

Terms of Reference

ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION CONSULTANT (EDCS) **Cluster Central**

1. Introduction

The Government of Punjab has launched a project for service improvement in rural areas of the Punjab through Punjab Rural Municipal Services Company (PRMSC) which has been established under Section 42 of Companies Act 2017. Through various studies, it has been proven that poor condition of WASH not only affects the health of masses, but it also adversely affects the economic growth of the region. Recently, a number of mega initiatives have been launched by the Government, and international organizations in the urban areas of all provinces of Pakistan for the improvement of water and sanitation but the rural areas still remain neglected. Rural settlements of Punjab, which hold 73 % the province's population living in 23,000 revenue villages, are in dire need for investments to improve WASH.

Outcomes of Pre-Feasibility Studies (PFS) and sector assessments, have identified requirements for improving climate resilience and planned economic growth of 2,000 villages which will be the part of the project. A typical Revenue Village comprises one or more large settlements and some scattered, small, and remote habitations. Due to the gravity of the situation, the Government of the Punjab, has endorsed selection of these 2,000 revenue villages, having 2009 large and 8000 small habitations for the water supply, sanitation and solid waste management interventions to the both large and small settlements to ensure that the poorest and remotely located residents are not left behind. Poverty, water contamination, stunting and sanitation condition of the areas have been taken as basic parameters for selection of project sites / tehsils. Over 6.0 million rural residents shall be served under the said component including Multi-village water supply scheme & 100% solid waste through recycling, composting and management of residual waste. The interventions shall be implemented in phased manner

Government of Punjab, with the assistance of World Bank, will finance complete detailed engineering designs through Engineering, Design & Supervision Consultancy Services (EDCS) under project in revenue villages of following Tehsils of Geographical based Clusters of selected districts given hereunder. The services will assist in; (i) design documentation, including Sub-scheme/Project Document (PC-I), Bill of Quantities, for water supply and sanitation services to achieve economies of scale and desired results, operational and business models and (ii) resident supervision of infrastructure development in below mentioned revenue village covering all settlements:

		Tehsils	No. of Revenue Villages covering all settlements
Central			
1	Jhang	Ahmedpur Sial	89
2	Chiniot	Bhowana	92
	Bhakkar	Darya Khan	85
	Pakpattan	Pakpattan	135
TOTAL =			401

All the relevant details along with coordinates are given in Annex – I.

2. Objective of the Assignment

The ToRs of the subject assignment have been framed to carry out following functions:

- (i) Identification of sites for the respective work and conducting feasibility studies for the water supply, sanitation and solid waste management interventions ensuring 100% solid waste through recycling, composting and management of residual waste,
- (ii) Preparation of detailed 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 World Bank guidelines and Punjab Environmental Protection Department,
- (iii) Preparation of operational design and business model to provide technical and operational support by assisting the respective village's water and sanitation services provider in (i) improving water and sewerage services to customers utilizing the additional asset base created in the selected revenue villages; (ii) improving technical and commercial efficiency of the water utility, sanitation, solid waste management operations; (iii) enhancing human resource management and productivity; (iv) ensuring full cost recovery and financial sustainability of the respective villages' water and sanitation service provider; (v) conducting gap analysis and design a business and operational model for municipal services for water supply, and sewerage services; (vi) designing an overall integrated rural management solution; and (vii) designing a mechanism for forecasting of return on investment for the Government.
- (iv) Detail Designs, preparation of Bill of Quantities, Sub-Scheme Documents (PC-Is), Bidding Documents and Construction Supervision of the entire sub- projects via detailed Topographic Surveys, authentication of technically suitable and hydraulically viable water supply and sewerage systems (100% solid waste through recycling, composting and management of residual waste), socio-economic and engineering surveys, and
- (v) Specialized services during Construction phase as Resident Supervision.

3. Scope of Consultancy Services

The consultant shall perform, but not limited to, the following tasks in close coordination with Project Implementation & Management Unit (PIMU) which is also Head Office of the Company (PRMSC-HO):

3.1: PLANNING, FEASIBILITY STUDY AND DETAILED ENGINEERING DESIGN, DRAWINGS, SPECIFICATIONS AND BILL OF QUANTITIES:

The Consultant's inputs shall include but not limited to the following tasks, to be carried out for each revenue village:

(i) PLANNING

- (a) Identify key stakeholders and ensure that they are aware about the planning

initiative and are willing to engage with it,

- (b) Collect and validate available secondary information, including reports, existing maps and plans etc. and information on planned activities,
- (c) Prepare a detailed GIS base map based on satellite imagery (0.6 m resolution) which will be acquired from an authentic source and shall be used to develop an updated land cover base map of the city and its surrounding areas. Prepare an updated GIS map of the villages based on field surveys, which includes all major features, such as, existing built-up area, infill sites, brown fields, agricultural land, forests, water bodies and open land available for future development for the study area/ planning boundary. Administrative boundaries should also be added to this base map,
- (d) Prepare overlays showing existing municipality services (water supply, drainage, sewerage, electricity, gas lines, telephone lines, water courses, canals etc.),
- (e) Engage with local stakeholders, to (a) collect local knowledge through focus groups discussions, and (b) collect information on their concerns and priorities,
- (f) Prepare situational analysis report, with the findings about existing conditions, current growth trends, any planned work to be undertaken, ongoing works, and an estimate of future growth trend/visions,
- (g) Assess options for meeting priority needs and forecasting the implementation of the masterplans and develop preliminary proposal/strategy for the schemes, which meet the requirements and facilitate implementation of the plan,
- (h) Present the Plan and possible options for meeting priority needs to local stakeholders and modify it accordingly in response to their suggestions and concerns,
- (i) Finalize the plans and list of priority sub projects,
- (j) Liaise with PIMU (PRMSC-HO) and relevant stakeholders to ensure that the plan and priority list of sub projects are formally approved and agreed upon,
- (k) Presentation of Final Report.

