by the Consultant and agreed with FIPAG during contract negotiations. These reports shall be prepared monthly and contain a brief statement of work carried out in the preceding month. Any problems encountered or findings that might affect the agreed approach and work program shall be highlighted together with proposals of the necessary changes that might be required to achieve the objective of the study.
A schedule of the work to be performed in the following month, a statement of expenditure both committed and forecast as well as the disbursement position shall also be included.

During the construction phase, the progress reports will consist of separate section for each works component (DCs and network) of the contract and will reflect Contractor's monthly payments and provide a means of closely monitoring and forecasting implementation costs and time for completion. The monthly reports shall as a minimum present the progress of the works against the contractual program, environmental management issues, summary of payments, a schedule of claims and potential settlement, cost predictions to the end of the scheme.

Monthly reports shall be delivered to FIPAG within **one week** from the end of the month being reported on.

(d) Minutes of meetings

The Consultant shall submit, to FIPAG, the minutes of all applicable meetings within **7 days** after the event.

(e) Environmental, Social, Hygiene, Health and Safety Monthly progress report

A brief, concise format for ESHS monthly progress report will be prepared by the Consultant and agreed with FIPAG during contracts negotiations. The ESHS report shall be prepared monthly and contain all relevant information related to the implementation of the EMP and Hygiene, Health and Safety Management Plan including all regular audits and regular inspections report, community liaison's records, monitoring findings and other ESHS related documentation, as necessary to confirm the contractor's compliance with ESHS requirements.

(f) Completion report

A completion report shall be prepared by the Consultant and submitted to FIPAG with as-built drawings, prepared by the implementation contractor and reviewed and approved by the Consultant. The completion report of the works contract shall be delivered to FIPAG within **four weeks** from the date of handover of the contract.

Defects Liability Period

The Consultant shall assist FIPAG during the defect liability period according to the conditions of contract, securing all post-construction activities up to the final acceptance of the works, at the end of the liability period. The performance of the Consultant shall include:

- Supervision of project completion.
- Corrective measures.
- Final testing and inspection.
- Verification of project results.
- Finalization of schedules.
- Preparation of completion certificates.
- Final reporting on project activities including project financial costs.

(g) Final Report

The final report shall be prepared following the completion of defects liability period (12 months) of the contract. It shall include a summary of works and details of the performance certificate and the final payment certificate.

6 QUALIFICATIONS AND RESOURCE REQUIREMENTS

6.1 Consultants qualifications

The Consultant shall be a reputable civil engineering consultancy firm with at least 20 years' experience in water engineering which at least 10-year experience that includes various design, rehabilitation and supervision of urban water distribution centers. The consultant should be fully conversant with World Bank procurement documents and safeguards, FIDIC conditions of contract and the design and supervision of projects in developing countries

Details of expertise required are presented below. Inclusion of local consultants in the Consultant team is encouraged.

6.2 Level of Effort

Design Services

The Consultant shall propose appropriate qualified and experienced full and part-time staff and time inputs for the assignment, but it is anticipated that the following key personnel will be required as well as draughtsman and technicians.

The professional inputs required for the design phase is estimated at **9.0 person-months**, excluding support staff. The estimated requirements for key staff are as detailed in the table that follows:

Position	Description	Level of Effort (person-month) per element
		DC
Design Team Leader/Hydraulic Specialist	Qualified water engineer with master's degree in water engineering, hydraulics, civil engineering or equivalent, 15 yrs of cumulative experience in water engineering, of which 10 years of design and supervision of distribution centers. The candidate should demonstrate at least 3 projects of similar nature and size and at least 5 years' experience in developing countries.	
Civil/ Structural Engineer with geotechnical expertise	Qualified civil engineer with degree in civil or structural engineering, 10 years of cumulative experience in structural design of rehabilitation and construction of water retaining structures, including foundation design in urban DCs, consisting of ground reservoirs, towers and pumping stations. The candidate should demonstrate at least 3 projects of similar nature and size and at least 5 years' experience in developing countries.	
Electromechanical Engineer	Qualified electromechanical engineer with degree in electromechanical or electrical or mechanical engineering, 7 years of cumulative experience in design and supervision of electromechanical installation on DCs. The candidate should demonstrate at least 3 projects of similar nature and size and at least 3 years' experience in developing countries.	
Environmental Specialist	Must have degree in environmental engineering or equivalent, 10 years' experience in environmental assessment of engineering projects involving working with World Bank safeguards, of which 7 years should be in water supply projects. At least 3 years' experience in developing countries, preferable including working with Mozambican Environmental legislation.	
	Total	**9.0**

It should be noted that an individual can be offered for more than one position if he/she meets all qualifications and experience and can produce the service within the stated time limit.

