

February 2021

Karachi Water & Sewerage Services Improvement Project [KWSSIP]

Project Implementation Unit, Karachi Water & Sewerage Board

Room No. 10, Block-C, 9th Mile KW&SB Office, Shahra-e-Faisal, Karachi

Request for Expression of Interest

For

Feasibility StudY & Detail Design of Preparatory WORKS OF Group 05OF SOP - 2 of KWSSIP

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**REQUEST FOR EXPRESSION OF INTEREST**

(CONSULTING SERVICES – FIRMS SELECTION)

**Islamic Republic of Pakistan**

**Karachi Water and Sewerage Services Improvement Project-2 (KWSSIP-2)**

**AIIB Special Fund - Grant Number: S0404A**

**Assignment Title: Feasibility & Detail Engineering Design of Group 05 Sub-Projects for KWSSIP-2**

**Reference No. (As per Procurement Plan): 5**

The Karachi Water and Sewerage Board (KWSB) has applied for financing as Grant in Aid from the Asian Infrastructure Investment Bank (AIIB) toward the cost of the consulting services for the preparation of sub-projects of KWSSIP-2.

The consulting services (“the Services”) for the Group 05 Sub-Projects for SOP-2 of KWSSIP includes (i) Priority Water Newtwork Rehabilitation & Extension to reduce Non-Revenue Water and (ii) Additional Chlorination (Intermidiate / Mobile) facilities to Improve the Water Quality to the end cunsumers of the Identified Areas for KWSSIP-2. The Services include level of effort of relevant professionals, with implementation period of 06 months, expected start date of March, 2021, ensuring full consistency with the TOR attached to this REOI.

The detailed Terms of Reference (TOR) for the assignment can be obtained from the address given below during the office hours, i.e. 0900 – 1700 Hours on working days, Monday to Friday or downloaded from KW&SB website.

The KWSB 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 shortlisting criteria i.e. experience in providing services in the areas of Feasibility Studies and Detailed Engineering Design for three (03) infrastructure development works undertaken during the last ten (10) years, as detailed in the Section 3 (Shortlisting Criteria) of this document. Key Experts will not be evaluated at the shortlisting stage.

The attention of interested Consultants is drawn to Section II, paragraph 4.4, and paragraph 4.9 of the AIIB’s “Procurement Instructions for Recipients” June 2, 2016, setting forth the AIIB’s policy on conflict of interest and eligibility.

Consultants may associate with other firms to enhance their qualifications, but should indicate clearly whether the association is in the form of a joint venture and/or a sub-consultancy. In the case of a joint venture, all the partners in the joint venture shall be jointly and severally liable for the entire contract, if selected.

A Consultant will be selected in accordance with the Quality and Cost Based Selection method set out in the Procurement Instructions for Recipients.

Further information can be obtained at the address below during office hours 0900 – 1700 Hours on working days, Monday to Friday

Expressions of interest must be delivered in a written form to the address below (in person, or by mail) latest by **5th March 2021.**

**The Project Director**

**Project Implementation Unit (PIU)**

**Karachi Water & Sewerage Services Improvement Project (KWSSIP)**

**Karachi Water & Sewerage Board**

**Room No. 10, Block-C, 9th Mile KW&SB Office,**

**Shahra-e-Faisal, Karachi.**

**Tel No. +92-21-99245134**

# Instruction to Consultants

## General Instructions

While expressing the interest, consultants have to consider the following:

