REQUEST FOR EXPRESSIONS OF INTEREST (REOI) FOR Consultancy Services for Design Review and Construction Supervision (Package Number: SD1).

(Firm Selection)

1. The Government of the People's Republic of Bangladesh (GoB) has received a credit from the International Development Association (IDA) and Asian Infrastructure Investment Bank (AIIB) towards the cost of ‘Dhaka Sanitation Improvement Project (DSIP)’, to be implemented by Dhaka Water Supply and Sewerage Authority (DWASA), an autonomous entity of the GoB and intends to apply a part of the proceeds of this credit to pay against the Consultancy Services for Design Review, Construction Supervision and Contract Management of different sewerage infrastructure to be executed under a few contracts/packages mostly DBO/DB which include Sewage Treatment Plant, Trunk mains, Sewer Networks, alternative sanitation system etc.

The main infrastructures to be constructed/reconstructed under this project are given below:

(i) Reconstruction of a Sewage Treatment Plant (STP).
(ii) Reconstruction/Rehabilitation of Trunk Mains (Eastern, Western and South-Western).
(iii) Reconstruction/Rehabilitation of Sewer Networks.
(iv) Construction/Development of alternative sanitation system etc.

2. The main objective of the proposed consulting services is to ensure proper implementation of the DSIP for Pagla catchment area by providing technical support to DWASA in selecting treatment process, reviewing the design of different components of the project which will be produced by the contractors of different Packages, contracts management and construction supervision along with capacity enhancement of DWASA’s engineers.

3. DWASA will appoint an independent engineering consulting (EC) firm to achieve the above objectives. The role of the consultant under this assignment shall be ‘Engineer’ as per FIDIC mostly and will render the following services mainly:

- Reviewing design to be prepared by the contractors (DBO/DB).
- Contract Management and Construction Supervision for the works mentioned above.
- Providing procurement support (as required) to DWASA in connection to the DB/DBO contracts for the STP, trunk mains and sewer networks etc.

4. DWASA now invites eligible consulting firms (“Consultants”) to indicate their interest in providing the services. Interested Consultants should provide information demonstrating that they have the required qualifications and relevant experience to perform the Services. The short-listing criteria are:

(a) General experience of the Firm(s);
(b) Experience in similar projects of compatible size, complexity and technical specialty in the required area;
(c) Financial soundness of the firm; and
(d) Staffing and logistics of the firm.

Consultants are requested to submit the following supporting documents in support of the above-mentioned criteria:
(a) Registration paper of the firm(s); (b) JV agreement/letter of intent (if applicable); (c) Firm’s brochure; (d) Audited financial reports for last three years; (e) service experience record (including nature, total cost, total input in terms of man month, employer, location of service etc.)

5. The attention of interested Consultants is drawn to Section III, paragraphs, 3.14, 3.16, and 3.17 of the World Bank’s “Procurement Regulations for IPF Borrowers” July 2016, Revised November 2017 and August 2018, setting forth the World Bank’s policy on conflict of interest.

6. Consultants may associate to enhance their qualification, but should mention whether the association is in the form of a “joint-venture” or of “sub-consultancy”. In the case of an association, all members of such “association” should have real and well-defined inputs to the assignment and in such "association" it is preferable to limit the total number of firms including the associates to a maximum of four.

7. A Consultant will be selected in accordance with the Quality and Cost Based Selection (QCBS) method set out in the Procurement Regulations.

8. Interested Consultant may obtain further information from the address below during office hours (i.e. 0900 to 1700 hours) and the intending entities may contact for any clarification and background information at the address given below. Terms of Reference (if necessary, may be modified) will be available in the DWASA’s website (www.dwasa.org.bd).

9. Expression of Interest (EoI) (both hard copy and soft copy preferable) needs to be submitted (either in person or by mail) to the following address by **1500 hours (BST) (GMT+6) on or before 30 September, 2020 (Wednesday)**. The soft copy of the same may be sent through e-mail mentioned below. Please clearly mention “Expression of Interest (EoI) for Consultancy Services for Design Review and Construction Supervision (Package Number: SD1) under DSIP, DWASA” in the e-mail’s subject line or on the top of the envelope.

10. DWASA will not be responsible for any delay in submission including delay due to postal or any other reason. The authority reserves the right to accept or reject any or all EoI proposals either in part or in full without assigning any reason, whatsoever.

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Terms of Reference
For
Consultancy Services for
Design Review and Construction Supervision (Package SD-1)
under Dhaka Sanitation Improvement Project (DSIP), Dhaka WASA.
Terms of References

1. GENERAL BACKGROUND AND ASSIGNMENT SCOPE

1.1. Introduction

Dhaka Water Supply and Sewerage Authority (DWASA) were established in 1963 as an autonomous entity under the Ministry of Local Government, Rural Development and Cooperatives (LGRD&C). Currently Dhaka WASA provides three services to the city dwellers i.e. potable water supply, collection and safe disposal of sewage and storm water drainage.

Dhaka, the capital of Bangladesh is one of the fastest growing mega cities in the world. Dhaka’s population has been increasing continuously and at a very high rate since Bangladesh's independence. The city has also expanded tremendously in an unplanned manner. Today the city is home to an estimated 17 million people. The rapid and haphazard urbanization is exerting immense pressure on Dhaka's urban environment, and city authorities are struggling to deal with pressing environmental issues such as solid waste management, wastewater management and drainage. As a result, the overall environmental situation is deteriorating rapidly to the extent that Dhaka is now considered one of the most polluted cities in the world.

1.2. Existing Wastewater Management Situation in Dhaka City

In terms of infrastructure, the city has only 930 km of sewer network (of varying pipe materials, status and sizes from Ø100mm to Ø1350mm) and 88,803 sewer connections (compared to 3,036 km of water network and 3,71,767 water connections). Within the city, there are 27 sewage ‘lift/pump’ stations and one central pumping station at Narinda. More than 80% of the city is not covered by any formal piped sewer network, although many areas are served by local combined sewers that discharge untreated sewage to local drains and storm water canals.

The salient information about the existing sewerage infrastructure is:

- Total length of sewer network: 930 km
- Numbers of Pumping/Lifting Stations: 27 nos.
- Sewage Treatment Plant (STP): located at Pagla, extreme south of the city with a treatment capacity of 120 MLD; treatment technology is primary settlement followed by facultative waste stabilization ponds
- Sewer construction material: bricks sewer, vitrified clay pipes, reinforced concrete pipes, ductile cast iron pipes and PVC pipes.

In terms of coverage, the existing sewer network is concentrated mainly in the Southern part (old town and the central part) of the city, i.e. in the Pagla catchment. Most of the Northern part of the city, in which rapid population growth is taking place, has no formal sewer network.

It may be noted that Dhaka City has been divided into five catchments (Please see Para 1.3). One of these, the Pagla catchment is located mainly in downtown area of the city. The Project, The Dhaka Sanitation Improvement Project (DSIP)(Please see Para 1.4 for more details) has been formulated for improvement of the sewerage facilities. In the Pagla catchment, the sewer network consists of 360 km of relatively small diameter sewers that are connected via branch lines to the main transmission mains known as ‘trunk mains’. The analysis conducted to date shows that only 39 km of the existing sewers can be rehabilitated; the remaining, that is, more than 90 percent of the existing sewers, are unsuitable.
for rehabilitation because of insufficient hydraulic capacity, sewer pipes with diameters smaller than the minimum permitted 200 mm, pipes with adverse slope, or inadequate flow velocity.

Three trunk mains exist: Eastern Trunk Main with 12.0 km, Western Trunk Main with 6.6 km, and South Western Trunk Main with 4.5 km. Manholes have been provided on the route of the mains but most are now inaccessible and in a very poor state of repair, with many being used as receptacles for household waste. Within the Pagla catchment, there are a total of 15 sewage ‘lift/pump’ stations that are designed to raise the hydraulic level of the sewage so that it can flow by gravity via the trunk sewers to the sewage treatment plant at Pagla. Both the Trunk Mains and the SLS/SPS are in predominantly bad shape. A new sewage treatment plant is also being constructed in the Dasherkandi area with the funding of China Exim Bank.

1.3. Initiative to improve the Sanitation System of the City

DWASA has prepared a Sewerage Master Plan in 2013 with the financial support of the World Bank. The master planning consultant has catered a number of recommendations for the improvement of sewerage services of the city including (a) the core city area has been divided into 5(five) catchment where Pagla is one of them, (b) Priority works. Accordingly, a project has been developed, called the Dhaka Sanitation Improvement Project (DSIP).

The Government of the People's Republic of Bangladesh (GOB) has signed a financial agreement with the World Bank (WB) and Asian Infrastructure Investment Bank (AIIB) to finance the implementation of DSIP priority works in the Pagla catchment. This project comprises a number of components and DWASA has decided to engage well experienced consultants for implementing the project. Amongst others, a consultant shall be responsible for providing services of design review, and construction supervision of the relevant infrastructure as described hereafter.

1.4. Dhaka Sanitation Improvement Project

Dhaka Sanitation Improvement Project (DSIP) includes the following four main components:

Component 1. Institutional Support for Sanitation Service Delivery: The component will provide institutional support to DWASA for sustainable sanitation service delivery. This component includes, but not limited to:

- **Sub-component 1.1.** Support for establishment of a strengthened sanitation function in the DWASA’s organizational structure, and support its operational and financial strengthening by: (i) conducting training of DWASA personnel in STP operations, trunk maintenance management and operation and maintenance management of sewers; (ii) conducting training of [DWASA personnel] in procurement and contract management; (iii) conducting training on climate change and improving operational efficiencies in sanitation systems through energy-efficient technologies and Information Technologies (IT); (iv) strengthening of its GIS and MIS for sanitation and (v) preparation and implementation of a gender action plan for DWASA;

- **Sub-component 1.2.** Support to commercial and financial strengthening activities for sanitation functions of DWASA through (i) developing and implementing a sewer connection strategy and plan; (ii) developing a water and sewerage tariff rationalization framework; (iii) improving DWASA’s billing and collection system; and (iv) providing technical assistance in accounting, financial management and auditing functions of DWASA;

- **Sub-component 1.3.** Strengthening communications and public engagement with
citizens, including (i) engagement with the low-income communities and female-headed households and providing training in climate adaptation for improved water, sanitation and hygiene practices; (ii) providing assistance for the implementation of DWASA’s communication and stakeholder engagement strategy; (iii) making improvements in citizen engagement including setting up an IT-enabled complaints management system; (iv) carrying out improvements in grievance redressal; and (v) conducting citizen report card surveys by third-party agencies;

- **Sub-component 1.4.** Technical assistance for a study for exploring the feasibility of advanced financing options in future infrastructure investments for DWASA; and

- **Sub-component 1.5.** Coordination with other stakeholders, including technical assistance to address coordination issues on sanitation between DWASA, DNCC, DSCC, DoE, RAJUK, and other utilities and agencies through (i) setting up a policy and coordination mechanism amongst these agencies; and (ii) carrying out of relevant studies and consultations to support this sub-component to improve the overall urban environment and management of Dhaka’s development.

