Section 3a: Schedule of Requirements and Technical Specifications

PROVISION OF CIVIL, FINISHING AND ELECTRO-MECHANICAL WORKS Construction of Transmission and Distribution water networks for Hnaider, Qarha & Knaise villages in Wadi Khaled, North Lebanon.

I. Objective

Within the context of the project "Construction of Transmission and Distribution water networks for Hnaider, Qarha & Knaise villages in Wadi Khaled, North Lebanon" executed by the United Nations Development Program (UNDP), the Lebanon Country Office wishes to contract the services of a company to execute all works related to the construction of transmission and distribution networks for the mentioned villages.

The work shall include the construction of transmission and distribution networks between villages in addition to the rehabilitation of three existing reservoirs (Hnaider, Qarha and Knaise) as well as the existing pipe network between Nabaa el Safa and Hnaider reservoir.

II. Background

Following the Syrian Crisis, the majority of refugees are being hosted in communities that are among the poorest in the country, including the North of Lebanon. These communities suffer from poor water services due to lack of adequate infrastructure and have limited means to expand local infrastructure.

As such under the umbrella of the Lebanese Center for Water Management and Conservation (LCWMC) at the Ministry of Energy and Water, a project funded by the Swiss Agency for Development and Cooperation is targeting to improve the water supply services in North Lebanon specifically in Wadi Khaled Area. This new project is managed and implemented by the United Nations Development Programme (UNDP), the Energy and Environment Programme.

III. Requirements of the Scope of Work:

In order to be able to execute the scope of work as required, the contractor shall take into consideration the following:

1- Carry out the trenches excavation, pipe bedding, pipe laying, backfilling, and several other related works for pipes in depth of 1 to 2 meters, depending on the type and nominal size of the pipe. All excavation works undertaken shall remain within the public domain.

2- It is expected that in some areas, the excavation will be made in rocky soils with the possibility of facing soil layers; however, the exact type of subsurface layers is to be determined by the contractor. If the soil type is found to be different from rocky soils, the contractor remains responsible to ensure the required excavation is completed based on the most appropriate methodology and according to modified design approved by the engineer, **at no additional cost to UNDP.**

3- The contractor shall review the detailed bill of quantities and submit a list of the required tools, accessories and machinery needed to perform the whole work.

4- The contractor shall be responsible for maintenance and repair of the contractor's machinery during the fieldwork and for the entire duration of the contract.

5- The contractor should have the ability in terms of resources (both human and machinery) to operate in different sites simultaneously in order to speed up the work process and to meet the work deadlines.
6- It is expected that the work will start in the rainy season; therefore, the contractor is fully responsible to respect and meet the deadlines by increasing the project resources when needed **with no additional cost to UNDP**.
7- In order to encourage the participation of the local community, the contractor is expected to use machinery and equipment that may already available in the town of Wadi Khaled if this equipment meet the working requirements.
8- The contractor is encouraged to use the available labor power in the target area in order to contribute to the social welfare of the local people and reduce cost of transportation.
9- The contractor shall maintain a good level of coordination with the project staff and local community especially the Municipality of Wadi Khaled in order to ensure smooth implementation of the fieldwork.
10- All works required within Lot 1 should be completed by 15 June 2015 while works within Lot II should be completed by 01 November 2015.

After selecting the contractor, the implementation of Lot 1 will start immediately. The implementation of Lot 2 may be delayed slightly.

IV. Scope of Work

Under the direct supervision of the Project Engineer, the contracted company shall undertake the following tasks:

1. **Lot 1:** Damage repair of the transmission line between Nabaa El Safa pumping station and Hnaider Water Tower. Replace the Asbestos Cement Lines to Ductile Iron transmission lines from Hnaider reservoir to Qarha & Knaise reservoirs. Implementation of Hnaider water network according to the design drawings: (Details are available in Annex 1 & 3)
   - Rehabilitation of Nabaa el Safa pumping station, pumps, panels, valves, intake, catchment room, and other civil works judged necessary…
   - Rehabilitation and damage repair of the transmission line between Nabaa El Safa pumping station & Hnaider water tower. (Existing pipe is Ductile Iron, Nominal Diameter 100 mm)
   - Replace the Asbestos Cement lines to Ductile Iron transmission lines from Hnaider reservoir to the other reservoirs (Qarha and Knaise) as per the following:
     - Ductile Iron Nominal Diameter 150mm from Hnaider Reservoir to Knaisse Connection (Tee Point), the total length is 850 m.
     - Ductile Iron Nominal Diameter 100mm from Knaisse Connection (Tee Point) to Knaisse and Qarha reservoirs, the total length is 3,650 m.
   - Implementation of Hnaider system according to consultant requirements, summarized as follows:
     - High Density Polyethylene OD 180mm, length : 450 m