1. The Project Implementation Unit (PIU) invites eligible consulting firms/ Joint Venture(s) with specific and proven competence and experience to indicate their interest in providing the services. Eligible firm(s) / JV’s should submit Expression of Interest (EOI) in English language along with the required relevant complete details of the qualification and experience requested in Item 3 – Shortlisting Criteria.
2. Interested consulting firm(s) / Joint Venture(s) must provide information indicating that they are qualified to perform above services (e.g. description of similar assignments, value of previous assignments, experience under similar conditions, availability of appropriate professionals etc.).
3. Association of consultants can either be in the form of joint venture (JV) or a sub-consultancy. Therefore, the consultant submitting their Expression of Interest in association should clearly mention whether the association is a Joint Venture or Sub-consultancy. The experience of all the firms in the JV will be considered for evaluation and each partner must meet the shortlisting criteria as defined under Section 3. In case of Sub consultancy, the experience of the sub-consultant will not be considered in qualification.
4. The maximum numbers of entities allowed in joint venture are three [03].
5. An applicant can express only one interest either as a single entity or in joint venture, however, a sub-consultant can associate with more than one applicant.
6. A firm that applied either as single entity or JV member cannot be a sub-consultant to another entity or JV. In such a case, all the applications in which the firm is involved shall be disqualified and rejected. While selecting a sub-consultant, applicants are advised to check this requirement.
7. A consulting firm / Joint Venture will be shortlisted in accordance with AIIB Procurement Policy, January 2016, and Interim Operational Directive: Procurement Instructions for Recipients, June 2016.
8. The attention of interested Consultants is drawn to Section II, paragraphs, 4.4 and 4.4.2 of the AIIB’s Interim Operational Directives on Procurement Instruction for Recipient (PIR) June 2016, setting forth the AIIB’s policy on conflict of interest that can be seen at <https://www.aiib.org/cms/en/search/index.html?query=procurement%20instructitons%20for%20recipient>
9. It is expected that the interested firm(s)/ joint venture(s) will have expertise in the areas of environmental and social management, all related public and donor-funded development projects / affairs of the city of Karachi in these areas including but not limited to management frameworks of these, dealing with relevant public sector governing authorities and coordination with, roles of civil societies, impacts of new projects, environmental and social safeguards, resettlement action plans, collection of data, field surveys, public campaigning, public hearings, specific problems of urban informal settlements [katchi abadi], land use patterns, village setup and system in rural areas etc.
10. The consultant(s) should ensure that the submitted information is correct. An EOI containing significant omissions / errors shall not be considered. A firm / JV qualifying on the grounds of misrepresentation of facts shall be disqualified at any stage even after the award of contract and the sanctions / penalties may also be imposed on the firm as per AIIB / World Bank’s rules and regulations.
11. The information need to be presented in a clear and comprehensive manner free of ambiguities. The copies of documents attached should be clean and legible.
12. If the EOI consists of more than one volume, the applicant must clearly number the volumes constituting the EOI and include a table of contents for each volume. **All documents should be securely bound**.
13. Consultant selection as a result of this REOI shall be in accordance with the Quality and Cost Based Selection Method. Both, local and international consulting firms can express interest.
14. Once a firm / JV is shortlisted and invited for submission of the Proposal, it is not permissible to transfer the invitation to any other firm, such as Consultant’s parent or sister companies, subsidiaries and affiliates.
15. The procuring agency will reject a Proposal if the Consultant drops a JV member without the Client’s prior consent, which is given only in exceptional circumstances, such as debarment of the JV partner or occurrence of Force Majeure.
16. Submit one original and two copies of EOI in hard format and soft copy of complete EOI on USB device. Documents related to qualification / generated docs have to be either in Word and Excel. Only attachments like certificates, company registration and financial documents are acceptable in scanned / pdf form.

# Information Needed for EOI

## Basic Information – Part A

1. Name of the Company, Phone, Fax, E-mail address, postal address of the head office and name of Contact Person. In case of JV, provide information of all JV members.
2. Certificate of Registration of the firm as Legal Entity. In case of JV, provide information of all JV members.
3. Firm(s)/ joint venture(s) name, address, copy of the Registration Certificate with relevant professional bodies of the concerned Government, supported by latest/ updated renewal, Country of Operations (if the firm is registered and operating in several countries). Memorandum/ Article of Association/ Partnership Deed or Joint Venture Agreement Or a letter of intent to form a joint venture (as applicable).
4. National Tax Number of the firm/joint venture;
5. List of other works similar to indicated in General and Specific Experience above completed in last ten (10) years or in progress of the firm / joint venture members indicating the following:
6. Name of the Project;
7. Name and address of the Client;
8. Value of the contract in US$.
9. Start and Completion Date
10. Whether worked as Consultant, Sub-consultant or JV Member. In case of JV Member indicate the share in the JV.
11. If worked as sub-consultant or JV member, provide details / component of works performed.
12. Any additional document(s) to support relevant experience of firm(s)/ Joint Venture(s);
13. List of the litigation/arbitration during last ten (10) years, if any, in which the company has been involved and the current status.
14. An Affidavit from firm / all the participating partners of the association / JV confirming that: (a) applicant firm has never been blacklisted by any International, Government / Semi Government Organization and (b) All the information provided by the applicant firm in this EOI is correct.