**Component 2. Sewerage and Wastewater Treatment:** This component includes, but not limited to,

- **Sub-component 2.1.** Rehabilitation, replacement of sewerage and re-activation/new construction of sewer connections to maximize connections in the Pagla catchment, including last mile coverage, using a Design-Build model and incentivizing contractors to maximize service connections by financing house-service connections;

- **Sub-component 2.2.** Replacement and/or rehabilitation of Eastern and Western Trunk Mains using a Design-Build approach; additionally, also the South-Western Trunk Main will be replaced / rehabilitated using the DB approach, albeit with exclusive GOB financing;

- **Sub-component 2.3.** Construction of a new Pagla Sewage Treatment Plant at the existing treatment site, including provision of about 200 million liters per day primary and secondary treatment capacity using a Design-Build-Operate model; and

- **Sub-component 2.4.** Consulting Services for finalization of feasibility studies, engineering designs and bidding documents for priority sewerage and wastewater treatment interventions in the Uttara catchment.

**Component 3. Alternative Sanitation:** This component will help DWASA to develop alternative sanitation services in areas where sewers are not feasible and/or where there are tenurial barriers, such as in low-income settlements. The component includes, but not limited to,

- **Sub-component 3.1.** Improve sanitation and septage management within Pagla catchment, through upgradation of unimproved toilets of poor households through the support of select non-governmental organizations;

- **Sub-component 3.2.** Provision and installation of demonstration units for alternative sanitation solutions viz. supporting pilot demonstrations of Decentralized Wastewater Treatment System (DEWATS), communal septic tanks; and

- **Sub-component 3.3.** Provision of services involving septage emptying, transport and treatment, including leasing of emptying and transport equipment to private operators.
Component 4. Project Implementation and Management Support: This component will support DWASA in coordinating and implementing project activities, complying with the World Bank fiduciary procedures and safeguards. This component comprises, but not limited to:

- The establishment of the Project Management Unit and recruitment of the specific individual consultants;
- Procurement of consulting firms for Project management and design-review and contract supervision to support Project implementation;
- Carrying out of audits of Project internal processes;
- Fiduciary and environmental and social management of the Project including implementation of the gender action plan and preparation and implementation of relevant safeguard documents;
- The acquisition of specialized equipment; and
- Project reporting.

This Terms of Reference (TOR) is for construction supervision of all activities under component 2, i.e. Sewage Treatment Plant, Trunk Mains and Sewer Networks etc., including reviewing the output of consulting service for sub-component 2.4; and component 3 (Alternative Sanitation) listed above.

1.5. Description of Works and Installations under Component 2

1.5.1 Construction of Sewage Treatment Plant-1 (One) Package

The capacity of the existing STP is about 120 MLD, using primary settlement followed by facultative waste stabilization ponds. This facility will be replaced by a completely new STP with a capacity of 200MLD at 1st stage, with the possibility for later expansion up to 800MLD inclusive of 200 MLD for a new but adjacent catchment. The required treatment standard for the new STP is characterized by BOD5 ≤ 30 mg/L, COD ≤ 120 mg/L, SS ≤ 30 mg/L, Total Ammonia Nitrogen ≤ 15 mg/L, and Fecal Coliforms ≤ 1,000 MPN/100 mL, amongst others. The treatment plant needs to be constructed on a modular basis so that the STP can be operated efficiently at any time. The mode of contract for this package shall be Design, Build and Operate (DBO).

For selection of the future treatment process, three permitted “families of technologies” are outlined in the DBO procurement document as follows: i) conventional activated sludge; ii) modern trickling filter, and iii) combinations of i) and ii). **Within that technology framework, prospective bidders are free to come up with their innovative approach, which is expected to maximize techno-economic benefits** in terms of minimized cost of operation and maintenance as well as high quality of all facilities (Civil Works/Mechanical & Electrical Installations).

The DBO contractor will be in place for at least 76 months, of which 40 months are for the design, construction, and commissioning period, with additional 36 months (3 years) assigned (at least) for the contractual operation and maintenance period. The DBO contractor will have to ensure, amongst others, that wastewater effluent standards are met, that odor from the plant is well controlled and that the sludge from the plant is handled in a proper way.

1.5.2 Construction of Trunk Mains (Eastern, Western, South-Western)– 3(three) Packages
The present condition of these trunk mains and associated infrastructure is poor – these are old, dilapidated as well as inadequate and needing improvement. The mode of contract for these packages shall be Design-Built (DB).

- **Eastern Trunk Main**

The Eastern trunk main passes through Modhubagh Rd, Dabanol Songsod Sorok road, Shahid Bakiroad; then the trunk main is aligned through Wasa Road, Maniknagar Link road, from where it enters Golapbagh SPS. At the Gandaria new road, the pipeline joins with sewage from Western trunk main through Narinda SPS. The combined sewage passes through Gandaria new road, and finally reaches Pagla STP. The diameter of the Eastern trunk main is 900 mm to 2600 mm and total length is approximately 12km according to the conceptual design (done under preparation for the DSIP).

The initial route of the Eastern trunk main route (about 6 km) is aligned along roads having substantially heavy local traffic and congested areas. Micro-tunneling is suggested here as the best option from social point of view. There are 35 shafts proposed for the micro-tunneling, and selected material for the pipe is CRCP (Centrifugal reinforced concrete pipe with lining to avoid corrosion).

In the later portion of the route, i.e. downstream of Golapbagh Pumping station, the depth of excavation is low. Also, the roads are considerably wide along the remaining 6 km. Therefore, open-trench method is proposed there and selected material for the pipe is GRP (Glass fiber reinforced plastic pipe).

The route from Golapbagh SPS to junction point with the Narinda SPS, approximately 1.3km, will be installed as force main. The Golapbagh SPS will be equipped with capacity to pump 5,929 m³/hr (peak-flow) of sewage, which is the flow forecast in the year 2035. However, civil and building works will be constructed for peak-flow of 7,667 m³/hr in the year 2050.

- **Western Trunk Main**

The Western trunk main passes through Pilkhana-New Market road and inflows to Nilkhet SLS. Later, the trunk main is aligned along Nilkhet road, Museum of Independence (Ramna Park), Culvert road, Gazi Dastagiri road, Motijheel road, Toyenbee road, Fazli Rabbi road, Hatkhola road, Narinda road, and then reaches Narinda SPS, after which the outlet of Narinda PS (pressurized) joins Eastern trunk main at the Gandaria New road. The diameter of the Western trunk main is 900mm to 1,350 mm and the total length is approximately 6.6 km.

Most of the Western trunk main route is located on wide roads. The whole route of the Western trunk main, excepting the section between Narinda SPS and junction with Eastern trunk main, will be installed as gravity pipeline.

Considering the buildability and social issues, micro tunneling method will be used as construction method at the crossing point of the flyover.

The selected material for the pipe is GRP (Glass fiber reinforced plastic pipe) at the open trench route and CRCP (Centrifugal reinforced concrete pipe with lining to avoid corrosion) at the micro tunneling route.

The Narinda SPS will be equipped with capacity to pump 12,154 m³/hr (peak flow) of sewage, which is the flow forecast in the year 2035. However, civil and building works will be constructed for peak-flow 13,333 m³/hr in the year 2050. The Nilkhet SLS will be equipped with pump capacity 1,854
m³/hr (peak flow) of sewage in the year 2035, and its civil and building works will be constructed for peak-flow of 1,992 m³/hr in the year 2050.

- **South-Western Trunk Main**

The length of South Western Trunk main is approximately 4.5 km with diameters ranging from 700 mm to 1,350 mm. It starts from Nawabganj SLS and joins with Western trunk main at the front of the Narinda SPS.

1.5.3 **Construction/Re-construction of Sewer Networks- 3(Three) Packages**

The Pagla catchment has been divided into 3 sub-catchments (East, West, Future sub-catchments). The East and West sub-catchments, under DSIP, are divided into 16 sewer zones; and total sewer network requirement in West and East sub-catchments is 742 km approximately. Under DSIP, a total of ±462 km of sewer networks will be constructed. The three sewer packages include 205 km, 187.1 km, and 69.4 km, respectively. The former two of those packages are co-financed by WB, AIIB, and GoB; and the last package is financed exclusively by GoB.

Consequently, it may be mentioned that the above components will be covering 52% of the population in Western and Eastern sub-catchments, which equals 35% of total Pagla catchment area.

1.6. **Description of Installations under Component 3**

DWASA will develop the infrastructure to extend alternative sanitation services to those city dwellers, who are living in either hard to reach areas as well as in informal settlements that may have space or tenure constraints. The design of installations for these settlements shall be furnished by an independent entity under the guidance of the PMU, and the construction and/or operations shall be done by engaging NGOs and/or by contractors.

The proposed infrastructure and services are as follows:

i) Up-gradation of unimproved toilets for poor households

ii) Construction of alternative sanitation solutions viz. Decentralized Wastewater Treatment System (DEWATS), communal septic tanks, etc.

iii) Septage emptying, transport and treatment services, including leasing of emptying and transport equipment to private operators.

2. **DETAILED OBJECTIVES & EXPECTED RESULTS**

2.1. **Overall Objective**

The overall objective of this assignment is to ensure proper implementation of the selected components (2 and 3) under DSIP stated above for Pagla catchment area, by providing design review and construction supervision support to DWASA.

DWASA plans to implement the relevant infrastructure described in the previous section, with financial assistance from GOB, WB and AIIB. DWASA is mandated to construct and commission the proposed infrastructure in stipulated time and upholding quality standards. This needs proper reviewing of the contractors’ designs and construction supervision. Though a Project Management Unit (PMU), consisting of relevant officers of different levels has been established by DWASA,
considering the vast scope, technical complexity and scale of the investment, a number of contractors and consultants are envisaged to support the PMU with its project implementation tasks.

As outlined above, contractors are proposed for STP (Design Build Operate, DBO); Trunk Mains (Design-Build, DB) and for sewer construction (Design-Build). A consultancy for Reviewing/Preparation of DD and BD of Sewerage Systems at Uttara Catchment Area will also be hired (All under Component 2). Contractors and NGOs shall be engaged for construction and operations of Alternative Sanitation component.

