



**Republic of Lebanon
Ministry of Agriculture**



**Climate Smart Agriculture: Enhancing Adaptive Capacity
of the Rural Communities in Lebanon (AgriCAL)**

Grant No.: C-AF-1-LB

**Bidding documents
(National Competitive Bidding)
For**

**Supply and Installation of a rainwater harvesting system in
Rihane and Bentaël (Jbeil Caza) – One lot**

Proc. Ref: W9/2019

Issued on Monday 2nd of March 2020

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Invitation for Bids (IFB)

Monday 2nd of March 2020

- Supply and Installation of a rainwater harvesting system in Rihane and Bental (Jbeil Caza) – One lot, Proc. Ref.: W9/2019

1. The Ministry of Agriculture (MoA) has received a grant from the International Fund for Agricultural Development (IFAD) towards the cost of Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon (AgriCAL) and intends to apply part of the funds to cover eligible payments under the Contract for the Supply and Installation of rainwater harvesting systems in Rihane and Bental – Jbeil Caza, Proc. Ref.: W9/2019.

2. The Project Coordination Unit (PCU) invites sealed bids from interested and qualified bidders for the implementation of abovementioned works under the Contract: Supply and Installation of a rainwater harvesting system in Rihane and Bental – Jbeil Caza.

Duration of Works: Two (2) months.

3. Interested eligible Bidders may obtain detailed information and inspect the Bidding Documents by the address mentioned below, from Monday to Thursday 8:00 – 15:00 p.m. and Friday 8:00 – 12:00 (noon) at Beirut local time before Thursday 2nd of April 2020 at 11:00 a.m. (Beirut local time).

Project Name: Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon

Procurement Officer: Ms. Amal Deghaili

Address: Green Plan – First Floor

Baltagi Building – Facing the General Directorate of the State Security – Jnah

Beirut – Lebanon

Tel: 961 1 853 141

Email address: procurement.agric@agmail.com

4. Interested Bidders may obtain the Bidding Documents in English at the address mentioned in point 3.

No pre-bid meeting or site inspection will be organized for this exercise.

5. Minimum qualification requirements include:

a) Average annual financial amount of construction works performed for the last five years makes US\$ 140,000 at least.

b) Experience in the successful construction of at least **two (2)** works related to irrigation and greenhouse installation over the past five (5) years;

6. Bids must be delivered to the address below at or before Thursday 2nd of April 2020 at 11:00 a.m. (Beirut local time). Electronic bidding shall not be permitted. Late bids will be rejected and returned to the Bidders unopened. Bids will be opened physically in the presence of the bidders' representatives who choose to attend in person at the address below at Thursday 2nd of April 2020 at 11:15 a.m. Beirut local time.

Attention: Ms. Amal Deghaili

AgriCAL Office

Green Plan, First floor

Baltagi Building – Facing the General Directorate of State Security – Jnah

Beirut – Lebanon

Tel: 961 1 853 141

7. Bidding will be conducted through the National Competitive Bidding (NCB) procedures method set out in IFAD' Project Procurement Guidelines and Handbook – September 2010. Bidding is open to all bidders from Eligible Source Countries as defined in the Bidding Documents.

8. All bids shall be accompanied by a Bid Security of US\$ 700 (Seven Hundred United States Dollars) or its equivalent in Lebanese pounds.

Volume I. Bidding Document

Section 1 – Instructions to Bidders (ITB)

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Section 1 – Instructions to Bidders

A. General

1. Scope of Bid

1.1 The Project Coordination Unit (PCU) established by the Employer defined in the Bidding Data invites bids for the construction of Works, as described in the Contract Data and Bidding Data. The name and identification number of the Contract and number of lots (contracts) are provided in the Contract Data and Bidding Data.

1.2 The successful Bidder will be expected to complete the Works by the Intended Completion Date specified in the Contract Data.

§ Throughout these Bidding Documents:

- (a) the term “in writing” means communicated in written form (e.g. by mail, e-mail) with proof of receipt;
- (b) if the context so requires, “singular” means “plural” and vice versa; and
- (c) “day” means calendar day

2. Source of Funds

2.1 The Borrower, as defined in section 2, Conditions of Contract and as specified in the Bidding Data, intends to apply part of the funds of a grant from the [insert name of the donor] (hereinafter called “the Financier”), as defined in the Bidding Data, towards the cost of the Project, as defined in the Bidding Data, to cover eligible payments under the Contract for the Works. Payments by the Financier will be made only at the request of the Borrower and upon approval by the Financier in accordance with the Grant Agreement, and will be subject in all respects to the terms and conditions of that Agreement. Except as the Financier may specifically otherwise agree, no party other than the Borrower shall derive any rights from the Grant Agreement or have any rights to the grant proceeds.

2.2 The grant agreement prohibits a withdrawal from the grant account for the purpose of any payment to persons or entities, or for any import of goods, if such payment or import, to the knowledge of the Financier, is prohibited by a decision of the United Nations Security Council, taken under Chapter VII of the Charter of the United Nations.

3. Eligible Bidders

3.1 All bidders shall provide in Section 3, Forms of Bid and Qualification Information, a statement that the Bidder (including all members of a joint venture and subcontractors) is not associated, nor has been associated in the past, directly or indirectly, with the consultant or any other entity that has prepared the design, specifications, and other documents for the Project or being proposed as Project Manager for the Contract. A firm that has been engaged by the Borrower to provide consulting services for the preparation or supervision of the Works, and any of its affiliates, shall not be eligible to bid.

3.2 Government-owned and majority public-owned enterprises from the Borrower country may only participate if they are (i) legally and financially

autonomous, (ii) operate under commercial law and (iii) are not a dependent agency of the Borrower or Sub-Borrower.

3.3 A Bidder, which has been sanctioned by the Financier, shall be ineligible to be awarded a contract financed by the Financier, or benefit from a contract financed by the financier, financially or otherwise, during such period of time as the Financier shall determine.

3.4 Bidders shall provide such evidence of their continued eligibility satisfactory to the Employer, as the Employer shall reasonably request.

3.5 All the above mentioned criteria shall apply to each member of a joint venture as well as all subcontractors and suppliers.

4. Qualification of the Bidder

4.1 All bidders shall provide in Section 3, Forms of Bid and Qualification Information, a preliminary description of the proposed work method and schedule, including drawings and charts, as necessary.

4.2 In the event that prequalification of potential bidders has been undertaken, only bids from prequalified bidders will be considered for award of Contract. These qualified bidders should submit with their bids any information updating their original prequalification applications or, alternatively, confirm in their bids that the originally-submitted prequalification information remains essentially correct as of the date of bid submission. The update or confirmation should be provided in Section 3.

4.3 If the Employer has not undertaken prequalification of potential bidders, all bidders shall include the following information and documents with their bids in Section 3, unless otherwise stated in the Bidding Data:

(a) copies of original documents defining the constitution or legal status, place of registration, and principal place of business; and an original copy of the power of attorney of the signatory empowering the person to sign the bid and all the related documents valid at least for the duration of bid validity;

(b) total monetary value of construction work performed for each of the last **five years**;

(c) evidence of relevant experience in carrying out works of a similar nature and size and complexity to the works concerned by this bid during the last five years, and details of work under way or contractually committed; and clients who may be contacted for further information on those contracts and copies of certificates of final acceptance signed by the contracting authority of the projects concerned;

(d) major items of construction equipment proposed to carry out the Contract. The minimum requirements are listed in the Bidding Data;

(e) qualifications and experience of key site management and technical personnel proposed for the Contract.

(f) reports on the financial standing of the Bidder, such as profit and loss statements and auditor's reports for the past three years;

(g) information regarding any litigation, current or during the last three years, in which the Bidder is involved, the parties concerned, and disputed amount; and

(h) information regarding any litigation, current or during the last three years, in which the Bidder is involved, the parties concerned, and disputed amount; and

(i) proposals for subcontracting components of the Works amounting to more than 10 percent of the Contract Price (stating subcontracted scope and value as well as proposed subcontractors).

4.4 Bids submitted by a joint venture of two or more firms as partners shall comply with the following requirements, unless otherwise stated in the Bidding Data:

(a) the Bid shall include all the information listed in Sub-Clause 4.3 above for each joint venture partner;

(b) the Bid shall be signed so as to be legally binding on all partners;

(c) all partners shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms;

(d) one of the partners will be nominated as being in charge, authorized to incur liabilities, and receive instructions for and on behalf of any and all partners of the joint venture; and

(e) the execution of the entire Contract, including payment, shall be done exclusively with the partner in charge.

4.5 To qualify for award of the Contract, bidders shall meet the following minimum qualifying criteria:

(a) annual volume of construction work of at least the amount specified in the Bidding Data;

(b) experience in the construction of at least two contracts of a nature, size and complexity equivalent to the Works over the last 5 years (to comply with this requirement, works cited should be at least 70 percent complete) or as stated in the Bidding Data;

(c) proposals for the timely acquisition (own, lease, hire, etc.) of the essential equipment listed in the Bidding Data;

(d) a Contract Manager with a university degree with three years' experience in works of an equivalent nature and volume, including no less than one year as Manager; and

(e) liquid assets and/or credit facilities, net of other contractual commitments and exclusive of any advance payments which may be made under the Contract, of no less than the amount specified in the Bidding Data.

(f) A consistent history of litigation or arbitration awards against the Applicant or any partner of a Joint Venture may result in disqualification.

4.6 The figures for each of the partners of a joint venture shall be added together to determine the Bidder's compliance with the minimum qualifying criteria of Sub-Clause 4.5(a), (b) and (e); however, for a joint venture to qualify, all partners combined must meet all the qualification requirements

under 4.5 and each of its partners must meet at least 25 percent and the partner in-charge at least 40 percent of the minimum requirement under 4.5(a), and for criteria 4.5 (b) at least one partner shall meet the requirement of at least one contract of a nature, size and complexity equivalent to the Works over the last 5 years (to comply with this requirement, works cited should be at least 70 percent complete). Failure to comply with this requirement will result in rejection of the joint venture's Bid. Subcontractors' experience and resources will not be taken into account in determining the Bidder's compliance with the qualifying criteria, unless otherwise stated in the Bidding Data.

- 5. One Bid per Bidder** **5.1** Each Bidder shall submit only one Bid, either individually or as a partner in a joint venture. A Bidder who submits or participates in more than one Bid (other than as a subcontractor or in cases of alternatives that have been permitted or requested) will cause all the proposals with the Bidder's participation to be disqualified.
- 6. Cost of Bidding** **6.1** The Bidder shall bear all costs associated with the preparation and submission of his Bid, and the Employer will in no case be responsible or liable for those costs.
- 7. Site Visit** **7.1** The Bidder, at the Bidder's own responsibility and risk, is encouraged to visit and examine the Site of Works and its surroundings and obtain all information that may be necessary for preparing the Bid and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the Bidder's own expense.

B. Bidding Documents

- 8. Content of Bidding Documents** **8.1** The set of bidding documents comprises the documents listed in the table below and addenda issued in accordance with Clause 10:
- Volume 1**
- Section 1. Instructions to Bidders
 - Section 2. Conditions of Contract
 - Section 3. Forms of Bid and Qualification Information and Letter of acceptance
 - Section 4. Security Forms
- Volume 2**
- Section 5. Bidding Data
 - Section 6. Contract Data
 - Section 7. Technical Specifications
 - Section 8. Bill of Quantities or Activity Schedule for lump sum contracts

Section 9. Drawings

8.2 The number of copies to be completed and returned with the Bid is specified in the Bidding Data.

9. Clarification of Bidding Documents

9.1 A prospective Bidder requiring any clarification of the bidding documents may notify the PCU in writing at the PCU's email address indicated in the invitation to bid. The PCU will respond to any request for clarification received earlier than 21 days prior to the deadline for submission of bids. Copies of the PCU's response will be forwarded to all purchasers of the bidding documents, including a description of the inquiry, but without identifying its source.

10. Amendment of Bidding Documents

10.1 Before the deadline for submission of bids, the PCU may modify the bidding documents by issuing addenda.

10.2 Any addendum thus issued shall be part of the bidding documents and shall be communicated in writing to all purchasers of the bidding documents. Prospective bidders shall acknowledge receipt of each addendum in writing to the Employer.

10.3 To give prospective bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer shall extend, as necessary, the deadline for submission of bids, in accordance with Sub-Clause 20.2 below.

C. Preparation of Bids

11. Language of Bid

11.1 All documents relating to the Bid shall be in the English language. All correspondence related to the bid exchanged between the Bidder and the PCU must be written in English. Where the supporting documents indicated in Clause 4 are not in English, a translation into English is required in order to facilitate the evaluation of the documents.

12. Documents comprising the Bid

12.1 The Bid submitted by the Bidder shall comprise the following:

- (a) The Bid (in the format indicated in Section 3);
 - (b) Bid Security in accordance with Clause 16, if required;
 - (c) Priced Bill of Quantities or priced Activity Schedule;
 - (d) Qualification Information Form and Documents required in Clause 4 and as specified in the bidding data;
 - (e) Alternative offers where invited;
- and any other materials required to be completed and submitted by bidders, as specified in the Bidding Data.

13. Bid Prices

13.1 The Contract shall be for the whole Works, as described in Sub-Clause 1.1, based on the priced Bill of Quantities / priced Activity Schedule for lump

sum contracts submitted by the Bidder. The type of contract (Unit Price or Lump Sum) shall be specified in the Bidding Data.

13.2 The Bidder shall fill in rates and prices for all items of the Works described in the Bill of Quantities (for lump sum contracts, described in the drawings and specifications and listed in the Activity Schedule). Items for 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/Activity Schedule.

13.3 All duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause, as of the date 28 days prior to the deadline for submission of bids, shall be included in the rates, prices, and total Bid price submitted by the Bidder (for lump sum contracts, "the rates and prices" are not applicable).

13.4 The rates and prices (or the lump sum price, as appropriate) quoted by the Bidder shall be subject to adjustment during the performance of the Contract if provided for in the Bidding and Contract Data and the provisions of Clause 45 of the Conditions of Contract. The Bidder shall submit with the Bid all the information required under the Contract Data and Clause 45 of the Conditions of Contract.

13.5 All lots (contracts) and items must be listed and priced separately in the Price Schedules. If so specified in ITB 1.1, bids are invited for individual lots (contracts) or for any combination of lots (packages). Bidders are allowed to quote separate prices for one or more lot. Bidders wishing to offer discounts for the award of more than one Contract shall specify in their bid the price reductions applicable to each package, or alternatively, to individual Contracts within the package. Discounts shall be submitted in accordance with ITB 22.5, provided the bids for all lots (contracts) are opened at the same time.

14. Currency of Bid and Payment

14.1 The unit rates and prices (or the lump sum price for lump-sum contracts) shall be quoted in the Bill of Quantities (or activity Schedule \ for lump-sum contract) by the Bidder entirely in the currency of the Employer's country specified in the Bidding Data.

15. Bid Validity

15.1 Bids shall remain valid for the period specified in the Bidding Data.

15.2 In exceptional circumstances, the Employer may request that the bidders extend the period of validity for a specified additional period. The request and the bidders' responses shall be made in writing. A Bidder may refuse the request without forfeiting the Bid Security. A Bidder agreeing to the request will not be required or permitted to otherwise modify the Bid, but will be required to extend the validity of Bid Security for the period of the extension, and in compliance with Clause 16 in all respects.

16. Bid Security

16.1 The Bidder shall furnish, as part of the Bid, a Bid Security in original form as specified in the Bidding Data.

16.2 The Bid Security shall be in the amount specified in the Bidding Data and denominated in the currency of the Employer's country and, at the Bidder's option, be in the form of a bank guarantee from a local bank which has been determined by the Bidder to be acceptable to the Employer. The format of the Bid Security should be substantially in accordance with the forms of Bid Security (Bank Guarantee) included in Annex A in Section 4. The Bid Security shall be valid for 30 days beyond the validity of the Bid, as extended, if applicable, in accordance with Sub-Clause 15.2.

16.3 Any Bid not accompanied by a substantially responsive Bid Security shall be rejected by the Employer. The Bid Security of a joint venture must define a "bidder" as all joint venture partners and list them in the following manner: a joint venture consisting of ".....", ".....", and ".....".

16.4 The Bid Security of unsuccessful bidders will be returned within 28 days of the end of the Bid validity period specified in Sub-Clause 15.1.

16.5 The Bid Security of the successful Bidder will be discharged when the Bidder has signed the Agreement and furnished the required Performance Security.

16.6 The Bid Security may be forfeited

- (a) if the Bidder withdraws the Bid after Bid opening during the period of Bid validity;
- (b) if the Bidder does not accept the correction of the Bid price, pursuant to Clause 27; or
- (c) in the case of a successful Bidder, if the Bidder fails within the specified time limit to:
 - (i) sign the Agreement; or
 - (ii) furnish the required Performance Security.

16.7 If a bid security is not required in the Bidding Data, and

- (a) if a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Letter of Bid Form, except as provided in ITB 15.2, or
- (b) if the successful Bidder fails to: sign the Agreement in accordance with ITB 31; or furnish a performance security in accordance with ITB 32;

the Borrower may, if provided for in the Bidding Data, declare the Bidder disqualified to be awarded a contract by the Employer for a period of time as stated instead in the Bidding Data.

17. Alternative Proposals by Bidders

17.1 Alternatives shall not be considered, unless specifically allowed in the Bidding Data. If so allowed, Sub-Clauses 17.1 and 17.2 shall govern, and Bidding Data shall specify which of the following options shall be allowed:

- (a) Option One. A bidder may submit alternative bids with the base bid and the Employer shall only consider the alternative bids offered by the Bidder whose bid for the base case was determined to be the lowest-evaluated bid, or

(b) Option Two. A bidder may submit an alternative bid with or without a bid for the base case. All bids received, for the base case, as well as alternative bids meeting the technical specifications and performance requirements pursuant to Section 7, shall be evaluated on their own merits.