- High Density Polyethylene OD 110mm, length : 850 m
- High Density Polyethylene OD 90mm, length : 450 m
- High Density Polyethylene OD 63mm, length : 450 m

- Rehabilitation of three existing reservoirs (Hnaider, Qarha and Knaisse Reservoirs).

2. **Lot 2:** Construction and implementation of Qarha and Knaise water network as well as the extension pipe for Hnaider network according to the design drawings, as listed below: (Details are available in Annex 2 & 3)
   - Implementation of Qarha and Hnaider systems according to the consultant requirements:
     - High Density Polyethylene OD 180mm, length : 200 m
     - High Density Polyethylene OD 125mm, length : 200 m
     - High Density Polyethylene OD 110mm, length : 4,150 m
     - High Density Polyethylene OD 90mm, length : 1,550 m
     - High Density Polyethylene OD 63mm, length : 10,300 m
   - Construction of the extension pipe for Hnaider distribution network
     - High Density Polyethylene OD 90mm, length : 1,400 m

V. Proposal

The contractor shall submit as a part of the proposal a detailed work plan including the project timeline and duration for the main activities mentioned in the annexes 1 and 2, as well as method statements for the excavation, pipe bedding, pipe laying, and backfilling works. The proposal shall be clear and comprehensive, and must be divided into two separate work plans for Lot 1 and Lot 2 (One work plan for each Lot)

VI. Standards of Performance

1.1 Contractor's Resources

The Contractor shall utilise all necessary resources, manpower, machinery and equipment etc. in order to perform the required works in a proper, safe and timely manner. The Contractor should employ, to the maximum extent possible, the necessary labourer (skilled and/or unskilled) from within the project area. The Contractor should ensure sufficient resources to work in different locations simultaneously in order to speed the process of structures establishment and meet the required deadline.

1.2 Site Safety

The Contractor shall be responsible for implementing strict safety measures on site in view of the type of works being implemented; the Contractor shall provide and erect protection items required by site conditions or as requested by the Engineer to protect persons, onsite and offsite property, as required and as supplementary to such items that have been left in place; ascertain legal and other requirements. The Contractor shall maintain protection in place until work is complete and danger of damage has ceased; at such time as approved by the Engineer, remove protections.

1.3 Site Operating Procedures

The contractor should assign a surveyor to carry out site topographic surveys as required for the proper execution of works and to ensure the pipe network is in line with the required specifications. The Contractor should also assign a resident site supervisor to follow-up on the works and to coordinate with the UNDP Project Engineer. The Site engineer shall have a good knowledge and practical experience in constructing transmission and distribution water networks. The contractor site engineer shall report on weekly basis to the UNDP Project Engineer on the progress of the work. In case of any changes, the contractor site engineer shall inform the UNDP Project Engineer before proceeding with any modifications.

The contractor shall maintain a good level of coordination with the project staff and local community especially the Municipality of Wadi Khaled in order to ensure smooth implementation of the fieldwork.

1.4 Movement of Heavy Machineries & Equipment between different sites

The contractor shall move the heavy machineries and equipment from one location to another in a safe and proper manner such as not to have an adverse impact on the neighbouring properties or causing any damage to the natural environment in the area.

1.5 Scheduling requirements

The contractor shall submit a weekly schedule of the planned works mentioning the work that will be done in the following week. The contractor shall also submit a report of the work accomplished during the preceding week.