In order to manage the above contractors, consultants and vendors, two consultancies will be hired to assist the DSIP PMU:

(a) a Project Management Consultancy (PMC) to assist the PMU for Institutional Support and project management Components 1 and 4.

(b) a Design-review and Supervision Consultancy, as described in this Terms of Reference.

The consulting services to be delivered under this assignment comprise all design reviews and approvals, the construction management and daily supervision of all construction activities under DSIP (Component 2 and 3), including the review of the output of another consultant responsible for feasibility studies, engineering designs and bidding documents for priority sewerage and wastewater treatment interventions in the Uttara catchment. It may be mentioned that the consultant under this assignment shall have to maintain an office with minimum staffs during the Defects Liability Period, after which the Performance Certificate will be issued by the consultant.

2.2. Detailed objectives

The present TOR serves as a guide for Consultants in the preparation of technical and financial proposals. It is the sole responsibility of the Consultant to ensure that all necessary tasks, assignments and associated costs required for the successful completion of the services are included in its technical and financial proposal.

The detailed objectives of the requested consulting services include:

1. To provide procurement support (as required) to Dhaka WASA in connection to the DB/DBO contracts for the STP, trunk mains and sewer networks etc. The support includes participation in the pre-proposal conference, pre-qualification/IS/pre-bid meeting and preparation of meeting minutes, preparing a draft DB/DBO contract, support during contract negotiations, finalization of the contracts for signing, and assisting DWASA in any aspects of the above procurements;

2. To serve as engineer of the Client in dealing with the construction activities to be executed by the construction contractors for the DB of Trunk mains, and DB of Sewer networks, and the DBO of the STP;

3. To coordinate and liaise with local authorities and the implementing agencies of other projects executed in the Project area and that may have an impact on the project implementation;

4. To manage all engineering aspects and necessary procedures to ensure orderly and unimpeded progress of the construction works;

5. To assist the contractors and review and supervise their performance, in implementing the environmental management programs that are part of their obligations under their contracts;

6. To assist the contractors and review and supervise their performance, in designing and implementing plans for maximizing connections/ re-connections to households and properties, and resolving social issues in respect of sewers and trunk mains as applicable, that are part of their obligations under their contracts;
7. To carry out tests on site, witness tests carried out by others, and perform pre-shipment factory tests of equipment to be incorporated in the works;
8. To assist in the measurement of works and certification of payments to the contractors;
9. To prepare and negotiate with contractors any variations of work for approval of those variations by the Client;
10. To assist in the start-up and commissioning of the completed works, and supervise the Technology Proving Period for the STP;
11. To strengthen the capacity of Client’s staff in design and O&M of the relevant facilities;
12. To prepare all reports required, and to assist the Client in preparing any other documents required.

3. DETAILED TASKS

3.1. Task Description
The scope of work shall include but not be restricted to the tasks listed below:

TASK A - MOBILIZATION
This task comprises the following activities, but not limited to:
1. Mobilization of Team Leader and other necessary;
2. Review construction contract documents and outline (a) pertinent initial activities to be complied with by the contractors; and (b) obligations of the Client to the contractors, if any. Bring to the attention of the Client any potential contractual issues that warrant early attention;
3. Establish the project office and any sub-offices, or site-offices provided by the contractors for the supervision consulting services;
4. Review and coordinate overall and detailed work programs featuring all pertinent activities and critical paths;
5. Establish means of communication and coordination procedures necessary to ensure orderly and unimpeded progress of the work;
6. Establish a document and filing system for the project office, adopting an internationally recognized management system such as ISO 9000. Set up an electronic and internet-based file sharing system, which allows the Client, as well as all supervision team members and contractors, to have access to all documents and files stored in the Consultant’s electronic system, as appropriate and needed;
7. Study the GIS maps of Pagla Catchment Sewerage already developed, update the GIS databases (with necessary verification, if required) and validate integration of the design of relevant infrastructure of sewer systems to be provided by the contractors of different packages to fit with the whole sewer network as well as any other information relevant;
8. Establish a project monitoring system to supervise and document all contractors’ performance in a timely manner, including critical path program management and tracking system (using applications such as MS Project or Primavera), quality control reports, quantity survey records, requests for variation or change orders, submittals and claims and invoices, etc.;
9. Prepare an Inception Report which shall include information regarding all of the above aspects and, as Appendices, stand-alone sub-reports/plans, as follows:
   • Detailed Implementation Schedule for Component 2 and 3 (aggregating all contractors’ implementation schedules to feed into the overall Project Implementation Plan collated by the Project Management Consultant, PMC);
   • Quality Supervision and Management Plan;
   • Indicative plan for Risk mitigation and Management;
   • Environmental and Social Supervision and Management Plan;
• Health, Safety and Security Supervision and Management Plan;

10. Any other tasks assigned by the Client/Owner.

**TASK B - SUPPORT Dhaka WASA DURING CONTRACT PROCUREMENT**

Support for the contract procurement will initially be provided by other individual procurement and technical consultants to some extent. Those consultants will provide support to the PMU for the initial stages of procurement, such as Initial Selection (Pre-qualification) and then RFP stage. Hence the Consultant's responsibilities under this assignment regarding procurement support to Dhaka WASA shall be limited to the remaining support tasks and include, but shall not be limited to, the following tasks:

11. Support DWASA during negotiations with the DB/DBO contracts (if necessary);
12. Support DWASA in all respects until the DB/DBO contracts are signed and the contracts have become effective;
13. Preparation of Bidding Documents along with the detailed technical specifications, including tendering support, for the procurement of (i) sewer cleaning equipment and (ii) desludging vehicles, within four months after the contract signing;
14. Any other tasks assigned by the Client/Owner.

**TASK C- HEALTH, SAFETY, ENVIRONMENT, TRAFFIC, SOCIAL MONITORING**

This task consists of monitoring the health, environmental, safety, traffic and social issues, prior to and during the construction of the project. It is the responsibility of the consultant to ensure that the consultant and contractors’ consultants’ staff all abide by all required procedures set forth in the contract documents, in the Environmental Management Plan, Social Safeguards Plan, etc. The contractors of different packages will prepare the necessary documents including Environmental Management Plans (EMP) and the consultant shall review/approve the same with necessary modification (if required). The Consultant shall ensure the following but not limited to:

15. The Consultant shall ensure that the DB/DBO Contractors carry out the construction works in accordance with the above-mentioned components of the contract documents and supervise Contractors’ implementation of necessary measures outlined in the Environmental Management Plan, Social Management and others Plans;
16. The Consultant shall report any relevant issues, including complaints by third parties and any accidents or damages that occurred, to DWASA and shall propose remedies and/or penalties to be imposed;
17. Any other related tasks.

**TASK D - REVIEW AND APPROVAL OF DETAILED DESIGNS FOR DB/DBO CONTRACTS**

The Bidding Documents for all DB/DBO contracts include Conceptual Designs for all facilities including STP, trunk mains and sewer networks. During the bidding process, the bidders may propose to design, build and operate, for instance the STP as per that Conceptual Design, or they may opt to bid with a design that (at first sight) satisfies all criteria, but uses permitted technology variations. During the bid evaluation process, all those bids will be evaluated, compared, and the most attractive bid will be selected.

It is the responsibility of the relevant contractors to prepare and submit, together with their bid, their specific designs of the concerned facilities. The selected DB/DBO contractors will need to complete those bid designs, and elaborate those further into Detailed Designs DDs that can be used for construction.
The DB/DBO contractors may also opt to carry out general site preparation works that may not require prior approval by the authorities, such as site clearance. At the request of the contractors and the Client, the Consultant shall aim to cooperate with the contractors to initiate works and process approvals for such works.

It shall also be noted that the contractors are expected to design and build in accordance with a fast-track method, designing in such a way that an early start can be made with construction, while other elements of the designs and drawings are still being elaborated. Within reason, and taking into account local approval processes, the Consultant shall cooperate with the contractors and facilitate the fast-track construction process, where and when possible.

During the Detailed Design period, the DB/DBO contractors may opt to obtain approvals for equipment they want to incorporate into the permanent works. The Consultant shall assist arranging for approvals of such equipment, automation etc., within reasonable time frames. This will require flexibility in the mobilization of some of the Consultant’s specialized staff involved, and the Consultant shall also be allowed to review the relevant documents in the Consultant’s home office, when such reviews need to be delivered at short notice.

The Consultant shall be responsible for the checking, commenting on errors and shortcomings of designs and drawings, and assist the Client in obtaining approvals for construction from the local authorities (if necessary).

The consultant of this assignment shall review all such designs professionally and provide necessary recommendations for modification, if required, to assure the techno-economic benefit for DWASA. The consultant of this assignment shall be responsible to assure the quality of the designs of various infrastructures to be constructed by the different contractors (DBO/DB) to meet the objective of the project. Hence, the consultant shall set up a proper and functional team having expertise in all relevant fields (civil, electrical & electronics and mechanical, sludge treatment process, contract management, contract law, etc.).

*It may be mentioned that the consultant shall confer with DWASA before final approval of any detailed design for major infrastructure. It is underscored by DWASA that the consultant must always target the maximum techno-economic benefit for the employer, when comparing different bids in terms of quality, durability, ease of Operation & Maintenance etc.*

The Consultant’s responsibilities regarding review and approval process of detailed designs for the DB/DBO contracts include, but shall not be limited to, the following tasks:

18. Collection of relevant data and information from different sources to be required for the checking of detailed designs;
19. Review the results of sub-soil investigations to be conducted by the contractors or by the authoritative agent/s of the contractors for different components of the project.
20. Check basic design criteria including hydraulic capacity of all components.
21. Review all designs and drawings from the proposals and verify that they comply with the DB/DBO contracts. If non-compliance is observed, make recommendations to the Client on possible solutions to rectify those deficiencies;
22. Agree with the DB/DBO contractors and the Client on a schedule of detailed design submittals by contractors and on a priority listing with regard of their approvals by the Consultant and the Client, to allow fast-track construction of the various contracts;
23. Review power supply arrangement of the contractors, discuss and agree with them on the appropriateness of those arrangements, and approve the same, so that sufficient power can be provided to the construction sites;

24. Review contractors’ detailed designs and drawings; verify if they comply with DB/DBO contracts and if they are sound from a technology, structural, mechanical and electrical point of view. Approve drawings, or make requests for improvements, as the case may be, generally within 2 weeks from the date of submittal, with longer review periods possible at times, depending on the complexity of the designs and/or drawings submitted and the volume of documents submitted by the contractors at a given time;

25. Review, approve, or comment (as the case may be) on the DB/DBO contractors’ detailed construction methodology;

26. Review, comment and process the DB/DBO contractors’ submittal of proposed procurement of mechanical, electrical and SCADA equipment. The Consultant shall comment in writing as necessary on the submittals by the contractors;

27. Attend and approve any pre-shipment testing of equipment, where so specified in the DB/DBO contracts, and if not arranged in other ways;

28. Review DB/DBO contractors’ work plans and proposed procedures to assure that they meet the design criteria, protect public and workers' safety, and give full consideration to special conditions and hazardous conditions. Advise on safety and security matters.