17.2 Alternative bids shall provide all information necessary for a complete evaluation of the alternative by the Employer, including design calculations, technical specifications, breakdown of prices, proposed construction methods and other relevant details.

18. Format and Signing of Bid

18.1 The Bidder shall prepare one original of the documents comprising the Bid as described in Clause 12 of these Instructions to Bidders, bound with the volume containing the Form of Bid, and clearly marked “**ORIGINAL**”. In addition, the Bidder shall submit copies of the Bid, in the number specified in the Bidding Data, clearly marked as “**COPIES**”. In the event of discrepancy between them, the original shall prevail.

18.2 The original and all copies of the Bid shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign on behalf of the Bidder, pursuant to Sub-Clauses 4.3(a) or 4.4(b), as the case may be. All pages of the Bid where entries or amendments have been made shall be initialed by the person or persons signing the Bid.

18.3 The Bid shall contain no alterations or additions, except those to comply with instructions issued by the Employer, or as necessary to correct errors made by the Bidder, in which case such corrections shall be initialed by the person or persons signing the Bid.

18.4 The Bidder shall furnish information as described in the Form of Bid on commissions or gratuities, if any, paid or to be paid to agents relating to this Bid, and to contract execution if the Bidder is awarded the contract.

D. Submission of Bids

19. Sealing and Marking of Bids

19.1 Bidders may submit their bids by mail or by hand. When so specified in the Bidding Data, bidders shall have the option of submitting their bids electronically. Bidders submitting bids electronically shall follow the procedures specified in the Bidding Data. The Bidder shall seal the original and all copies of the Bid in inner envelopes and one outer envelope, duly marking the inner envelopes as “**ORIGINAL**” and “**COPIES**”.

19.2 The inner and outer envelopes shall:

- (a) be addressed to the Employer at the address provided in the Bidding Data;
- (b) bear the name and identification number of the Contract as defined in the Bidding and Contract Data; and
- (c) provide a warning not to open before the specified time and date for Bid opening as defined in the Bidding Data.

19.3 In addition to the identification required in Sub-Clause 19.2, the inner envelopes shall indicate the name and address of the Bidder to enable the Bid to be returned unopened in case it is declared late, pursuant to Clause 21.

19.4 If the outer envelope is not sealed and marked as above, the Employer will assume no responsibility for the misplacement or premature opening of the Bid.

20. Deadline for Submission of Bids

20.1 Bids shall be delivered to the Employer at the address specified in Clause 19.2 (a) above no later than the time and date specified in the Bidding Data.

20.2 The PCU may extend the deadline for submission of bids by issuing an amendment in accordance with Clause 10, in which case all rights and obligations of the Employer and the bidders previously subject to the original deadline will then be subject to the new deadline.

21. Late Bids

21.1 Any Bid received by the Employer after the deadline prescribed in Clause 20 will be returned unopened to the Bidder.

22. Modification and withdrawal of Bids

22.1 Bidders may modify or withdraw their bids by giving notice in writing before the deadline prescribed in Clause 20.

22.2 Each Bidder's modification or withdrawal notice shall be prepared, sealed, marked, and delivered in accordance with Clauses 18 and 19, with the outer and inner envelopes additionally marked “**MODIFICATION**” or “**WITHDRAWAL**”, as appropriate.

22.3 No Bid may be modified after the deadline for submission of Bids.

22.4 Withdrawal of a Bid between the deadline for submission of bids and the expiration of the period of Bid validity specified in the Bidding Data or as extended pursuant to Sub-Clause 15.2 will result in the forfeiture of the Bid Security pursuant to Clause 16.

22.5 Bidders may only offer discounts to, or otherwise modify the prices of their bids by submitting Bid modifications in accordance with this clause, or included in the original Bid submission.

E. Bid Opening and Evaluation

23. Bid Opening

23.1 The Evaluation committee will open the bids, including modifications made pursuant to Clause 22, in the presence of the bidders' representatives who choose to attend at the time and in the place specified in the Bidding Data. Any specific opening procedures required if electronic bidding is permitted in accordance with Sub-Clause 19.1, shall be as specified in the Bidding Data.

23.2 The bidders' names, the Bid prices, the total amount of each Bid and of any alternative Bid (if alternatives have been requested or permitted), any discounts, Bid modifications and withdrawals, the presence or absence of Bid Security, if required, and such other details as the Employer may consider appropriate, will be announced by the Employer at the opening.

23.3 The Evaluation committee will prepare minutes of the Bid opening, including the information disclosed to those present in accordance with Sub-Clause 23.2.

24. Process to Be Confidential

24.1 Information relating to the examination, clarification, evaluation, and comparison of bids and recommendations for the award of a contract shall not be disclosed to bidders or any other persons not officially concerned with such process until publication of the award to the successful Bidder has been announced.

25. Clarification of Bids and Contacting the Employer

25.1 To assist in the examination, evaluation, and comparison of bids, the Evaluation committee may, ask any Bidder for clarification of the Bidder's Bid, including breakdowns of unit rates (or the prices in the Activity Schedule for lump-sum contracts). The request for clarification and the response shall be in writing, but no change in the price or substance of the Bid shall be sought, offered, or permitted except as required to confirm the correction of arithmetic errors discovered by the Employer Evaluation Committee in the -evaluation of the bids in accordance with Clause 27.

25.2 From the time of bid opening until publication of contract award, if any bidder wishes to contact the Employer on any matter related to the bidding process, it should do so in writing to the same email address requiring clarification about the bid and as mentioned in the Bidding data.

25.3 Any effort by the Bidder to influence the E-valuation committee or the Employer in the process of bid evaluation, bid comparison or contract award decisions may result in the rejection of the Bidders' bid.

26. Examination of Bids

26.1 Prior to the detailed evaluation of bids, the Evaluation committee will determine whether each Bid (a) meets the eligibility criteria defined in Clause 3; (b) has been properly signed; (c) is accompanied by a substantially acceptable Bid Security as mentioned in Annex B section 4, if required; and (d) is substantially responsive to the requirements of the bidding documents.

26.2 A substantially responsive Bid is one which conforms to all the terms, conditions, and specifications of the bidding documents, without material deviation or reservation. A material deviation or reservation is one (a) which affects in any substantial way the scope, quality, or performance of the Works; (b) which limits in any substantial way, inconsistent with the bidding documents, the Employer's rights or the Bidder's obligations under the Contract; or (c) whose rectification would affect unfairly the competitive position of other bidders presenting substantially responsive bids.

26.3 If a Bid is not substantially responsive, it will be rejected by the Evaluation committee, and may not subsequently be made responsive by correction or withdrawal of the nonconforming deviation or reservation.

27. Correction of Errors

27.1 Bids determined to be substantially responsive will be checked by the Evaluation committee for any arithmetic errors. Errors will be corrected by the Committee as follows:

(a) where there is a discrepancy between the amounts in figures and in words, the amount in words will govern; and

(b) where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern, unless in the opinion of the Employer there is an obviously gross misplacement of the decimal point in the unit rate, in which case the line item total as quoted will govern, and the unit rate will be corrected.

27.2 The amount stated in the Bid will be adjusted by the Employer in accordance with the above procedure for the correction of errors and, with the concurrence of the Bidder, shall be considered as binding upon the Bidder. If the Bidder does not accept the corrected amount, the Bid will be rejected, and the Bid Security may be forfeited in accordance with Sub-Clause 16.6(b).

28. Evaluation and Comparison of Bids

28.1 The Evaluation committee will evaluate and compare only the bids determined to be substantially responsive in accordance with Clause 26.

28.2 Bids will be evaluated lot by lot. In evaluating the bids, the Evaluation committee will determine for each Bid the evaluated Bid price by adjusting the Bid price as follows:

(a) making any correction for errors pursuant to Clause 27;

(b) excluding provisional sums and the provision, if any, for contingencies in the Bill of Quantities (or Activity Schedule for lump sum contracts), but including Daywork, where priced competitively;

(c) making an appropriate adjustment for any other acceptable variations, deviations, or alternative offers submitted in accordance with Clause 17; and

(d) making appropriate adjustments to reflect discounts or other price modifications offered in accordance with Sub-Clause 22.5.

(e) If the Bidding Document allows Bidders to quote separate prices for different lots (contracts), the methodology to determine the lowest evaluated price of the contract combinations, including any discounts offered in the Letter of Bid is done as follows: Bids will be evaluated lot-wise, taking into account discounts offered, if any, for combined lots. The contract(s) will be awarded to the Bidder or Bidders offering the lowest evaluated cost to the Employer for combined lots, subject to the selected Bidder(s) meeting the required qualification criteria for lot or combination of lots as the case may be.

28.3 The Employer reserves the right to accept or reject any variation, deviation, or alternative offer. Variations, deviations, and alternative offers and other factors which are in excess of the requirements of the bidding documents or otherwise result in unsolicited benefits for the Employer will not be taken into account in Bid evaluation.

28.4 The estimated effect of any price adjustment conditions under Clause 45 of the Conditions of Contract, during the period of implementation of the Contract, will not be taken into account in Bid evaluation.

F. Award of Contract

29. Award Criteria **29.1** Subject to Clause 30, the Employer will award the Contract to the Bidder whose Bid has been determined to be substantially responsive to the bidding documents and who has offered the lowest evaluated Bid price, provided that such Bidder has been determined to be (a) eligible in accordance with the provisions of Clause 3, and (b) qualified in accordance with the provisions of Clause 4.

Each Lot will be awarded separately.

30. Employer's Right to accept any Bid and to reject any or all Bids **30.1** Notwithstanding Clause 29, the Employer reserves the right to accept or reject any Bid, and to cancel the bidding process and reject all bids, at any time prior to the award of Contract, without thereby incurring any liability to the affected Bidder or bidders or any obligation to inform the affected Bidder or bidders of the grounds for the Employer's action.

31. Notification of Award and Signing of Agreement **31.1** The Bidder whose Bid has been accepted will be notified of the award by the Employer prior to expiration of the Bid validity period in writing. The letter (hereinafter and in the Conditions of Contract called the "Letter of Acceptance") will state the sum that the Employer will pay the Contractor in consideration of the execution, completion, and maintenance of the Works by the Contractor as prescribed by the Contract (hereinafter and in the Contract called the "Contract Price").

31.2 The notification of award will constitute the formation of the Contract, subject to the Bidder furnishing the Performance Security in accordance with Clause 32 and signing the Agreement in accordance with Sub-Clause 31.3.

After the contract has been signed and the successful bidder has provided the performance guarantee in accordance with Clause 32, the Employer will promptly notify the other bidders that their bids have not been successful and release their tender guarantees.

31.3 The Agreement will incorporate all agreements between the Employer and the successful Bidder. It will be signed by the Employer and sent to the successful Bidder, within 28 days following the notification of award along with the Letter of Acceptance. Within 21 days of receipt, the successful Bidder will sign the Agreement and deliver it to the Employer.

31.4 The Employer shall publish in the national press the results identifying the bid and lot numbers and the following information: (i) name of each bidder who submitted a bid; (ii) bid prices as read out at bid opening; (iii) name and evaluated prices of each bid that was evaluated; (iv) name of bidders whose bids were rejected and the reasons for their rejection; and (v) name of the winning bidder, and the price it offered, as well as the duration and summary scope of the contract awarded. After publication of

the award, unsuccessful bidders may request in writing to the Employer for a debriefing seeking explanations for the failure of their bids. The Employer shall promptly respond in writing to any unsuccessful Bidder who, after publication of contract award requests the Employer in writing to explain on which grounds its bid was not selected.

32. Performance Security

32.1 Within 21 days after receipt of the Letter of Acceptance the successful Bidder shall deliver to the Employer a Performance Security in the amount stipulated in the Contract Data and in the form stipulated in the Bidding Data.

32.2 If the Performance Security is provided by the successful Bidder in the form of a Bank Guarantee, it shall be issued by a local bank.

32.3 Failure of the successful Bidder to comply with the requirements of Sub-Clause 32.1 shall constitute sufficient grounds for cancellation of the award and forfeiture of the Bid Security.

33. Advance Payment and Security

33.1 The Employer will provide an Advance Payment on the Contract price as stipulated in the Conditions of Contract, subject to a maximum amount, as stated in the Bidding Data. The Advance Payment shall be guaranteed by a Security. Section 4 “Security Forms” provides a Bank Guarantee for Advance Payment form.

34. Payment Conditions

34.1 Payment shall be made in *United States Dollars*, no later than thirty (30) days following submission by the Contractor of invoices in duplicate to the Coordinator designated in paragraph 4.

Payments shall be made to the Contractor’s bank account.

34.2 Any payment of above US\$ 10,000 equivalents may be paid directly by the International Fund for Agricultural Development (IFAD) (hereinafter called “the Financier”) to the Contractor’s bank account

35. Adjudicator

35.1 Not Applicable.

36 Ethics clauses

36.1 The Contractor and its staff are obliged to maintain professional secrecy for the entire duration of the contract and after its completion. All reports and documents drawn up or received by the Contractor are confidential.

36.2 The Contractor must at all times act impartially and as a faithful adviser in accordance with the code of conduct of its profession. It must refrain from making public statements about the project or services without the Employer prior approval. It may not commit the Employer in any way without its prior written consent

37. Fraud and Corruption

37.1 It is the Financier's policy to require that Borrowers (including beneficiaries of Financier grants), as well as bidders, suppliers, and contractors and their agents (whether declared or not), personnel, subcontractors, sub-consultants, service providers and suppliers, under Financier-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts¹.

In this regard, IFAD requires compliance with the "Revised IFAD Policy on Preventing Fraud and Corruption in its Activities and Operations" in regard to corrupt and fraudulent practices. Details of this policy are found at the following link:

<https://www.ifad.org/en/document-detail/asset/40189695>

37.3 Furthermore, Bidders shall be aware of the provision stated in sub-Clause 23.2 and sub-Clause 62.1 of the Conditions of Contract.

37. Cancellation of the tender procedure

37.1 In the event of cancellation of a tender procedure, tenderers will be notified by the Employer if the tender procedure is cancelled before the tender opening session; the sealed envelopes will be returned, unopened, to the tenderers.

Cancellation may occur, for example, where:

- a) the tender procedure has been unsuccessful, namely where no qualitatively or financially worthwhile tender has been received or there has been no valid response at all;
- b) the economic or technical parameters of the project have been fundamentally altered;
- c) exceptional circumstances or force majeure render normal execution of the project impossible;
- d) all technically compliant tenders exceed the financial resources available;
- e) there have been irregularities in the procedure, in particular where these have prevented fair competition.

¹ In this context, any action taken by a bidder, supplier, contractor, or any of its personnel, agents, sub-consultants, sub-contractors, service providers, suppliers and/or their employees to influence the procurement process or contract execution for undue advantage is improper.

Section 2. Conditions of Contract

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Section 2 – Conditions of Contract

A. General

1. Definitions

1.1 Terms that are defined in the Contract Data are not also defined in the Conditions of Contract but keep their defined meanings. Boldface type is used to identify defined terms.

The **Bill of Quantities** means the priced and completed Bill of Quantities forming part of the Bid.

The **Certificate of Completion** is the certificate issued by the Project Manager upon completion of the Works, as provided for in Clause 52 hereunder.

The **Compensation Events** are those defined in Clause 42 hereunder.

The **Completion Date** is the date of completion of the Works as certified by the Project Manager, in accordance with Sub-Clause 52.1.

The **Contract** is the Contract between the Employer and the Contractor to execute, complete, and maintain the Works. It consists of the documents listed in Clause 2.1 below.

The **Contractor** is a person or corporate body whose Bid to carry out the Works has been accepted by the Employer.

The **Contractor's Bid** is the completed bidding document submitted by the Contractor to the Employer.

The **Contract Price** is the price stated in the Letter of Acceptance and thereafter as adjusted in accordance with the provisions of the Contract.

The **Days** are calendar days; **months** are calendar months.

The **Dayworks** are varied work inputs subject to payment on a time basis for the Contractor's employees and Equipment, in addition to payments for associated Materials and Plant.

A **Defect** is any part of the Works not completed in accordance with the Contract.

The **Defects Liability Period** is the period named in the Contract Data and calculated from the Completion Date.

The **Drawings** include calculations and other information provided or approved by the Project Manager for the execution of the Contract.

The **Employer** is the party who employs the Contractor to carry out the Works.

The **Equipment** is the Contractor's machinery and vehicles brought temporarily to the Site to construct the Works.

The **Initial Contract Price** is the Contract Price listed in the Employer's Letter of Acceptance.

The **Intended Completion Date** is the date on which it is intended that the Contractor shall complete the Works. The Intended Completion Date is

specified in the Contract Data. The Intended Completion Date may be revised only by the Project Manager by issuing an extension of time or an acceleration order.

The **Materials** are all supplies, including consumable, used by the Contractor for incorporation in the Works.

The **Plant** is any integral part of the Works that shall have a mechanical, electrical, chemical, or biological function.

The **Project Manager** is the person named in the Contract Data (or any other competent person appointed by the Employer and notified to the Contractor, to act in replacement of the Project Manager) who is responsible for supervising the execution of the Works and administering the Contract.

The **Site** is the area defined as such in the Contract Data.

The **Site Investigation Reports** are those that were included in the bidding documents and are factual and interpretative reports about the surface and subsurface conditions at the Site.

The **Specification** means the Specification of the Works included in the Contract and any modification or addition made or approved by the Project Manager.

The **Start Date** is given in the Contract Data. It is the latest date when the Contractor shall commence execution of the Works. It does not necessarily coincide with any of the Site Possession Dates.

A **Subcontractor** is a person or corporate body who has a Contract with the Contractor to carry out a part of the work in the Contract, which includes work on the Site.

Temporary Works are works designed, constructed, installed, and removed by the Contractor that are needed for construction or installation of the Works.

A **Variation** is an instruction given by the Project Manager which varies the Works.