(ii) FEASIBILITY STUDY

- (a) Assess the sub projects relevancy showing their relationship with existing infrastructure under integrated rural development concept,
- (b) Identification and assessment of alternative technical and operational options with comparative cost effectiveness. The technical option includes exploration of a sustainable water source that can provide up to 70lpcd on a sustainable basis.
- (c) Collect and evaluate all new data needed to produce a robust study and will make no assumptions drawn from the Previous Report or Study,
- (d) Produce an appropriate tentative cost estimate of each sub project, based on typical sections and details using appropriate unit rates,
- (e) Assess the relevance and feasibility of each sub project ensuring that:
 - It fulfills a clear need of the revenue village,
 - It is compatible with existing infrastructure (for instance those levels are such

that proposed drains and sewers can be discharged to existing facilities or can receive flows from their proposed drainage areas and that existing drains have sufficient capacity to carry any additional flow resulting from proposed schemes, likewise existing drains are utilized for storm water),

- The O&M of the proposed technology is manageable by the Village Councils and services related to long term maintenance are available in the local market,
 - Carry out financial viability analysis and relevant indicators, including a financial model and value for money analysis,
- (f) Based on the assessment, produce a brief feasibility report for each sub project and present this for clearance (a clustering exercise for similar sub-projects is recommended in the report),
- (g) Possibilities of a Public-Private-Partnership (PPP) set-up for operation and maintenance,
- (h) Priority should be given to multi-village schemes with skimming wells near canals, where possible. This will require source selection point, alignment of network, groundwater analysis and surface water quality based on testing of NEQS parameters for detail designing,
- (i) Problem analysis / problems to be addressed. Present organizational and financial situation of the service providers comprised by the project and other project financially involved parties; non-autonomous (departmental)/ semi-autonomous/ autonomous; organizational set-up; tariff system and rates; income and cost recovery
- (j) Feasibility Plans for complete Solid Waste and Liquid Waste Management in tehsil wise.
- (k) Provision of coasted O&M plan of most feasible option.

(iii) DEMOGRAPHIC AND SOCIO-ECONOMIC DATA

- (a) Based on survey, prepare local level statistical information and reconcile it with government records, where possible. Disaggregated data on most vulnerable groups will be preferred) on; (a) Population, (b) Income, (c) Occupation, (d) Poverty, (e) Economic growth and growth potentials,
- (b) Prepare and forecast (20-25 years) demand for the services (extension of service area; increase of population and per capita income; industrial, commercial and institutional development, affordability index). Design is expected to be phased to extend services during the lifetime of infrastructure,
- (c) Collect & assess Socio-economic situation of main project beneficiaries.

(iv) OPERATIONAL DESIGN AND BUSINESS MODEL

- (a) Asses the current level of services being provided by the Village Councils with respect to water supply and sanitation, wastewater, and solid waste

management, and challenges in delivery of these services efficiently and on sustainable basis.

- (b) Develop a long-term financial model for the water and sanitation, sewerage and solid waste management system. In particular, this would include incremental reduction of provincial subsidy and projected enhancement of local revenue.
- (c) Following a diagnosis of the water supply and sanitation, sewerage, and solid waste management sector, and of the VC's operational and financial aspects, the consultant will present various options / business models, also exploring avenues for private sector participation in the municipal services.
- (d) Study the current operating regime of water, wastewater and solid waste management services and develop a detailed operating plan. Assist and engage with community members and VCs for the successful implementation of the same. The operating plan shall clearly elucidate the different operating tasks, functions, responsibilities and monitoring mechanism and the related organization structure and inter relationships.

(v) DETAILED ENGINEERING DESIGN

- (a) Review, conduct and ensure that all the available surveys data are correct (amend if required) and meet the best international practices,
- (b) Undertake field surveys (geotechnical [(field investigations along with in- situ & lab testing) to arrive at the geotechnical parameters required for the design], engineering, site investigations, topographic etc.) and studies to establish firm basis for design. The geotechnical investigations should explore the underground salinity lens and make every attempt to propose sustainable water source devoid of salinity. In addition, yield tests must demonstrate adequate quantity of abstractable water for meeting the needs of the communities connected to the network,
- (c) Undertake environmental and social safeguard studies (including but not limited to EIA, IEE, land acquisition and resettlement plans, health and safety management plan, gender action plan for the proposed investments,
- (d) Conduct energy requirement analysis for the overall project and the best suitable solutions must be recommended (inclusive of solarization), which will be used for cost calculation of O&M,
- (e) Description and assessment of the project's adherence to legal agreements of Project, including the Guiding Principles for sustainable Infrastructure and suitability for sustainable Infrastructure Finance funding,
- (f) Description and assessment of the project's adherence to the government policies and laws,
- (g) Description and assessment of sustainability aspects of the project as per:
 - UN Sustainable Development Goals,
 - IFC Performance Standards on Environmental and Social Sustainability (IFC PS),
 - UN Guiding Principles on Business and Human Rights (UNGPR),

- IFC/World Bank EHS General Guidelines and sector relevant guidelines,
 - FIDIC Project Sustainability Management,
 - ISO Life-cycle Costing,
- (h) In addition, it will include a high-level gap assessment between national requirements and international requirements (IFC PS and UNGP),
- (i) Undertake technical due diligence and geotechnical assessment, for the proposed priority sub-projects,
- (j) Prepare and finalize the detailed engineering designs of priority sub-projects, technical specifications, detailed cost estimates (including costs for addressing environmental concerns based on ESMP), climate resilience measures, as per international best practices. The detailed engineering designs of the priority sub-projects should be prepared using integrated rural planning approach keeping the future needs in mind and new technologies,
- (k) The design should include both piped options for the larger settlements and non-piped options for smaller settlements, for both water and sewage solutions,
- (l) Identify the infrastructure (if any) to be replaced/ removed in relation to any priority sub-projects and prepare its detailed implementation/relocation plan(s),
- (m) Assist Client in appropriate packaging/ repackaging of activities,
- (n) Assist in preparing the subproject(s) PC-1 or other PIMU (PRMSC-HO) required documents/requirements for administrative/ management approvals for starting of the procurement process. The Consultant will be responsible for the costing of the detail engineering design of priority sub-projects to be finalized by the PIMU / Punjab Rural Municipal Services Company (PRMSC) and LG&CD
- (o) Design the Solid Waste Management (SWM) Machinery/ Equipment required for primary, secondary & tertiary the waste collection and disposal of Solid and liquid Waste. Designing of optimum route plans for collection and disposal of waste.