29. Review, comment and process the DB/DBO contractors’ submittal of working methods and working drawings. The Consultant shall comment in writing as necessary on the working drawings prepared by the contractors. All types of related calculations, reports, designs, quantity schedules, and technical specifications shall also be examined;

30. Ensure that approved designs, drawings and equipment submittals are marked “APPROVED FOR CONSTRUCTION” and that no construction or procurement takes place based on documents without such mark;

31. Review, comment on the contractors’ proposed implementation schedules and programs. Make recommendations and assist with improving schedules in case of possible conflicts between schedules of different contractors and/or sub-contractors;

32. Any other related tasks.

**TASK E - CONSTRUCTION MANAGEMENT/SUPERVISION**

The consultant of this assignment shall be treated as the representative of the employer for the contracts (DB/DBO and DEWATS) mentioned above and shall be responsible to deliver its duties following the terms and condition of World Bank Guidelines in this connection. The role of the consultant shall be to provide full Supervisory and Construction Management services on behalf of the Client. So the consultant shall set up a team to deliver its services as full supervisory including Contract Management entity comprising the manpower of different disciplines for different activities. An indicative input of professionals is given in Article-5, but the consultants are requested to provide their best judgment to propose their team with requisite members as far as possible drawn from the local market of Bangladesh. It may be mentioned here that - if the list of professionals is deemed not enough to deliver the services - then it is requested to propose a team, which will ensure meeting the demands for an efficient construction supervision and construction management administration, i.e. quality and quantity control, monitoring of progress, health and safety, liaison with statutory authorities and other related parties, cost control and contractual administration of the works contracts.

In addition to these, DWASA has decided to extend the sewer services to hard-to-reach areas, where the design of relevant infrastructure or installations, will be furnished by a separate entity. It is planned to engage different NGOs and contractors to construct the required infrastructure as described in Component-3, Paragraph 3.2.
Thus, the consultant shall assist the Client in all aspects of (i) managing and administering the contracts (DB/DBO) for construction of the STP, Trunk Mains and Sewer Networks etc. as well as the works to be executed to meet the requirement of Component-3, Paragraph 3.2,- and of (ii) daily supervision of works and installations, including, but not limited to:

33. Monitor the approved contractors’ schedules and make recommendations for remedial action if delays occur;
34. Review contractors’ work plans and proposed methodology/procedures to assure that they meet the design criteria, protect public and workers' safety, and give full consideration to special conditions and hazardous conditions. Advise on safety and security matters if required;
35. Review and comment on the contractors' submittals of proposed procurement of equipment and materials etc. The Consultant shall comment in writing as necessary on the submittals by the contractors;
36. Check that all permanent works are constructed according to approved designs and specifications;
37. Make and keep records of conditions at each site prior to occupation of the sites by the contractors;
38. Maintain, at site offices, copies of contracts, technical specifications, standards, engineering drawings, relevant legislation and regulations regarding construction management, vendor catalogues, survey records, work measurements, test logs, samples, revision drawings, variation orders, etc. as appropriate for carrying out the daily supervision tasks;
39. Conduct supervision of day-to-day construction and installation works to ensure that the standard of materials and workmanship comply with the design specifications and standards;
40. Establish field survey control in accordance with the construction contracts and check contractors’ layout and setting out of works to ensure that they comply with the tolerances established by the contract documents;
41. Review all works, reject defective works, conduct continuous inspections of works in progress, oversee tests of materials and review contractors’ reported results of such tests;
42. Cooperate with the Client and the contractors in matters relating to permits, licenses, right-of-way, etc., which are within the authority of the Client;
43. Carry out inspections and witness testing, if mentioned in the contracts, at source of equipment and materials to be incorporated into the permanent works;
44. Review all survey and leveling reports in an effort to detect procedural errors on the part of the contractors;
45. Maintain accurate and comprehensive site records including, inter alia, master daily diary, monthly reports, photographs, videos (if necessary), correspondence files, minutes of meetings, measurement books, contractors’ staffing and equipment, test results and records on unusual occurrences which may reflect on the progress of work, such as inclement weather, fire, civil commotion, strikes, lack of construction materials, etc.;
46. Maintain permanent reproducible record drawings that include detailed 'as-built' information;
47. Provide coordination at site between the contractors for trunk mains and sewer networks and/or others, including mediation in disputes between these parties;
48. Interpret the meaning of contract documents if required;
49. Assist the contractors in developing alternative methods to overcome unforeseen obstacles to the performance or progress;
50. Review contract drawings and/or specifications as required to reflect any changes in conditions that make such revision necessary;
51. Check adequacy of contractors’ work force and equipment and make recommendations regarding any shortfalls;
52. Assess critically progress of the contractors against both contract and overall project schedules;
53. Assist the Client in the coordination with other agencies to solve problems on traffic, public
nuisance and others, as may arise from construction;
54. Conduct weekly meetings at the site and report the results to the Client;
55. Assist the contractors in executing the Environmental Management Plan and Social
Management Plan, and check if in the implementation of the works the contractors comply with
all conditions of the plan;
56. Monitor and report on physical progress of the works and financial disbursements;
57. Periodically check and verify contractors’ progress measurements, certify the contractors’
claims for progress payments;
58. Review, evaluate and process the contractors’ requests for changes and claims throughout the
contract period, and issue variation orders after having obtained prior approval from the Client;
59. Review, evaluate and advise on any difficulties and disputes that may arise during the contract
period, propose solutions to them, and assist in the implementation of the solutions;
60. Review, evaluate and advice on any claims by the contractors for additional time;
61. Throughout the duration of the project implementation, assist in liaison with national and local
Government agencies, as well as liaison with the World Bank;
62. Verify completion and issue certificates for completion of the works, including a description
and specification of all works that need to be completed and/or remedied if found defective, as
well as their required dates of completion;
63. Review and verify “As-built” drawings prepared by the contractors;
64. Assist with preparation of all documents required for handing over of the completed works to
the respective division of the Client;
65. Any other tasks assigned by the Client/Owner.

TASK F - DEFECTS LIABILITY PERIOD
During the Defects Liability Period, a number of obligations of the contractors require attendance,
supervision and verification by the Consultant. This task comprises, but is not limited, to the
following activities:
66. Check all items of works that need to be finalized and/or remedied, as identified in the
Completion Certificates;
67. Instruct the contractors to rectify any defect that becomes apparent during the Defects Liability
Period and specify the date of completion for each defective item;
68. Scrutinize and verify all statements of completion including financial statements submitted by
the contractors during the Defects Liability Period and advise the Client on their acceptability
or on any rectification thereof required;
69. Upon completion of the Defects Liability Period and remediation and completion of all works
to the satisfaction of the Consultant and the Client, prepare Defects Liability Certificates for
issuance to the contractors, indicating that he has satisfactorily carried out the works and is
entitled to receive any outstanding amounts due to him;
70. Advise the Client on any outstanding claim, variation or change order;
71. Scrutinize and verify the Final financial statement by the contractors, which shows final values
of all works constructed and the final sums to which any contractor is entitled and prepare Final
Certificates to be issued to the Contractors;
72. Review and advise on any outstanding issues related to the final as-built drawings prepared by
the contractors;
73. Prepare a Final Completion Report, which summarizes important features of the works,
including time schedules, reasons for deviation from the schedules, overviews of claims and
variation orders, as well as an inventory of all documents and records prepared during the
contract period and that were handed over to the Client;
74. Any other tasks assigned by the Client/Owner.
**TASK G - START-UP ASSISTANCE**

The start-up assistance during pre-commissioning comprises the following tasks for STP, trunk mains, sewer networks & DEWATS; and for alternative sanitation as relevant:

75. Assess the professional expertise available with the proposed DBO contractor’s staff and make recommendations for improvement, if necessary;

76. Verify if counterpart staff employed by the Project Owner/the Client is available for the start-up process and suitable for long-term operation and maintenance of the completed STP;

77. Review the Operation and Maintenance manuals provided by the DB/DBO contractors in detail and verify that these Manuals cover all relevant aspects of operation and maintenance of STP, trunk mains, sewerage, SLS, SPS.

78. Review the initial operations of the STP, trunk mains and sewer networks, including SLS and SPS, and make recommendations for improvements, if needed;

79. Check if effluent criteria specified in the DBO contract for Pagla STP are met and agree with the DBO contractor and the Client on a completion of the start-up period and transition to the next Technology Proving Period;

80. Provide design review and supervision support in respect of alternative sanitation;

81. Any other tasks assigned by the Client/Owner.

**TASK H - SUPERVISION OF TECHNOLOGY PROVING PERIOD FOR PAGLA STP**

Immediately after the start-up period, and regardless of the duration of the start-up period, the six months technology proving period will commence. During this technology proving period, the DBO contractor must prove that the outputs of the STP (treated effluent, sludge, odors), as per his bid design, comply with all criteria of the DBO contract and similarly, that other conditions of the contract are met. The supervision during this period will include the following tasks, but not limited to:

82. Review intermittently operation data and operation practices by the DBO contractor as compared to what has been defined in the DBO contract, verify that sampling has been carried out in compliance with the contract and that samples have been tested in independent laboratories as specified in the DBO contract;

83. Check that all criteria on effluent discharge, energy consumption and chemicals consumption comply with the DBO contract. In case of non-compliance, advice on remedial measures;

84. Check if competent Client’s staff seconded to the contractor for O&M of the STP are receiving training as specified in the DBO contract, and verify if sufficient responsibility is given to Client’s staff in operating the STP;

85. Prepare a list of all other (physical) defects observed in the STP, instruct the contractor to rectify these defects and specify the date of completion for each defective item; check all items that needs to be finalized and/or remedied, as identified in the Completion Certificates;

86. Scrutinize and verify all statements of completion including financial statements submitted by the contractor during the Technology Proving Period and advice the Client on their acceptability or on any rectification thereof, if required;

87. Upon completion of the Technology Proving Period and remediation and completion of all works to the satisfaction of the Consultant and the Client, prepare a report on the compliance of the STP with all contract criteria. In case of (partial) non-compliance, make recommendations to the Client regarding the remedial actions the DBO contractor should take and penalties that should be imposed on the DBO contractor, in accordance with the DBO contract, if no remedial actions are agreed upon, or if they are unfeasible;

88. Advise the Client on any outstanding claim, variation or change order;

89. Scrutinize and verify the Final financial statement for STP construction by the contractor, which shows final values of all works constructed and the final sums for construction to which the contractor is entitled.