The **Works** are what the Contract requires the Contractor to construct, install, and turn over to the Employer, as defined in the Contract Data.

2. Interpretation

2.1 The documents forming the Contract shall be interpreted in the following order of priority:

- (1) Agreement,
- (2) Letter of Acceptance,
- (3) Contractor's Bid,
- (4) Contract Data,
- (5) Conditions of Contract,
- (6) Technical Specifications,
- (7) Drawings,

(8) Bill of Quantities or Activity Schedule and

(9) any other document listed in the Contract Data as forming part of the Contract.

3. Language and Law

3.1 The language of the Contract and the law governing the Contract are stated in the Contract Data.

4. Project Manager's Decisions

4.1 Except where otherwise specifically stated, the Project Manager will decide contractual matters between the Employer and the Contractor in the role representing the Employer.

4.2 The Project Manager shall obtain the specific approval of the Employer before instructing a Variation that would increase the Initial Contract value in excess of 15%. Any increase in price, including the net cumulative value of successive variations, cannot exceed 50 % of the initial contract value.

4.3 An Addendum must be issued and signed by both parties when the changes entail an increase or reduction of the total value of the works in excess of 15 % of the initial contract price.

4.4 Modifications to contract amounts may entail changes for the financial guarantees linked to the contract.

5. Delegation

5.1 The Project Manager may delegate any of his duties and responsibilities to other people, except to the Adjudicator, after notifying the Contractor, and may cancel any delegation after notifying the Contractor.

6. Communications

6.1 Communications between parties that are referred to in the Conditions shall be effective only when in writing. A notice shall be effective only when it is delivered.

7. Sub-contracting

7.1 The Contractor may subcontract with the approval of the Project Manager, but may not assign the Contract without the approval of the Employer in writing. Subcontracting shall not alter the Contractor's obligations.

8. Other Contractors

8.1 The Contractor shall cooperate and share the Site with other contractors, public authorities, utilities, and the Employer between the dates given in the Schedule of Other Contractors, as referred to in the Contract Data. The Contractor shall also provide facilities and services for them as described in the Schedule. The Employer may modify the Schedule of Other Contractors, and shall notify the Contractor of any such modification.

9. Personnel

9.1 The Contractor shall employ the key personnel named in the Schedule of Key Personnel, as referred to in the Contract Data, to carry out the functions stated in the Schedule or other personnel approved by the Project Manager. The Project Manager will approve any proposed replacement of key

personnel only if their relevant qualifications and abilities are substantially equal to or better than those of the personnel listed in the Schedule.

9.2 If the Project Manager asks the Contractor to remove a person who is a member of the Contractor's staff or work force, stating the reasons, the Contractor shall ensure that the person leaves the Site within seven days and has no further connection with the work in the Contract.

10. Employer's and Contractor's Risks

10.1 The Employer carries the risks which this Contract states are Employer's risks, and the Contractor carries the risks which this Contract states are Contractor's risks.

11. Employer's Risks

11.1 From the Start Date until the Defects Liability Certificate has been issued, the following are Employer's risks:

(a) The risk of personal injury, death, or loss of or damage to property (excluding the Works, Plant, Materials, and Equipment), which are due to:

(i) use or occupation of the Site by the Works or for the purpose of the Works, which is the unavoidable result of the Works or

(ii) negligence, breach of statutory duty, or interference with any legal right by the Employer or by any person employed by or contracted to him except the Contractor.

(b) The risk of damage to the Works, Plant, Materials, and Equipment to the extent that it is due to a fault of the Employer or in the Employer's design, or due to war or radioactive contamination directly affecting the country where the Works are to be executed.

11.2 From the Completion Date until the Defects Liability Certificate has been issued, the risk of loss of or damage to the Works, Plant, and Materials is an Employer's risk except loss or damage due to

(a) a Defect which existed on the Completion Date,

(b) an event occurring before the Completion Date, which was not itself an Employer's risk, or

(c) the activities of the Contractor on the Site after the Completion Date.

12. Contractor's Risks

12.1 From the Start Date until the Defects Liability Certificate has been issued, the risks of personal injury, death, and loss of or damage to property (including, without limitation, the Works, Plant, Materials, and Equipment) which are not Employer's risks are Contractor's risks.

13. Insurance

13.1 The Contractor shall provide, in the joint names of the Employer and the Contractor, insurance cover from the Start Date to the end of the Defects Liability Period, in the amounts and deductibles stated in the Contract Data for the following events which are due to the Contractor's risks:

(a) loss of or damage to the Works, Plant, and Materials;

- (b) loss of or damage to Equipment;
- (c) loss of or damage to property (except the Works, Plant, Materials, and Equipment) in connection with the Contract; and
- (d) personal injury or death.

13.2 Policies and certificates for insurance shall be delivered by the Contractor to the Project Manager for the Project Manager's approval before the Start Date. All such insurance shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.

13.3 If the Contractor does not provide any of the policies and certificates required, the Employer may effect the insurance which the Contractor should have provided and recover the premiums the Employer has paid from payments otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due.

13.4 Alterations to the terms of an insurance shall not be made without the approval of the Project Manager.

13.5 Both parties shall comply with any conditions of the insurance policies.

14. Site Investigation Reports

14.1 The Contractor, in preparing the Bid, shall rely on any Site Investigation Reports referred to in the Contract Data, supplemented by any information available to the Bidder.

15. Queries about the Contract Data

15.1 The Project Manager will clarify queries on the Contract Data.

16. Contractor to Construct the Works

16.1 The Contractor shall construct and install the Works in accordance with the Specifications and Drawings.

17. The Works to Be Completed by the Intended Completion Date

17.1 The Contractor may commence execution of the Works on the Start Date and shall carry out the Works in accordance with the Program submitted by the Contractor, as updated with the approval of the Project Manager, and complete them by the Intended Completion Date.

18. Approval by the Project Manager

18.1 The Contractor shall submit Specifications and Drawings showing the proposed Temporary Works to the Project Manager, who is to approve them if they comply with the Specifications and Drawings.

18.2 The Contractor shall be responsible for design of Temporary Works.

18.3 The Project Manager's approval shall not alter the Contractor's responsibility for design of the Temporary Works.

18.4 The Contractor shall obtain approval of third parties to the design of the Temporary Works, where required.

18.5 All Drawings prepared by the Contractor for the execution of the temporary or permanent Works, are subject to prior approval by the Project Manager before this use.

19. Safety

19.1 The Contractor shall be responsible for the safety of all activities on the Site.

20. Discoveries

20.1 Anything of historical or other interest or of significant value unexpectedly discovered on the Site shall be the property of the Employer. The Contractor shall notify the Project Manager of such discoveries and carry out the Project Manager's instructions for dealing with them.

21. Possession of the Site

21.1 The Employer shall give possession of all parts of the Site to the Contractor. If possession of a part is not given by the date stated in the Contract Data, the Employer will be deemed to have delayed the start of the relevant activities, and this will be a Compensation Event.

22. Access to the Site

22.1 The Contractor shall allow the Project Manager Coordinator and any person authorized by the Project Manager access to the Site and to any place where work in connection with the Contract is being carried out or is intended to be carried out.

23. Instructions, Inspections and Audits

23.1 The Contractor shall carry out all instructions of the Project Manager which comply with the applicable laws where the Site is located.

23.2 The Contractor shall permit, and shall cause its Subcontractors and subconsultants to permit, the Financier and/or persons appointed by the Financier to inspect the Site and all accounts and records relating to the performance of the Contract and the submission of the bid, and to have such accounts and records audited by auditors appointed by the Financier if requested by the Financier. The Contractor's and its Subcontractors' and subconsultants' attention is drawn to Sub-Clause 61.1[Corrupt or Fraudulent Practices] which provides, inter alia, that acts intended to materially impede the exercise of the Financier's inspection and audit rights provided for under Sub-Clause 23.2 constitute a prohibited practice subject to contract termination (as well as to a determination of ineligibility pursuant to the Financier's prevailing sanctions procedures).

24. Disputes

24.1 If the Contractor believes that a decision taken by the Project Manager was either outside the authority given to the Project Manager by the Contract or that the decision was wrongly taken, the decision shall be referred to the competent court in the Republic of Lebanon within 14 days of the notification of the Project Manager's decision.

25. Procedure for Disputes **25.1** Any dispute arising out of or in connection with this Contract shall be settled by means of negotiations between the parties. In case if the parties didn't come to an agreement for the disputed issue then any party may apply to the competent court in the Republic of Lebanon. In that case the final regulation of the disputed issue will be the resolution of court entered into force

26. Replacement of Adjudicator **26.1** Not applicable.

B. Time Control

27. Program **27.1** Within the time stated in the Contract Data, the Contractor shall submit to the Project Manager for approval a Program showing the general methods, arrangements, order, and timing for all the activities in the Works.

27.2 An update of the Program shall be a program showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work, including any changes to the sequence of the activities.

27.3 The Contractor shall submit to the Project Manager for approval an updated Program at intervals no longer than the period stated in the Contract Data. If the Contractor does not submit an updated Program within this period, the Project Manager may withhold the amount stated in the Contract Data from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue Program has been submitted.

27.4 The Project Manager's approval of the Program shall not alter the Contractor's obligations. The Contractor may revise the Program and submit it to the Project Manager again at any time. A revised Program shall show the effect of Variations and Compensation Events.

28. Extension of the Intended Completion Date **28.1** The Project Manager shall extend the Intended Completion Date if a Compensation Event occurs or a Variation is issued which makes it impossible for Completion to be achieved by the Intended Completion Date without the Contractor taking steps to accelerate the remaining work, which would cause the Contractor to incur additional cost.

28.2 The Project Manager shall decide whether and by how much to extend the Intended Completion Date within 21 days of the Contractor asking the Project Manager for a decision upon the effect of a Compensation Event or Variation and submitting full supporting information. If the Contractor has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delay by this failure shall not be considered in assessing the new Intended Completion Date.

- 29. Acceleration**
- 29.1** When the Employer wants the Contractor to finish before the Intended Completion Date, the Project Manager will obtain priced proposals for achieving the necessary acceleration from the Contractor. If the Employer accepts these proposals, the Intended Completion Date will be adjusted accordingly and confirmed by both the Employer and the Contractor.
- 29.2** If the Contractor's priced proposals for an acceleration are accepted by the Employer, they are incorporated in the Contract Price and treated as a Variation.

- 30. Delays Ordered by the Project Manager**
- 30.1** The Project Manager may instruct the Contractor to delay the start or progress of any activity within the Works.

- 31. Early Warning**
- 31.1** The Contractor shall warn the Project Manager at the earliest opportunity of specific likely future events or circumstances that may adversely affect the quality of the work, increase the Contract Price or delay the execution of the Works. The Project Manager may require the Contractor to provide an estimate of the expected effect of the future event or circumstance on the Contract Price and Completion Date. The estimate shall be provided by the Contractor as soon as reasonably possible.
- 31.2** The Contractor shall cooperate with the Project Manager in making and considering proposals for how the effect of such an event or circumstance can be avoided or reduced by anyone involved in the work and in carrying out any resulting instruction of the Project Manager.

C. Quality Control

- 32. Identifying Defects**
- 32.1** The Project Manager shall check the Contractor's work and notify the Contractor of any Defects that are found. Such checking shall not affect the Contractor's responsibilities. The Project Manager may instruct the Contractor to search for a Defect and to uncover and test any work that the Project Manager considers may have a Defect.

- 33. Tests**
- 33.1** If the Project Manager instructs the Contractor to carry out a test not specified in the Specification to check whether any work has a Defect and the test shows that it does, the Contractor shall pay for the test and any samples. If there is no Defect, the test shall be a Compensation Event.

- 34. Correction of Defects**
- 34.1** The Project Manager shall give notice to the Contractor of any Defects before the end of the Defects Liability Period, which begins at Completion, and is defined in the Contract Data. The Defects Liability Period shall be extended for as long as Defects remain to be corrected.

34.2 Every time notice of a Defect is given, the Contractor shall correct the notified Defect within the length of time specified by the Project Manager's notice.

35. Uncorrected Defects

35.1 If the Contractor has not corrected a Defect within the time specified in the Project Manager's notice, the Project Manager will assess the cost of having the Defect corrected, and the Contractor will pay this amount.

D. Cost Control

36. Bill of Quantities

36.1 The Bill of Quantities (for lump sum contracts entire Clause 36 shall be replaced with a new Clause as indicated in Contract Data) shall contain items for the construction, installation, testing, and commissioning work to be done by the Contractor.

36.2 The Bill of Quantities is used to calculate the Contract Price. The Contractor is paid for the quantity of the work done at the rate in the Bill of Quantities for each item.

37. Changes in the Quantities

37.1 If the final quantity of the work done differs from the quantity in the Bill of Quantities for the particular item by more than 25 percent, provided the change exceeds 1 percent of the Initial Contract Price, the Project Manager shall adjust the rate to allow for the change. (For lump-sum contracts, this clause shall be substituted by a new clause as indicated in Contract Data).

37.2 The Project Manager shall not adjust rates from changes in quantities if thereby the Initial Contract Price is exceeded by more than 15 percent, except with the prior approval of the Employer.

37.3 If requested by the Project Manager, the Contractor shall provide the Project Manager with a detailed cost breakdown of any rate in the Bill of Quantities.

38. Variations

38.1 All Variations shall be included in updated Programs or Activity Schedules produced by the Contractor.

39. Payments for Variations

39.1 The Contractor shall provide the Project Manager with a quotation for carrying out the Variation when requested to do so by the Project Manager. The Project Manager shall assess the quotation, which shall be given within seven days of the request or within any longer period stated by the Project Manager and before the Variation is ordered.

39.2 If the work in the Variation corresponds with an item description in the Bill of Quantities and if, in the opinion of the Project Manager, the quantity of work above the limit stated in Sub-Clause 37.1 or the timing of its execution do not cause the cost per unit of quantity to change, the rate in the Bill of Quantities shall be used to calculate the value of the Variation. If the

cost per unit of quantity changes, or if the nature or timing of the work in the Variation does not correspond with items in the Bill of Quantities, the quotation by the Contractor shall be in the form of new rates for the relevant items of work. (For lump sum contracts, this Sub-clause shall be deleted as indicated in Contract Data).

39.3 If the Contractor's quotation is unreasonable, the Project Manager may order the Variation and make a change to the Contract Price, which shall be based on the Project Manager's own forecast of the effects of the Variation on the Contractor's costs.

39.4 If the Project Manager decides that the urgency of varying the work would prevent a quotation being given and considered without delaying the work, no quotation shall be given and the Variation shall be treated as a Compensation Event.

39.5 The Contractor shall not be entitled to additional payment for costs that could have been avoided by giving early warning.

40. Payment Certificates

40.1 The Contractor shall submit to the Project Manager monthly statements of the estimated value of the work executed less the cumulative amount certified previously.

40.2 The Project Manager shall check the Contractor's monthly statement and certify the amount to be paid to the Contractor.

40.3 The value of work executed shall be determined by the Project Manager.

40.4 The value of work executed shall comprise the value of the quantities of the items in the Bill of Quantities completed. (For lump sum contracts, this Sub-clause shall be substituted by a new Sub-clause as indicated in the Contract Data).

40.5 The value of work executed shall include the valuation of Variations and Compensation Events.

40.6 The Project Manager may exclude any item certified in a previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information.

41. Payments

41.1 Payments shall be adjusted for deductions for advance payments and retention. The Employer shall pay the Contractor the amounts certified by the Project Manager within 28 days of the date of each certificate. If the Employer makes a late payment, the Contractor shall be paid interest on the late payment in the next payment. Interest shall be calculated from the date by which the payment should have been made up to the date when the late payment is made at the prevailing rate of interest for commercial borrowing for each of the currencies in which payments are made.

41.2 If an amount certified is increased in a later certificate or as a result of the decision of the competent court in the Republic of Lebanon, the Contractor shall be paid interest upon the delayed payment as set out in this

clause. Interest shall be calculated from the date upon which the increased amount would have been certified in the absence of dispute.

41.3 Unless otherwise stated, all payments and deductions will be paid or charged in the proportions of currencies comprising the Contract Price.

41.4 Items of the Works for which no rate or price has been entered in will not be paid for by the Employer and shall be deemed covered by other rates and prices in the Contract.

42. Payment Conditions

42.1 Payment shall be made in *United States Dollars*, no later than thirty (30) days following submission by the Contractor of invoices in duplicate to the Contractor designated in paragraph 4.

Payments shall be made to Consultant's bank account.

42.2 Any payment of above US\$ 10,000 equivalents may be paid directly by the International Fund for Agricultural Development (IFAD) (hereinafter called "the Financier") to the Contractor's bank account

43. Compensation Events

43.1 The following shall be Compensation Events:

(a) The Employer does not give access to a part of the Site by the Site Possession Date stated in the Contract Data.

(b) The Employer modifies the Schedule of Other Contractors in a way that affects the work of the Contractor under the Contract.

(c) The Project Manager orders a delay or does not issue Drawings, Specifications, or instructions required for execution of the Works on time.

(d) The Project Manager instructs the Contractor to uncover or to carry out additional tests upon work, which is then found to have no Defects.

(e) The Project Manager unreasonably does not approve a subcontract to be let.

(f) Ground conditions are substantially more adverse than could reasonably have been assumed before issuance of the Letter of Acceptance from the information issued to bidders (including the Site Investigation Reports), from information available publicly and from a visual inspection of the Site.

(g) The Project Manager gives an instruction for dealing with an unforeseen condition, caused by the Employer, or additional work required for safety or other reasons.

(h) Other contractors, public authorities, utilities, or the Employer does not work within the dates and other constraints stated in the Contract, and they cause delay or extra cost to the Contractor.

(i) The advance payment is delayed.

(j) The effects on the Contractor of any of the Employer's Risks.

(k) The Project Manager unreasonably delays issuing a Certificate of Completion.