## Basic Information – Part B

**Expression of Interest (EOI) Consulting Firms**

Table 2.1: EOI for Assignment

|  |  |
| --- | --- |
| Assignment Name |  |
| Project Name |  |
| Project Country |  |

**I. Consulting Firm Information**

Table 2.2: Firm Information

|  |  |
| --- | --- |
| Date: | Country of Incorporation: |
| Consultant Name: | Acronym: |
| EOI Submission Authorized by: | Position |

**Associations (Joint Venture or Sub-consultancy)**

Table 2.3: Information of Association

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Consultant | Acronym | Country of  Incorporation1 | Joint Venture  (JV) or Sub- consultant | EOI  Submission  Authorized By | Position |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
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**II. Assignment Specific Qualifications and Experience**

**E. Project References**

Please select three (03) post relevant projects completed in last 10 years to demonstrate the firm’s technical qualifications and geographical experience where similar technical studies have been performed preferably on the MDB’s financed projects for water supply which include bulk transmission, distribution and treatment facilities. The completion date of each project must be within last 10 years and the total construction value of each shall not be less than US$10 million. The services must include technical feasibility studies and detailed engineering designs. . Minor engineer services such as pre-feasibility studies or conceptual designs will not be considered. For each Project, submit a letter from Client about the Performance.

Table 2.5: Most Relevant Projects during Last 10 Years

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| SN | Project | Period | Client | Country | Firm |
| 1 |  |  |  |  |  |
| 2 |  |  |  |  |  |
| 3 |  |  |  |  |  |
| 4 |  |  |  |  |  |
| 5 |  |  |  |  |  |

Project Summary

**Project 1 of**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ● Project Name |  | | | | | |
| ● Name of Client |  | | | | | |
| ● Country |  | | | Project location  Country | |  |
| ● Participation |  | As lead firm  As associate firm | | | | |
| ● Value of Services |  | | (US$) | | | |
| ● Source of Financing |  | | | | | |
| • Consultancy Services | | | | | | |
| (i) No. of staff |  | | | | | |
| (ii) No. of person months |  | | | | | |
| • Length of Consultancy Assignment | | | | | | |
| ● Start Date |  | | | | (dd/mm/yyyy) | |
| ● Scheduled date of Completion |  | | | | (dd/mm/yyyy) | |
| ● Actual Date of Completion |  | | | | (dd/mm/yyyy) | |
| ● Continuous / Intermittent |  | | | |  | |
| • Name of Associate Firms (if any) | | | | | | |
|  | | | | | | |
| • No. of Person-Months of Professional Staff Provided by Associated Firm(s) | | | | | | |
| • Name of Senior Staff (Project Director/Coordinator, Team Leader) Involved and Functions  Performed | | | | | | |
|  | | | | | | |
| • Detailed Narrative Description of the Project with total cost | | | | | | |
|  | | | | | | |
| • Detailed Description of the Actual Services Provided by your Firm | | | | | | |
|  | | | | | | |

(Please insert more tables as necessary)

**III. Comments on Terms of Reference**

|  |
| --- |
|  |

**VI. EOI Attachments**

Table 2.6: Attachments

|  |  |
| --- | --- |
| SN | Description |
| 1 | Certificate of Incorporation of the lead member |
| 2 | Certificate of Incorporation of the JV member (for each member) |
| 3 | Certificate of Incorporation of the Sub-Consultant (for each sub-consultant) |
| 4 | Letter of Association |
| 5 |  |

(Please insert more rows as necessary)

**VI. Eligibility Declaration**

We, the undersigned, certify to the best of our knowledge and belief [Eligibility refers to AIIB’s Procurement Policy, Clause 5.8 and 7.0 on Prohibited Practice and Integrity].