90. Prepare a Final Construction Completion Certificate to be issued to the contractor;
91. Review and advice on any outstanding issue related to the final as-built drawings prepared by the contractor;

92. Prepare a Final Completion Report of the STP construction component of the project, which summarizes important features of the STP construction works, including time schedules, reasons for deviation from the schedules, overviews of claims and variation orders, as well as an inventory of all documents and records prepared during the contract period and that were handed over to the Client;

93. Assist with preparation of all documents required for handing over of the completed STP to the respective division of the Client/Owner;

94. Any other tasks assigned by the Client/Owner.

**TASK I - TECHNOLOGY AND KNOWLEDGE TRANSFER**

Capacity enhancement and training of staff is an important objective of DWASA. The Consultant shall, on an intermittent basis, provide training to engineering staffs of DWASA. The training shall include all technical aspects of sewerage design, operation & maintenance (STP and Collection Networks) and any other related subjects.

The training program shall be carried out as follows, but not limited to:

95. Local training on the design and operation & maintenance of STP and sewer system may be conducted in Dhaka or any other suitable location in Bangladesh (to be agreed with DWASA). The number of participants shall be a maximum of 20 (twenty), to be nominated by DWASA. All the costs related to this training program shall be borne by the Consultant;

96. The DB/DBO Contractors will also prepare training modules for DWASA engineers and submit the different Standard Operating Procedures (SOP) and O&M manuals for STP, Trunk Mains and the Sewer Network. The Consultant will review these modules/manuals to be provided by the contractors, in detail and verify that these Modules/Manuals cover all relevant aspects of operation and maintenance management.

97. Short overseas formal courses on design, and operation and maintenance of modern sewer systems, trunk mains and STPs; at Utilities or reputed academic and training institutions that have demonstrated experience in O&M of such installations relevant to Dhaka WASA. The overseas training shall be for six (6) participants in each trip and there will be three (3) trips, and the duration of each trip will be at least 10 days excluding the transit period. All the costs, including air-fares, Visa fees, accommodation, meals, per diems, training fees, out of pocket expenses etc. will be borne by the Consultant. Bidders shall propose the Utilities/institutions for such overseas training (may be multiple locations) with full cost break-downs in their bids.

98. Once the above activity (no. 97) is completed, the Consultant shall organize a one-day workshop in Dhaka, where the participants of the overseas trainings provide internal trainings for other DWASA personnel, to further distribute the knowledge they obtained overseas. Up to three such one-day workshops will need to be budgeted for.

**TASK J - REVIEW OF ENGG. DESIGNS AND BIDDING DOCUMENTS FOR UTTARA CATCHMENT AREA:**

99. A consultant under a separate contract will be engaged to prepare the feasibility studies, engineering designs, and bidding documents for priority sewerage and wastewater treatment interventions in the Uttara catchment area. These documents will also be reviewed by the Consultant under this assignment.

**3.2. Project Management**

The suggested methodology of executing the assignment would be through a ‘task force’ approach wherein the Consultant is expected to assemble a task force of specialist, engineers and technicians, who would be assigned to carry out the required services. It shall be noted that the size of the team
will be very variable over the assignment period and that several experts will only have intermittent inputs.

In order to enable an optimally executed assignment, the Consultant is strongly recommended to cooperate and work closely under the guidance of the PMU and the PMC, with other relevant authorities and with utilities and other projects of relevance.

4. OFFICE LOCATION AND TIMING

4.1. Location
The Consultant shall set up a central office on a first priority basis at WASA Bhaban (if space is available), Address: 98 Kazi Nazrul Islam Avenue, Kawranbazar, Dhaka, or at other suitable location in Dhaka City (must be agreed with Dhaka WASA) and shall carry out most work in Dhaka City as field basis, in order to consult and coordinate with personnel of the Client as much as possible into the day-to-day work and to facilitate a maximum transfer of knowledge and experience, as well as with other Government agencies and organizations and Consultants involved in related projects.

4.2. Commencement date, duration and critical milestones of the assignment
The DSIP is to be implemented in a period of 60 months, with the longest individual contract period among the construction packages being the 40 months for Design-Build phase of Pagla STP (not taking the Operation phase into account). The construction of all packages other than STP are expected to be completed within 24 to 30 months of contract duration. Project start is tentatively expected in the year 2020.

The Contract period of this assignment is scheduled for 50 months approximately.

5. PERSONNEL REQUIREMENTS

5.1. General
The Consultant is strongly encouraged to make appropriate use of available local expertise to ensure the local conditions and capacities are best considered. In selection of local individuals, if any, conflicts of interest shall be avoided. The Consultant should also note that public servants and other staff of the public administration of the beneficiary country cannot be recruited as experts.

5.2. Key Experts – Assigned duties and minimum required time input
The following table presents a complete list of Key Experts, both internationally and nationally experienced, describing their duties and responsibilities for the execution of the assignment. Additionally, the expected time input by those key experts has been estimated, and a minimum total, separate for internationally and nationally experienced key experts, is defined in this table.