(l) Other Compensation Events described in the Contract Data or determined by the Project Manager shall apply.

43.2 If a Compensation Event would cause additional cost or would prevent the work being completed before the Intended Completion Date, the Contract Price shall be increased and/or the Intended Completion Date shall be extended. The Project Manager shall decide whether and by how much the Contract Price shall be increased and whether and by how much the Intended Completion Date shall be extended.

43.3 As soon as information demonstrating the effect of each Compensation Event upon the Contractor's forecast cost has been provided by the Contractor, it shall be assessed by the Project Manager, and the Contract Price shall be adjusted accordingly. If the Contractor's forecast is deemed unreasonable, the Project Manager shall adjust the Contract Price based on the Project Manager's own forecast. The Project Manager will assume that the Contractor will react competently and promptly to the event.

43.4 The Contractor shall not be entitled to compensation to the extent that the Employer's interests are adversely affected by the Contractor's not having given early warning or not having cooperated with the Project Manager.

44. Taxes

44.1 The Project Manager shall adjust the Contract Price if taxes, duties, and other levies are changed between the date 28 days before the submission of bids for the Contract and the date of the last Certificate of Completion. The adjustment shall be the change in the amount of tax payable by the Contractor, provided such changes are not already reflected in the Contract Price or are a result of Clause 45.

45. Price Adjustment

45.1 Prices shall be adjusted for fluctuations in the cost of inputs only if provided for in the Contract Data. If so provided, the amounts certified in each payment certificate, after deducting for Advance Payment, shall be adjusted by applying the respective price adjustment factor to the payment amounts. A formula of the type indicated below applies:

$$P = A + B * I_{mc} / I_{oc}$$

Where

P is the adjustment factor for the portion of the Contract Price.

A and **B** are coefficients specified in the Contract Data, representing the nonadjustable and adjustable portions, respectively, of the Contract Price; and

I_{mc} is the index prevailing at the end of the month being invoiced and **I_{oc}** is the index prevailing 28 days before Bid opening for inputs payable.

Note: The sum of the two coefficients A and B should be 1 (one) in the formula.

45.2 If the value of the index is changed after it has been used in a calculation, the calculation shall be corrected and an adjustment made in the next payment certificate. The index value shall be deemed to take account of all changes in cost due to fluctuations in costs.

46. Retention

46.1 The Employer shall retain from each payment due to the Contractor the proportion stated in the Contract Data until Completion of the whole of the Works.

46.2 On Completion of the whole of the Works, half the total amount retained shall be repaid to the Contractor and half when the Defects Liability Period has passed and the Project Manager has certified that all Defects notified by the Project Manager to the Contractor before the end of this period have been corrected.

46.3 On completion of the whole Works, the Contractor may substitute retention money with an "on demand" Bank guarantee.

47. Liquidated Damages

47.1 The Contractor shall pay liquidated damages to the Employer at the rate per day stated in the Contract Data for each day that the Completion Date is later than the Intended Completion Date. The total amount of liquidated damages shall not exceed the amount defined in the Contract Data. The Employer may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not affect the Contractor's liabilities.

47.2 If the Intended Completion Date is extended after liquidated damages have been paid, the Project Manager shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate. The Contractor shall be paid interest on the overpayment, calculated from the date of payment to the date of repayment, at the rates specified in Sub-Clause 41.1.

48. Bonus

48.1 The Contractor shall be paid a Bonus calculated at the rate per calendar day stated in the Contract Data for each day (less any days for which the Contractor is paid for acceleration) that the Completion is earlier than the Intended Completion Date. The Project Manager shall certify that the Works are complete, although they may not be due to be complete.

49. Advance Payment

49.1 The Employer shall make advance payment to the Contractor of the amounts stated in the Contract Data by the date stated in the Contract Data, against provision by the Contractor of an Unconditional Bank Guarantee in a form and by a bank acceptable to the Employer in amounts and currencies equal to the advance payment. The Guarantee shall remain effective until the advance payment has been repaid, but the amount of the Guarantee shall be progressively reduced by the amounts repaid by the Contractor. Interest will not be charged on the advance payment.

49.2 The Contractor is to use the advance payment only to pay for Equipment, Plant, Materials, and mobilization expenses required specifically for execution of the Contract. The Contractor shall demonstrate that advance payment has been used in this way by supplying copies of invoices or other documents to the Project Manager.

49.3 The advance payment shall be repaid by deducting proportionate amounts from payments otherwise due to the Contractor, following the schedule of completed percentages of the Works on a payment basis. No account shall be taken of the advance payment or its repayment in assessing valuations of work done, Variations, Compensation Events, Bonuses, or Liquidated Damages.

50. Securities

50.1 The Performance Security shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in an amount and form specified in the Contract Data and by a bank or surety acceptable to the Employer. The Performance Security shall be valid until the end of the Defects Liability Period.

51. Dayworks

51.1 If applicable, the Dayworks rates in the Contractor's Bid shall be used for small additional amounts of work only when the Project Manager has given written instructions in advance for additional work to be paid for in that way.

51.2 All work to be paid for as Dayworks shall be recorded by the Contractor on forms approved by the Project Manager. Each completed form shall be verified and signed by the Project Manager within two days of the work being done.

51.3 The Contractor shall be paid for Dayworks subject to obtaining signed Dayworks forms.

52. Cost of Repairs

52.1 Loss or damage to the Works or Materials to be incorporated in the Works between the Start Date and the end of the Defects Liability Period shall be remedied by the Contractor at the Contractor's cost if the loss or damage arises from the Contractor's acts or omissions.

E. Finishing the Contract

53. Completion

53.1 The Contractor shall request the Project Manager to issue a Certificate of Completion of the Works, and the Project Manager will do so upon deciding that the work is completed.

54. Taking Over

54.1 The Employer shall take over the Site and the Works within seven days of the Project Manager's issuing the Certificate of Completion.

55. Final Account

55.1 The Contractor shall supply the Project Manager with a detailed account of the total amount that the Contractor considers payable under the

Contract before the end of the Defects Liability Period. The Project Manager shall issue a Defects Liability Certificate and certify any final payment that is due to the Contractor within 56 days of receiving the Contractor's account if it is correct and complete. If it is not, the Project Manager shall issue within 56 days a schedule that states the scope of the corrections or additions that are necessary. If the Final Account is still unsatisfactory after it has been resubmitted, the Project Manager shall decide on the amount payable to the Contractor and issue a payment certificate.

56. Operating and Maintenance Manuals

56.1 If “as built” Drawings and/or operating and maintenance manuals are required, the Contractor shall supply them by the dates stated in the Contract Data.

56.2 If the Contractor does not supply the Drawings and/or manuals by the dates stated in the Contract Data, or they do not receive the Project Manager's approval, the Project Manager shall withhold the amount stated in the Contract Data from payments due to the Contractor.

57. Termination

57.1 The Employer or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract.

57.2 Fundamental breaches of Contract shall include, but shall not be limited to, the following:

(a) the Contractor stops work for 28 days when no stoppage of work is shown on the current Program and the stoppage has not been authorized by the Project Manager;

(b) the Project Manager instructs the Contractor to delay the progress of the Works, and the instruction is not withdrawn within 28 days;

(c) the Employer or the Contractor is made bankrupt or goes into liquidation other than for a reconstruction or amalgamation;

(d) a payment certified by the Project Manager is not paid by the Employer to the Contractor within 84 days of the date of the Project Manager's certificate;

(e) the Project Manager gives Notice that failure to correct a particular Defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Project Manager;

(f) the Contractor does not maintain a Security, which is required; and

(g) the Contractor has delayed the completion of the Works by the number of days for which the maximum amount of liquidated damages can be paid, as defined in the Contract Data.

57.3 When either party to the Contract gives notice of a breach of Contract to the Project Manager for a cause other than those listed under Sub-Clause 56.2 above or Sub-Clause 61.1 below, the Project Manager shall decide whether the breach is fundamental or not.

57.4 Notwithstanding the above, the Employer may terminate the Contract for convenience.

57.5 If the Contract is terminated, the Contractor shall stop work immediately, make the Site safe and secure, and leave the Site as soon as reasonably possible.

58. Payment upon Termination

58.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Project Manager shall issue a certificate for the value of the work done and Materials ordered less advance payments received up to the date of the issue of the certificate and less the percentage to apply to the value of the work not completed, as indicated in the Contract Data. Additional Liquidated Damages shall not apply. If the total amount due to the Employer exceeds any payment due to the Contractor, the difference shall be a debt payable to the Employer.

58.2 If the Contract is terminated for the Employer's convenience or because of a fundamental breach of Contract by the Employer, the Project Manager shall issue a certificate for the value of the work done, Materials ordered, the reasonable cost of removal of Equipment, repatriation of the Contractor's personnel employed solely on the Works, and the Contractor's costs of protecting and securing the Works, and less advance payments received up to the date of the certificate.

59. Property

59.1 All Materials on the Site, Plant, Temporary Works, and Works shall be deemed to be the property of the Employer if the Contract is terminated because of the Contractor's default.

60. Release from Performance

60.1 If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of either the Employer or the Contractor, the Project Manager shall certify that the Contract has been frustrated. The Contractor shall make the Site safe and stop work as quickly as possible after receiving this certificate and shall be paid for all work carried out before receiving it and for any work carried out afterwards to which a commitment was made.

61--. Suspension of Financier Grant or Credit

61.1 In the event that the Financier suspends the Grant or Credit to the Employer from which part of the payments to the Contractor are being made:

(a) The Employer is obliged to notify the Contractor of such suspension within 7 days of having received the Financier's suspension notice.

(b) If the Contractor has not received sums due it upon the expiration of the 28 days for payment provided for in Sub Clause 41.1, the Contractor may immediately issue a 14-day termination notice.

62. Corrupt or Fraudulent Practices

62.1 If the Employer determines that the Contractor and/or any of its personnel, or its agents, or its Subcontractors, subconsultants, services providers, suppliers and/or their employees has engaged in corrupt, fraudulent, collusive, coercive or obstructive practices, in competing for or in executing the Contract, then the Employer may, after giving 14 days' notice to the Contractor, terminate the Contractor's employment under the Contract and expel him from the Site, and the provisions of Clause 56.5 shall apply.

62.2 Should any employee of the Contractor be determined to have engaged in corrupt, fraudulent, collusive, coercive, or obstructive practice during the execution of the Works, then that employee shall be removed in accordance with Clause 9 [Personnel].

62.3 For the purposes of this Sub-Clause the definitions are adopted as follows:

(i) "**coercive practice**" is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of any party, to improperly influence the actions of that or another party;

(ii) "**collusive practice**" is an arrangement between two or more parties designed to achieve an improper purpose, including improperly influencing the actions of another party;

(iii) "**corrupt practice**" is the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value in order to improperly influence the actions of another party;

(iv) "**fraudulent practice**" is any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party in order to obtain a financial or other benefit or to avoid an obligation;

(v) "**obstruction practice**" is (i) deliberate destroying, falsifying, altering or concealing evidence that may be material to an investigation by IFAD or making false statements to investigators in order to materially impede an investigation by IFAD ii) threatening, harassing or intimidating any party in order to prevent that party from disclosing its knowledge of matters relevant to an investigation by IFAD or from pursuing such an investigation; and/or (iii) the commission of any act intended to materially impede the exercise of IFAD's contractual rights of audit, inspection and access to information.

Section 3 – Forms of Bid and Qualification Information and Letter of Acceptance

Table of Standard Forms

A. Contractor's Bid	
B. Qualification Information	
C. Letter of Acceptance.....	
D. Agreement.....	

Standard Form: Contractor's Bid

Date:

To: The Ministry of Agriculture

Project Coordination Unit

Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon (AgriCAL) Project

Facing Henri Chehab Barrack, Bir Hassan District, Beirut, Lebanon

Tel: 01 849 618

(a) We offer to execute the *Supply and installation a rainwater harvesting system in Rihane and Bentaal (Jbeil Caza), Proc. Ref: W19/2020* in accordance with the Conditions of Contract accompanying this Bid.

(b) The total price of our Bid, excluding any discounts offered in item (c) below is
..... *[insert the total price of the bid in words and figures, indicating the various amounts and the respective currencies];*

(c) The discounts offered and the methodology for their application are:

(i) The discounts offered are: *[Specify in detail each discount offered.]*

(ii) The exact method of calculations to determine the net price after application of discounts is shown below: *[Specify in detail the method that shall be used to apply the discounts];*

(d) This Bid and your written acceptance of it shall constitute a binding Contract between us. We understand that you are not bound to accept the lowest or any Bid you receive.

(e) Commissions or gratuities, if any, paid or to be paid by us to agents relating to this Bid, and to contract execution if we are awarded the contract, are listed below:

Name and address of the agent	Amount and Currency	Purpose of Commission / gratuity

(If none, state “none”)

(f) We hereby confirm that this Bid complies with the Bid validity and, if required, Bid Security as required by the bidding documents and specified in the Bidding Data.

(g) We, including any subcontractors or suppliers for any part of the Contract, have nationalities from eligible countries in accordance with ITB Sub-Clause 2.2;

(h) We have no conflict of interest in accordance with ITB Sub-Clause 3.1;

(i) Our firm, its affiliates or subsidiaries—including any subcontractors or suppliers for any part of the contract—has not been declared ineligible by the [insert name of the donor], or under the Employer’s country laws or official regulations, in accordance with ITB Sub-Clause 3.3.

Authorized Signature:

Name and Title of Signatory:

Name of Bidder:

Address:

.....

Standard Form: Qualification Information

1. Individual Bidders or Individual Members of Joint Ventures

1.1 Constitution or legal status of Bidder *[attach copy]*

Date and Place of registration:

Principal place of business:

Power of attorney of signatory of Bid *[attach]*

1.2 Total annual volume of construction work performed in the last five years, in local currency

2015	
2016	
2017	
2018	
2019	

1.3 Work performed on works related to irrigation and greenhouse installation over the last five years.

- The values should be indicated in the same currency used for Item 1.2 above.

Project name and country	Name of client and contact person	Type of work performed and year of completion	Value of contract

1.4 Major items of Contractor's Equipment proposed for carrying out the Works.

- List all information requested below.
- Refer also to Sub-Clause 4.3 (d) of the Instructions to Bidders.

Item of equipment	Description, make, and age (years)	Condition (new, good, poor) and number available	Owned, leased (from whom?), or to be purchased (from whom?)

1.5 Qualifications and experience of key personnel proposed for administration and execution of the Contract.

- Attach biographical data.
- Refer also to Sub-Clause 4.3 (e) of the Instructions to Bidders and Sub-Clause 9.1 of the Conditions of Contract.

Position	Name	Years of experience (general)	Years of experience in proposed position

1.6 Proposed subcontracts and firms involved. Refer to Clause 7 of Conditions of Contract.

Sections of the Works	Value of subcontract	Subcontractor (name and address)	Experience in similar work

1.7 Financial reports for the last three years: balance sheets, profit and loss statements, auditors' reports, etc. List below and attach copies.

1.8 Information regarding any litigation, current or during the last three years, in which the Bidder is involved, the parties concerned, and disputed amount.

1.9 Information on current litigation in which the Bidder is involved.

Other party(ies)	Cause of dispute	Amount involved

1.10 Proposed Program (work method and schedule).

- Descriptions, drawings, and charts, as necessary, to comply with the requirements of the bidding documents.

- The schedule must detail the temporary and permanent works to be constructed taking into consideration the weather conditions.
- The work method shall show the methods by which the bidder proposes to carry out the works.

2. Joint Ventures

2.1 The information listed in 1.1 - 1.10 above shall be provided for each partner of the joint venture.

2.2 The information in 1.11 above shall be provided for the joint venture.

2.3 Attach the power of attorney of the signatory(ies) of the Bid authorizing signature of the Bid on behalf of the joint venture.

2.4 Attach the Agreement among all partners of the joint venture (and which is legally binding on all partners), which shows that

- (a) all partners shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms;
- (b) one of the partners will be nominated as being in charge, authorized to incur liabilities, and receive instructions for and on behalf of any and all partners of the joint venture; and
- (c) the execution of the entire Contract, including payment, shall be done exclusively with the partner in charge.

3. Additional Requirements

3.1 Bidders should provide any additional information required in the Bidding Data or to fulfill the requirements of Sub-Clause 4.1.

Standard Form: Letter of Acceptance

[letterhead paper of the Employer]

Date:

To: *[name of the Contractor]*
Address:
..... *[Address of the Contractor]*

This is to notify you that your Bid dated for execution of the *[name of the Contract and identification number, as given in the Contract Data]* for the Contract Price of *[if the Employer has allowed the bidders to state their foreign currency requirements add "the equivalent of"* *[amount in numbers and words]* *[name of currency]*, as corrected and modified in accordance with the Instructions to Bidders is hereby accepted by our Agency.

You are hereby instructed to:

- (a) proceed with the execution of the said Works in accordance with the Contract documents;
- (b) sign and return the attached Contract Documents, and
- (c) forward the performance security pursuant to ITB Sub-Clause 32.1, i.e., within 21 days after receipt of this Letter of Acceptance.

Authorized Signature:

Name and Title of Signatory:

Name of Agency:

Attachment: Agreement

Standard Form: Agreement

AGREEMENT

This Agreement, made the day of2020, between

.....
..... *[name and address of Employer]* (hereinafter called “the Employer”)

and

.....
..... *[name and address of Contractor]* (hereinafter called “the Contractor”) of the
other part.

Whereas the Employer is desirous that the Contractor execute

..... *[name and identification number of Contract]*
(hereinafter called “the Works”) and the Employer has accepted the Bid by the Contractor for the
execution and completion of such Works and the remedying of any defects therein.

Now this Agreement witnesses as follows:

1. In this Agreement, words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to, and they shall be deemed to form and be read and construed as part of this Agreement.
2. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy any defects therein in conformity in all respects with the provisions of the Contract.
3. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects wherein the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

In Witness whereof the parties thereto have caused this Agreement to be executed the day and year first before written.