(vi) PROCUREMENT OF WORKS

- (a) Prepare draft bidding documents for the individual packages to be identified in the procurement plan as per World Bank Procurement Regulations using appropriate procurement documents. Bidding documents shall include detailed design/construction/working drawings, technical specifications, BOQs, EMP, HSMP, GAP or any other documents required as per legal agreements and associated documents,
- (b) Provide necessary support to the Client in all aspects of the procurement process for civil works contracts in accordance with the World Bank Procurement Regulations. The support shall include but not limited to the following:
- Assist in the pre-bid meetings (as per requirement) and site visits of interested bidders (if applicable), preparation of responses for bidders;
 - Assist the Client in preparing and finalization of contracts submission for review by concerned agencies including the Client and the World Bank, contract negotiation and awarding,
 - Prepare a Process Action Plan (PAP), detailing steps to be taken to deliver

the full project.

3.2. CONTRACT ADMINISTRATION & CONSTRUCTION SUPERVISION AS RESIDENT ENGINEER

The Consultant while supervising the construction works, shall also make all necessary arrangements for quality control and implementation of the civil works sub-schemes/project(s), as Resident Engineer. The task of the Consultant shall include, but not be limited to, the following:

- (i) Supervision of civil works and contracts shall be carried out based on the World Bank standards and guidelines. The consultant on behalf of the Client will administer both the goods and the civil works' contracts, make engineering decisions, be responsible for quality and quantity assurance, provide general guidance and furnish timely responses to the suppliers and contractors and ensure that all clauses of the contract agreements between the suppliers/contractors and PIMU (PRMSC-HO) are implemented,
- (ii) Assure submission(s) of contractual documents and advise PIMU (PRMSC-HO) on the adequacy of the Contractor's insurance policies, performance guarantees and advance payment guarantees,
- (iii) Give notice to contractor to commence the works,
- (iv) Provide advance payment advice to PIMU (PRMSC-HO) concerning schedule of handing over of project sites, and any anticipated delays due to various reasons,
- (v) Liaise with PIMU/PRMSC-HO, PRMSC-TO, District office, Village Councils and other concerned parties/consultants, as required, to ensure that the sub-scheme/project sites are made available to the Contractors on time and that any issues related to land acquisition and utilities relocations are resolved in minimum time,
- (vi) Assess the competence of the contractors' inputs in material, labor selection, construction methods, and safety measures,
- (vii) Monitor the progress of sub-schemes/projects against the contractual construction schedules/workplans. Warrant that the Contractor submits regular updated workplans that take into account the time passed and work completed. A realistic timetable for completing the works within the specified contract period must also be furnished periodically. Initiate action if the Contract is clearly going to time overrun,
- (viii) Assure the receipt of the materials and maintain permanent records of all warranties required under terms and conditions of the Contract Agreement,
- (ix) Without relieving the Contractors of their obligations under the Contract, check and approve the contractors' Working Drawings, Method Reports and Temporary Works proposals,
- (x) Carry out any subsequent design changes, and expeditiously issue supplementary/revised drawings, site instructions, variation orders and day work orders to avoid delay to the works and to ensure that the works are executed in accordance with Contract/on time,
- (xi) Ensure that the Contractors shall have all necessary data including the right- of-

way limits, centerline, and grade etc.,

- (xii) Check that the lines, levels and layouts of the construction work follows with those specified in the contract document,
- (xiii) Develop and implement a quality monitoring plan to ensure the works comply with the specifications in the contract documents regarding materials used, and technical requirements etc. by preparing QA/QC Manual and will be responsible for Quality Assurance i.e. project components are tested according to the specifications as per the Contract; also make a report for imported items for efficiency and quality including testing on manufacturing site test bed and check duty & import documents of each item being imported for the project,
- (xiv) Inspect quarries, borrow pits, and crushing plants,
- (xv) Conduct material tests and approve the sources of materials, as per standards,
- (xvi) Continuously inspect the soils and materials, construction operations and the works with regard to workmanship and compliance with the specifications. Approve or disapprove and certify the works that conform to the specifications and maintain permanent records of the results of all the tests,
- (xvii) Give notice (s) to the Contractors of any defects and deficiencies, and issue instructions/directions for the removal and replacement of the improper works, as per the contract. If required, order suspension of the work(s) under intimation to the PIMU and/or recommend to PIMU/ PRMSC and sought other recourse available under the Contract,
- (xviii) Monitor and appraise progress of the works, and maintain a day-by-day project log which shall record all activities/progress pertaining to the administration of the contract, liaise with MIS to update real time data, requests taken and orders given to the Contractors, and any other information which may be at a later date be of assistance in resolving queries which may arise concerning execution of the works,
- (xix) Check the Contractor's periodic statement of the estimated value of work-completed and certify that these statements clearly and accurately describe the value of work executed on the value of the quantities of the items in the Bill of Quantities,
- (xx) Verify and endorse the interim payment certificates to PIMU/ PRMSC for payment to the Contractors based on inspected Work Items, having regard to any contractual provisions for advance payment, variation of price, escalation, Comparative statement according to the acceptance letter and exchange rate fluctuation etc. Certify and endorse the completion of the activities/works or parts thereof in order to process final payments to the Contractors,
- (xxi) Assist in clarification of Contract Documents, explain and/or reconcile any ambiguities and or discrepancies that may occur in the Contract Documents, and assist PIMU (PRMSC-HO/TO) along with all relevant documentation needed for settling disputes/claims (if any) with the Contractors, and suggest recommendations to PIMU (PRMSC-HO) for resolving the Contractors' escalation claims, contract time extensions (if needed), variation orders, subletting of work, additional cost, rate and price fixing etc.,
- (xxii) Advise PIMU (PRMSC-HO)/PRMSC-TOs on the need for effective and efficient liaison with the local authorities, police, landowners, utility owners, the public and

others affected by the works in progress in order to minimize or avoid unnecessary delays or disputes,