<table>
<thead>
<tr>
<th>No</th>
<th>Proposed position</th>
<th>Main assignments (Indicatory only)</th>
<th>Person-months</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Team Leader &amp; Contract Management Specialist</td>
<td>The responsibilities include, but not limited to: 1. Start-up of project and responsible for administration of Consultant team; 2. Establishment of task’s schedule and qualitative control plan for Consultant services;</td>
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<tr>
<td>No</td>
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<td>3</td>
<td>Management, coordination of Consultant’s staff in line with work plan accepted by Client;</td>
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<td>4</td>
<td>Ensure the quality of Consultant’s services and work’s process satisfying requirements of Client, WB and Bangladesh Government continuously and thoroughly during assignment period;</td>
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<td>5</td>
<td>Full responsibility for overall implementation in line with technical approval of relevant designs and management of the contracts supervised by this assignment, covering all relevant aspects e.g. technical, financial, legal/statuary, health/social etc.;</td>
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<td>6</td>
<td>Reviewing all concerned contract documents signed by the employer and give feedback with recommendation on the comprehensiveness of such documents;</td>
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<td>7</td>
<td>Monitoring progress, evaluating results, and identification and resolution of financial &amp; contract constraints;</td>
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<td>8</td>
<td>Taking of necessary action for checking and certifying the bills of the contractors of different Packages;</td>
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<td>9</td>
<td>Provide advice and direction to the multi-disciplinary team of the Consultant to perform the duties of the team in a comprehensive manner to protect the interest of the employer;</td>
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<td>10</td>
<td>Oversee all procurement of services, equipment and materials required for the project (If necessary);</td>
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<td>11</td>
<td>Responsible for responding to contractors with regard to contractual matter including any financial claims and approvals;</td>
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<td>12</td>
<td>Assist the Client to manage financial &amp; contractual issues with contractors;</td>
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<td>13</td>
<td>Orient the necessary training program in consultation with Project Director to ensure maximum knowledge transfer;</td>
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<td>14</td>
<td>Maintaining liaison with the Client and World Bank to achieve the ultimate goal of the assignment;</td>
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<tr>
<td>15</td>
<td>Assisting the PMU in handling legal matters with contractors regarding the execution of contracts;</td>
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<td>16</td>
<td>Participating in site meetings and preparing minutes of the meetings;</td>
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<td>17</td>
<td>Reviewing/justifying all relevant variation orders;</td>
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<td>18</td>
<td>Reviewing/justifying all claims/variations from the contractors and assisting the supervision engineers in handling all contractual matters;</td>
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<td>19</td>
<td>Reviewing of previous relevant studies and data;</td>
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<td>20</td>
<td>Taking part in all relevant meetings with concerned stakeholders, providing feedback to the PMU on pertinent issues;</td>
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<td>No</td>
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</table>
| 2  | Resident Engineer-Trunk Mains                         | The responsibilities include, but not limited to:  
1. Review and assist the TL for approval of design of trunk mains in consultation with the relevant members of the team of consultant;  
2. Responsible for administration of the trunk mains supervision team;  
3. Establishment of task’s schedule and quality control plan for trunk mains supervision services;  
4. Management, coordination of trunk mains supervision staff in line with work plan accepted by Client;  
5. Ensure the quality of trunk mains supervision services and work’s processes;  
6. Responsible for contact with the contractors for the trunk main packages and with Client and other local authorities;  
7. Responsibility for reviewing all payments and certificates requested by the trunk main contractors;  
8. Responsibility for all performance with regard to supervision of the trunk mains’ construction;  
9. Any other tasks assigned by the Client/Owner.                                                                                                                                                                                                                                                           | 24           |
| 3  | Resident Engineer- STP                                | The responsibilities include, but not limited to:  
1. The responsibilities include, but not limited to:  
2. Review and assist the TL for approval of design of the relevant infrastructure of STP in consultation with the relevant members of the team of consultant;  
3. Responsible for administration of the STP construction supervision team;  
4. Establishment of task’s schedule and qualitative control plan for the STP supervision services;  
5. Management, coordination of STP supervision staff in line with work plan accepted by Client;  
6. Ensure the quality of STP supervision services and work’s processes;  
7. Responsible for contact with the DBO contractor of the STP and with Client and other local authorities;  
8. Responsibility for reviewing all payments and certificates requested by the DBO contractor;  
9. Responsibility for all performance of the Consultant with regard to supervision of the DBO contract for the STP;  
10. Any other tasks assigned by the Client/Owner.                                                                                                                                                                                                                                                   | 24           |
| 4  | Resident Engineer-Sewer Networks                       | The responsibilities include, but not limited to:  
1. Review and assist the TL approval of design of the sewage collection networks in consultation with the relevant members of the team of consultant;                                                                                                                                                                                                                                      | 32           |
<table>
<thead>
<tr>
<th>No</th>
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<th>Main assignments (Indicatory only)</th>
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<tbody>
<tr>
<td>2</td>
<td>Responsible for administration of the Sewer Networks supervision team;</td>
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<tr>
<td>3</td>
<td>Establishment of task’s schedule and qualitative control plan for Sewer Networks supervision services;</td>
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<tr>
<td>4</td>
<td>Management, coordination of Sewer Networks supervision staff in line with work plan accepted by Client;</td>
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<tr>
<td>5</td>
<td>Ensure the quality of sewer network supervision services and work’s processes;</td>
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<tr>
<td>6</td>
<td>Responsible for contact with the contractors of the sewer network packages and with Client and other local authorities;</td>
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<td>7</td>
<td>Responsibility for reviewing all payments and certificates requested by the sewer network contractors;</td>
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<td>8</td>
<td>Responsibility for all performance with regard to supervision of the sewer networks’ construction;</td>
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<td>9</td>
<td>Any other tasks assigned by the Client/Owner.</td>
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<tr>
<td>5</td>
<td>Micro-Tunnel Specialist</td>
<td>The responsibilities include, but not limited to:</td>
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<tr>
<td>6</td>
<td>Mechanical Engineer</td>
<td>The responsibilities include, but not limited to:</td>
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<tr>
<td></td>
<td></td>
<td>1. Responsible for micro-tunneling aspects of the Consultant responsibilities;</td>
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<td>2. Review and assist the TL for approval of design of trunk mains and sewer network using any trenchless methods;</td>
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<td>3. Review of the civil engineering components of the detailed designs and drawings for permanent and temporary works and approvals for micro-tunnel design;</td>
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<td>4. Review and approvals of geotechnical solutions, designs and execution methods proposed by the contractors of trunk mains;</td>
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<td>5. Any other tasks assigned by the Client/Owner.</td>
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<tr>
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<td>5. Pre-shipping factory tests of mechanical equipment (if required under the contract); 6. Checking of installation of all mechanical equipment under the project; 7. Checking of pre-commissioning tests of all mechanical equipment on site; 8. Verifying if operation and maintenance of mechanical equipment is in line with manufacturer’s instructions and the operation manuals; 9. Providing necessary recommendation and assist the TL for approval of the relevant subjects; 10. Guidance and co-operation with local mechanical engineer; 11. Any other tasks assigned by the Client/Owner.</td>
<td>5. Pre-shipping factory tests of electrical/SCADA equipment (if required under the contract); 6. Checking of installation of all electrical/SCADA equipment and instrumentation under the project; 7. Checking of pre-commissioning tests of all electrical/SCADA equipment on site; 8. Verifying if operation and maintenance of electrical/SCADA equipment is in line with manufacturer’s instructions and the operation manuals; 9. Providing necessary recommendation and assist the TL for approval of the relevant subjects; 10. Guidance and co-operation with local electrical engineer; 11. Any other tasks assigned by the Client/Owner.</td>
<td>10</td>
</tr>
<tr>
<td>No</td>
<td>Proposed position</td>
<td>Main assignments (Indicatory only)</td>
<td>Person-months</td>
</tr>
<tr>
<td>----</td>
<td>-----------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>8</td>
<td>Wastewater Process Engineer</td>
<td>The responsibilities include, but not limited to: 1. Review and make recommendations for improvement of detailed designs of the STP to be prepared and submitted by the contractor; 2. Aligning with other key staffs and suggest modifications and changes as required and assist the TL for approval of the design of concerned infrastructure; 3. Collect relevant studies and data available with the contractor or in DWASA; 4. Reviewing the relevant reports to be prepared by the contractor; 5. Assisting the employer as well as the TL that the treatment process is optimized to the benefit of DWASA in terms of quality of treatment and best practice, ease of operation and maintenance, least cost, etc.; 6. Conducting training programs on selection of wastewater treatment technologies and STP design, to scale-up the technical knowledge of the project supervising team including the PMU staffs; 7. Assisting the TL and the team; 8. Review and make recommendations for improvement of O&amp;M manuals prepared by the DBO contractor; 9. Responsible for review of contractor’s proposals for start-up and commissioning of the STP treatment processes; 10. Review operation data and operation practices by the DBO contractor; 11. Check that all criteria on effluent quality, sludge quality, energy &amp; chemicals’ consumption, etc. comply with the DBO contract during the Technology Proving period; 12. Prepare a report on the compliance of the STP with all contract criteria; 13. Any other tasks assigned by the Client/Owner.</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Minimum required sub-total for International Key Experts</strong></td>
<td>164</td>
</tr>
<tr>
<td></td>
<td><strong>Key Professional Staff (Nationally experienced)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Deputy Team Leader</td>
<td>The responsibilities include, but not limited to: 1. Responsible to support the Team Leader in all aspects of the project, notably with regard to liaison with the Client and Bangladesh authorities,</td>
<td>44</td>
</tr>
<tr>
<td>No</td>
<td>Proposed position</td>
<td>Main assignments (Indicatory only)</td>
<td>Person-months</td>
</tr>
<tr>
<td>----</td>
<td>-------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Support the team with the interpretation of the standards and regulations, coordinate site supervision and all project supporting activities. 3. Take the responsibility of Team Leader in absence of him. 4. Any other tasks assigned by the Client/Owner.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Civil Engineer/Geo-technical Engineer</td>
<td>The responsibilities include, but not limited to: 1. Responsible for checking all kinds of civil engineering issues, including geo-technical aspects; 2. Provide recommendation of same; 3. Assist the TL in approval of the relevant subjects.</td>
<td>48</td>
</tr>
<tr>
<td>11</td>
<td>Social Development Specialist</td>
<td>The responsibilities include, but not limited to: 1. Responsible for reviewing and assisting on any contractor activities that require innovations and resolution of social issues, including maximizing connections of households and properties to sewer network, and social issues in the construction of Trunk Mains. 2. Ensuring compliance with Social Safeguards plans; 3. Any other tasks assigned by the Client/Owner.</td>
<td>18</td>
</tr>
<tr>
<td>12</td>
<td>Alternative Sanitation Specialist/Septage Management Specialist</td>
<td>The responsibilities include, but not limited to: 1. This professional staff should have sound experience in designing faecal sludge/septage management systems, from collection to treatment and final end-uses/disposal relevant for the Bangladeshi context, including institutional, organisational and management aspects of the systems; 2. Contribute to the team with deep knowledge of service delivery to customers outside centralised sewerage collection systems; 3. Any other tasks assigned by the Client/Owner.</td>
<td>28</td>
</tr>
</tbody>
</table>

As indicated in the above table, minimum time input requirements for all Key Experts are defined. Minimum total input by international Key Experts results as 164 man-months, and minimum total input by local Key Experts results as 138 man-months. If deemed useful, of course, higher time inputs for Key Experts may be foreseen, but lesser than the indicated time inputs are not allowed for any of those Key Experts.

It is to be noted that the qualifications and experiences of key-experts will be considered during evaluation of technical proposal and that of non-key experts will not be evaluated.
5.3 Key Experts – Minimum required qualifications
The composition of the team for the implementation of this consultancy shall include the key staff shown below. For the purposes of this Contract, the term ‘international assignments’, as used in the Key Experts’ description, is intended to refer to as having working experience in other than the home country of the relevant staff, with preference given to working experience in countries similar to the Client’s country. “Nationally experienced” refers to working experience in Bangladesh. Experience with “international companies in Bangladesh or abroad” means that personnel must have worked with an International company’s project in Bangladesh or should have experience of international assignments.

Key Expert 1: Team Leader & Contract Management Specialist (International)

Qualifications and skills:
The Team Leader & Contract Management Specialist should have minimum M.Sc. (Engineering) degree in Water/Sanitary Engineering or Civil Engineering with specialization in the water and wastewater sector, including proven experience in procurement and contract issues in the water and wastewater sector; he must be fluent in English and must have proven team management skills.

General professional experience:
Minimum of 20 years professional experience in the design, tendering, implementation and operation of wastewater treatment plants and/or drainage or sewerage systems, experience in procurement / contract management of water/wastewater projects, with a minimum 10 years as Project Manager or Team Leader on international assignments and experience with international donor-funded projects.

Specific professional experience:
Well working experience in World Bank/ other MDBs and/or FIDIC procurement policies and procedures and contract management; experience in international donor-funded projects; experience in the implementation of large wastewater projects in developing countries; experience with supervision of large wastewater projects. Minimum references: (i) Working as a TL in the implementation of a (international donor-funded) wastewater project with investment cost above $50 million within the last 7 years. (ii) Minimum 1 reference project for the involvement as contract management specialist using FIDIC gold or yellow book, and/or World Bank standard bidding documents for DB/DBO within the last 7 years.

Key Expert 2: Resident Engineer-Trunk Mains (International)

Qualifications and skills:
The Resident Engineer Trunk Mains should have minimum M.Sc. (Engineering) degree in Water/Sanitary Engineering or Civil Engineering with specialization in the water and wastewater sector; he must be fluent in English and must have proven team management skills. Higher university degrees will be considered as an added advantage.

General professional experience:
Minimum of 15 years professional experience in the implementation and operation of sewerage systems, with a minimum 5 years as Resident Engineer on international assignments and experience with international donor-funded projects.

Specific professional experience:
Familiarity with World Bank procurement procedures; experience in international donor-funded projects; experience in the implementation of large wastewater projects in developing and transition countries; experience with supervision of large wastewater projects. Minimum references: 1 international donor-funded reference trenchless pipeline project as resident engineer, preferably micro tunneling, and project of a diameter equal or above 1000 mm with investment cost above $5 million within the last 7 years.

**Key Expert 3: Resident Engineer-STP (International)**

*Qualifications and skills:*
The Resident Engineer STP should have minimum M.Sc. (Engineering) degree in Water/Sanitary Engineering or Civil Engineering with specialization in the wastewater sector; he must be fluent in English and must have proven team management skills. Higher university degrees will be considered as an added advantage.

*General professional experience:*
Minimum of 15 years professional experience in the design, tendering, implementation and operation of wastewater treatment plants and/or drainage or sewerage systems, with a minimum 5 years as Resident Engineer on international assignments and experience with international donor-funded projects.

*Specific professional experience:*
Familiarity with World Bank procurement procedures; experience in international donor-funded projects; experience in the implementation of large wastewater treatment projects in developing and transition countries; experience with supervision of large wastewater treatment projects. Minimum references: 1 international donor-funded reference wastewater treatment plant project as resident engineer, preferably in DBO contract, with investment cost above $30 million within the last 7 years.

**Key Expert 4: Resident Engineer-Sewer Network (International)**

*Qualifications and skills:*
The Resident Engineer Sewer Network should have minimum M.Sc. (Engineering) degree in Water/Sanitary Engineering or Civil Engineering with specialization in the water and wastewater sector; he must be fluent in English and must have proven team management skills. Higher university degrees will be considered as an added advantage.

*General professional experience:*
Minimum of 15 years professional experience in the implementation and operation of sewerage systems, with a minimum 5 years as Resident Engineer on international assignments and experience with international donor-funded projects.