Binding Signature of Employer:

The Common Seal of Employer:

Binding Signature of the Contractor:

The Common Seal of the Contractor:

Section 4 – Security Forms

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Annex A Form:
Bid Security (Bank Guarantee)

*[If required, the **Bank/Bidder** shall fill in this Bank Guarantee form in accordance with the instructions indicated in brackets]*

[Bank's Name, and Address of Issuing Branch or Office]

To: Ministry of Agriculture

Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon (AgriCAL) Project

The Project Coordination Unit

Facing to Henri Chehab Barrack, Bir Hassan District, Beirut, Lebanon

Telefax: 01 849 618

Date:

BID GUARANTEE No.:

We have been informed that *[name of the Bidder]* (hereinafter called "the Bidder") has submitted to you its bid dated (hereinafter called "the Bid") for the execution of **the Supply and installation of a rainwater harvesting system in Rihane and Bentaël – Jbeil Caza – Proc. ref: W19/2019** under Invitation for Bids No. *[IFB number]* ("the IFB").

Furthermore, we understand that, according to your conditions, bids must be supported by a bid guarantee.

At the request of the Bidder, we *[name of Bank]* hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of *[amount in figures]* (*[amount in words]*)¹ upon receipt by us of your first demand in writing accompanied by a written statement stating that the Bidder is in breach of its obligation(s) under the bid conditions, because the Bidder:

(a) has withdrawn its Bid during the period of bid validity specified by the Bidder in the Form of Bid; or

(b) having been notified of the acceptance of its Bid by the Employer during the period of bid validity, (i) fails or refuses to execute the Form of Agreement, if required, (ii) fails or refuses to furnish the performance security, in accordance with the Instructions to Bidders (ITB), or (iii) does not accept the correction of the Bid Price pursuant to ITB Clause 27.

This guarantee will expire: (a) if the Bidder is the successful bidder, upon our receipt of copies of the contract signed by the Bidder and the performance security issued to you upon the instruction

¹ The amount of the Guarantee shall be denominated in the currency of the Employer's country. This figure should be the same as shown in Clause 16.2 of the Instructions to Bidders.

of the Bidder; or (b) if the Bidder is not the successful bidder, upon the earlier of (i) our receipt of a copy of your notification to the Bidder of the name of the successful bidder; or (ii) twenty-eight days after the expiration of the Bidder's Bid.

Consequently, any demand for payment under this guarantee must be received by us at the office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 758.

.....

[signature(s)]

DO NOT COPY

Annex B Form:
Performance Bank Guarantee
(Unconditional)

*[The **bank/successful Bidder** providing the Guarantee shall fill in this form in accordance with the instructions indicated in brackets, if the Employer requires this type of security.]*

[Insert bank's name and address of issuing branch or office]

Beneficiary:
.....
..... *[Insert name and address of Employer]*

Date: *[insert date]*

PERFORMANCE GUARANTEE No.: *[insert Performance Guarantee number]*

We have been informed that *[insert name of Contractor]* (hereinafter called "the Contractor") has entered into Contract No. *[insert reference number of the Contract]* dated *[insert signature date]* with you, for the execution of *[insert name of Contract and brief description of Works]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

At the request of the Contractor, we *[insert name of Bank]* hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of *[insert amount in figures]* (*[insert amount in words]*)¹, such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation(s) under the Contract, without your needing to prove or to show grounds for your demand or the sum specified therein.

¹ The Guarantor (bank) shall insert an amount representing the percentage of the Contract Price specified in the Contract and denominated in the currency of the Employer's country.

This guarantee shall expire at the end of the Defects Liability Period, or on the [*insert number* day of [*insert month*], [*insert year*],¹ whichever occurs first. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

[signature(s) of an authorized representative(s) of the Bank]

¹ Insert the date of the end of the Defect Liability Period. The Employer should note that in the event of an extension of the Defect Liability Period Date, the Employer would need to request an extension of this Guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the Guarantee. In preparing this Guarantee, the Employer might consider adding the following text to the form, at the end of the penultimate paragraph: “The Guarantor agrees to a one-time extension of this Guarantee for a period not to exceed six months, in response to the Employer’s written request for such extension, such request to be presented to the Guarantor before the expiry of the Guarantee.”

Annex C Form: Bank Guarantee for Advance Payment

[The **bank / successful bidder** providing the Guarantee shall fill in this form in accordance with the instructions indicated in brackets, if an Advance Payment is to be provided under the Contract]

[insert Bank's name, and address of issuing branch or office]

Beneficiary:
.....
..... *[Insert name and address of Employer]*

Date: *[insert date]*

ADVANCE PAYMENT GUARANTEE No.: *[insert number]*

We have been informed that *[insert name of Contractor]* (hereinafter called "the Contractor") has entered into Contract No. *[insert reference number of the contract]* dated *[insert date]* with you, for the execution of *[insert name of contract and brief description of Works]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, an advance payment is to be made against an advance payment guarantee in the sum or sums indicated below.

At the request of the Contractor, we *[insert name of Bank]* hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of *[insert amount in figures]* (*[insert amount in words]*¹) upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation under the Contract because the Contractor used the Advance Payment for purposes other than the costs of mobilization in respect of the Works.

It is a condition for any claim and payment under this guarantee to be made that the Advance Payment referred to above must have been received by the Contractor on its account number *[insert account number]* at *[insert name and address of Bank]*.

The maximum amount of this guarantee shall be progressively reduced by the amount of the Advance Payment repaid by the Contractor as indicated in copies of interim statements or payment

¹ The Guarantor shall insert an amount representing the amount of the Advance Payment and denominated in the currency of the Advance Payment as specified in the Contract.

certificates which shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of a copy of the Interim Payment Certificate indicating that eighty (80) percent of the Contract Price has been certified for payment, or on the *[insert number]* day of *[insert month]*, *[insert year]*,¹ whichever is earlier. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 758.

[insert signature(s)) of authorized representative(s) of bank]

¹ Insert the Intended Completion Date. The Employer should note that in the event of an extension of the Completion Date, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following text to the form, at the end of the penultimate paragraph: “We agree to a one-time extension of this guarantee for a period not to exceed six months, in response to the Employer’s written request for such extension, such request to be presented to us before the expiry of the guarantee.”

Volume II. Specific Bidding Document

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Section 5 – Bidding Data

Instructions to Bidders

Clause Reference

(1.1)	The Employer is: The Ministry of Agriculture – Government of Lebanon
(1.1)	The name and the Procurement Reference of the NCB is: Supply and Installation of rainwater harvesting system in Rihane and Bental - Proc. Ref. W9/2019
(1.1)	Site A is located in Rihane Latitude : 34°08'34.73"N Longitude : 35°42'25.14"E Site B is located in Bental Latitude: 34°09'18.88"N Longitude :35°38'09.50"E
(2.1)	The Borrower is: The Ministry of Agriculture – Government of Lebanon
(2.1)	The Fund means: <i>The Grant</i> received from International Fund for Agricultural Development (IFAD) which, has been approved by IFAD as of the date of issue of the bidding documents.
(2.1)	The Project is: Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon (AgriCAL)
(2.2)	All Goods purchased under this Contract shall have their origin in the countries and territories eligible under Chapter VII of the Charter of the United Nations also. The Goods should not have their origin in Israel and from countries under embargo from Lebanon, the European Union or the United States. The origin of Goods and non-consulting Services is distinct from the nationality of the Supplier. In addition Bidders from Israeli nationality cannot bid for this bidding exercise.
(4.3)	In addition to the information required from Bidders pursuant to ITB Sub-Clause 4.3 is modified as follows: in addition to the requested documents, the Bidder shall submit the following: - شهادة تسجيل صادرة عن وزارة المالية - إذاعة تجارية - براءة ذمة من الصندوق الوطني للضمان الإجتماعي صالحة بتاريخ الإلتزام
(4.3 d)	The minimum required equipment <u>for each site</u> to be made available for the Contract by the successful Bidder shall be: - Excavator, Backhoe, Bobcat and Truck - Concrete mixer, Concrete Pump and Concrete power trowel - HDPE sheet welding machine and electric generator - Masonry and irrigation tools
(4.4)	The qualification data required from Bidders pursuant to ITB Sub-Clause 4.4 is modified as follows: None
(4.5)	The qualification criteria in ITB Sub-Clause 4.5 are modified as follows: None

(4.5a)	The minimum required average annual volume of construction work for the successful Bidder over the period of last five years is US\$ 140,000 .
(4.5b)	The qualification data required from Bidders pursuant to ITB Sub-Clause 4.5 b is modified as follows: Experience in the successful construction of at least two (2) works related to irrigation and greenhouse installation over the past five (5) years
(4.5c)	The minimum required equipment <u>for each site</u> to be made available for the Contract by the successful Bidder shall be: - Excavator, Backhoe, Bobcat and Truck - Concrete mixer, Concrete Pump and Concrete power trowel - HDPE sheet welding machine and electric generator - Masonry and irrigation tools
(4.5e)	The minimum amount of liquid assets and/or credit facilities net of other contractual commitments of the successful Bidder shall be: Not Applicable
(4.6)	Subcontractors' experience and resources will not be taken into account.
(12.1)	The additional materials required to be completed and submitted by the bidder are as follows: Not applicable .
(13.1)	This shall be a "Unit price Contract based on the priced Bill of Quantities".
(13.4)	The Contract is not subject to price adjustment in accordance with Clause 45 of the Conditions of Contract.
(14.1)	The currency of Bid shall be: United States Dollars or Lebanese pounds. "Bid price should not include VAT" .
(15.1)	The period of Bid validity shall be ninety (90 days) after the deadline for Bid Opening specified in the Bidding Data.
(16.1)	Bid shall include a Bid Security issued by a bank using the form for bid security (bank guarantee) included in Section 4 "Security Forms."
(16.2)	The amount of the Bid Security shall be US 700 (seven Hundred United States Dollars)) or its equivalent in Lebanese pounds .
(17.1)	Alternative proposals to the requirements of the bidding documents will not be permitted.
(18.1)	The number of copies of the Bid to be completed and returned shall be: Two (2) copies in addition to the original copy of the Bid in addition to a soft copy of the Bid.
(19.1)	Bidders may submit their Bids electronically: Not applicable
(19.2)	The Employer's address for the purpose of Bid submission is: Green Plan – First Floor Attention: Ms. Amal Deghaili Baltagi Building – Facing the General Directorate of the State Security – Jnah Beirut – Lebanon Tel: 961 1 853 141

(20.1)	The deadline for submission of bids is: Thursday 2nd of April 2020 at 11: 00 a.m. Beirut local time
(23.1)	Time, Date and Place of Bid Opening are: Thursday 2nd of April 2020 at 11:15 a.m. Beirut local time in the address as mentioned in 19.2 of the bidding data
(32.1)	The Standard Form of Performance Security acceptable to the Employer shall be of Unconditional Bank Guarantee type as presented in Section 4 of the Bidding Documents.
(33.1)	The Advance Payment shall be limited to 10% percent of the Contract Price.
Any dispute arising out of or in connection with this Contract shall be settled by means of negotiations between the parties. In case if the parties didn't come to an agreement for the disputed issue then any party may apply to Republic of Lebanon. In that case the final regulation of the disputed issue will be the resolution of court entered into force.	

Section 6 – Contract Data

Serial No.		Contract Clause Reference
1.	The following documents also make part of the Contract:	
	Schedule of Operation and maintenance manuals	[55]
	The Schedule of Key Personnel	[9]
2.	The Borrower is: Government of Lebanon	[1.1]
3.	The Employer is: Ministry of Agriculture Address: Facing to Henri Chehab Barrack, Bir Hassan District, Beirut, Lebanon Name of Authorized Representative: Mr. Raymond Khoury	[1.1]
4.	The Project Manager is: Name: Mr. Raymond Khoury Address: Green Plan – First Floor Baltagi Building – Facing the General Directorate of the State Security – Jnah – Beirut – Lebanon	[1.1]
5.	Contract name and Identification number: [to be filled at time of award]	[1.1]
6.	The Works consist of: The works include the following: a) for site A: the installation of a drain canal system that shall collect rainwater from three (3) existing greenhouses and the installation in this site of two (2) metallic water tanks with a capacity of 80 m³ each. b) for site B: the installation of a drain gutters system that shall collect rainwater from four (4) existing greenhouses and the installation in this site of one single metallic tank with a capacity of 200 m³.	[1.1]
7.	Site A is located in Rihane Latitude : 34°08'34.73"N Longitude : 35°42'25.14" E Site B is located in Bentaël Latitude: 34°09'18.88"N Longitude :35°38'09.50"E	[1.1]
8.	The Start Date shall be the site possession Date.	[1.1]
9.	The Intended Completion Date for the whole of the works shall be: within three (3) months from the Start Date.	[1.1]
10.	Sectional Completions are: Not applicable	[1.1]

11.	The following documents also form part of the Contract: N/A	[2.1]
12.	The language of the Contract document is English. The Law applying to the Contract is the Law of the Republic of Lebanon	[3.1]
13.	The minimum insurance amounts shall be: (a) for the Works, Plant and Materials: 110% of contract value. (b) for loss or damage to Equipment: 20% of contract value. (c) for loss or damage to property (except the Works, Plant, Materials, and Equipment) in connection with Contract: 50% of contract value. (d) for personal injury or death: (i) of the Contractor's employees: US\$ 100,000 per accident with numbers of accidents unlimited. (ii) of other people: US\$ 100,000 per accident with numbers of accidents unlimited.	[13.1]
14.	The Site Possession Date shall be advised upon contract signature but not later than one (1) month from contract signature.	[21.1, 42.1]
15.	The contractor shall submit a program for the works within 10 days of delivery of the Letter of Acceptance.	[27.1]
16.	The period between the program updates is 30 days	[27.3]
17.	The amount to be withheld for the late submission of an updated program is 30% of the value of the invoice.	[27.3]
18.	The Defects Liability Period is six (6) months	[34.1]
19.	The following events also be Compensation Events: N/A	[42.1]
20.	The Contract is not subject to price adjustment in accordance with the Clause 45 of the Conditions of Contract.	[44]
21.	The amount to be retained from each payment due the Contractor is 10%	[45.1]
22.	CC 46.1 Clause is amended to read as follows: The liquidated damages for delayed completion of Works: 0.05 % of the Contract price per day.	[46.1]
23.	CC 46.1 Clause is amended to read as follows: The maximum amount of liquidated damages for delayed completion of Works is 10% of the value of the contract.	[46.1]
24.	The advanced payment is 10% of Contract price shall be paid to the Contractor against an Advance Payment Bank Guarantee for the same amount, not later than 14 days from the submission of the Unconditional Bank Guarantee described in GCC 48.1	[48.1]

25.	<p>The advance payment will be returned in accordance with the following schedule:</p> <table><tr><td>Completed works %</td><td>returned advanced payment (%)</td></tr><tr><td>20</td><td>20</td></tr><tr><td>50</td><td>65</td></tr><tr><td>85</td><td>100</td></tr></table>	Completed works %	returned advanced payment (%)	20	20	50	65	85	100	[48.1]
Completed works %	returned advanced payment (%)									
20	20									
50	65									
85	100									
26.	<p>The Performance Security shall be for the following minimum amount equivalent as a percentage of the Contract price: The Performance Bank Guarantee: in amount of 10% of the Contract price.</p>	[49.1]								
27.	<p>The standard form of Performance Security acceptable to the Employer shall be of the “Unconditional Bank Guarantee” type as presented in the Section 4 of the Bidding Documents.</p>	[49.1]								
28.	<p>The date by which operating and maintenance manuals are required is upon completion of the works.</p>	[55.1]								
29.	<p>The dates by which “as built” drawings are required is: Within five (5) days from completion of works and before issuance of Certificate of Completion.</p>	[55.1]								
30.	<p>The amount to be withheld for failing to produce “as built” drawings and/or operating and maintenance manuals: 10% of contract value.</p>	[55.2]								
31.	<p>The percentage to apply to the value of the work not completed, representing the Employer’s additional cost for completing the Works is 30%.</p>	[57.1]								

Section 7 – Technical Specifications

Part 1 – Generalities

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List of Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
ASTM International	American Society for Testing and Materials
BOQ	Bill of Quantities
e	Wall thickness
EN	European norms
HDPE	High density polyethylene
LN	Lebanese Norms
V.O.	Order variation
PVC	Polyvinyl Chloride
PP	Polypropylene
SMC	Sheet Molding Compound
UV	Ultra Violet
@	at
cm	centimeter
HP	Horse Power
Kg/m ³	Kilogram per cubic meter
Kw	Kilowatts
g/cc	gram per cubic centimeter
g/m ²	gram per square meter
g/10 min	gram per ten minutes
l/min	Liter per minute
m	meter
m ³	cubic meter
min	minute
mm	millimeter
N/mm ²	Newton per square millimeter
PN	Nominal Pressure
ppi	Pressure per inch
%	percent

Part 1 – Generalities

1. Definition

The **Contract documents** are the documents in Section 2 and in Volume 2 of the specific bidding documents.

The **Contract** is the Contract between the Employer and the Contractor to execute, complete, and maintain the Works. It consists of the documents listed in Clause 2.1 below.

The **Contractor** is a person or corporate body whose Bid to carry out the Works has been accepted by the Employer.

The **Employer** is the party who employs the Contractor to carry out the Works.

The **Equipment** is the Contractor's machinery and vehicles brought temporarily to the Site to construct the Works.

The **Materials** are all supplies, including consumable, used by the Contractor for incorporation in the Works.

The **Owner A** means the person which owns the site A and shall be responsible for the operations and maintenance of the implemented Works in this site.

The **Owner B** means the person which owns, use and shall be responsible for operations and maintenance of the implemented Works in site B.

The **Project Manager** is the person named in the Contract Data (or any other competent person appointed by the Employer and notified to the Contractor, to act in replacement of the Project Manager) who is responsible for supervising the execution of the Works and administering the Contract.