- (xxiii) In close coordination with PIMU (PRMSC-HO)/PRMSC-TOs and the local authorities, prepare a traffic management plan where the sub-projects are in the densely populated areas of the city,
- (xxiv) Jointly inspect with PIMU (PRMSC-HO)/ PRMSC-TOs /Village Councils the completed civil works, and assist in formal taking over process, completion certificates and review and approve "as built" drawings and plans (as the case may be) and provide report(s) affirming that the contracts have been completed in a satisfactory manner and develop a checklist for re-works or incomplete works. In addition, review the final commissioning tests being conducted upon completion of each construction package, such as, network, pumping stations, approve acceptance of performance in accordance with the targets set in the tender documents/workplan, approve the content of the O&M manuals and advise the PIMU (PRMSC-HO), PRMSC-TOs and Village Councils on delivery of certificate of performance,
- (xxv) Inspect the completed work periodically during the defect liability period within the term covering the Consultant's Agreement, prepare lists of deficiencies/incomplete works (if any) in consultation with PIMU (PRMSC_HO), and carry out supervision of the rectification works, and issue the Defects Liability certificates after the rectification of notified defects by the Contractors,
- (xxvi) Establish a comprehensive monitoring system that entails maintaining site records including site correspondence, inspection records, test data, site diaries, records of meetings, financial records, progress records etc,
- (xxvii) Support the PIMU (PRMSC-HO) and consultants to implement the safeguard related policies, prior to starting work and as work progresses, which may include the environment management plans, IEEs, resettlement plan, public consultation, verification of the resettlement compensation payment, and preparation of all safeguard monitoring reports (bi-weekly/monthly),
- (xxviii) Make available record to the auditor appointed by AG office of Pakistan and draft replies and clarifications along all supporting documents against any observation raised by auditor, to facilitate the Client,
- (xxix) Assist PIMU (PRMSC-HO)/PRMSC-TOs in preparing monthly and quarterly progress and monitoring reports for submission to various authorities, including the World Bank,
- (xxx) Coordinate with contractors and local authorities on obtaining clearances during construction and commissioning of works,
- (xxxi) Provide any other technical services requested by PIMU (PRMSC-HO)/PRMSC-TOs and other Consultants under the project, as mutually agreed, and
- (xxxii) Shall be responsible to make visit arrangements by any Government/Donor delegation or authority/management and shall prepare presentation arrangement when required.

3.3 Linkage with MIS:

PRMSC is also endeavoring to develop and deploy a Management Information System (MIS).

The System will ensure adequate monitoring of project activities including flow and utilization of funds, tracking water and sanitation service delivery performance and progress towards project outcomes, transparency in decision making, and accessibility of complaints and grievance system to project beneficiaries. The MIS system will be designed to receive data from multiple sources including PRMSC Tehsil Office field staff, customers, community-level Ambassadors of Change (AoC), and others that receive permission from the Government of Punjab. Parts of the MIS will be publicly accessible, to aide transparency and accountability, while some sections that include personal data or sensitive financial information will have restricted access.

MIS System shall also employed f contract management support through tracking of physical and financial progress of infrastructure development. This will include data on; progress milestones related to design, procurement, physical and financial progress including finalization of detailed design, initiation and completion of bidding process, contract award, procurement of equipment, groundbreaking, construction progress, handover to PRMSC, etc. All data on construction will be geo-tagged and will include time-stamped images. The System shall also be used for service delivery monitoring, including all billing data and complaints logged from households/villages.

The Engineering, Design and Construction Supervision Consultant shall be extending their technical support in all the phases of MIS System development, deployed, maintenance and reporting through it, to PRMSC.

3.4 Development of Operational & Business Model

The Engineering, Design and Construction Supervision Consultant shall prepare the integrated operational and business model of investments for the sustainability of tehsil wise under the PRSWSSP for Water Supply, Sewerages and Solid Waste Management system.

The EDCS shall conduct a thorough needs assessment of the target villages to identify the water and sanitation needs and requirements of the communities and develop an operational design for water and sanitation services that meet the identified needs and requirements of the communities. It shall also develop a business model that is financially sustainable and scalable for the provision of water and sanitation services in the target villages as well as the identification of potential sources of funding and partnerships to support the implementation of the operational design and business model. It shall also develop a comprehensive implementation plan that outlines the steps, timelines, and resources required for the successful implementation of the operational design and business model and provide technical support and guidance to the project team during the implementation phase to ensure that the operational design and business model are effectively implemented

Operational Design shall cover the operational needs and requirement to operate and maintain the water supply and sanitation system that will be designed and constructed under EDCS supervision. EDCS Consultant shall prepare the draft service agreements for outsourcing that required for the operation of PRMSC in terms of Water Supply and Sanitation services.

4. Staffing:

The quality of staff, expertise and their numbers, shall be the key factors in evaluation of the consultant's proposal. The firm may propose inputs required to complete the assignment within the contractual time. The Consultancy firm must be specialized and have capacity to carry out Design, Construction Supervision, Contract Management and Environment & Social

Management Services of the proposed works. However, an indicative staff requirements with expertise, is given hereunder:

Sr. #	Description of Personnel	Qualification
Key Staff		
1	Team Leader (Design)	Master's Degree or above in Civil Engineering or relevant discipline In general, 20 years of overall professional experience in project planning, designing, public health engineering and project management. Working experience in World Bank/Foreign Funded Projects will be an added advantage. Registered with relevant professional bodies.
2	Team Leader (Construction Supervision)	Bachelor's degree in Civil Engineering preferably Masters in Civil Engineering/Transportation Engineering/Environmental Engineering/Construction Management/Project Management or equivalent. In general, 15 years of experience as Resident Engineer/Senior Resident Engineer/Project Manager on major infrastructure projects of civil works (water, sanitation, buildings, roads etc), contract management, processing of claims and implementation.
3	Senior Procurement and Contracts Management Specialist	Bachelor's Degree or above in Civil Engineering or relevant discipline. In general, 12 years of professional experience in Contract Management and Procurement of large infrastructure projects. Working experience in World Bank/Foreign Funded Projects will be an added advantage. Registered with relevant professional bodies.
4	Municipal Operational and Business Model Expert	Preferably Master's degree in Management, Business Administration or a relevant discipline In general, 12 years of experience in operational planning, implementation and business modeling and process reforms. Expertise in strategic planning, performance management, sustainable municipal service delivery. Having knowledge of world best practices for O&M of Water Supply and Sanitation systems for optimizing the service delivery
5	Municipal Finance Specialist	Preferably Master's degree in Finance/ Economics/Business Administration or a relevant discipline. In general, 12 years of relevant work experience in financial management, business development, business positioning and sustainability etc. Preferably 5 years of experience of working in similar projects/assignments, in similar capacity and in organizations with comparable conditions.
6	Institutional Development Specialist	Preferably Master's degree in Management, business administration or a relevant discipline. In general 12 years of work experience in institutional planning,

		business modeling, process reforms and institutional capacity building is desired. Preferably 5 years of working experience in similar projects in countries with similar geographic conditions is expected. Expertise in strategic planning, performance management, change management and institutional reforms are highly desirable. Experience with rural services providers would be preferred.
7	Design Engineer (Water Supply)	Master's Degree or above in Civil Engineering or relevant discipline. In general, 12 years of professional experience in project designing, planning and project management pertaining to Water supply works. Working experience in World Bank/Foreign Funded Projects will be an added advantage. Registered with relevant professional bodies.
8	Sanitation Expert/Public Health Engineer	Bachelor Degree in Civil Engineering, preferably M.Sc. in structure Engineering / Water Engineering / Hydrological Engineering or equivalent. In general, 12 years of experience as Designer /Design Engineer for major water and wastewater projects with proven experience in urban development water and sanitation infrastructure design.
9	Solid Waste Management Expert	Bachelor in Civil Engineering / Environmental Engineering / Waste management or related subject or equivalent, preferably Masters in Civil Engineering / Waste management or related subject or equivalent. In general, 12 years of experience in solid waste management planning and designing. Preferably having designed landfills sites, secondary and primary transfer equipment/vehicles design/specification and transfer stations expertise
10	Resettlement/Social Safeguards Specialist	Post-graduate degree in a relevant social science (resettlement studies, development studies, sociology, anthropology, rural studies etc.). In general, 12 years of experience working on involuntary resettlement and preparation of RAPs. Should also have experience as team leader. Some experience should also be in rural development projects. Experience of working on World Bank funded projects will be advantageous.
11	Gender Specialist	Master's degree in Gender Studies, Sociology, Anthropology, Environmental Sciences or a relevant discipline. In general, 12 years of relevant work experience in matters related to gender mainstreaming and in the preparation of Gender Action Plans. Preferably, experience of working in similar projects/assignments (related to WASH), in similar capacity, with international donors, and in organizations with comparable conditions.

12	Environmental Expert	Master's degree or equivalent in environmental engineering/sciences In general, 12 years of experience of which at least 10 years on environmental impact assessment of rural infrastructure development projects and experience of preparing environmental management plans. The candidate must have full knowledge of the national/provincial regulatory framework as well as the World Bank's guidelines, procedures and operational policies/directives. Experience of working as environmental expert in at least two World Bank or multilateral funded projects with similar level of complexity (for E&S assessment and management) is required.
13	Plumbing Design Expert	Bachelor degree in Civil Engineering, or M.Sc./equivalent. In general, 12 years of work experience as Civil engineer/plumbing expert with proven experience in plumbing design of buildings.
14	Design Engineer (Civil Structure)	Master's Degree or above in Civil Engineering or relevant discipline. In general, 12 years of professional experience in project designing pertaining to water supply works, sewer and disposal works. Working experience in World Bank/Foreign Funded Projects will be an added advantage. Registered with relevant professional bodies.
15	Design Engineer (Electromechanical)	Bachelor Degree in Mechanical Engineering / Electrical Engineering / Mechatronics Engineering, preferably M.Sc. or equivalent. In general, 10 years of experience as Designer / Design Engineer for equipment of water, wastewater and solid waste projects with proven experience in urban development water and sanitation infrastructure design.
16	IoT Design Expert	Bachelor in Engineering or relevant subject or equivalent. In general, 10 years of overall experience with 5 years as a SCADA design/IT/MIS and operational expert
17	Groundwater Expert	Master's Degree or above in Civil Engineering or relevant discipline. In general, 10 years of professional experience in groundwater analysis related to project designing, planning and project management pertaining to rural development. Experience in multi-village sub-projects will be preferred. Working experience in World Bank/Foreign Funded Project is a plus. Registered with relevant professional bodies.
18	Waste Water Treatment Expert	Master's Degree or above in Civil Engineering or relevant discipline. In general, 12 years of professional experience in project designing pertaining to waste water treatment ABR and trickling filters and disposal works. Working experience in World