VII.Competencies/Qualifications:

a) Qualifications of firm

Contractors wishing to be considered for the services described should have the following qualifications:

- At least 7 years experience in construction of primary and secondary water networks with a wide knowledge of Ductile Iron and HDPE pipes and all its relevant accessories.
- Possession of very good and well-maintained equipment and machinery.
- Possession of good and well-maintained transport facilities to remote sites in Wadi Khaled area.
- Highly familiar with Al Wa'ar region and Hnaider, Qarha and Knaise in particular.
- Ability to work in remote areas and mountains and under harsh environmental conditions.
- Proficiency in English language and good reporting skills.

b) Site Engineer

- Holder of a B.A /M.A. degree in related engineering fields
- At least 5 years of relevant experience
- Professional experience
- Proficiency in English language and good reporting skills

c) Topographer

- Holder of B.E/B.Sc degree in related fields

- At least 3 years of relevant experience
- Professional experience in similar projects

d) Foreman

- At least 5 years of relevant experience
- Experience in similar projects

e) Labour
The contractor shall propose a minimum number of skilled personnel

VIII.Deliverables

1- Detailed work plan 2 weeks after the contract signature (20% payment)

2- Completion the work in Lot I within 4 months of contract signature and submission of a detailed progress report. (30% payment)

3- Completion of 50% of the works in Lot II within 7 months after contract signature and submission of a detailed progress report. (20% payment)

4- Completion of 100% of the works in Lot II within 10 months after contract signature and submission of a detailed final report including photographs, mechanical and structural designs, operation manual and maintenance requirements (30% payment).

List of drawings

No	Name	Drawing No	Design No
1.	**GENERAL LAYOUT**	**WS-WK-201**	**A**
2.	**HNAIDER RESERVOIR TO KNAISSE CONNECTION**	**WS-WK-202**	**A**
3.	**KNAISSE CONNECTION TO KNAISSE RESERVOIR**	**WS-WK-203**	**A**
4.	**KNAISSE CONNECTION TO KNAISSE RESERVOIR**	**WS-WK-203**	**A**
5.	**KNAISSE CONNECTION TO QARHA RESERVOIR**	**WS-WK-204**	**A**
6.	**KNAISSE CONNECTION TO QARHA RESERVOIR**	**WS-WK-204**	**A**
7.	**LINE D2.1 (A1-A33)**	**WS-WK-205**	**A**
8.	**LINE D2.2 (A24-AA13) & D2.3 (A18-AB19)**	**WS-WK-206**	**A**

9.	**LINE D2.4 (AC1-AC22) (1-2)**	**WS-WK-207**	**A**
10.	**LINE D2.4 (AC1-AC22) (2-2)**	**WS-WK-208**	**A**
11.	**LINE D2.5 (A9-AD2) & D2.6 (AE1-AE2) & D2.7 (AA11-AF2) & D2.8 (AA9-AG2)**	**WS-WK-209**	**A**
12.	**LINE D2.9 (AH1-AH4) & D2.10 (AI1-AI3) & D2.11 (A26-AJ7) & D2.12 (A20-AK4)**	**WS-WK-210**	**A**
13.	**LINE D2.13 (AC3-AL9) & D2.14 (AC16-AM6) & D2.15 (AC22-AN3)**	**WS-WK-211**	**A**
14.	**LINE D2.20 (B1-B44)**	**WS-WK-215**	**A**
15.	**LINE D2.20 (B44-B84)**	**WS-WK-216**	**A**
16.	**LINE D2.21 (BA1-BA12)**	**WS-WK-217**	**A**
17.	**LINE D2.22 (BB1-BB36)**	**WS-WK-218**	**A**
18.	**LINE D2.23 (BC1-BC47)**	**WS-WK-219**	**A**
19.	**LINE D2.24 (BD1-BD12) & LINE D2.25 (BE1-BE15)**	**WS-WK-220**	**A**
20.	**LINE D2.26 (BF1-BF2) & LINE D2.27 (BG1-BG4) & LINE D2.28 (BH1-B55)**	**WS-WK-221**	**A**
21.	**LINE D2.29 (BI1-BI8) & LINE D2.30 (BJ1-BJ3) & LINE D2.31 (BK1-BK9)**	**WS-WK-222**	**A**
22.	**LINE D2.32 (BL1-BL7) & LINE D2.33 (BM1-BM4) & LINE D2.34 (BN1-BN3)**	**WS-WK-223**	**A**
23.	**LINE D2.35 (B01-BO5) & LINE D2.36 (BP1-BP4) & LINE D2.37 (BQ1-BQ4)**	**WS-WK-224**	**A**
24.	**LINE D2.38 (BR1-BR6) & LINE D2.39 (BS1-BS6)**	**WS-WK-225**	**A**
25.	**LINE D2.40 (BT1-BT11) & LINE D2.41 (BU1-BU3)**	**WS-WK-226**	**A**
26.	**LINE D2.42 (BV1-BV8) & LINE D2.43 (BW1-BW7) & LINE D2.44 (BX1-BX4)**	**WS-WK-227**	**A**
27.	**LINE D2.45 (BY1-BY3) & LINE D2.46 (BZ1-BZ10)**	**WS-WK-228**	**A**
28.	**LINE D2.50 (C1-C44)**	**WS-WK-230**	**A**

