Water Governance and Capacity Building Support – Jacobabad
(Contract No. 72039119C00001)

Terms of Reference

Hiring the Consultant to update/develop Operations Manual for Training the Staff on Electrical, Mechanical, Filtration and Distribution Operations of water services at Jacobabad

Sindh is the second largest province of Pakistan with respect to population. The 2017 census of Pakistan indicates a population of 207,774,520 and Sindh is 47,886,051. Just under half of the population is urban dweller. The status of water supply, sanitation and hygiene are below satisfactory level. In most of the cities; the piped water supply system has become older and dysfunctional due to decay and lack of maintenance.

Issues faced in respect to water supply include irregular frequency, declining institutional capacities of municipalities and line departments (to manage and maintain the systems), poor quality (mixed with Arsenic and other impurities), lack of awareness to recognize water as a service with a cost factor associated with it, poor recovery of water bills, stress on the existing sources of water and swift changes in the institutional arrangements.

In 2010, USAID/Pakistan entered into a partnership with the Government of Sindh (GoS) to improve the provision of basic municipal services. Beginning in 2014, USAID/Pakistan financed the Municipal Services Program-Sindh (MSP-S) in Jacobabad City that had three components: (1) water and sanitation infrastructure upgrades; (2) civic engagement for inclusive governance; and (3) establishment of management information systems. The augmentation in water supply system included rehabilitation of existing infrastructure and construction of additional components with a major shift that now the people will be getting water by gravity from the six newly constructed Overhead reservoirs and no household pumping would be needed, which is otherwise a common cause of water contamination through distribution network. The new system is currently under testing and will be put to operation shortly. As a result of the infrastructure upgrades, which also include household connections for all of the households in Jacobabad will have improved access to safely managed drinking water. Infrastructure activities for improved management of effluent water and solid waste are also being rolled out.

HANDS under the "Water Governance and Capacity Building Support- Jacobabad" funded by USAID intends to hire a Consultant/s to update/develop a comprehensive Operations Manual for the electrical/ mechanical equipment and the entire water filtration and supply processes for Jacobabad city in consultation with relevant stakeholders.

SCOPE OF WORK:

The Consultant hired for this assignment will develop/update and design Operations Manual in consultation with MC Jacobabad and Local Government Department for training the staff for efficient operation and maintenance of all the Civil works and the Electrical and Mechanical

equipment installed at Low-lift and High-lift water supply pumping stations (LLPS and HLPS) and at the water filtration plant. The details of the machinery and pumping equipment installed at these locations and major civil work components are as under:

1. **Low Lift Pumping Station:** At this pumping station 6 pumps coupled with electrical motors of 18.5 KW are installed. The discharge of each pump is 1050 IGPM at the head of 14.63 meters. These are old pumps are rehabilitated under USAID funding. A diesel generator of 100 KVA is also available for use during electric power shutdowns.
2. **High Lift Pumping Station:** There are two pump houses at HLPS, one is called Old Pump House and the other is New Pump House. At the Old Pump House, 7 pumps coupled with 60 KW motors having discharge of 900 IGPM at 64 meters head are installed which are rehabilitated under USAID grant. The New Pump House is having installation of 6 new pumps coupled with 75 KW motors having discharge of 900 IGPM at 64 meter head. A generator of 700 KVA is also installed at HLPS.
3. **Filtration Plant:** There is lot of machinery and equipment at the filtration plant; some of them are being mentioned here.
    - **i.** 6 Nos. 80 HP Old pumps and 6 Nos. 100 HP New pumps for pumping filtered water to overhead reservoirs.
    - **ii.** 1 No. 100 HP Backwash blower
    - **iii.** 3 Nos. Hypochlorite dosing pumps
    - **iv.** 4 Nos. Alum dosing pumps
    - **v.** 3 Nos. Sludge pumps
    - **vi.** 2 diesel generators of 300 KVA each
4. **Civil Structure Components:** Following are the main civil structures of the water supply system.
    - **i.** Pump House and Generator room at Low Lift Pumping Station
    - **ii.** 2 No. Pump Houses (Old and New) and Generator room at High Lift Pumping Station.
    - **iii.** 3 Nos. Lagoons (Two Operational and One to be rehabilitated)
    - **iv.** Water Filtration Plant:
        - **a.** Hydraulic Jump/ Distribution Chamber
        - **b.** 2 Nos. Clarifiers
        - **c.** 10 Nos. Filter Beds
        - **d.** Under Ground Clear Water tank
        - **e.** Main Pump House
        - **f.** Laboratory and Office Block
        - **g.** Alum and Hypochlorite dosing stations
    - **v.** 6 Nos. Overhead Reservoirs
    - **vi.** Twin 22 km 24” dia Rising mains from HLPS to Filtration Plant
    - vii. 6.25 km 24” dia clear water bulk transmission main
    - viii. 2.568 km 16” dia clear water transmission mains to feed 6 OHRs
    - ix. 158.5 km of distribution network of varying size

