

6591 Terms of Reference

Lake Design-Build

Objective:

World Vision is seeking interested Design Build Contractors experienced in design and execution of Hill Lakes, in order to construct a hill lake and rainwater collection network in Tall Amara area in Central Bekaa.

Project Overview:

- The project concept is to collect rainwater from roof tops of some existing buildings and structures at LARI (Lebanese Agriculture Research Institute) and convey it to a hill lake in order to be used later on for irrigation

Project Data:

Proposed location area for the lake is shown in Annex A (Aerial Photo). The precise shape, dimensions and location are to be designed and determined under the scope of this contract.

- Proposed volume of the lake is 6000 cubic meters
- The roofs of existing buildings are already equipped with the gutters and downspouts
- The collected water will be used for irrigation (no treatment is needed)
- An existing well (borehole) should be connected to the system as a feeder

Requirements:

Design Phase:

- Carry out a topographic survey for the concerned area shown in Annex A (Aerial Photo)
- Prepare the designs for the **Pipe Network**, the pipe network will be approximately 2000 m that will join all catchment areas and convey the water to the Lake , including all needed manholes, road cutting, encasement, reinstatement, etc...
- Prepare the quantities take off (BOQ) and specifications of the of the **Pipe Network** components
- Prepare the designs and all needed sections and profiles (every 3 m) of the **Lake**. Prepare all shop drawings, details, and specifications for the designed **Lake** and for all corresponding and related items, including the identification of the existing soil type
- Prepare a method statement for the construction works of the **Lake** including excavation, backfilling, grading, leveling, compacting, embankment, installing drainage, installing of geo-membrane and geotextile, installation of fences etc...
- Submitting a work schedule, and testing & commissioning plan
- All designs shall be done in coordination with LARI's administration and WVL
- All drawings and surveying works should be delivered in two hard copies and one soft copy (AutoCAD)
- All other documents should be delivered in two hard copies and one soft copy (PDF)

Construction Phase:

- Supply and install the **Pipe Network** as per the approved designs, including all needed materials, according the specifications and standards mentioned in Annex B
- Supply material and construct the **Lake** as per approved designs, including all needed materials, according the specifications and standards mentioned in Annex B
- Testing and commissioning

LOGISTICS AND TIMING

Location: Tal Amara– Riyak –Bekaa

NB: All Bidders are strongly encouraged to attend a site visit to ensure familiarity with the conditions of work and the site. A site visit will be held on 28th of June 2018 and on 29th of June 2018 in the presence of World Vision WASH Engineer. Interested candidates are to liaise with World Vision Procurement Department for site visit: 04-401 980 Ext 1081 LBN_Procurement@wvi.org.

Period of implementation of tasks

- 1 month for Design – 2 months for Implementation
- Tentative Start Date: Mid of July

BID SECURITY

- The Bidder must provide, as a part of his bid, a bid security. The bid security must be for an amount of **USD 2,000 (Two Thousand US dollars only)**. The original bid security must be included in the original bid
- It may be provided in the form of a bank guarantee (Annex C), a banker's draft, a certified cheque, a guarantee provided by an insurance and/or guarantee company or an irrevocable letter of credit made out to the Employer. The company issuing the guarantee must satisfy the eligibility criteria applicable for the award of the contract
- The bid security must be valid for at least 30 days from the deadline for submission of bids and be issued to the Employer for the requisite amount
- The bid security of unsuccessful bidders will be released as soon as possible and in any event not later than 30 days after the expiry of the period of validity of the bid. For the successful bidder, it will be released following the signature of the contract

PAYMENT TERMS

- All invoices and other necessary documents shall be sent to World Vision Procurement Department

MONITORING AND EVALUATION

The Contractor's work will be measured in line with the following standard indicators:

- Time: Adhering to the agreed-upon schedule/work plan for each deliverable
- Quality: Adhering to the minimum professional standard and of quality for each deliverable

Submission of Sealed Bids:

Offers must be submitted in 3 (three) separately sealed envelopes to World Vision National Office as follows:

- 1 (one) sealed envelope containing Company Portfolio
- 1 (one) sealed envelope containing technical part of the offer
- 1 (one) sealed envelope containing financial part of the offer