		Bank/Foreign Funded Projects will be an added advantage. Registered with relevant professional bodies.
19	Geophysicist / Electrical Resistivity Expert	Bachelor degree in Geophysics or M.Sc./equivalent. Preferably 05 years of work experience as ERS Surveyor with proven experience in carrying out electrical resistivity survey.
20	GIS Expert	Bachelor degree in Science with M.Sc. in Space Science or equivalent. Preferably 10 years of work experience as GIS Expert with proven experience in preparing GIS maps for different urban development projects.
21	Senior Geotechnical Expert	Bachelor degree in Civil Engineering, or M.Sc./equivalent. Preferably 12 years of work experience as Geo-technical engineer with proven experience in geotechnical design for structural design of buildings and road projects etc.
22	Economist/ Financial Expert	Bachelor in Economics/ Agriculture Economics or Masters/equivalent. Preferably 10 years of work experience as Economist on conducting traffic studies for urban development projects.
23	Claim Expert	Bachelor degree in Civil Engineering, or M.Sc./ equivalent. Preferably 10 years of work experience in contracts and claims management of urban development projects.
24	Resident Engineer (Civil)	Bachelor's Degree or above in Civil Engineering or relevant discipline. In general, 15 years of overall professional experience in project execution, construction supervision and project management of water supply and sewerage projects. Working experience in World Bank/Foreign Funded Projects will be an added advantage. Registered with relevant professional bodies
25	Resident Engineer (Electromechanical)	Bachelor's degree in Electrical / Mechanical / Electromechanical Engineering – preferably Masters in Electrical Engineering / Electronics Engineering / Mechatronics Engineering or equivalent. In general, 12 year of experience as Resident Engineer in civil works projects related to electromechanical equipment and components in urban development projects
National (Non-Key Experts)		
1	Planning & Primavera/ Office Engineer	Bachelor degree in Engineering Preferably 08 years of work experience as Office Engineer.

2	Assistant Water Supply Expert/Public Health Engineer	Bachelor degree in Civil Engineering/ Environmental Engineering or Masters/equivalent. Expert /Public Health Engineer with proven experience in water supply designing for urban development projects. Preferably 08 years work experience as Water Supply
3	Assistant Sanitation Expert/Public Health Engineer	Bachelor degree in Civil Engineering/ Environmental Engineering or Masters/equivalent. Preferably 05 years of work experience as Sanitation Expert /Public Health Engineer with proven experience in water supply and sewerage system designing for urban development projects.
4	Assistant Sanitation Expert/Environmental Engineer	Bachelor degree in Civil Engineering/ Environmental Engineering or Masters/equivalent. Preferably 05 years of work experience as Sanitation Expert /Public Health Engineer with proven experience in water supply and sewerage system designing for urban development projects.
5	Chief Quantity Surveyor	Certificate in Mechanical Draftsman or equivalent. Preferably 10 years of work experience as CAD Officer with proven experience in preparing drawings for mechanical component in urban development projects.
6	Chief CAD Officer (W&S)	Certificate in Civil Draftsman or equivalent. Preferably 10 years of work experience as CAD Officer with proven experience in preparing drawings for water and sanitation component in urban development projects.
7	Chief Quantity Surveyor (Structure)	Diploma of Associate Engineering or B.Sc./equivalent. Preferably 10 years of work experience as Quantity Surveyor with proven experience in preparing cost estimates for structural component in urban development projects.
8	Chief CAD Officer (Electromechanical)	Certificate in Civil Draftsman or equivalent. Preferably 10 years of work experience as CAD Officer with proven experience in preparing drawings for structural component in urban development projects.
9	Assistant Geophysics/ Electrical Resistivity	Preferably 05 years of work experience as ERS Surveyor with proven experience in carrying out electrical resistivity survey. Bachelor degree in Geophysics or M.Sc./equivalent.
10	Chief CAD Officer (Irrigation)	Preferably 05 years of work experience in Irrigation with proven experience in design of irrigation system. Bachelor degree in Agriculture or M.Sc./equivalent.
11	Senior Survey Engineer	Preferably 05 years of work experience as surveyor. Diploma of Associate Engineering or B.Sc./equivalent. Responsible for supervision of the survey work during execution of WATSAN Works. Any other task assigned relevant to the assignment.

12	Finance Officer	Preferably 10 years of work experience as Economist on conducting traffic studies for urban development projects. Bachelor in Economics/ Finance or Masters/equivalent. He/she will assist in preparation of economic and financial plans, conduct traffic study and associated studies etc., under the supervision of economist. Any other task assigned relevant to the assignment.
13	Assistant Resident Engineer (Civil)	Preferably 8 years of experience as ARE or Senior engineer in respective field Bachelor's degree in Engineering in respective field—or equivalent. JD will be as follows; Reports to the Resident Engineers and will undertake the following tasks: Works directly with the Resident Engineers to ensure timely implementation and efficient construction management of the Project; Supervise day to day activities of the subprojects; Ensure quality of work; and Provide inputs to quarterly, semi-annual and annual reports as needed
14	Assistant Resident Engineer (Electromechanical)	Preferably 8 years of experience as ARE or Senior engineer in respective field Bachelor's degree in Engineering in Electromechanical/Mechanical –or equivalent.
15	Material Engineer	Bachelor's Degree or above in Civil Engineering or relevant discipline. Minimum 10 years of overall professional experience in execution of large-scale civil infrastructure projects as Material/Quality Control Engineer. Working experience in World Bank/Foreign Funded Projects will be an added advantage. Registered with relevant professional bodies.
16	Site Inspector	Diploma of Associate Engineering or B.Sc./equivalent. Preferably 3 years of work experience as site inspector with proven experience in supervision of Water and Sanitation projects etc.
17	Lab Technician	Diploma of Associate Engineering or B.Sc./equivalent. Preferably 3 years of work experience as Lab Technician.
18	Quantity Surveyor	DAE in Civil Engineering or relevant discipline. Minimum 10 years of overall professional experience in surveying especially at large water supply and sewerage projects. Working experience in World Bank/Foreign Funded Projects will be an added advantage. Registered with relevant professional bodies.
19	Sociologist (For Social Safeguard Compliance During Execution)	Bachelor degree in Environmental Engineering/ Environmental Sciences/ Sociology or M.Sc./equivalent. Preferably 10 years of work experience as Sociologist with proven experience in preparing resettlement action plans for different urban development projects.