Table 2.7: Eligibility Declarations

|  |  |  | Indicate  Yes / No |
| --- | --- | --- | --- |
| We have read the advertisement, including the terms of reference (TOR), for this assignment. | | |  |
| Neither the consulting firm nor its JV member or sub-consultant or any of its experts prepared the TOR for this activity. | | |  |
| We confirm that the project references submitted as part of this EOI accurately reflect the experience of the specified firm/consortium. | | |  |
| We further confirm that, if any of our experts is engaged to prepare the TOR for any ensuing assignment resulting from our work product under this assignment, our firm, JV member or sub-consultant, and the expert(s) will be disqualified from short-listing and participation in the assignment. | | |  |
| All consulting entities and experts proposed in this EOI are eligible to participate in AIIB-funded, supported and administered activities. | | |  |
| The lead entity and JV member or sub-consultant are NOT currently sanctioned by AIIB or other MDBs. Neither the consulting firm nor the JV member or sub- consultant has ever been convicted of an integrity-related offense or crime related to theft, corruption, fraud, collusion or coercion. | | |  |
| We understand that it is our obligation to notify AIIB should any member of the consortium become ineligible to work with AIIB or other MDBs or be convicted of an integrity-related offense or crime as described above. | | |  |
| JV member or sub-consultant, including all proposed experts named in this EOI, confirmed their interest in this activity in writing. | | |  |
| JV member or sub-consultant, including all proposed experts named in this EOI, authorized us in writing to represent them in expressing interest in this activity. | | |  |
| None of the proposed consortiums are subsidiaries of and/or dependent on the Executing Agency or the Implementing Agency or individuals related to them. | | |  |
| We understand that any misrepresentations that knowingly or recklessly mislead or attempt to mislead may lead to the automatic rejection of the proposal or cancellation of the contract, if awarded, and may result in further remedial action, in accordance with AIIB’s Prohibited Practice. | | |  |

# Shortlisting Criteria

## Shortlisting Criteria

The shortlisting criteria are as under:

Table 3.1: Shortlisting Criteria

|  |  |
| --- | --- |
| **No.** | **Criterion** |
|  | **General Experience** of providing services in the areas of Feasibility Studies and Detailed Engineering Design for three (03) infrastructure development works undertaken during the last ten (10) years.  List the project name, name of the Client, location and type of facility / development for that works were performed.  Single Entity: Must Meet.  Joint Venture:  The Lead Member: must have done two [02] projects  Other Members: must have done minimum one [01] project of above nature |
|  | **Specific Experience of Water Supply System and Water Filtration Plants:**   1. Experience of at least three (03) consultancy assignment(s) completed in last 10 years for Feasibility Studies and Detailed Engineering Design of major water infrastructure project(s) including water trunk and rising mains, water networks modelling & water disinfection especially chlorination process, having contract value of US$ 0.2 million, are required. 2. All above consultancy assignment should have been for the projects having minimum construction value of US$ 4 million, are required.   Single Entity / Firm: Must Meet  Joint Venture:   1. The lead member must have done at least one [02] Water infrastructure project with [01] water disinfection / chlorination project of value as defined above.   Other members: must have done one [01] water infrastructure project.  The projects listed here and in Item 2 above:   * Must be a completed project with a completion certificate issued by the Client. Attach the Completion Certificate and letter of award indicating the contract value for each reference project. * If the work(s) have been performed in a joint venture, indicate share in the JV to work out the number of projects required for the qualification of this assignment. |
|  | Overall **Managerial Capacity** (Core Managerial and Technical Staff) |

Appendices

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| --- |
| [Appendix A](#_Toc56524253)[: Terms of Reference­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_](#_Toc56524253) |

# **Terms of Reference for Feasibility & Detail Design of Group-05 Sub-Projects for KWSSIP-2**

**1. Background:**

Karachi, like all megacities, has grown so quickly that it struggles to deliver basic infrastructure services, including potable water and wastewater collection and treatment. Karachi Water and Sewerage Board (KW&SB), is no longer equipped or empowered to deal with the challenging reality on the ground. There is a huge unmet demand for water (550 MGD current capacity versus an estimated demand of 1200 MGD); and a high non-revenue water percentage (50-60 percent); There is currently no sewage treatment, as the city’s sewage treatment facilities are dilapidated and not working, resulting in an estimated 475 MG of sewage/day being discharged into the Arabian Sea. The utility has not had significant capital investment for more than a decade and most of its infrastructure is worn out and operating far below its rated capacity.