29.	**LINE D2.50 (C44-C70)**	**WS-WK-231**	**A**
30.	**LINE D2.51 (CA1-CA48)**	**WS-WK-232**	**A**
31.	**LINE D2.52 (CB1-CB15) & LINE D2.53 (CC1-CC14)**	**WS-WK-233**	**A**
32.	**LINE D2.54 (CD1-CD22)**	**WS-WK-234**	**A**
33.	**LINE D2.54 (CD22-CD45)**	**WS-WK-235**	**A**
34.	**LINE D2.55 (CE1-CE7) & LINE D2.56 (CF1-CF19)**	**WS-WK-236**	**A**
35.	**LINE D2.57 (CG1-CG18) & LINE D2.58 (DC1-DC5)**	**WS-WK-237**	**A**
36.	**LINE D2.59 (CH1-CH6) & LINE D2.60 (CI1-CI6)**	**WS-WK-238**	**A**
37.	**LINE D2.62 (CK1-CK6) & LINE D2.63 (CL1-CL5) & LINE D2.64 (CF6-CM1)**	**WS-WK-239**	**A**
38.	**LINE D2.65 (CN1-CN4) & LINE D2.66 (CO1-CO5) & LINE D2.67 (CP5-CP1)**	**WS-WK-240**	**A**
39.	**LINE D2.68 (CQ1-CQ5) & LINE D2.69 (CR1-CR4) & LINE D2.70 (CS1-CS13)**	**WS-WK-241**	**A**
40.	**LINE D2.71 (CT1-CT3) & LINE D2.72 (CU1-CU2) & LINE D2.73 (CV1-CV4)**	**WS-WK-242**	**A**
41.	**LINE D2.74 (CW1-CW2) & LINE D2.75 (CX1-CX2) & LINE D2.76 (CY1-CY3)**	**WS-WK-243**	**A**
42.	**LINE D2.77 (CZ1-CZ3) & LINE D2.78 (D1-D2) & LINE D2.79 (DA1-DA4) & LINE D2.80 (DB.1-DB.4)**	**WS-WK-244**	**A**
43.	**WASH OUT & AIR VALVE CHAMBER**	**WS-WK-250**	**A**
44.	**GATE VALVE CHAMBER**	**WS-WK-251**	**A**
45.	**GATE VALVE CHAMBER - STEEL REINFORCEMENT**	**WS-WK-252**	**A**
46.	**TYPICAL CONNECTIONS OF NEW PIPES TO EXISTING GALVANIZED STEEL PIPES (1/2)**	**WS-WK-253**	**A**
47.	**TYPICAL CONNECTIONS OF NEW PIPES TO EXISTING GALVANIZED STEEL PIPES (2/2)**	**WS-WK-254**	**A**
48.	**THRUST BLOCKS REINFORCEMENT DETAILS (1/4)**	**WS-WK-255**	**A**
49.	**THRUST BLOCKS REINFORCEMENT DETAILS (2/4)**	**WS-WK-256**	**A**

50.	**THRUST BLOCKS REINFORCEMENT DETAILS (3/4)**	**WS-WK-257**	**A**
51.	**THRUST BLOCKS REINFORCEMENT DETAILS (4/4)**	**WS-WK-258**	**A**
52.	**THRUST BLOCKS LAYOUT & DETAILS (1/2)**	**WS-WK-259**	**A**
53.	**THRUST BLOCKS LAYOUT & DETAILS (2/2)**	**WS-WK-260**	**A**
54.	**FIRE HYDRANT DETAILS**	**WS-WK-261**	**A**
55.	**FLOWMETER CHAMBER DETAILS**	**WS-WK-262**	**A**
56.	**GATE VALVE FOR HDPE PIPES CHAMBER DETAILS**	**WS-WK-263**	**A**
57.	**HOUSE CONNECTIONS TYPICAL DETAILS**	**WS-WK-264**	**A**
58.	**PIPE TRENCHES TYPICAL DETAILS**	**WS-WK-265**	**A**

Appendices:

- **Technical Specifications**
- **Price Schedule Detailed Information**
- **Drawings**