20	Health, Safety and Environment Expert	Master's degree or equivalent in environmental engineering/science. The candidate should have minimum 15 years of experience of which at least 10 years on environmental impact assessment of rural infrastructure development projects and experience of preparing environmental management plans. The candidate must have full knowledge of the national/provincial regulatory framework as well as the World Bank's guidelines, procedures and operational policies/directives. Experience of working as environmental expert in at least two World Bank or multilateral funded projects with similar level of complexity (for E&S assessment and management) is required.
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4.1: Indicative time allocation of staff

The services will require the following person-months of national consultant inputs for each cluster. Expected inputs for key and non-key experts are set out in the table below:

Central

Staff Position	Person No.	Duration (Person-Month)
National (Key Experts)		
Team Leader (Design)	1	12
Team Leader (Construction Supervision)	1	20
Senior Procurement and Contracts Management Specialist	1	12
Operational and Business Model Expert	1	6
Municipal Finance Specialist	1	6
Institutional Development Specialist	1	6
Design Engineer (Water Supply)	4	12
Sanitation Expert/Public Health Engineer	4	12
Waste Water Treatment Expert	1	4
Solid Waste Management Expert	4	3
Sociologist/ Social Safeguard Specialist	4	6
Gender Specialist	1	6
Environmental Expert	4	4
Plumbing Design Expert	4	1

Design Engineer (Civil Structure)	4	3
Design Engineer (Electromechanical)	4	3
IoT Design Expert	1	4
Groundwater Expert	4	6
Geophysicist / Electrical Resistivity Expert	4	6
GIS Expert	2	4
Senior Geotechnical Expert	1	4
Economist/ Financial Expert	1	6
Claim Expert	1	14
Resident Engineer (Civil)	4	20
Resident Engineer (Electromechanical)	1	4
Sub-Total National Experts	58	184
National (Non-Key Experts)		
Planning & Primavera/ Office Engineer	4	20.00
Assistant Water Supply Expert/Public Health Engineer	4	6.00
Assisstant Sanitation Expert/Public Health Engineer	4	6.00
Assistant Sanitation Expert/Environmental Engineer	4	6.00
Chief Quantity Surveyor	8	4.00
Chief CAD Officer (W&S)	8	4.00
Chief Quantity Surveyor (Structure)	4	3.00
Chief CAD Officer (Electromechanical)	4	4.00
Assistant Geophysicist / Electrical Resistivity Expert	4	4.00
Chief CAD Officer (Irrigation)	1	4.00
Senior Survey Engineer	4	6.00

Finance Officer	1	6.00
Assistant Resident Engineers (Civil)	8	20.00
Assistant Resident Engineers (Electromechanical)	4	4.00
Material Engineer	4	18.00
Site Inspector	40	18.00
Lab Technician	1	18.00
Quantity Surveyor	40	18.00
Sociologist (For Social Safeguard Compliance During Execution)	4	3.00
Health, Safety and Environment Expert	4	18.00
Sub-Total Non-Key Experts	155	190
Sub-Total Key + Non-Key Experts	213	374

5. Duration of the Contract

The duration of the contracts shall be thirty-two (32) months amongst which nine (09) months have earmarked for the Planning, Baseline, Surveys & Feasibility Studies, Detailed Engineering Design, Preparation of Drawings, Specifications, Bill of Quantities and three (03) months for Tendering Phases. Consultant has to provide feasible studies, PC-Is covering all environmental and social safeguard documents as per World Bank's requirement, Detailed Engineering Design, Drawings and Specifications and Bill of Quantities in three phases (Three batches) with equal number of revenue villages covering all revenue villages under each cluster.

villages will be randomly selected using a control and treatment method for each phase. The consultant must submit the first, second, and third batches for each cluster in the first three, Six, and nine months, respectively, with each batch covering an equal number of revenues villages. Whereas, the remaining twenty (20) months shall be for Contract Management and Resident Construction Supervision of each cluster mentioned above.

6. Facilities to be arranged by the Consultant

The Consultant has a mandatory obligation to arrange office space and residence and station the focal persons at Lahore and field offices in all tehsils. Office equipment/vehicles, such as vehicles, office furniture, communications equipment, photocopying equipment, fax machines, and computers and printers, including relevant software, such as Primavera, Microsoft Word, Excel, AutoCAD needs, shall also be the responsibility of the consultant. All documents, equipment, software purchased for project, facilities related to the works are, and shall remain the property of the Client after completion of works for which Registration and licensing should be named to the client.

7. Performance Monitoring & Reporting

The Consultant shall be required to:

- i) Establish a baseline reporting format in consultation with the Client for monitoring the project performance;
- ii) Establish systems for recording data and statistics for such monitoring;
- iii) Review and verify document which clearly and accurately describes the total verified work done and payment due for the Contractor, in order to process interim certificates for payment to the Contractor on the basis of measured / verified work items and certify the completion of the works or parts thereof;
- iv) Make presentations on digitized / multimedia systems and progress reports on computer-based techniques to be displayed in meetings & conferences; and
- v) Prepare the reports mentioned here-in-after and distribute the Client each in three copies along-with soft records.

In this regard, the consulting team is expected to submit the required reports to PIMU (PRMSC-HO) as per the requirement given in the table below.

TABLE 1: REPORTING REQUIREMENTS FROM CONSULTANTS

S#	Report	Report Content	Date of Submission
Payment Milestone Reporting			
Phase 1: Planning, Feasibility Study and Detailed Engineering Design, Drawings, Specifications and Bill of Quantities, PC-I and Bid Document			
1.	Inception Report	After mobilization the consultant will provide a comprehensive report covering therein all the tasks to be covered under this contract and elaborating therein on the related Methodology, Project Implementation Plan, Quality implementation Plan, Staff Plan with numbers & positions and timelines.	Within 4 weeks from the date of contract effectiveness
2.	Feasibility Report	The Consultants will prepare and submit a comprehensive Feasibility Report of the all the selected revenue villages covering all the activities/tasks listed at Section 3.1: Paras (i) to (iii) of TORs The schedule of submission of Topographic Survey and Feasibility Report of Revenue Villages will be in three batches having equal no. of revenue villages against each cluster are as under; i. First batch of villages within 3 months ii. Second batch of villages within 6 months iii. Third batch of villages within 9 months	Within 09 months from the date of contract effectiveness
3.	Operational Design and Business Model Report	The Consultants will prepare and submit a comprehensive Operational Design and Business Model Report of the all the selected revenue villages covering all the activities/tasks listed at Section 3.1: Para (iv) of TORs	Within 09 months from the date of contract