To transform KW&SB into a financially sustainable and technically sound water utility and to improve the service delivery level Government of Sindh (GOS) and the KW&SB with the assistance of World Bank (WB) and Asian Infrastructure Investment Bank (AIIB) has conceived Karachi Water and Sewerage Services Improvement Program (KWSSIP) to provide clean, safe drinking water and proficient sewerage services to the general public. Phase –I of KWSSIP has been approved in 2019, with planned Series of Projects (SOP-I) consists of 4 different projects, for which each AIIB and WB will provide a loan of USD 40 million to support critical water and sanitation infrastructure and operational reforms. The proposed Phase-2 of this program (KWSSIP-2 or SOP-II) will deepen the reforms undertaken under the Phase-1 project and significantly scale-up the infrastructure investments to improve water supply and sewerage services in Karachi. The investments in the rehabilitation of existing and the construction of new infrastructure will enhance the development impacts by reaching more beneficiaries, at the same time, building support for continued mainstreaming of the operational reforms. Proposed activities are grouped into three components:

1. Reforms of KWSB: This component will continue to build capacity and improve the operational performance of Karachi Water and Sewerage Board (KWSB) by supporting institutional reforms; revenue management, customer care and communication; non-revenue water reduction; preparation and implementation of water safety plans; water wastage reduction program and water audits.
2. Securing Sustainable Water Supply and Sewerage Services: This component will invest in key water and sewerage infrastructure to address three interlinked structural problems in Karachi’s water and sanitation system – the overall supply shortfall; the low water quality; and the lack of sewage treatment capacity. Proposed sub-projects include:

* Additional bulk water supply investments
* Malir basin wastewater interceptors and treatment plant (S-III) Phase 2
* Water supply and sewerage investments in additional low-income communities (Katchi Abadis.
* Priority sewer network rehabilitation & extension and rehabilitation of wastewater pumping stations
* Priority water network rehabilitation and extension to reduce NRW
* Reducing energy consumption
* K-IV augmentation
* Rehabilitation of existing and construction of new filtration plants

1. Project Management: This component will support project management, implementation supervision and institutional strengthening of KWSB.

**AIIB is committed to provide approximately US$ 4.136 million to GOS / KW&SB as Project Preparation Special Fund Grant (the Grant) to finance technical and environmental & social consulting services for preparation of the different sub-components of the KWSSIP-2.**

1. **Objectives of the Assignment**

The objectives of this assignment are to carry out the feasibility studies and detailed engineering designs for the selected investments related to Priority Water Network Rehabilitation under the Component-2. The ToRs will provide outline for the Consultant, to be selected through competitive bidding process in accordance with the AIIB Procurement guidelines to comprehensively render services of Feasibility and Design obligations to prepare quality bidding documents incorporating all the aspects in detail and professional manner for smooth implementation during construction phase of the sub-projects.

**3. Scope of Services, Tasks and Expected Deliverables**

The Scope of Services consists of the assignments detailed below:

* Identification of sites for the respective work and feasibility.
* Review the Environment and Social Safeguard Documents i.e., Environmental and Social Management Plans (ESMPs), Initial Environmental Examination (IEE) / Environmental Impact Assessment (EIA), Resettlement Action Plan (RAP) / Abbreviated Resettlement Action Plan (ARAP) under the Bank guidelines and Sindh Environmental Protection Agency (SEPA) for the identified project areas to mitigate the potential E&S risks.
* Conduct Feasibility and Detailed Designing, preparation of Bidding Documents, cost estimation and assist KWSSIP in bidding process by responding the queries related to Design issues and other relevant matters of the entire sub- projects. The assignment also includes Topographic Surveys, authentication of technically suitable and hydraulically viable water supply scheme and improvement plans, socio-economic and engineering surveys and other allied activities requires for a comprehensive detailed design for Priority Water Network Rehabilitation including O&M Equipment and Water Meters to reduce Non- Revenue Water (NRW).

The sub-project will focus on:

* Installation of different sizes of Full-Bore Electromagnetic Water Flow Meters with Data Transmitter for real-time retrieval through SCADA System coupled with the mainframe GIS Software to ascertain the actual water supplied to the city from the Bulk Water Supply System of Karachi.
* Establishment of District Metering Zones (DMZs) by replacement of required sections of Water Trunk Main System comprising of large diameter pipes ranging from 18" diameter to 72" diameter and installing master area meters, pressure reducing valves, air valves for leakage controls and non- return valves on elevated supply areas along with construction of RCC Valve and meter Chambers.
* Consider replacing most vulnerable / deteriorated rising main and the water trunk mains in consultation with the respective Chief Engineer-KW&SB to control the water loss.
* Propose effective and efficient regulating valves at various location identified following detailed survey to manage and regulate the water supply in equitable manner with rehabilitation / replacement of existing valves based on the present performance.
* Installation of intermittent Chlorination Stations in the water supply network at the prescribed locations for effective disinfection by maintaining required residual chlorine at the end user level. The identification of locations will merely base on the water quality determined through lab-tests and subsequent evaluation by the Consultants.
* The outcome of the sub project will assist KWSSIP implement of Priority Water Network Rehabilitation including O&M equipment and installation of System Water Meters to reduce Non-Revenue Water (NRW) with defined goals / targets set by the consultant during construction phase.