The **Site A** is the area defined as such in the Contract Data.

The **Site B** is the area defined as such in the Contract Data.

2. Scope of works

The works in this contract shall include the following:

a) the installation in site A of a drain canal system that shall collect rainwater from three (3) existing greenhouses and the installation in this site of two (2) metallic water tanks with a capacity of 80 m³ each.

b) the installation in site B of a drain gutters system that shall collect rainwater from four (4) existing greenhouses and the installation in this site of one single metallic tank with a capacity of 200 m³.

3. General requirements

Prior to any works in site A and site B independently, the Contractor should obtain a written approval from the Project Manager for these works in each of these two sites and a written approval from the Owner A and the Owner B respectively.

The approval should include a proposed timetable schedule submitted by the Contractor.

The Contractor should be responsible for maintaining all existing greenhouse structures and should always keep them in service while implementing the Works.

4. Sign boards & Visibility panels

The Contractor should provide visibility **signs or sign boards** approved by the Project Manager.

5. Method statements and Time table schedule

The Contractor should provide the Project Manager within seven (7) days a method statement to for any part of works upon his request.

The Contractor should also provide the Project Manager and the land owners of site A and site B for their approval a detailed timetable schedule, indicating all the phases of the project, including starting and ending dates.

The Contractor should submit all schedules in English language and any system of dimensions (English or metric) shown should be consistent with that used in the contract documents.

The Contractor should submit to the Project Manager and the land owners of site A and site B for their approval an update of the activities schedule showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work, including any changes to the sequence of the activities.

The Project Manager and the land (site A and site B) owners' approval of the schedule should not alter the Contractor's obligations to perform within the period of performance. The Contractor may revise the schedule and submit it to the Project Manager and the Land owners again at any time.

A revised schedule should show the effect of change orders, where applicable.

6. Safeguards to existing greenhouse structures and pipes

The Contractor should be responsible to safeguard by means of temporary or permanent supports or otherwise all existing greenhouse structures, pipes, cables, or other things which would be liable to suffer damage if such precautionary measures were not taken. Safeguards should remain pending until the approval of the Project Manager and the lands owners concerned.

7. Project Management

The Contractor should provide a project management section to recommend and be directly responsible to the Contractor's Project Manager. The duties of the section should include the following:

- a) Planning and program preparation particularly in relation to the requirements of the Employer, and the requirements to maintain the system where careful detailed arrangements have to be made and adhered to.
- b) Planning the works execution in a manner which minimizes disruption to the land owner production and will permit the efficient and effective commissioning of the water harvesting systems and their respective components.

- c) Continuous surveillance of progress and anticipation of factors likely to affect the timely performance of the contract.
- d) Making proposal for modification to forward planning and to the program at an early stage in the light of factors resulting from above.
- e) Continuous appraisal of the Contractor's methods and routines particularly as to their effectiveness relating to speed of execution and to their effect on the community and property.
- f) Forward planning for resource requirements taking due account of possible shortages and delays in the arrival on site of materials, equipment, plant and personal and their mobilization for effective usage.

8. Required Standards

The Works within this project should conform to the technical specifications described in the Contract documents.

Any reference to **codes or standards** means the latest edition or revision of referenced codes or standards.

Any work(s) should be manufactured / constructed, tested and installed in conformance to international standards, or regulations applicable to such work(s).

The approval of the Project Manager and the Owner A is a must prior to any works in site A.

The approval of the Project Manager and the Owner B is a must prior to any works in site B.

Any alternative proposal on required standards covering specifications, drawings and bill of quantities, should be approved by the Project Manager.

9. Silence of specifications

The apparent silence of the specifications as to any detail, should be considered as meaning "that only the best general practice" is to be used. In such case, the Project Manager will make the necessary and relevant interpretations covering such works.

10. Correspondence and Records

All correspondence between the Contractor and the Project Manager should be made in English.

All records, sheets, drawings and documents should be in English language.

11. Units

The international system of metric units should be used throughout this contract.

12. Intent of the Contract

The contract determines and specifies all the work(s) conditions for the construction and completion of the desired work(s).

The intent of contract is also the description of the work procedures in every detail enlisting all items related to:

- The responsibilities and duties of the Contractor to furnish all the supplies, such as: labors, materials, equipments, transportation in accordance with the plans, the specifications and the terms of the contract documents.
- The shop drawings will be approved by the Project Manager or returned for modifications within eight (8) days of submittal.

13. Quality Control

The Contractor is responsible for his own quality control and should provide competent personal for supervising the works, taking and preparing samples and for carrying out all necessary required tasks including, tanks and reservoir installation, greenhouse installations, concrete construction, gutters and pipes, pumping units and carrying out all necessary tests during work implementation.

14. Reporting

The Contractor, in coordination with the Project Manager, should prepare and submit a detailed measurement of works that are completed within the month frame

Measurements should be done according to the Bill of Quantities (BOQ) items. Any addition in works greater than what is mentioned in the BOQ must be within an approved work order variation (V.O).

All materials needed to accomplish the works and that should be brought on Site A and site B should be supplied in suitable containers and in appropriate batch sizes for the works to be undertaken.

The following information about these materials should be provided:

- Storage instructions,
- The manufacturer's name,
- Shelf life and dates of manufacture,
- Material identification,
- Batch reference number,
- Net weight,
- Mixing instructions.
- Any warnings or precautions concerning the contents and their safe use;

In addition, upon request of the Project Manager, the Contractor should supply with each consignment of proprietary material delivered to the site, a certificate furnished by the manufacturer including:

- The manufacturer's name and address,
- The Material identification,
- The Batch reference numbers, size of each batch and the number of containers in the consignment,
- The manufacture Date.

15. Rejection of delivered materials

In case delivered equipments or materials are found not compatible with the technical specifications in the Contract documents, these items should not be used and must be removed from the Sites A and B and replaced by materials pre-inspected and approved by the Project Manager

16. Approval on materials

All proposed and supplied sources of materials, construction requirements and proposed standards should be deemed to the Project Manager approval. The Project Manager should approve and agree upon any standard or method of manufacture or specification whether to maintain or change these items.

In other words, nothing related to the constructions or works, or the choice of standard materials in terms of quality (and liability or validity) should be carried out or obtained without the ultimate approval of the Project Manager.

The Contractor should submit samples of materials to the Project Manager for approval. These materials should confirm to the quality of the samples that have been approved by the Project Manager.

17. Damages to utility properties

Any damage occurring in the course or progress of works that is adjacent to the existing infrastructures or even adjacent to neighboring property, should be rearranged on the Contractor's expenses in cooperation with the owners of any underground or overhead utility lines.

The damage resulting in terms of considerable expense or inconvenience should be managed before the continuation of works.

18. Starting of works – submittal of shop drawings

Upon receiving the Start Date for both sites, the Contractor should submit to the Project Manager approval detailed drawings and data sheets required to start works on both sites.

The Contractor should submit to the Project Manager the shop drawings that should satisfactorily establish actual details of manufactured or fabricated items and of works to be executed.

The Shop drawings should clarify and amplify the design drawings and other design requirements and should, incorporate minor changes in design or construction as may be necessary to suit the requirements of the works.

By submitting the shop drawings to the Project Manager, the Contractor thereby admits that he has determined and verified all dimensions in relations to existing works, as well as with regards to future works on site.

The accuracy of information submitted by Contractor is under his strict responsibility and any discrepancies, errors or omissions in supplied drawings must be corrected and then re-approved by the Project Manager.

The Contractor should submit the final as-built record drawings to the Project Manager for his review within two (2) weeks after work completion.

After review and approval of the Project Manager on the final as-built drawings, the Contractor should within seven (7) days thereof, produce a final set of “as-built drawings” and submit to the Project Manager, one (1) computerized soft copy in AutoCAD format and two (2) printed copies.

In case there are no changes with proposed design drawings, the Contractor should obtain the approval of the Project Manager prior to the commencement of works.

19. The miscellaneous works on Site

While working on the Site, the Contractor should keep the site as clean as possible by removing wastes, debris and other materials to approved dumping locations.

At the end of works, the Contractor should clean the Site to restore it to its initial condition, to the exception of works he has completed.

20. The insurance

The Contractor should insure his staff, workers and materials against incident and theft, and should also insure the Site A and the Site B against any third party claim with regard to his work on site.

The insurance should cover the whole period of works on each Site.

21. The Site demobilization

Upon completion of works on both Sites and after getting the approval of the Project Manager, the Contractor should start to remove of all equipments from both Sites.

The Contractor should clean both Sites and remove all remaining debris, materials in excess and temporary structures.

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Part 2. Technical specifications for Works in site A

The Contractor should purchase, deliver and install all the necessary equipments, materials and accessories in site A according to the technical specifications mentioned in the Contract documents.

1. General

The Contractor should purchase and deliver and install all the necessary equipments, materials and accessories according to technical specifications mentioned in the contract documents.

The execution of the water harvesting collection network is not allowed until a full supply of accessories and necessary fittings are available on site.

The water tank and the related parts should be brought in their specific locations in site A carefully avoiding any sudden shocks or falls, and after the execution of the concrete basement.

Placing and installing the gutters and downspouts in addition to the installation of drain canals should be performed by experienced laborers from the Contractor staff.

2. Rainwater drainage collection system

2.1 Trench Excavations

All trenches should be properly opened.

The Contractor should pay attention to protect existing greenhouse structures.

The trenches dimensions must be according to the detailed drawings and the BOQ.

The Contractor should carry out “Hand” excavation works in a manner, which safeguards any existing services, and should be responsible for the cost of any repair work necessitated by damages caused by his work.

Any temporary or permanent diversion of drain or pipes and services should be agreed with the Project Manager and the farmer.

2.1.1 Trench width

The width of trench should be ample enough to permit drainpipes and polyethylene membranes to be laid and jointed according to the manufacture catalogues.

However, trench width should be decided depending on the ground conditions. When rocks are encountered during excavation, all rocks have to be removed to provide a clearance of at least 10 cm below and on each side of pipe.

2.1.2 Trench depth

The minimum depth of trench is given in attached drawings (Details drawing) and the BOQ.

2.1.3 Excavated materials – Handling and Disposal

The Contractor should be entirely responsible for the removal of all surplus excavated material from the Site at his own cost and responsibility and should keep the Employer indemnified against

any claims, charges or proceedings arising out of the transportation and disposal of such surplus excavated material.

2.2 Geomembrane

2.2.1 Geomembrane materials

The Geomembrane should consist of new, designed and manufactured specifically for the purpose of this work follows the below mentioned ASTM Standards.

The Geomembrane rolls should be seamless, made from high density polyethylene (HDPE – Formulated Sheet Density ≥ 0.94 g/cc) 2 mm thick containing no plasticizers, fillers or extenders and should be free of holes, blisters or contaminants, and leak free verified by 100% in line spark or equivalent testing. HDPE is the most chemically resistant of all geomembranes.

It should be manufactured on a computer controlled flat sheet extruder using virgin, first quality, high molecular weight polyethylene.

The Geomembrane sheets should meet the following requirements:

Resin properties	Method	Minimum	Typical
Melt flow index (g/10 min)	ASTM D1238	0.5	0.25
Oxidative induction time (min)	ASTM D3895	100	120

Sheet properties	Method	Minimum	Typical
Average thickness (mils)	ASTM D751, NSF mod.	80.0	81.5
Individual thickness	ASTM D751, NSF mod.	76.0	79.1
Density carbon black content %	ASTM D1603	2.0-3.0	2.35
Carbon black dispersion	ASTM D3015, NSF mod.	A1,A2,B1	A1
Tear resistance (ppi)	ASTM D1004	750	860
Puncture resistance (ppi)	ASTM D4833	1800	1975

2.2.2 Geomembrane installation

The Contractor should complete all seaming, patching, testing, and other welding operations.

The Contractor should guarantee the Geomembrane installation against defects in the installation and workmanship for **a time period o satisfactory to all parties** commencing with the date of final acceptance.

The sub grade should be prepared in accordance with the technical specifications in the Contract documents. The Geomembrane sub grade should be uniform and free of sharp or angular objects that may damage the Geomembrane prior to installation of the Geomembrane.

Seaming should primarily be performed using fusion welding equipment and techniques. The Contractor should use of extrusion welding where fusion welding is not possible such as at pipe penetrations, patches, repairs and short (less than a roll width) runs of seams.

On completion of installation, the Contractor should dispose of all trash and scrap material in a location approved by the Owner, remove equipment used in connection with the work herein, and should leave the premises in a neat clean and approved by the Project Manager acceptable manner. Finally, the Contractor should remove all scrap materials from the surface of the Geomembrane.

2.3 PVC perforated pipe

2.3.1 Pipe materials

Perforated pipes should be made from PVC Schedules 80 materials following the ASTM D 1785 Standard Specification for Poly Vinyl Chloride (PVC) Plastic Pipe, and ASTM D 2729 to meet the needs drain water distribution systems.

2.3.2 PVC pipe hole pattern

The PVC pipe should be perforated according to the following hole size, spacing and hole rows angles:

Nominal Pipe Size	Hole Size	Hole Spacing	Hole Rows
140 mm	12 mm	12 cm +/- 3 cm	2 @ 90° ($\pm 5^\circ$) 2 @ 60° ($\pm 5^\circ$) 2 @ 30° ($\pm 5^\circ$) 1 @ 0° ($\pm 5^\circ$)

2.3.3 PVC pipe installation

The Contractor should install the pipes in the drain canals following the design and the dimensions indicated on the detailed drawings and where needed and as directed by the Project Manager.

The Contractor should keep clean the pipes during storage, handling, and placing in trench. Close ends of in-place pipe at the end of any work period to preclude the entry of animals and foreign materials.

The Contractor should lay the pipes on grade and on a stable foundation. The Contractor should remove unstable trench bottom soils.

Pipes should be leveled as specified on the drawings following the direction of the slope maintaining a consistent slope to the outlet of at least 0.5% to allow drain water to flows towards the water collection reservoirs.

The Contractor should place all drainage PVC pipes on the geomembrane bed in the trench. The Contractor should place PVC drainpipe in the trench with the holes facing up. Pipe connections should not impair the overall function of the pipeline. The Contractor should then backfill the trenches with gravel, taking care not to displace any of the drainage pipes.

2.4 Drainage Gravel

The Contractor should extract these materials from the rocky zones of the region or from any official natural quarry approved by the Project Manager.

A layer of drainage gravel should be placed in the trench over the PVC pipes to a minimum depth of 30 cm. It may be deeper, as necessary, to ensure minimal slope requirements.

Aggregate of drainage gravel should be hard, durable having an apparent specific gravity of not less than 2.4 cm and the absorption should not exceed 3%. The gravel should be free of weak laminations and cleavages, and should not disintegrate on exposure to water or weathering. The aggregate should be round or angular and not less than 95% of the gravel should be retained on a screen having 40 mm square openings.

Gravel size aggregate for the drainage layer should be washed and should have 20 to 40 mm across; the larger it is, the better the water flow and less chance of clogs and blockages of the system.

The backfill should use smaller gravel size gravel towards the top of the trench, larger course gravel should be used in the bottom of the trench to compliment the natural filtration of water. The larger gravel should be tough long-lasting materials so as to avoid constant and potentially expensive replacement going forward. All layers of gravel should be tightly packed.

2.5 Weed control membrane

Weed control membranes should be placed after laying over the gravel aggregate as specified on the detailed drawing.

Weed control membranes should be covered with a thin layer of gravel aggregates, to hold the fabric down, improve the aesthetic appearance and keep light away which avoids fabric UV photo-degradation.

The weed control membranes should be easily to cut and trimmed as they do not fray, materials should be made from woven polypropylene (PP) UV resistant; stronger and puncture resistant.

The Contractor properly cleared the Site from weeds and if necessary herbicides should be used before laying down the membranes.

2.6 Rainwater manhole collector

The Contractor should install the rainwater manhole collector to collect and to connect the harvested rainwater from drain canals towards the water tanks. The Contractor should construct a blind concrete underlying layer with a minimum width of 100 cm and 100 cm in length and a minimum thickness of 10 cm to withstand the collector wall sides. The Collector walls should be made from concrete bricks (at least 15 cm thickness) with all necessary cement rendering from inside and outside and according to the dimensions specified in the detailed drawings.

The manhole cover should be a full floor (square) model made from PVC or Sheet Molding Compound (SMC) composite. The cover should be designed to withstand pedestrian and lightweight with a Class A15 load capacity. The cover should have the following dimensions:

- Lid size at 600 x 600 x 40 mm (+/- 3 mm)
- Frame size 700 x 700 x 60 mm (+/- 3 mm)

The Contractor should install the rainwater manhole collector as indicated on the drawings or as directed by the Project Manager.

3. Galvanized corrugated steel tanks

3.1 General description

The tank should have a black net cover shadow to 95%, to protect the development of algae and to reduce evaporation during the summer.

Every tank should be equipped with a discharge outlet of 2-inch connected to a brass 2-inch gate valve.

3.1.1 The steel panels

The steel panels should follow ASTM A 653 – 97 standards and should be galvanized with lead free zinc to 275 g/m². Metallic plate should have a thickness of not less than 1.5 mm with the ability to be removable and simple to assembly and disassembly.

The tank should have a minimum capacity of 80 m³ with a minimum diameter of 7.5 m and should not exceed 2.5 m in height.

3.1.2 The lining materials

The lining materials should have ten (10) years' warranty exposed to UV light with the following specifications:

- Flexible polypropylene (fpp)
- Thickness, at least 0.6 mm according to ASTM D751
- Puncture Resistance at least 50 (10) kN (lb) according to ASTM D4833.

3.2 Installation

3.2.1 Construction of base concrete platform

The Contractor should construct the base platform from reinforced concrete; the foundation should have a minimum width of 9 m and 18 m in length. The Contractor should construct the foundation base from a 10 cm underground blind concrete layer and a reinforced concrete above ground layer with 20 cm height.