Offer must **ALSO** be submitted by email to LBN_Tenders@wvi.org and to be divided into 3 separate files:

- Set 1: Company Portfolio
- Set 2: Technical proposal + Methodology
- Set 3: Financial Proposal

CONTENT OF COMPANY PORTFOLIO

No financial information should be included in the Portfolio. Failure to comply may risk disqualification. The portfolio should include:

- Company profile – your company must have experience in construction of Lakes and water pipe construction
- Registration documents with the Lebanese Order of Public Works and Buildings Contractors
- Classification of Contractor
- Qualification and CV of proposed personnel
- List of previous similar projects and copies of work completion certificates or equivalent certificates for projects completed within the last 5 years

CONTENT OF TECHNICAL OFFER

No financial information should be included in the Technical Offer. Failure to comply may risk disqualification. The technical offer should include:

- Detailed work schedule – work flow diagram
- Listing of all the names of manufacturers (and, where appropriate, model numbers) of major items of goods or materials that he proposes to incorporate in the Works
- Technical proposal

CONTENT OF FINANCIAL OFFER




- The Contract shall be for the Works as shown in the below table, based on the unit rates and prices submitted by the Bidder
- The currencies for the bid and all rates in the Bill of Quantities shall be in US Dollars
- The Bidder shall fill in rates and prices for all items of the Works described in the Bill of Quantities
- The quantities specified in the Bill of Quantities below are subject to change, based on the approved detailed design of the Bidder
- Items against which no rate or price is entered by the Bidder will not be paid for by the Employer when executed and shall be deemed covered by the other rates and prices in the Bill of Quantities
- All duties, taxes (except the VAT) and other levies payable by the Bidder under the Contract, or for any other cause, as of the date of the deadline for submission of bids, shall be included in the rates and prices.
- The Employer shall have the right to request, and the Bidder shall provide a further breakdown of all unit rates and prices including a detailed breakdown of "other charges".

Item #	Item	Item Description	Unit	Quantity	Unit Cost (\$)	Total Cost (\$)
1	Design	Design of Lake and Pipe Network	L.S	1		
2	Network Construction	Connection of the surrounding roofs and buildings to the lake (as per the specifications in the TOR)	L.m	2000		
3	Lake Construction	As per the specifications in the TOR	M3	6000		
4	Fence Construction	As per the specifications in the TOR	L.m	300		
Total (Excluding V.A.T)						
V.A.T.						
Grand total with VAT						

Tal Amara Lake

Annex B - Located in LARI premises

Legend

-  Lake
-  Limit of Work
-  Tal Al Amara



Google Earth

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Image © 2018 DigitalGlobe

700 ft



ANNEX B

Special Requirements and Technical Standards

- POLYVINYL CHLORIDE (PVC) PIPES

PVC pipes and fittings for gravity drainage shall comply with EN1401 and shall be obtained from an approved manufacturer.

- POLYETHYLENE (PE) PIPES

Material Grade: PE 100

Pressure classes: The supplied pipes shall be of PN 10 pressure class

Codes and Standards: All PE pipes should meet the requirements of the following standards:

- ASTM D 3350, "Standard Specification for Polyethylene Plastic Pipe and Fittings Materials"
- ASTM F714 (Plastic Pipe Standards)
- AWWA C906, "Polyethylene (PE) Pressure Pipe and Fittings,
- ISO Standards 4427
- IS 4984:1995

The wall thickness of the PE pipe should meet the specification in table (6):

Table Specification for the wall thickness of the PE pipe

OD	PN 6 Wall Thickness	PN 8 Wall Thickness	PN 10 Wall Thickness	PN 12.5 Wall Thickness	PN 16 Wall Thickness
20	-	-	-	-	2.3-2.8
25	-	-	-	2.3-2.8	2.9-3.4
32	-	-	2.4-2.9	2.9-3.4	3.7-4.3