**Terms of Reference for Feasibility & Detail Design of (i) Priority Water network rehabilitation & Extension to reduce Non-Revenue Water (NRW) and (ii) Additional Chlorination Facilities to Improve the Water Quality \_\_\_\_ Identified Areas Under Group-05 Sub-Projects for KWSSIP-2**

**Feasibility Study, Review of ESS Studies**

1. Desk study of all the available data of the existing water utilities in identified subproject area provided by the Client, with further analysis required for smooth execution including any or all surveys and investigations, if required.
2. Performance Assessment Report covering capacity and conditions of the existing Water Supply Network including water distribution pumping stations.
3. Figure out the precise locations to install water meters (Full-bore EM flow meters or equivalent or any other type) for effective measurement of water flows.

1. Reaffirm the District Meter Zones for Water Trunk Main Networks (Larger Diameter Mains >= 24-inch diameter) and identify metering points for proper quantification to water mass entering from Bulk to Distribution system at Sub-division or town level.
2. Identification of sites for the installation of Chlorinators at intermittent stage to ensure proper disinfection to maintain the quality of water at the end user. Alternate economical but modular ways and means to be explored for liquid chlorination (hypochlorite) and the provision and method for mobile chlorination facilities shall be ascertained, where required.
3. Conduct surveys and investigations as stated but not limited to the following:
4. Reconnaissance Survey
5. Topographic Survey with detailed GIS based mapping of all water supply either owned by KWSB or other parties and shall also include mapping of Right-Of-Ways.
6. Socio-Economic surveys to determine the availability of the construction corridors and related resettlement issues in these corridors.
7. Soil Investigation / Geotechnical Surveys
8. CCTV Surveys to assess conditions of water mains, if required.
9. Determine Economical and Financially viable solution including cost comparison of the type of piping system to be laid, pipes repair, rehabilitation, and replacement with internationally accepted modular technologies for repair and rehabilitation works like Trenchless Technology. Economic and Financial viability of the proposed investments shall be assessed by preparing acceptable economic and financial models.
10. A market analysis to be carried out on the availability and application of in-situ rehabilitation and replacement technologies.
11. Environmental and Social Framework to be followed for the identification of sites and preparation of works. Feasibilities and detailed designs will be carried out in accordance with the recommendations of these ESF. Site specific ESIA will be conducted by separate ES Consultants. The consulting firm will work closely with the ES Consultants in carrying out the site-specific Environmental and Social Impact Assessments (ESIA), and preparation of Environmental and Management Plans (EMP), Social Management Plans (SMP), and Abbreviated Resettlement Action Plans / Resettlement Action Plans (RAP), as per ground realities for the subject project compliant with the relevant laws and policies of the Islamic Republic of Pakistan, the Provincial Government of Sindh, the City of Karachi, and the applicable Safeguards Policies of the AIIB Bank with budget estimation.
12. Incorporate Environmental and Social Screening for the sub-project and prepare respective instruments for proper monitoring and mitigation.
13. Adopt participatory approaches to the work with different stakeholders dealing with Water & Sewerage Services operating / existing in the City, Cantonments Boards, DHA, Port Qasim Authority, six large Industrial Areas are few of them. Besides, KMC, KBCA, DMCs. KDC, Pakistan Railways carries a frequent mutual interaction with KW&SB.

1. Prepare detailed Feasibility Study incorporating all the environmental, social and economic analysis with mitigation plan and technical viability of the project with anticipated desired goals and targets on carrying out the proposed rehabilitation and extension of sewerage networks.