Supervision Services

The Consultant shall propose appropriate qualified and experienced full and part-time staff and time inputs for the assignment but it is anticipated that the following key personnel including inputs for defects liability period will be required:

Position	Description	Level of Effort (person-month) per element
		DC & Network
Resident Engineer (Team Leader & Hydraulic) – Full time on site	Qualified engineer with master's degree in civil or hydraulic engineering, 15 years cumulative experience, of which 10 years in water engineering including construction of DCs and distribution network, 5 yrs experience of construction in developing countries.	
Assistant of Resident Engineer (Structural & Geotechnical) – Full time on site	Qualified engineer with master's degree in civil or Structural engineering, 10 years cumulative experience, of which 7 years in water engineering including construction of DCs water retaining structures including geotechnical investigation and foundation design as well as 5 yrs experience of construction in developing countries.	
Electromechanical Engineer	Qualified electromechanical engineer with degree in electromechanical or electrical or mechanical engineering, 10 years cumulative experience, of which 7 years' experience in design and supervision of installation of pumping systems. At least 5 yrs experience of construction in developing countries.	
Environmental Control Officer - Full time on Site	Qualified environmental engineer with environmental engineering or equivalent, 7 years cumulative experience, of which 5 years in water supply projects, good knowledge of national environmental legislation and environmental safeguard policies of the World Bank.	
	Total	**32.0**

The estimated number of professional staff-months required for the 9-month supervision assignment, excluding supervisors, clerks of works, draughtsman and support staff is **32.0 person-months** including the defects liability period. All key staff shall be able to communicate effectively in English.

The supervisors are not considered as key staff. Their CVs should be approved before the start of supervision part of the contract in order to ensure that they meet the minimum requirements for water supply works. At least 2 inspectors are required during the execution of the works, being one for the new DCs, and one for rehabilitation of DCs.

The resident engineer and environmental control officer should be full time on site during the construction period. Inputs for resident engineer should include one month for supervision of the defect liability period.

The Consultant shall show clearly and separately in their technical and financial proposals, the inputs proposed for the 12 months defects liability period.

"Developing countries" is a term used by the United Nations to mean countries from developing regions. The developing regions are Africa, Asia (excluding Japan) and Latin America and the Caribbean, as well as Melanesia, Micronesia and Polynesia.

7 OTHER REQUIREMENTS AND CONSIDERATIONS FOR THE SERVICES

7.1 General Reporting Requirements

All documents, correspondence, instructions, communications, etc. related to the project shall be in English and environmental related submissions translated to Portuguese where required. This principle shall apply to the employer, consultant, suppliers, contractors and any other associated party.

All other reports shall first be submitted in draft form for review and comments. When all of the client's comments have been attended to the client's satisfaction, four hard copies of the final reports will be delivered to the client together with three complete electronic versions on a CD, one in the PDF format for possible reproduction to interested parties or the public and two in the MS Word for text and MS Excel for tabular and financial data. The drawings and maps shall be submitted in electronic format compatible with AutoCAD and ArcGIS, respectively.

Draft reports shall be submitted in English. The final detailed design review report should be presented as two A4 size volumes (executive summary and main report) accompanied by separate volumes of appendices together with a set of A1 size drawings.

The Consultant will report formally to FIPAG's Director General, Mr. Pedro Paulino, or his designated representative, and liaise informally with the FIPAG's Project and Investments Director and his designated representative and counterpart.

7.2 Specials Reports

Additionally, to the above-mentioned reports, the Consultant shall prepare the following special reports:

- Report on quality tests on construction materials and performance tests on installed equipment.
- Reports on witnessing of tests on equipment, performed by the manufacturer.
- Advising on the issue of any temporary acceptance certificates.
- Variation order justifications and claims management
- The consultant shall prepare a detailed work program, broken down to individual tasks and indicating the contributions by all study personnel, that identifies the report milestones in his design program developed, which shall include due dates (both drafts and final) shall be outlined. Any proposed changes to the selected due dates during the course of the work shall be subject to the approval of the FIPAG.
- The timing of key reports, starting from the date of commencement of work, is given in the table 1 below, including fifteen days for client comments on each report.

7.3 Tentative Timing and Planned Implementation Schedules

It is planned that the contracts for design and supervision will be signed, started and completed as per the dates set out in the table below.

Description	Contracts for Design and Supervision Signed	Services Start Date for Design	Design Completed		Services Start Date for Supervision	Supervision/ Works Completion Date
			Design	Works Procurement (preparation of BER included)		
Construction of distribution centers, Beira	February 2021	March 2021	**7 months:** October 2021	**7 months:** October 2021 – May 2022	June 2022	June 2023

The duration presented above for the design (excluding the procurement phase for the works contract) includes the comments and approvals by FIPAG. The preparation of the bid evaluation report is included under the procurement stage.

The durations of the various tasks are planned to be as reflected above, but the actual time required will also depend on the performances of the appointed consultants and contractor. The 365 days of DLP shall be included after completion.