To withstand the load of water, the ground soil should be watered and compacted and masonry work must be done with experienced mason and proper quality raw materials need to be used as per the following standard specification:

- The ingredients to be used should consist solely of a standard type Portland cement, clean sand, natural coarse aggregate and clean water.
- Unless otherwise specified or called for by the Project Manager, the cement should be ordinary cement, only one (1) type or brand of cement should be used; Mixing of different types of cement within the same structure should not be permitted. The cement to be used is type PAL 42.5 for all concrete structures according to the Lebanese Norm (NL 53).
- "Aggregate" in general designates both fine and coarse inert materials used in the manufacture of concrete.

Fine Aggregate is aggregate most of which passes through 4.75 mm sieve.

Coarse Aggregate is aggregate most of which is retained on 4.75 mm sieve.

- Aggregate should, consists of natural sand, crushed stone and gravel from a source known to produce satisfactory aggregate for concrete and should be chemically inert, strong, hard, durable

against weathering, of limited porosity and free from deleterious materials that may cause corrosion to the reinforcement or may impair the strength and/or durability of concrete. Crushed rock should be screened and/or washed for the removal of dirt or dust coating, if so demanded by Project Manager.

- Water used for both mixing should be clean and free from injurious amounts of deleterious materials; oils, acids, alkalis, salts, sugar, organic materials or other substances that may be deleterious to concrete or steel.

- All reinforced concrete in the works should be “Design Mix Concrete” as defined in AASHTO T 121. All “Design Mix Concrete” work to be carried out under these specifications should be in grades designated as follows:

Reinforced concrete should be of class M 35. The cement content is 450 kg/m³ and minimum compressive strength at 28 days should go up to 35 N/mm². The nominal maximum size of aggregate is 25 mm. The maximum free water/cement ratio is 0.5.

Blind concrete should be of class M 15. The cement content is 250 kg/m³ and minimum compressive strength at 28 days is 15 N/mm². The nominal maximum size of aggregate is 25 mm.

Steel reinforcement bars should be of a deformed or plain type in accordance with AASHTO M31. All deformed steel reinforcement should be of Grade 60 and the plain ones of Grade 40. Substitution of reinforcement will not be permitted except upon written approval from the Project Manager.

3.2.2 Tanks installation

The Contractor should install the water tank following the listed below steps:

- 1) Fixing of the tanks panel assembly.

- 2) Connect the piping system to the reservoirs (Inlet & outlet).

- 3) Conduct leakage test.

- 4) Fixe the shadow net properly and tight.

- Each tank should be equipped with a transparent vertical pipe connected to the outlet to indicate the internal water level.

- All corrugated sheets should be fixed vertically without any buckling, no spaces or voids should be left between the sheets.

- The Contractor should provide shop drawings and design documents before supply and install the reservoirs.

4. Water connection network

4.1 Polyethylene (PE) pipes

4.1.1 Specifications

This specification should cover the requirements for polyethylene piping system (pipe and fittings) for the supply of water under pressure.

The polyethylene compounds used in the manufacture of products should be made from compounded pellets obtained by the addition of the correct type and amount of carbon black and

necessary antioxidants and other additives to protect the pipe during extrusion and assure the life expectancy of the pipe.

All pipes should bear permanent identification markings that should remain legible during normal handling, storage, installation, and service life and that have been applied in a manner that should not reduce the strength nor otherwise damage the products.

Marking on pipe should include the following and should be applied at intervals of not more than 1.5 m:

- Normal size (i.e. 63 mm)
- Standard PE designation (i.e. PE-HD PE 100)
- Marking the product with the applicable standards designation (EN 12201)
- Production date
- Nominal pressure rating of pipe (i.e. PN 16)
- Manufacturer's Name
- Country of production

Service Identification: PE Pipes should be permanently Black color as irrigation water service pipes.

All pipes should be supplied in coils where the inside diameter of the coil is 30 times OD.

Item list:

Material	Size OD (mm)*	Pressure (PN)*	PE	Minimum e (mm)*
HDPE	63	6	80	2.8
HDPE	40	6	80	1.9

* OD = Outside Diameter

e = Wall Thickness

PN = Nominal Pressure Ratings in Bar

4.1.2 Reference standards

All pipes should be made from 100% virgin materials and according to EN 12201-2 or DIN 8074/8075 standards.

The PE manufacturer should have the ISO 9001-2008 or ISO 9001-2015.

4.1.3 Warranty and Acceptances

The Contractor should warrant all works to be free from defects in workmanship and materials for a period of six (6) months from the date of completion of system installation.

4.2 Fittings and accessories

4.2.1 Compression fittings specifications

All compression fittings types should use mechanical anchoring that holds the pipe in place (clamp ring usually made of Acetylic resin or C-PVC) and a sealing gasket (EPDM or Rubber/food approved) to create a tight grip and prevent water from leaking. Pipes should be pushed inside the fitting without the necessity to disassemble the fittings.

4.2.2 Saddles specifications

The Contractor should use pipe saddles on PE pipes having a full collar type to support the plastic pipe and with a fully rubber lined sealing area around the full circle with multiple O-rings or multiple lip seals around the outlet.

4.2.3 PVC ball valves specifications

The Contractor should install ball valves made from polyvinyl chloride. The moving direction of the hand plastic rod should be clockwise to close the valve. Unless otherwise specified, the valves should be provided to match the maximum work pressure (6 PN at least), including all pressure peak values (6 PN at least). The valves should have the following engraved on its body: the nominal diameter, the rated pressure.

4.2.4 Brass ball valves specifications

The Contractor should install brass ball valve with a hand rod made of cast iron. The moving direction of the rod should be clockwise to close the valve. Unless otherwise specified, these valves should be provided to match the maximum work pressure (16 PN at least), including all pressure peak values (16 PN at least). The valves should have the following engraved on its body: the nominal diameter, the rated pressure and an arrow indicating the direction of flow of the liquid flow rate.

4.2.5 Screen filter specifications

The Contractor should install an in-line disk filter, mesh size No. 150, with backwash. The filter casing and associated components should be made from plastic materials.

The size of the filter should be sufficient to ensure pressure loss less than 0.3 bar at the maximum designed flow (80 l/min at least). The Contractor should control flushing by the controller and should normally occur at the end of every irrigation cycle.

The Contractor should provide, with his offer, a copy of the manufacturer catalogue including, country of origin, structural characteristics and performance data of screen filters in accordance with the bill of quantities.

4.2.6 Pressure Gauge specifications

The Contractor should install pressure gauges for filtration station made of stainless steel, direct reading, Glycerin filled capable of 0-10 bars register with 0.25 graduations. Gauge should be of glass or Plexiglas faced, drip-proof and minimum diameter of 50 mm. Gauge cock should be of same size as pressure gauge and be fabricated from stainless steel or brass. The Contractor should provide, with his offer, a copy of the manufacturer catalogue including, country of origin and specifications of pressure gauge in accordance with the bill of quantities.

4.3 Pumps

Centrifugal pumps should be used to lifting the collected rainwater from the collective reservoirs to the greenhouse.

The Contractor should install pumps made from cast iron with a stainless steel body mechanical shaft seal (graphite to ceramic) with thermal protector and a brass impeller with radial peripheral blades.

Pump Technical Data

Voltage (one phase)	Power (Kw)	Power (HP)	In Out (Inch)	Max Head (m)	Max Flow (l/min)	Max Suction (m)
220V 60 Hz	1.1	1.5	1 x 1	85	80	8

5. Sign specifications

5.1 Sign size and materials

One sign per site is required; the panel sizes should be 90 cm width by 50 cm height and should have at least 1.5 mm thickness.

Each sign shall be constructed from durable, reflective, weather-resistant materials i.e. galvanized, and should be mounted with two galvanized steel round sign posts as shown in the detailed drawing; (2.5 m total height out of which 0.5 m should be installed under the ground and fixed using concrete bases, the post should have 1.5’’ diameter and at least 1.6 mm thickness). Each post should be fixed to the panel with at least two round post clamps.

5.2 Sign locations

Signs must be located in close collaboration with AgriCAL project coordinator, and should be clearly visible to the public.

5.3 Message on signs

A maximum of 75% of the sign area must be used to provide the project name and a general description of the activities on each site with all needed logos (to be given by the project coordinator).

5.4 Sign installation and maintenance

a. Prior to installation of the Project Notification Sign, plans for the sign shall be submitted to and receive approval from the project Coordinator.

The plans shall include the following:

i. Detailed elevation of the sign, showing the proposed sign size, materials, colors and proposed wording, including letter height and font.

ii. Site plan showing the location on the property where the sign will be installed.

iii. Installation details showing a cross section through the sign and other installation information including materials and means of affixing to the ground.

b. Timing of Installation: Signs are required to be installed a minimum of ten (10) days prior to the date of project approval.

c. Maintenance of Signs: All signs must be well maintained throughout the review and approval process.

Part 3. Technical specifications for Works in site B

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Part 3. Technical specifications for Works in site B

The Contractor should purchase, deliver and install all the necessary equipments, materials and accessories in site B according to the technical specifications mentioned in the Contract documents.

1. General

The Contractor should purchase and deliver and install all the necessary equipments, materials and accessories according to technical specifications mentioned in the contract documents.

The execution of the water harvesting collection network is not allowed until a full supply of the accessories and the necessary fittings are available on the Site.

The water tank and the related parts should be brought in their specific locations in site A carefully avoiding any sudden shocks or falls, and after the execution of the concrete basement.

Placing and installing the gutters and downspouts in addition to the installation of drain canals should be performed by experienced laborers from the Contractor staff.

2. Rainwater collection network

2.1 Downspout gutters

The downspout gutters should be made from a hot-dip galvanized coating with high corrosion protection performance conforming with the international standard for hot-dip galvanizing BS EN ISO 1461.

The galvanized steel should have a minimum thickness of 3 mm. The downspout outlet connections should be according to the manufacturer's preformed outlets for the given size shown on the design, unless otherwise approved by the Project Manager.

All components of the downspout gutters system should conform to the lines, grades, elevations, dimensions and materials shown on the drawings.

2.2 Drain spout installation

The drain spout should be made from PVC Schedules 80 materials following the ASTM D1785 Standard Specification for Poly Vinyl Chloride (PVC) Plastic Pipe, and ASTM D2729 to meet the needs drain water distribution systems.

The drain spout should be fixed and leveled as specified on the drawings following the direction of the gutter's slope to allow drain water to flows towards the water collection tanks direction.

Each drain spout pipe portion should be in one piece as much as possible in order to reduce to the minimum the linkage.

The drain spout should be mounted to the existing greenhouses structures using pipe clips and bolts and screws as specified on the detailed drawings.

2.3 Trench Excavations

All trenches should be properly opened.

The Contractor should protect existing greenhouse structures.

The Trenches dimensions must be according to the detailed drawings and BOQ.

The Contractor should carry out “Hand” excavation works in a manner, which safeguards any existing services, and should be responsible for the cost of any repairs of works necessitated by damages caused by his works.

Any temporary or permanent diversion of drain or pipes and services should be agreed with the Project Manager and the Site owner.

2.3.1 Trench Width

The trench width should be ample enough to permit polyethylene pipes to be laid and jointed according to the manufacture catalogues.

However, trench width should be decided depending on the ground conditions. When rocks are encountered during excavation, all rocks have to be removed to provide a clearance of at least 10 cm below and on each side of pipe.

2.3.2 Trench depth

The minimum depth of trench is given on attached drawings (Details drawing) and BOQ.

2.3.3 Excavated materials – Handling and Disposal

The Contractor should be entirely responsible for the removal of all surplus excavated materials from the Site at his own cost and responsibility and should keep the Employer indemnified against any claims, charges or proceedings arising out of the transportation and disposal of such surplus excavated material.

2.3.4 Backfilling materials

All materials used for backfill should be of a quality acceptable to the Project Manager. All backfill materials shall be made from fine coarse crushed stone and should be free from rocks, wood, or other unsuitable material.

3. Galvanized corrugated steel tanks

3.1 General description

The tank should have a black net cover shadow to 95%, to protect the development of algae and to reduce evaporation during the summer.

Every tank should be equipped with a discharge outlet of 2-inch connected to a brass 2-inch gate valve.

3.1.1 The steel panels

The steel panels must follow ASTM A 653 – 97 standards and should be galvanized with lead free zinc to 275 g/m². The metallic plate should have a thickness of not less than 1.5 mm with the ability to be removable and simple to assembly and disassembly.

The tank should have a minimum capacity of 200 m³ with a minimum diameter of 7.5 m and should not exceed 4.5 m in height.

3.1.2 The lining materials

The lining materials should have ten (10) years warranty exposed to UV light with the following specifications:

- Flexible polypropylene (fpp)
- Thickness, at least 0.6 mm according to ASTM D751
- Puncture Resistance at least 50 (10) kN (lb) according to ASTM D4833

3.2 Installation

3.2.1 Construction of base concrete platform

The base platform should be constructed from reinforced concrete. The foundation should have minimum dimensions of 9 m x 9 m. The foundation base should be constructed from a 10 cm underground blind concrete layer and a reinforced concrete above ground layer with 25 cm height.

To withstand the load of water, the ground soil need to be watered and compacted and masonry works should be done with experienced mason and proper quality raw materials need to be used as per the following standard specifications:

- The ingredients to be used should consist solely of a standard type Portland cement, clean sand, natural coarse aggregate and clean water.
- Unless otherwise specified or requested by the Project Manager, the cement should be ordinary cement, only one (1) type or brand of cement should be used; Mixing of different types of cement within the same structure should not be permitted. The cement to be used is type PAL 42.5 for all concrete structures according to the Lebanese norm (NL 53).
- “Aggregate” in general designates both fine and coarse inert materials used in the manufacture of concrete.

Fine Aggregate: is aggregate most of which passes through 4.75 mm sieve.

Coarse Aggregate: is aggregate most of which is retained on 4.75 mm sieve.

- The Aggregate should, consists of natural sand, crushed stone and gravel from a source known to produce satisfactory aggregate for concrete and should be chemically inert, strong, hard, durable against weathering, of limited porosity and free from deleterious materials that may cause corrosion to the reinforcement or may impair the strength and/or durability of concrete. Crushed rock should be screened and/or washed for the removal of dirt or dust coating, if so demanded by the Project Manager.
- The Water used for both mixing should be clean and free from injurious amounts of deleterious materials; oils, acids, alkalis, salts, sugar, organic materials or other substances that may be deleterious to concrete or steel.
- All reinforced concrete in the works should be “Design Mix Concrete” as defined in AASHTO T121. All “Design Mix Concrete” work to be carried out under these specifications should be in grades designated as follows:

Reinforced concrete should be of class M 35. The cement content is 450 kg/m³ and minimum compressive strength at 28 days should go up to 35 N/mm². The nominal maximum size of aggregate is 25 mm. The maximum free water/cement ratio is 0.5.

Blind concrete should be of class M 15. The cement content is 250 kg/m³ and minimum compressive strength at 28 days is 15 N/mm². The nominal maximum size of aggregate is 25 mm.

- Steel reinforcement bars should be of a deformed or plain type in accordance with AASHTO M31. All deformed steel reinforcement should be of Grade 60 and the plain ones of Grade 40. Substitution of reinforcement will not be permitted except upon written approval from the Project Manager.

3.2.2 Tank installation

The Contractor should install the water tank following the listed below steps:

- 1) Fixing of the tank panel assembly.
- 2) Connecting the piping system to the tank (Inlet & outlet).
- 3) Conducting leakage test.
- 4) Fixing the shadow net properly and tight.

The tank should be equipped with a transparent vertical pipe connected to the outlet to indicate the internal water level.

All corrugated sheets should be fixed vertically without any buckling. No spaces or voids should be left between the sheets.

The Contractor should provide the Project Manager for his approval the shop drawings and the design documents before supply and tank installation.

4. Water connection network

4.1 Polyethylene (PE) pipes

4.1.1 Specifications

This specification should cover the requirements for the polyethylene piping system (pipes and fittings) for the supply of water under pressure.

The polyethylene compounds used in the manufacture of products should be made from compounded pellets obtained by the addition of the correct type and amount of carbon black and necessary antioxidants and other additives to protect the pipes during extrusion and assure the life expectancy of the pipes.

All pipes should bear permanent identification markings that should remain legible during normal handling, storage, installation, and service life and that have been applied in a manner that should not reduce the strength nor otherwise damage the products.

Marking on pipes should include the following information and should be applied at intervals of not more than 1.5 m:

- Normal size (i.e. 63 mm)
- Standard PE designation (i.e. PE-HD PE 100)
- Marking the product with the applicable standards designation (EN 12201)
- Production date
- Nominal pressure rating of pipe (i.e. PN 16)

- Manufacturer's Name

- Country of production

Service Identification: PE Pipes should be permanently Black color as irrigation water service pipes.

All pipes should be supplied in coils where the inside diameter of the coil is 30 times OD.

Item list:

Material	Size OD (mm)*	Nominal Pressure Bar*	PE	Minimum e (mm)*
HDPE	63	6	80	2.8
HDPE	40	6	80	1.9

* OD = Outside Diameter

e = Wall Thickness

PN = Nominal Pressure Ratings in Bar

4.1.2 Reference standards

All pipes should be made from 100% virgin materials and according to EN 12201-2 or DIN 8074/8075 standards.

The PE manufacturer should have the ISO 9001-2008 or ISO 9001-2015.

4.1.3 Warranty and Acceptances

The Contractor should warrant all works free from defects in workmanship and materials for a period of six (6) months from the date of completion of system installation.

4.2 **Fittings and accessories**

4.2.1 Compression fittings specifications

All compression fittings types should use mechanical anchoring that holds the pipe in place (clamp ring usually made of Acetylic resin or C-PVC) and a sealing gasket (EPDM or Rubber/food approved) to create a tight grip and prevent water from leaking. Pipes should be pushed inside the fitting without the necessity to disassemble the fittings.