*Specific professional experience:*
Familiarity with World Bank procurement procedures; experience in international donor-funded projects; experience in the implementation of large wastewater projects in developing and transition countries; experience with supervision of large wastewater projects. Minimum references: 1 international donor-funded reference sewer network pipeline project as resident engineer with length of the pipelines of minimum 50km minimum and with investment cost above $20 million within the last 7 years.

**Key Expert 5: Micro-Tunnel Specialist (International)**
Qualifications and skills:
The Micro-Tunnel Specialist should have minimum M.Sc. (Engineering) degree in Geotechnical Engineering or Civil Engineering; he must be fluent in English.

General professional experience:
Minimum of 15 years professional experience in the design and/or supervision in underground structures such as tunnels and trenchless pipelines.

Specific professional experience:
Must have experience with design and construction supervision of micro-tunneling projects. Minimum reference: 1 reference project for the design and/or construction supervision of a micro-tunneling water or sewage pipe with investment cost above USD 5 million within the last 7 years.

Key Expert 6: Mechanical Engineer (International)

Qualifications and skills:
The Mechanical Engineer should have minimum M.Sc. (Engineering) degree in Mechanical Engineering; he/she must be fluent in English.

General professional experience:
Minimum of 15 years professional experience in the design & installation of mechanical equipment and experience in supervision of installation of mechanical equipment of wastewater treatment plants, thereof a minimum 5 years on international assignments. Higher university degrees will be considered as an added advantage.

Specific professional experience:
Must have experience with design and construction, as well as construction supervision, of mechanical equipment for large wastewater treatment plants. Minimum reference: 1 reference project for the supervision of installation of mechanical equipment for a wastewater treatment plant with investment cost above USD 10 million within the last 7 years.

Key Expert 7: Electrical / SCADA Engineer (International)

Qualifications and skills:
The Electrical /SCADA Engineer should have minimum M.Sc. (Engineering) degree in Electrical Engineering with specialization in SCADA equipment and instrumentation; he/she must be fluent in English. Higher university degrees will be considered as an added advantage.

General professional experience:
Minimum of 15 years professional experience in the design & installation of electrical equipment/SCADA and experience in supervision of installation of electrical equipment/SCADA components of wastewater treatment plants, thereof a minimum 5 years on international assignments.

Specific professional experience:
Must have experience with design and construction, as well as construction supervision, of electrical/SCADA equipment for large wastewater treatment plants. Minimum reference: 1 reference project for the supervision of installation of electrical/SCADA equipment for a wastewater treatment plant with investment cost above USD 10 million within the last 7 years.
**Key Expert 8: Wastewater Process Engineer** (International)

*Qualifications and skills:*  
The Wastewater Process Engineer should have minimum M.Sc. (Engineering) degree in Process Engineering, or Water / Sanitary Engineering, or Civil / Mechanical Engineering with specialization in the water and wastewater technology sector; he must be fluent in English.

*General professional experience:*  
Minimum of 15 years professional experience in the design, operation and start-up of wastewater treatment plants, both of activated sludge & trickling filter technology type, thereof a minimum 5 years on international assignments.

*Specific professional experience:*  
Must have experience with the design of wastewater treatment plants. Minimum 2 reference projects as process engineer in the start-up and commissioning of a wastewater treatment plant that includes a biological treatment step such as activated sludge, trickling filters, as well as advanced sludge treatment and with a design flow rate larger than 50,000 m³/d within the last 7 years.

**Key Expert 9: Deputy Team Leader** (National)

*Qualifications and skills:*  
The nationally experienced Deputy Team Leader should have a B.Sc. (Engineering) degree in Water/Sanitary Engineering or Civil Engineering with specialization in the water and wastewater sector; he must be fluent in English and Bengali and must have proven team management skills.

*General professional experience:*  
Minimum of 15 years professional experience in the construction supervision of wastewater projects, thereof a minimum 5 years, as project Deputy Team Leader on international assignments.

*Specific professional experience:*  
Familiarity with local regulations and procedures for civil design projects. Minimum reference: 1 reference project as co-team leader in design and/or supervision of a sanitation project with investment cost above $25 million with international consultants within the last 7 years.

**Key Expert 10: Civil Engineer / Geotechnical Engineer** (National)

*Qualifications and skills:*  
The Civil Engineer/ Geotechnical Engineer should have minimum university degree (B.Sc.) in Civil Engineering, preferably with specialization in geotechnical engineering; he must be fluent in English.

*General professional experience:*  
Minimum of 10 years professional experience in the design and construction of civil works and experience in supervision of civil works components of wastewater treatment plants and of major geotechnical works, thereof a minimum 5 years on assignments with international companies in Bangladesh or abroad.

*Specific professional experience:*  
Must have experience with design and construction, as well as construction supervision, of civil works for large wastewater treatment plants, plus demonstrated knowledge of geotechnical designs. Minimum reference: 1 reference project for the installation supervision of civil works for a STP with investment cost above $10 million within the last 7 years.
**Key Expert 11: Social Development Specialist** (National)

*Qualifications and skills:*
The Social Development Specialist should have minimum university degree (B.Sc.) in Social Sciences; and must be fluent in English.

*General professional experience:*
Minimum of 10 years professional experience in social / community development in large infrastructure construction projects.

*Specific professional experience:*
Must have experience with bilateral/ multilateral institutions’ supported projects involving construction supervision.

**Key Expert 12: Alternative Sanitation Specialist/Septage Management Specialist** (National)

*Qualifications and skills:*
This professional staff should have minimum B.Sc. degree in Sanitary Engineering or Civil Engineering degree with sufficient experience in alternative sanitation system/septage management/decentralized wastewater treatment.

*General professional experience:*
Minimum of 10 years professional experience in the decentralized wastewater treatment/ septage management.

*Specific professional experience:*
Must have experience with design and construction supervision of minimum 1 decentralized wastewater treatment plant within the last 7 years.

### 5.4 Non-key Experts & Support staff

In addition to the key experts described above, the Consultant shall mobilize sufficient non-key experts and support personnel. The following only provides some indications for possible such non-key positions and support staff (listing is not complete). The Consultant is not bound by this compilation, and is free to come up with the necessary non-key experts and support staff, as the consultant deems best suited to meet the objectives of this assignment.

Examples for possible international non-key experts:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of Post</th>
<th>Minimum inputs</th>
<th>Educational Qualification and experiences required</th>
<th>Major Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>a) Commissioning Expert and b) O&amp;M Specialists (Electrical, Mechanical) for Sewerage</td>
<td>24 MMs</td>
<td>Should have minimum university degree (B. Sc. Engineering) in the respective fields. Must be fluent in English.</td>
<td>1. Responsible for supervising of related activities. 2. Any other tasks as assigned by the Client/Owner.</td>
</tr>
</tbody>
</table>
Must have minimum ten years similar professional experiences.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of Post</th>
<th>Minimum Inputs</th>
<th>Educational Qualification and experiences</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>DEWATS Specialist</td>
<td>6 MMs</td>
<td>Should have minimum university degree (B. Sc. Engineering) in the respective field. Must have minimum three years similar professional experiences. Must be fluent in English.</td>
<td>1. Responsible for supervising of related activities. 2. Any other tasks as assigned by the Client/Owner.</td>
</tr>
<tr>
<td>3</td>
<td>Social Development Specialist</td>
<td>6 MMs</td>
<td>Should have minimum university degree in the respective field. Must have minimum three years similar professional experiences. Must be fluent in English.</td>
<td>1. Responsible for supervising of related activities. 2. Any other tasks as assigned by the Client/Owner.</td>
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<tr>
<td>4</td>
<td>Any others</td>
<td></td>
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</tbody>
</table>

Examples for possible national non-key experts:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of Post</th>
<th>Minimum Inputs</th>
<th>Qualifications and skills:</th>
<th>General professional experience:</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mechanical Engineer</td>
<td>15 MMs</td>
<td>The Mechanical Engineer should have minimum university degree (B.Sc.) in Mechanical Engineering; he must be fluent in English.</td>
<td>Minimum of 10 years professional experience in the design &amp; installation of mechanical equipment and experience in supervision of mechanical-electrical components of wastewater treatment plants, thereof a minimum 5 years on assignments with international companies in Bangladesh or abroad.</td>
<td>The responsibilities include, but not limited to: 1. Review proposals of the contractors related to all electro-mechanical equipment offered during the contract period, other than equipment already agreed upon during contract negotiations; 2. Checking of installation of all electro-mechanical equipment under the project (in cooperation with</td>
</tr>
</tbody>
</table>
### Specific professional experience:
Must have experience with design and construction, as well as construction supervision, of mechanical-electrical equipment for large wastewater treatment plants. Minimum reference: 1 reference project for the installation supervision of mechanical-electrical equipment for a STP with investment cost above $10 million within the last 7 years.

### Qualifications and skills:
The Electrical Engineer should have minimum university degree (B.Sc.) in Electrical and/or Electronics Engineering; he must be fluent in English.

### General professional experience:
Minimum of 10 years professional experience in the design & installation of electrical equipment and experience in supervision of mechanical-electrical components of wastewater treatment plants, thereof a minimum 5 years on assignments with international companies in Bangladesh or abroad.

### Specific professional experience:
Must have experience with design and construction, as well as construction supervision, of mechanical-electrical equipment for large wastewater treatment plants.

<table>
<thead>
<tr>
<th>2</th>
<th>Electrical Engineer</th>
<th>15 MMs</th>
<th>Electrical Engineer, if required;</th>
<th>The responsibilities include, but not limited to:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td>3. Checking of pre-commissioning tests of all equipment and installations on site;</td>
<td>1. Responsible for electrical engineering tasks;</td>
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<tr>
<td></td>
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<td></td>
<td>4. Verifying if operation and maintenance of equipment is in line with manufacturer’s instructions and the operation manuals.</td>
<td>2. Any other tasks assigned by the Client/Owner.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5. Any other tasks assigned by the Client/Owner.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>wastewater treatment plants. Minimum reference: 1 reference project for the installation supervision of mechanical-electrical equipment for a STP with investment cost above $10 million within the last 7 years.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Environment Specialist</td>
<td>15 MMs</td>
<td>Qualifications and skills: The Environmental Specialist should have minimum university degree (B.Sc.) in Environmental Sciences/Engineering; and must be fluent in English. General professional experience: Minimum of 10 years professional experience in environmental assessments and supervision of management plans in large infrastructure construction projects. Specific professional experience: Must have experience with IFI-supported projects involving construction supervision. The responsibilities include, but not limited to: 1. Responsible for environmental tasks; 2. Ensuring compliance with Environmental plans 3. Any other tasks assigned by the Client/Owner.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Site Supervision Engineers (Civil - Minimum 3 Nos.)</td>
<td>120 MMs</td>
<td>Should have minimum university degree (B. Sc. Engineering) in the respective fields. Must have minimum three years similar professional experiences. Must be fluent in English. 1. Responsible for supervising of related activities. 2. Any other tasks as assigned by the Client/Owner.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Structural Engineer</td>
<td>10 MMs</td>
<td>Should have minimum university degree (B. Sc. Engineering) in the respective field. Must have minimum three years similar professional experiences. 1. Responsible for supervising of related activities. 2. Any other tasks as assigned by the Client/Owner.</td>
<td></td>
</tr>
</tbody>
</table>
The consultant shall ensure sufficient support staffs with logistics including but not limited to the following disciplines:

- Survey engineers;
- HSET inspectors;
- AutoCAD draftsmen;
- Office Managers;
- Secretaries;
- Administrative staff;
- Drivers;
- Other support staff.