S#	Report	Report Content	Date of Submission
		The schedule of submission of Operational Design and Business Model report of Revenue Villages will be in three batches having equal no. of revenue villages against each cluster are as under; i. First batch of villages within 3 months ii. Second batch of villages within 6 months - Third batch of villages within 9 months	effectiveness
4.	Detailed Engineering Designs & PC-I	The Consultants will prepare and submit detailed Engineering Designs in respect of all the selected revenue villages, related to scope given in objectives and covering all the activities/tasks listed at Section 3.1: Paras (iv) of TORs. The schedule of submission of Detail Engineering Design & PC-I of Revenue Villages will be in three batches having equal no. of revenue villages against each cluster are as under; i. First batch of villages within 3 months ii. Second batch of villages within 6 months iii. Third batch of villages within 9 month	Within 09 months from the date of contract effectiveness
5.	Tendering Report & Bid Document	The Consultants will prepare and submit a detailed reporting, comprehensively summarizing all activities, regarding assistance provided to the Client in the Tendering Process, as per the scope mentioned at Section 3.1: Para (v) of TORs. The schedule of submission of Detail Cost Estimate for Technical Sanction and Bid Documents of Revenue Villages will be in three batches having equal no. of revenue villages against each cluster are as under; i. First batch of villages within 4 months ii. Second batch of villages within 7 months iii. Third batch of villages within 10 months	Within 12 months from the date of contract effectiveness
6.	Reporting Requirements	i) The scale of topographic survey should be 1"=100' ii) The Consultant shall mark minimum 3 benchmarks on existing permanent features i.e., electric pole, culvert, stairs or any other features suitable at site. iii) The Consultant shall mark all existing services above and the ground by conducting physical survey, data pertaining to underground services shall be marked on drawings. iv) The Consultant shall coordinate and have meetings with all relevant agencies to identify the on-going and existing development work/projects in the area and prepare documents. v) The consultant shall give priority to multi-village schemes with skimming wells to reduce the cost. vi) The Consultant shall conduct electrical resistivity survey (ERS) and drilling of boreholes to check the quality and availability of water by performing the yield test etc. at each water source. vii) The Consultant shall conduct standard penetration test (SPT) to determine the bearing capacity for overhead reservoir and ABR tank etc.	

S#	Report	Report Content	Date of Submission
		viii) The Consultant shall identify the land requirement/shape for disposal/ABR, solid waste, tube well, overhead water Tank, and rising main route and prepare all necessary documentation for land acquisition and NOC etc. ix) Identify the source of electricity and route for transmission line and prepare price estimates for electrical connection. x) The Consultant shall prepare design criteria and get approval from Client xi) Drawing/map sizes shall be one copy of A3 for review only. The minimum 6 copies of final deliverables should be submitted on A2 paper size. xii) The cost estimate should be prepared on MRS issued by Finance Department and for non-schedule on market based verifiable three quotations and prepare the rate analysis as per FD template for technical sanction. xiii) The Consultant will submit an undertaking that the Bill of Quantities (BOQ) in detail estimate will not varies more than 10% from feasibility stage/PC-I to detail engineering design and not more than 5% from detail engineering design to final execution at site. xiv) The Consultant shall submit all deliverable and payment invoices to the Tehsil Office and copy to Client's designate Coordinator as mentioned in contract agreement.	
Phase 2: Contract Administration & Construction Supervision as Resident Engineer			
7.	monthly Progress Report	The Consultants will prepare a comprehensive report summarizing all activities under the component at the end of each quarter of the respective phase, covering all the actions & deliverables prescribed in Section 3.2 of the Terms of Reference, and also at other special times when considered warranted by either party. Such reports shall summarize not only the activities of the Consultants but also the progress of the contract including all variations and change orders, the status and brief description of the Contractor's claims (if any), technical & contractual problems being encountered and other relevant information. Concise reports to be prepared that give more details of the project and key issues. These reports must present all the findings related to the monitoring requirements, including progress on delivering the outputs. The reports shall also summarize the results of relevant data collected. During the Contract Administration & Construction Supervision Phase, the report shall also provide: (i) a comparison of actual and forecasted expenditure(s) during the month and cumulative to date for each individual contract, and prepare a record of the status of payment(s) of the Contractors' monthly invoices, of all claims for cost or time extensions, and of actions required of PIMU (PRMSC-HO) to permit unconstrained work for	15 days after the end of every two months

S#	Report	Report Content	Date of Submission
		implementation. The Consultant will also advise on the final estimated cost for each individual contract and draw attention to any major changes in the project budget (if needed) including details of rectification action(s) taken or if any recommendations to be given to PRMSC, (ii) Brief on all correspondence exchanged with the contractors, particularly relating to contractual clauses, finances, liabilities, rectification works, delay, staffing, inappropriate behavior, and time implications, (iii) Technical appreciation of any design or quality control problems for each individual contract including details of remedial action taken or recommended to PRMSC, (iv) Status of compliance with the Monitoring	
6.	Environment and Resettlement Report	The Consultant shall submit an exclusive and detailed Environment and Resettlement Report, on compliance or non-compliances, made by the contractors during the construction phase against the requirements/standards which were prescribed by the Consultant & PRMSC during the Engineering & Detailed Design Phase, as well as the requirements/guidelines which PRMSC has defined for the project such as Environmental & Social Impact Assessment, Environmental Management Plan, Resettlement Action Plan etc.	12 th month from the date of contract effectiveness
7.	Final Report	A detailed project completion which will present a summary of all aspects of project implementation and comparison with the expectations of the loan vs. actual. The report will summarize and discuss the results of special aspects of the project including construction, contract management, social mobilization, social and environmental safeguards, together with conclusions, recommendations, shortcomings, and lessons learned for next phase of project. The contents of the report shall be agreed with the PIMU (PRMSC-HO) and World Bank prior to its preparation.	Within 1 month after project completion