7.4 Payments

Contract Nr FIPAG/WASIS II/ CON-24A/18: Design of Rehabilitation and Construction of Distribution Centers, Beira

Payments shall be made on the basis of an agreed percentage of the total lump sums for each completed milestone of the assignment. The relative milestone payments in proportion to the total sum for the assignment are given below:

Milestone (After Approval by the Client)	**DC´s**	**Milestone Date**
Start date	-	SD
Advance payment	10%	On submission of Bank Guarantee
Inception report including presentation in Maputo.	10%	30 days after SD (SD + 1 month)
Preliminary design including workshop in Beira	20%	90 days after SD (SD + 3 months)
Detailed design	30%	150 days after SD (SD + 5 months)
Bidding documents	20%	180 days after SD (SD + 6 months)
Bid evaluation report	10%	420 days after SD (SD + 14 months)
Total	**100.0%**	

Contract No. FIPAG/WASIS II/ CON-24B/18: Supervision of rehabilitation and construction of distribution centers, Beira

This will be a time-based assignment for the provision of supervision services. Payment will be based upon a time-based staffing schedule related to the construction contracts duration. Variations will be permissible based upon actual circumstances related to the execution of the contracts with the pre-agreement of FIPAG. Payments will be made following approval of consultant's invoices which are to be submitted on a monthly basis.

APPENDIX A to the TOR

SERVICES, FACILITIES AND PROPERTY MADE AVAILABLE TO THE CONSULTANT

Design and Supervision of Distribution Center, Beira

Contract Nr. FIPAG/WASIS II/CON- 24/18

In reference to clause 38 of the consultants time-based supervision contract, the client shall make available free of any charge the services, facilities and property described below. This will be made available through the works contract, to be prepared by the consultant, for the duration of the construction supervision period. Facilities, including transportation, hotel, and equipment, during the design check phase should be the responsibility of the consultant.

A1– Supervision of Distribution Centres

A1a – Site office for the Engineer during the supervision phase

- A securely lockable Engineer's site office in the location of the new DCs, including the costs of electricity, water and maintenance, a good functioning new laptop computer with software installed, a new functioning color printer/scanner / copy machine, air conditioning, telephone, fax and Internet, as detailed below. The site office facilities will also include washing facilities with hot and cold water and hygienic toilet facilities.

- Effective guarding as well as all cleaning and servicing facilities for the office.

- The installation, commissioning and maintenance in use of two telephone lines to serve the resident engineer's office from the public exchange. Three handsets, one at each desk and one at the conference table) shall be provided on one line and a plain paper fax / telephone on the other. In addition, the contractor shall provide and maintain a mobile phone for the Team Leader up to a maximum of $150 per month.

- The office will be furnished with the following:
  - 2 (two) desks for the offices and 1(one) meeting table for 8 persons,
  - 2 (two) office arm chairs and 8(eight) office chairs,
  - 2 (two) lockable filing cabinets, one of them of big size with doors,
  - 1 (one) plan chest,
  - Drawing material and office consumables
  - One laptop computer, one printer/ scanner/ copier and internet connection
  - Software:
    - Microsoft office professional;
    - Microsoft project;
    - Autocad viewer;
    - Arcview.
- The contractor shall, when required by engineer, supply labour and necessary measuring aids such as leveling instruments, theodolite for assisting the engineer in various tasks such as measuring, leveling and setting out.

A1b - Vehicles for the Engineer during the supervision phase

The contractor shall provide four (4) 4x4 vehicles being two (2) double cabs and two (2) single cabs according to FIPAG specifications, licensed and comprehensively insured for full replacement value and shall maintain and provide experienced licensed drivers, fuel, oil and replacement parts during the whole of the contract period. The vehicles shall be for the exclusive use of the engineer and his staff during the contract period. The contractor shall also insure the vehicles and passengers fully comprehensively for any driver at all times throughout the contract. They shall be printed with FIPAG and the consultant's logo.

The contractor shall service and maintain the vehicle in good working order at all times. In the event of any vehicle being unavailable for use due to accident, damage or its being maintained or repaired, the contractor shall immediately provide a substitute acceptable to the engineer.

In the event of the contractor defaulting on this obligation, the engineer shall be authorized to hire a substitute similar vehicle for the period of non-availability of the contractor's vehicles and the cost incurred will be recovered from FIPAG

A1c - Accommodation for the Engineer during the supervision phase

The contractor will rent / hire two (2) suitable two-bedroom apartments as accommodation for the supervising consultant and his staff from the commencement and throughout the execution of the construction works. Each house will be furnished with basic furniture including 3 beds, an electrical/gas stove and hot water geyser, refrigerator, dining room table and lounge furniture accommodating 6 people. Electricity and water services will be arranged and consumption will be paid by the contractor.

An effective security guarding service as well as all cleaning and servicing facilities should be provided.

A1d – Services and facilities during design phase

In reference to the consultant's lump-sum design contract, no accommodation, offices, services, equipment or transport will be made available to the consultant. These facilities must be included in the consultant proposal, as required.