The necessary non-key experts and support staff can be defined by the consultant, as is deemed most appropriate to meet the tasks of the present assignment. Based on the required progress and quantity of services as well as the Consultant’s own experience, he shall propose the man-months for those necessary non-key experts and support staff.

### 5.5 Staff Mobilization and Scheduling

Regardless of the Consultant’s proposal, and approval thereof by the Client during contract negotiations and subsequent signing of a contract, no Consultant’s staff shall be mobilized unless expressly having obtained prior clearance by the Client. No payment will be made for any staff, proposed and approved, or not, whose mobilization has not been cleared prior to employment on the project.

Further, the Consultant shall take into account the following conditions:

(i) A minimum total time input for Key Experts, separately for international and national ones, has been defined earlier in this ToR. For national key-experts also individual minimum time input requirements have been defined. These requirements must be met always.

(ii) The Consultant shall propose a Personnel Schedule in line with the tasks required and use his own experience to decide the optimum mix of internationally experienced and nationally experienced experts and support staff. During the preparation of the proposal, the Consultant will have to consider and propose the most suitable and effective Team composition for completion of the tasks assigned.

(iii) A maximum 10% of input of the international key staff may be allowed from their home country, if it is required to deliver the services in a comprehensive manner.

(iv) The Consultant may take the payment to the home with the permission of the relevant authority following the rule of the People’s Republic of Bangladesh. In such case, the Consultant will be
responsible to take permission for the relevant authority/ies and all concerned expenditure related to this shall be borne by the Consultant. DWASA will provide necessary assistance by issuing letter to the different authority/ies. It may be mentioned that the Consultant should be acquainted fully with the rules and regulation of transferring money from Bangladesh to home of the Consultant and for any ambiguity in this connection likely to be arisen afterwards shall not be the responsibility of the Client.

(v) The Consultant shall assure the presence of TL and/or DTL at field during the execution of this assignment at all times.

(vi) The input of relevant key-staffs may be in staggered manner to supervise the pertinent works as per requirement during execution.

(vii) Expert opinion on international procurement law is likely to be required to combat claims of contractors during the execution of those contracts. It is expected that the Consultant shall be aware of that.

(viii) In his proposal, the Consultant shall clearly identify the number of man-months allocated to each of the internationally and nationally experienced experts, including the elaboration of a detailed work schedule.

6. SERVICES AND FACILITIES

6.1 Data, services and facilities to be provided by the Client
The Client will provide, free of charge, to the Consultant the subsequently described assistance. Notwithstanding this assistance, the final responsibility of all those activities stays exclusively with the Consultant. Some of the data, services and facilities to be provided by the Client are-

(i) Counterparts who are responsible for all coordination activities with the Consultant;
(ii) Other suitably qualified counterpart personnel to co-ordinate with the Consultant on technical issues;
(iii) Studies, reports, plans etc., as available, will be provided at no costs to the Consultant;
(iv) Coordination assistance with respect to introduction to relevant authorities, professionals etc.;
(v) Assistance in obtaining other relevant information and materials from government institutions and state authorities, at no costs to the Consultant;
(vi) Assistance in obtaining all staff permits, authorizations and licenses required for the performance of the Consultant’s services;
(vii) Assistance in customs clearance of all equipment, materials and personal effects to be imported (and exported upon completion of the Consultant’s assignment) for the purposes of this project.

6.2 Services and Facilities to be provided by the Consultant
The Consultant will be responsible for:

(i) Providing assistance to the Client of the highest professional standards;
(ii) Preparation of Reports to the highest professional standards;
(iii) Providing accommodation, international and local transport and freight expenditures of
the Consultant’s staff. All means of local transport, including cars and motor bikes for the
Consultant’s experts and support staff shall be provided by the Consultant. The
Consultant will also have to provide a new jeep (2200-2600 cc) for the exclusive use of
the PMU. Also, all the costs such as fuel, maintenance, salary of driver etc. during the
contract period shall be at the Consultant’s expense.

(iv) Providing local office support services for report production and international and
national communication for the full assignment period;

(v) Providing outputs and reports, as requested in this TOR;

(vi) The Consultant will be responsible for all other arrangements and cover in its budget for
the assignment all expenses for all kinds of logistics as required to successfully complete
the assignment.

7. OUTPUTS AND REPORTS

7.1 Reporting requirements
Paper copies of all reports, in the numbers as shown in the table in the next section, with CD-ROM
or flash drive containing the electronic version of the reports must be submitted with every paper
copy of all required reports.

Reports shall be prepared using commonly used software, notably Word, Excel, AutoCAD, GIS, as
well as in pdf format. All reports shall be prepared in A4 size paper but separate volumes in A3
format or larger may be used to contain plans, drawings, photographs, etc. The title of the project and
the identification of the specific volume shall be printed on the front cover and the spine of every
volume of all Final Documents.

7.2 Submission of reports
The Consultant shall prepare at least, but not limited to, the following reports. All reports (must be
in English) shall be submitted in the numbers and at the times shown below.

<table>
<thead>
<tr>
<th>Report</th>
<th>No. of reports</th>
<th>Submission date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Draft Inception Report</td>
<td>5</td>
<td>1 month after contract signing</td>
</tr>
<tr>
<td>Final Inception Report</td>
<td>10</td>
<td>1 week after receiving Client’s comments</td>
</tr>
<tr>
<td>Monthly Progress Reports</td>
<td>5</td>
<td>Within 1 week after the end of each month</td>
</tr>
<tr>
<td>Semi-annual Progress Reports</td>
<td>10</td>
<td>Within 2 weeks after the end of each (calendar) half year</td>
</tr>
<tr>
<td>Review of As-Built drawings</td>
<td>10</td>
<td>Within 30 days after receiving the As-built drawings from the contractor</td>
</tr>
<tr>
<td>Report on GIS database</td>
<td>10</td>
<td>Within 30 days after receiving the GIS data from the contractor</td>
</tr>
<tr>
<td>Review of Manual(s)</td>
<td>10</td>
<td>Within 30 days after receiving the draft operation manual from the contractor</td>
</tr>
<tr>
<td>STP Completion / Technology Proving Period Report</td>
<td>10</td>
<td>Within 30 days after completion of the STP Technology Proving Period</td>
</tr>
</tbody>
</table>
### Report No. of reports Submission date
| Completion Report | 10 | 7 days prior to the ending of this Contract. |

**Inception Report (draft and final)**
A Draft Inception Report has to be submitted within 1 month after the signing of the contract. The Inception Report shall present an updated and well-defined work plan and the schedule for completing all components of the project, planned staffing and outline indications of any reports to be provided or services planned. It shall include all the components listed under Task A. The Final Inception Report shall be completed, taking into account all of Client’s comments, within 1 week after receiving those comments in writing.

**Monthly Progress Reports**
Within 1 week after the end of each (calendar) month, monthly progress reports shall be submitted. The progress reports shall show progress of the all construction contracts under the supervision of the Consultant in a narrative form, but using tables and graphs as appropriate or agreed with the Client and the Bank.

The reports shall show progress made, milestones achieved, problems encountered and possible solutions, proposed activities in the next month, as well as the Consultant’s staffing during the past month and cumulative since the start of the assignment and shall include a list of variations approved during the month and those under review.

**Semi-annual Progress Reports**
Within 2 weeks after the end of each half year (calendar) period, i.e. before mid-July and before mid-January of each year, semi-annual progress reports shall be submitted. The reports shall provide detailed information regarding the progress of all the construction contracts under the supervision of the Consultant, problems encountered, overcome or still outstanding, and describe proposed activities in the next period, and other matters as appropriate. A complete financial overview shall be prepared, complete with past and projected disbursements, an overview of variations approved and pending and liquidity requirement forecasts for each contract. These Progress Reports shall be prepared throughout the duration of the assignment and shall include an estimate of the completion dates of key milestones in each contract.

**Review of As-Built Drawings (separately for each package)**
Upon the submission of As-Built Drawings by the contractors, the Consultant shall review the drawings and compare them with Consultant’s records made during the construction period. The Consultant shall comment on the completeness and accuracy of the As-Built Drawings made by the contractors and make recommendations to improve their quality and/or accuracy, if and as needed.

**Report on GIS database:** The Consultant will extract the different data from the As-Built Drawings submitted by the Contractors or others and update the same in the existing GIS database of sewerage system for Pagla catchment area. After the finalization of GIS database, the Consultant will be responsible to hand over the same to the respective division of DWASA.

**Review of Manual(s), (separately for each package)**
Contractors must prepare Operation and Maintenance manuals well before the completion and commissioning of respectively STP, SPS, SLS, Trunk Mains & DEWATS etc. The Consultant shall prepare a review report of the manuals supplied and comment on their quality and completeness, as well as shortcomings, if any, and make recommendations to improve their quality and/or accuracy, if and as needed.
**STP Completion/Technology Proving Period Report**

The STP Completion / Technology Proving Period Report shall describe all results of the STP during commissioning and following its start-up. Input data (sewage influent quality and quantity, fecal sludge quality and quantity), performance results, compliance with contractual requirements, dates of key milestones, problems encountered and overcome, and any other issues of relevance must be described and documented. It shall also describe lessons learned from the project implementation and the conditions to successfully continue O&M of the completed facilities. The report shall include financial overviews, including O&M expenditures and all payments made to the contractors under the contract, complete overview of all approved variations and any outstanding payments or issues.

**Completion Report**

The Completion Report shall describe the achievements of all the contracts supervised under this consultancy services in different sections separately, including completion dates of key milestones, problems encountered and overcome, and any problems outstanding. It shall also describe lessons learned from the project implementation and the ability of Client’s staffing to successfully continue O&M of the completed works. The completion report shall include financial overviews, including all payments made to the contractors under the contracts, complete overviews of all approved variations and any outstanding payments or issues.