40	-	2.4-2.9	3.0-3.5	3.7-4.3	4.6-5.3
50	2.3-2.8	3.0-3.5	3.7-4.3	4.6-5.3	5.7-6.5
63	2.9-3.4	3.8-4.4	4.7-5.4	5.7-6.5	7.1-8.1
75	3.5-4.1	4.5-5.2	5.6-6.4	6.8-7.7	8.5-9.6
90	4.1-4.8	5.4-6.2	6.7-7.6	8.2-9.3	10.2-11.5
110	5.0-5.7	6.6-7.5	8.1-9.2	10.0-11.2	12.4-13.9
125	5.7-6.5	7.5-8.5	9.5-10.4	11.3-12.7	14.1-15.8
140	6.4-7.3	8.4-9.5	10.3-11.6	12.7-14.2	15.8-17.6
Note: Pressure Rating in: Kg/cm²					

- **GEOTEXTILE SHEETS SPECIFICATIONS**

Geotextile sheets shall be of the non-woven heavy duty type, needle punched or needle entangled and shall consist of long chain polymeric filaments of polypropylene, polyester, nylon or any material approved by the Engineer. The fabric shall be a stable network of fibers, which retain their positions relative to each other. The Geotextile sheets shall meet the requirements shown in table (8):

Table Geotextile sheets specification

PROPERTY	TEST PROCEDURE	METRIC		ENGLISH	
Grab Tensile Strength	ASTM-D-4632	1335	N	300	Lbs
Grab Elongation	ASTM-D-4632	50	%	50	%
Trapezoid Tear	ASTM-D-4532	512	N	115	Lbs
CBR Puncture	ASTM-D-6241	3694	N	830	Lbs
UV Stability (500 hrs)	ASTM-D-4355	70	%	70	%
Permittivity	ASTM-D-4491	0.9	Sec-1	0.9	sec-1
Weight	ASTM-D-5261	407	g/m ²	12	oz/yd ²

Geotextiles shall be furnished in rolls wrapped with protective covering to protect them against ultraviolet radiation and abrasion. Torn wrappers shall be repaired within 48 hours, using an approved protective covering, each roll of fabric shall be marked or tagged to identify the manufacturer, type, length, width, and production identification number.

- **GEOMEMBRANES SPECIFICATIONS**

The Geomembrane shall be High Density Polyethylene (HDPE) membranes, 2 mm thick. It should be manufactured using virgin, first quality, high molecular weight polyethylene.

HDPE is the most chemically resistant of all Geomembrane. Its low permeability provides assurance that water will not penetrate the liner, nor will infiltrate a cap.

The properties of HDPE shall conform to the average mechanical properties shown in table (9).

Table High Density Polyethylene (HDPE) Geomembrane specification

Properties	Test value
Thickness	2mm /3mm
Density (min.)	0.940 g/cc
Tensile Properties (min.ave.) <ul style="list-style-type: none"> • Yield strength • break strength • yield elongation] • break elongation 	22 kN/m 40 kN/m 12% 700%
Tear Resistance (min.ave.)	187 N
Puncture Resistance (min. ave.)	480 N
Stress Crack Resistance	300 hr.
Carbon Black Content- %	2.0-3.0 %
UV Resistance	
a. Standard OIT (min.ave.)	N.R.
or b. High Pressure OIT (min.ave.)- % retained after 1600 hrs (9)	50 %

EARTH FILL: Fill Materials should be well graded (see Table), to reach high density, strength and modulus after compaction (98% at OWC + 2%) might be used as embankment construction material after testing the material already mixed on a stock and taking the laboratory approval.

Table (code for fill lakes and dams fill)

Zone 2D (ICOLD, 1989a)	
Size (mm)	Finer (%)
75	90 - 100
37	70 - 100
19	55 - 80
4.76	35 - 55
0.6	8 - 30
0.075	5 - 15

The material should be tested (including gradation) after compaction due to the effect of breakdown (degradation) and the found soil strength parameters should be used in seismic slope stability analysis, please note that slope stability analysis should be done as requested by ICOLD.

Fill materials should be free from organic matters and debris and have the following approximate properties:

- Plasticity index shall not exceed 6%.
- Liquid limit shall not exceed 25%.
- The maximum percentage of fines passing No. #200 Sieve shall be 10%.
- A minimum dry density of 1.95 g/cm³.
- Soaked CBR value (at 95% modified proctor) shall not be less than 15.
- The maximum thickness of compacted layers should not exceed 25cm.
- When compaction is required, compaction operations must be intensive and performed by 20 tones steel roller and passing about 20 times at each point and executed into two directions East-West and North-South.
- After compaction, plate load bearing tests or field compaction tests may be executed at the final level to evaluate the degree of compaction and the vertical displacement of soil.