The manual will clearly explain the process of operation and maintenance of all the electrical and mechanical equipment and the entire water filtration and distribution process including the

maintenance of civil structures (pump houses, lagoons, clarifiers, filter beds, OHRs) and pipelines, valves and meters etc. with necessary explanations as well as pictorial representations. The manual will suggest the skill mix required for human resource and an organogram. Specific job aids will also be needed. Offeror may consider following but can think beyond the following:.

1. A pocket to do list for operations staff at all levels of water distribution
2. Quick and handy reference flash card for chemical composition of water and NEQS
3. Algorithm card for the chief water filter plan operator (a detailed chart to be put on wall)
4. Things to do when operating and maintaining the distribution network in the city
5. Algorithm to identify contamination and leakage in the water distribution system
6. Algorithm and steps to comply SDG guidelines for water quality testing at the user end
7. Steps in preventive maintenance

The Manual will include details of all the Electrical and Mechanical equipment installed at various locations of the Water Supply system, Jacobabad including but not limited to cabling, switchboards, panel boards, relays, motors, generators, pumping equipment and valve operations; and a complete filtration process. The details provided in the manual must cover the routine operation and maintenance issues and troubleshooting. The manual will be developed in English and in vernacular language for easy understanding of the field staff to ensure safe and smooth operations of the equipment and machinery and achieving their optimal efficiency. The Consultant will get these manuals approved from the Municipal Committee Jacobabad for its adaptation/use.

The consultant will also prepare the soft copies of the Presentations for efficient knowledge transfer.

MILESTONES:

Milestone	Task	Means of Verification	Level of Effort in working days	Timeline
MS 01	Approval of work-plan	Document	3 days	Within 5 working days from the date of signing the contract
MS 02	Development of Organogram and JDs on the basis of O&M principles and best practices	Document	10 days	Within 18 calendar days after the 1st Milestone
MS 03	Preparation of draft manual for O&M in consultation with LGD and MC staff at all levels and getting its approval from MC Jacobabad and USAID	Document	22 days	Within 37 calendar days after the 2nd Milestone
MS 04	Submission of Presentations (soft copies) for knowledge transfer and its approval by MC Jacobabad and USAID	Soft copies	5 days	Within 10 calendar days after the 3rd Milestone

MS 05	Submission of Manual translated in vernacular language and its approval by MC Jacobabad and USAID	Document	10 days	Within 20 calendar days after the 4th Milestone

ELIGIBILITY CRITERIA:

This is a high impact assignment and a dynamic person, having excellent communication skills is needed. The Project will facilitate in field coordination but it is expected that the bidder can work without much hand holding. The successful candidate has to explain in clear and explicit manner, that how a multispecialty (Civil / Electrical / Mechanical) deliverable will be generated. The Project is looking for a person:

1. Having minimum of graduation in civil / mechanical / electrical engineering Masters in Engineering or related area will be preferred.
2. Demonstrable track record of writing and producing high quality documents.

PERIOD OF ASSIGNMENT:

Three months (September, 2019 - November, 2019)

GUIDELINE FOR SUBMISSION OF PROPOSAL:

1. Interested consultant can apply through submission of electronic copy of proposal to hr@hands.org.pk , the contents of proposal are mentioned below
    a. Brief introduction of consultant (attach detailed CV with references)
    b. Understanding of context
    c. Methodology
    d. Work Plan
    e. The contract has the total level of effort of 50 Man-days. The bidder has to quote the financial cost as Cost per day in PKR.

CONTRACT TYPE:

This is a fix cost assignment and “reimbursement mode of payment” against the achievement of milestones. No additional support/ operational cost will be paid by HANDS beyond the quoted amount by the Consultant at the proposal submission stage.