1. Prepare the Conceptual / Preliminary Design for the propose project.

**Detail Design**

1. Detailed designing of the repair, rehabilitation and or extension and construction of new water supply networks and rehabilitation of Water Pumping Stations as recommended in the Conceptual & Preliminary Design.
2. Detailed designing for the types, standards and specifications, country of origin, installation of flow meters at predetermined locations of bulk and water trunk mains for precise quantification of the water flows and supply.
3. Make effective use the modern technology (trenchless) to minimize public inconvenience, wherever possible and economically viable.
4. Select the piping material with merits and demerits. Design proper pipe sizing, slope calculations and hydraulics for efficient transmission of the water.
5. Develop hydrological analysis report of the selected water supply priority work areas.
6. Set the internationally accepted standards and specification while selection of Chlorinators (Stationed / Mobile) for water disinfection to ensure residual chlorine at intermittent water pumping stations considering O&M and after sales service facilities.
7. Flood protection mechanism for the Water Distribution Pump houses during monsoon shall be devised to keep the pumping station working during rains. Climate change and pattern of erratic rains with 50 years rainfall record of MET department shall be considered.
8. Propose best type of procurement for the Rehabilitation / up gradation of existing water supply network and accordingly prepare the bidding documents on recommended mode of procurement practically viable for implementation.

1. Set out Ground Control Points (GCP) by using GPS system to mark the centre line of the propose alignment with True Benchmark to be obtained from the Survey of Pakistan.

1. Prepare Cost Estimates with rationale.
2. Prepare & recommend the realistic timelines for completion of the project considering the level of difficulties likely to be encountered during execution phase.
3. Propose best economical Methodologies for smooth and timely implementation of the project.
4. Prepare all necessary bidding documents, drawings, specification on World Bank’s respective Standard Bidding Document / Guidelines.
5. Prepare well defined B.O.Qs with preamble to cover all aspects of the works for healthy competitive bids.
6. Identify probable necessary Approvals / NOC’s/ Permissions, etc required during the currency of Proposed Project from different authorities.
7. Prepare engineering estimate to be used as benchmark for assessment of financial proposals.
8. Assist KWSSIP team / Procurement Specialist during procurement process for technical and financial evaluation of the bids till award of Contract.
9. Respond to all the queries related to the bid documents raised by the interested bidders during procurement.
10. The Contractor shall be solely responsible for its Design during the currency of the project implementation and shall aid to rectify / modify / clarify any design variation.
11. Any other task or assignment to achieve high standard of design quality.

**Deliverables**

By way of illustrations, and not limitation, the reports to be submitted by the Consultants to KWSSIP as part of deliverables under consultancy services will include the following:

|  |
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| **Description** |
| Inception Report of Group 05 Works |
| **Feasibility Study & Review of ES Study**  Performance Assessment and Pipe / Structure Stability Report of the Identified Bulk Water Conveyance System, Water Distribution Network with Condition assessment of Existing Water Distribution Pumping Station. |
| Comprehensive GIS Mapping of the project area showing the project areas, water mains, underground utilities, encroached areas, if any, including ROW details and availability etc. |
| Technical Survey Reports including Geotechnical surveys, Topographic surveys, Reconnaissance Surveys etc |
| Detailed technical Report to adopt trenchless technology with merits and demerits and cost comparison. |
| Selection of modular pipe material with value engineering and economic viability. |
| Qualitative and quantitative analysis of the water supplied in the specified areas. |
| Review Report of the ES study with findings and risk mitigation plan. |
| Feasibility Report (Draft) |
| Feasibility Report (Final) |
| Submit Conceptual / Preliminary Design Report |
| **Detailed Designing** |
| Detailed Design calculations categorizing based on rehabilitation, extended modification or construction of new facility with flow details, hydrological analysis and computerised modelling and detailed hydrology with structural stability. |
| L-Section of the new proposed water mains with lines and levels, NGL, Service crossings etc. |
| “Design Report” (Draft) |
| “Design Report” (Final) |
| Engineering estimates with rationale and detailed preamble. |
| Bidding documents with Bidding drawings complete in all respect |
| Preliminary design covering all the basic information, guidelines, specifications, and standards for EPC based Contracts in respect of Pumping stations with Intermittent Chlorination facilities and Mobile Chlorination units. |
| Technical data to support the design and site conditions of the respective sub projects |
| Any other task or assignment necessary for detailed designing. |

**Timeframe for the Assignment**

The total duration of the, Feasibility Study and Detailed Engineering Design will be (06) months.