Compaction: The minimum required density shall not be less than 95% of maximum dry density with moisture content within $\pm 2\%$ of the optimum. soil moisture and density may be specified and tested in accordance with procedures in AASHTO Method T-99 (Standard Proctor).

- SAFETY DURING CONSTRUCTION

Special considerations should be made for safety and access during the construction of the pond. Measures to be considered may include fencing slope benching, access roads, flattened side slopes, etc.

Barriers and warning signs

The Contractor must ensure that

- (a) Suitable barriers are erected between the person at risk and the likely cause of the danger; and
- (b) Suitable signs that warn of the risk are erected at the place where the excavation work is to be done.

The barrier must be placed well back from the edge of the excavation to protect the edge from collapse and allow work to be carried out around the edge of the excavation.

- Geomembrane Rolls:

Property	Test method
Thickness,	ASTM D 5199
Sheet Density	ASTM D 1505
Tear Resistance, lb.	ASTM D 1004

Puncture Resistance, lb.	ASTM D 4833
Carbon Black Content, %	ASTM D 1603
Carbon Black Dispersion, %3	ASTM D 5596
yield strength, lb/in	ASTM D 6693
break strength, lb/in	ASTM D 6694
yield elongation, %	ASTM D 6695
break elongation, %	ASTM D 6696

I- FENCE SPECIFICATION

General

Fencing shall be designed and constructed so that at any point in the outside of the fencing will present an effective barrier to young children and animals

Materials

Wire fences will be used: Wire fences shall be constructed of wire mesh of galvanized steel. Wire mesh should be mounted on 7.5cm diameter galvanized pipe spaced not over than 3 m on centers. All pipes shall be embedded at least 40 cm into concrete fill in holes not less than 50x50cm and 50 cm in depth.

Fencing height

The effective fencing height shall be not less than 200 cm from finished ground level

Ground clearance

Height of any opening between the bottom of the fencing and the finished ground level shall not exceed 20 cm.

Gates and doors

The fence should have door equipped with lock devices

ANNEX C

FORM OF BID SECURITY (BANK GUARANTEE)

To: World Vision Lebanon

World Vision National Office, Villa Sinyora, Mountazah, Mansourieh
Office Phone: 961-4-401-980

WHEREAS, *[name of Bidder]* (hereinafter called "the Bidder") has submitted his Bid dated *[date]* for the execution of *[name of Contract]* (hereinafter called "the Bid").

KNOW ALL PEOPLE by these presents that We *[name of Bank]* of *[name of country]* having our registered office at *[address]* (hereinafter called "the Bank") are bound unto World Vision Lebanon (hereinafter called "the Employer") in the sum of _____ USD (*number in character*) for which payment well and truly to be made to the said Employer the Bank binds himself, his successors, and assigns by these presents.

SEALED with the Common Seal of the said Bank

this _____ day of _____
20 _____.

THE CONDITIONS of this obligation are:

- (1) if the Bidder withdraws his Bid during the period of Bid validity specified in the Form of Bid; or
- (2) if the Bidder refuses to accept the correction of errors in his Bid; or
- (3) if the Bidder, having been notified of the acceptance of his Bid by the Employer during the period of Bid validity:
 - (a) fails or refuses to execute the Agreement generated by this Request for Proposal (RFP); or
 - (b) fails or refuses to furnish the Performance Guarantee, as required by the relevant conditions of the Subcontract Agreement.

we undertake to pay to the Employer up to the above amount upon receipt of his first written demand, without the Employer having to substantiate his demand, provided that in his demand the Employer will note that the amount claimed by him is due to him owing to the occurrence of one or several of the above mentioned conditions.

This Guarantee will remain in force up to and including the date 120 days after the deadline for submission of bids. Any demand in respect of this Guarantee should reach the Bank not later than the above date.

DATE _____ SIGNATURE OF THE BANK

WITNESS _____ SEAL

[signature, name, and address]