4.2.2 Saddles specifications

The pipe saddles to be use on PE pipes should have a full collar type to support the plastic pipe and with a fully rubber lined sealing area around the full circle with multiple O-rings or multiple lip seals around the outlet.

4.2.3 PVC ball valves specifications

The Contractor should install ball valves made from polyvinyl chloride. The moving direction of the hand plastic rod should be clockwise to close the valve. Unless otherwise specified, the valves should be provided to match the maximum work pressure (6 PN at least), including all pressure peak values (6 PN at least). The valves should have the following engraved on its body: the nominal diameter, the rated pressure.

4.2.4 Brass ball valves specifications

The Contractor should install brass ball valve with a hand rod made of cast iron. The moving direction of the rod should be clockwise to close the valve. Unless otherwise specified, the valves should be provided to match the maximum work pressure (16 PN at least), including all pressure peak values (16 PN at least). The valves should have the following engraved on its body: the nominal diameter, the rated pressure and an arrow indicating the direction of flow of the liquid flow rate.

4.2.5 Screen filter specifications

An in-line disk filter, mesh size No. 150, with backwash should be installed. The filter casing and associated components should be made from plastic materials.

The size of the filter should be sufficient to ensure pressure loss less than 0.3 bar at the maximum designed flow (80 l/min at least). Flushing should be controlled by the controller and should normally occur at the end of every irrigation cycle.

The Contractor should provide, with his offer, a copy of the manufacturer catalogue including, country of origin, structural characteristics and performance data of screen filters in accordance with the bill of quantities.

4.2.6 Pressure Gauge specifications

Pressure gauges for filtration station should be made of stainless steel, direct reading, Glycerin filled capable of 0-10 bars register with 0.25 graduations. The gauges should be of glass or Plexiglas faced, drip-proof and minimum dia. of 50 mm. The Gauge cock should be of same size as pressure gauge and be fabricated from stainless steel or brass. The Contractor should provide, with his offer, a copy of the manufacturer catalogue including, country of origin and specifications of pressure gauge in accordance with the bill of quantities.

4.3 Pumps

Centrifugal pumps should be used to lifting the collected rainwater from the collective reservoirs to the greenhouse.

The Pumps should be made from cast iron with a stainless steel body mechanical shaft seal (graphite to ceramic) with thermal protector and a brass impeller with radial peripheral blades.

Pump Technical Data

Voltage (one phase)	Power (Kw)	Power (HP)	In Out (Inch)	Max Head (m)	Max Flow (l/min)	Max Suction (m)
220V 60 Hz	1.1	1.5	1 x 1	85	80	8

5. Sign specifications

5.1 Sign Size and materials

One sign per site is required; the panel sizes should be 90 cm width by 50 cm height and should have at least 1.5 mm thickness.

Each sign shall be constructed from durable, reflective, weather-resistant materials i.e. galvanized, and should be mounted with two galvanized steel round sign posts as shown in the detailed drawing; (2.5 m total height out of which 0.5 m should be installed under the ground and fixed using concrete bases, the post should have 1.5'' diameter and at least 1.6 mm thickness). Each post should be fixed to the panel with at least two round post clamps.

5.2 Sign Locations

Signs must be located in close collaboration with AgriCAL project coordinator, and should be clearly visible to the public.

5.3 Message on Signs

A maximum of 75% of the sign area must be used to provide the project name and a general description of the activities on each site with all needed logos (to be given by the project coordinator).

5.4 Sign Installation and Maintenance

a. Prior to installation of the Project Notification Sign, plans for the sign shall be submitted to and receive approval from the project Coordinator.

The plans shall include the following:

- i. Detailed elevation of the sign, showing the proposed sign size, materials, colors and proposed wording, including letter height and font.
 - ii. Site plan showing the location on the property where the sign will be installed.
 - iii. Installation details showing a cross section through the sign and other installation information including materials and means of affixing to the ground.
- b. Timing of Installation: Signs are required to be installed a minimum of ten (10) days prior to the date of project approval.
- c. Maintenance of Signs: All signs must be well maintained throughout the review and approval process.

Section 8 – Bill of Quantities

1. General

The bill of quantities does not purport to be either exhaustive or explanatory of all the obligations and duties of the Contractor who should be deemed to have satisfied himself as to the correctness and sufficiency of the rates and prices entered by him in the bill of quantities.

All of which should cover all his obligations under the Contract (including those in respect of the supply of work, goods, materials, equipment, services or contingencies) and all matters and things necessary for the proper execution and completion of the works and the remedying of any defects therein and which may reasonably be inferred to be necessary for the works.

The price should include all necessary for completion of the works and should include the prices for all necessary building work and all necessary safety and access measures.

Works in the present bill of quantities will be re-measured on completion and valued at the rates inserted by the Contractor hereinafter in accordance with the Contract Documents.

The Contractor should be deemed to have visited the Site and taken into account all local and existing conditions.

The Contractor should be responsible for carrying out any necessary associated design changes, which should be submitted to the approval of the Project Manager and should be at no extra cost to the Contracting authority.

The unit prices are to be fully inclusive of the works described in the specifications, in the drawings, in the bill of quantities or ordered by the Project Manager for proper execution of the Works and Contract and inclusive works that are not clearly stated in the above documents or by the Project Manager, but implicitly required to bring to a satisfactory completion all Works under the scope of this contract.

The rates entered against the items defined in this bill of quantities should cover the construction of all the works that should include but not be limited to the supply of material, labor, tools, equipment, consumables and transport to the various parts of the project (easy to access or not) and all costs, services, taxes, overheads and profits required for the proper completion of all the works (excavation, backfilling, structures, pipelines, etc, ...) under this Contract without any exception and without any reservation.

The Contractor should execute all works as described in and according to the Conditions of Contract, Specifications, Bill of Quantities, Drawings, and the Project Manager's requirements.

The Contractor should purchase and install all materials used in construction in compliance with the specifications and recognized standards indicated in the technical specifications and should be approved by the Project Manager prior to the beginning of the works. The rates should also include, but not be limited to, the following:

- Installation and maintenance of the site equipments and temporary facilities, dismantling removal of site equipments and temporary facilities after works completion.

- Supply of material, labors, tools and equipments, consumables, machineries and all the required items for works completion and for the subsequent operations, maintenance and repairs. All goods, materials, equipments and accessories should be submitted to the Project Manager for approval.
- Performing all kinds of testing during construction (hydraulic pressure tests for pipes and accessories and all other required tests in conformity with the specifications and as directed by the Project Manager).
- Providing site security.
- Preparation of drawings, reports, submittals and all other required office work in order to complete the works with their related expenses.
- Protection of public and private properties, preservation of the existing utilities and indemnification against all damages caused by the construction activities under this contract.
- Insurance for all works, equipments and personnel.
- All costs pertaining to the Contractor work area (stores, workshops, repair zones).
- All taxes and customs fees.
- Supply of water and power including piping and wiring to all parts of the project and all related costs.
- Supply of fuel, oil, spare parts, etc..... for all the vehicles and equipments involved in the construction works related to this Contract.
- Providing qualified personnel, technicians, workers, etc... needed for the proper execution of all works and their related charges (salaries, pensions, etc...),
- Execution of all survey works to position structures, monitor the progress and constructions and prepare topographic as built layouts to be submitted to the Project Manager on paper and electronic copy.
- Preparation of all kinds of submittals, reports and studies required by the Conditions of Contract, the specifications, the drawings and the Project Manager.

2. Description of items

Price Schedules are referring to the sections of the Bill of Quantities (BOQ). They give a detailed description of all works involved and of the conditions under which the works are to be done and measured.

3. Prices to be fully inclusive

No omission in the description should relieve the Contractor from his obligations to design and carry out the whole of the Works as specified and in accordance with the specifications in the contract documents. Where an item necessary for the proper completion of the Works is not itemized in the Bill of Quantities, the Contractor should include it in the unit prices of the priced items.

In the pricing of the items of the following Bill of Quantities, the Contractor should include and should be deemed to have included for all works, services and materials which may be reasonably inferred as necessary for completion of the Works as described in the Specifications and the BOQ whether expressly mentioned therein or not.

4. Coverage

Where the bill of quantities does not include separate items for Contractor's equipments, temporary works, temporary site facilities of all kind and the like, the Contractor should be deemed to have covered his obligations in these respects in the unit rates of the BOQ.

5. Bidder to price each item

The Contractor should be deemed to have inserted against each item in the bill of quantities such rates and prices as he may deem necessary to cover the requirements of the Contract. Where neither price nor rate is entered against an item, it should be deemed to be "nil" and measured accordingly. The term "included" or any such similar term should be deemed to be nil. Rates and prices should be inserted in the unit price and total prices columns of the BOQ. However not pricing an item of the BOQ does not relieve the Contractor from fulfilling the complete requirements set out in the Contract documents related to this project.

6. Measurement

All measurements in the BOQ are strictly net. The principle of net measurements should apply to all works executed. All quantities measured for payment should be measured by the Project Manager on the basis of actual net quantities installed.

Net measurements should be done according to net dimensions. The net dimensions are the dimensions shown on the drawings. In case of lack of details on some drawings and in case of design changes approved by the Project Manager, the Contractor should prepare and submit to the approval of the Project Manager any necessary associated drawings. Accordingly, the net dimensions shown on the above drawings and approved by the Project Manager should be the base for the measurements.

The Lump Sum items should not be subject to re-measurement and should include the prices of all necessary equipments, construction, supply, transport, installation, testing and commissioning among others. The lump Sum entered in the BOQ should include the price for a complete installation as described in the bill of quantities, specifications and other documents forming this Contract.

The Contractor should be responsible for checking quantities and for making any necessary surveys and investigations prior to submitting his bid and eventually placing any order for materials.

7. Alternative standards of equipments

If alternative equipments of equal or better standards is proposed by the Contractor and accepted by the Project Manager, the Contract Price should be deemed to include for such alternative equipments and no additional payment will be made.

8. Water and Electricity

Unless otherwise explicitly stated in the Contract documents, water and electricity for the purpose of constructing, cleaning, testing, commissioning the works and human consumption should be provided by the Contractor at his own expense, and should not be measured separately.

9. Transport of Materials

All materials should be transported at the Contractor's own expense from and to all works sites (including Contractor work area, storage areas, etc...) whether these sites are accessible or not. The Contractor should bear all charges related to access roads construction unless a separate item for access roads construction is included in the BOQ.

Bill of Quantities – Supply and Installation of Rainwater Harvesting System for a tunnel arch greenhouse in site A (Rihane)

Item nb	Designation	Unit	Quantity	Unit Price (Indicate currency) (Excluding VAT)	Total Price (Indicate currency) (Excluding VAT)
1.	Excavation of trenches for the installation of drain system.				
1.1	Excavation of trenches (50 W x 40 D) cm.	m	170		
1.2	Excavation of trenches (100 W x 40 D) cm.	m	70		
	Sub-Total (1)				
2.	Supply, install and connect the following rainwater drainage collection system with all the necessary pipes, accessories and materials as in the technical specifications and in the detailed drawings.				
2.1	HDPE Geomembrane 2 mm thickness.	m ²	250		
2.2	PVC perforated pipe – Schedule 80-140 OD mm – Hole size 12 mm – Hole space 12 cm +/- 3 cm – Hole rows 2 @ 90° (± 5°)	m	270		
2.3	PVC End Cup – Schedule 80 140 mm.	pc.	6		
2.4	Concrete manhole (90 W x 50 H x 90 L) cm.	pc.	4		
2.5	Blind concrete base (100 W x 10 H x 100 L) cm.	m ³	0.5		
2.6	Manhole cover (70 L x 70 W) cm.	pc.	4		

2.7	Aggregate washed gravel materials for the drainage (20 to 40) mm.	m ³	100		
2.8	Weed Block membrane made from UV resistant woven polypropylene (PP) materials.	m ²	100		
2.9	Miscellaneous fittings and accessories.	item	-		
	Sub-Total (2)				
3.	Supply and install of galvanized corrugated steel tanks assembly.				
3.1	Galvanized corrugated steel tank 80 m ³	pc.	2		
3.2	Outlet brass gate valve 2 inch (PN 20) (Assembly)	pc.	3		
3.3	Galvanized TEE (2 x 2 x 2) Inch.	pc.	1		
3.4	Tank lining membrane (at least 0.6 mm thickness)	unit	2		
3.5	Black net cover (95 % shadow).	unit	2		
3.6	Blind concrete base (900 W x 1800 L x 10 H) cm.	m ³	17		
3.7	Reinforced concrete base (900 W x 1800 L x 20 H) cm.	m ³	33		
3.8	Polyethylene transparent pipe, 16 mm to be used as level indicator.	m	5		
3.9	Miscellaneous fittings and accessories	Item	-		
	Sub-Total (3)				

4.	Supply, install and connect the following HDPE pipes with all their accessories as in the technical specifications and in the drawings.				
4.1	HDPE pipes 63 mm PE80 PN6 2.8 mm wall thickness.	m	100		
4.2	HDPE pipes 40 mm PE80 PN6 2.8 mm wall thickness.	m	100		
4.3	Compression TEE 63 x 63 x 63 mm.	pc.	2		
4.4	Compression TEE 63mm x 2 Inch x 63 mm.	pc.	1		
4.5	Compression Elbow (63 x 63) mm.	pc.	8		
4.6	Compression Elbow (40 x 40) mm.	pc.	6		
4.7	Compression Adaptor 63 mm x 2 inch (M).	pc.	3		
4.8	Compression Adaptor 63 mm x 1.5 inch (F).	pc.	1		
4.9	Compression Adaptor 40 mm x 1 inch.	pc.	2		
4.10	PVC ball Valve double union threaded (PN 16) (F).	pc.	3		
4.11	Polyethylene threaded reducing nipple (1.5 x 1.25) Inch.	pc.	1		
4.12	Miscellaneous fittings and accessories.	item	-		
	Sub-Total (4)				

5.	Supply and install a pumping unit as in the technical specifications and in the detailed drawings.				
5.1	Centrifugal pump 1.5 HP 1.1 Kw - 220 V 60 Hz – 1" threaded inlet 1" threaded outlet up to 5 m ³ /h with head up to 85 m	pc.	1		
5.2	Plastic Screen filter assembly 1.25 Inch; Flow: up to 5 m ³ /h – 150 mesh – with all their necessary accessories	pc.	1		
5.3	Ball valve brass 1.25 Inch (PN 20).	pc.	1		
5.4	Strainer Brass 1.25 Inch.	pc.	1		
5.5	Check valve 1.25 Inch.	pc.	1		
5.6	Galvanized 1.25 Inch elbow.	pc.	1		
5.7	Air release valve, Kinetic series, Plastic body 1 Inch.	pc.	1		
5.8	Pressure gauge glycerin 0-10 Atm assembly.	pc.	1		
5.9	Saddle 40 mm x 1 Inch.	pc.	1		
5.10	Electrical Breakers and dry contact including all the electrical installation (wiring and conduits between the panel board and the pumps).	item	1		
5.11	Connect to irrigation tank all necessary piping and fittings.	item	-		
5.12	Miscellaneous fittings and accessories.	item	-		
	Sub-Total (5)				

6.	Supply and install a sign panel as in the technical specifications and in the detailed drawings.				
6.1	Sign panel (90 W x 50 H) cm, minimum thickness 1.5 mm with two round galvanized posts 1.5 inch diameter and 2.5 m length.	item	1		
	Sub-Total (6)				
	Total I (excluding VAT)				

Bill of Quantities – Supply and Installation of rainwater Harvesting System for a Multispan greenhouse in site B (Bentael)

Item nb	Designation	Unit	Quantity	Unit Price (Indicate currency) (Excluding VAT)	Total Price (Indicate currency) (Excluding VAT)
1.	Excavation of trenches for the installation of drain system.				
1.1	Excavation of trenches (50 W x 40 D) cm.	m	225		
1.2	Fine coarse material for trench backfilling.	m ³	40		
	Sub-Total (1)				
2.	Supply, install and connect the following rainwater collection system with all the necessary pipes, accessories and materials as in the technical specifications and in the detailed drawings.				
2.1	Downspout gutters (as per the detailed drawing (RG-MSG-002)).	unit	2		
2.2	Brass valve 2 inch (PN 20).	pc.	4		
2.3	PVC pipe Schedules 80 - 2 inch.	m	12		
2.4	PVC elbow 2 inch (120°angle).	pc.	8		
2.5	PVC Male threaded terminal adapter 2 inch.	pc.	4		
2.6	Pipe clamps 2 inch.	pc.	8		
2.9	Miscellaneous fittings and accessories.	Item	-		
	Sub-Total (2)				

3.	Supply and install of galvanized corrugated steel tanks assembly.				
3.1	Galvanized corrugated steel tank 200 m ³ .	pc.	1		
3.2	Outlet brass gate valve 2 inch (Assembly).	pc.	1		
3.3	Tank lining membrane (at least 0.6 mm Thickness).	unit	1		
3.4	Black net cover (95 % shadow).	unit	1		
3.5	Blind concrete base (900 W x 900 L x 10 H) cm.	m ³	9		
3.6	Reinforced concrete base (900 W x 900 L x 25 H) cm.	m ³	21		
3.7	Polyethylene transparent pipe, 16 mm to be used as level indicator.	m	5		
3.8	Miscellaneous fittings and accessories.	Item	-		
	Sub-Total (3)				

4.	Supply, install and connect the following HDPE pipes with all their accessories as in the technical specifications and in the drawings.				
4.1	HDPE pipes 63 mm PE 80 PN 6 2.8 mm wall thickness.	m	100		
4.2	HDPE pipes 40 mm PE 80 PN 6 2.8 mm wall thickness.	m	140		

4.3	Compression TEE 63 x 2 Inch x 63 mm (F).	pc.	1		
4.4	Compression Elbow (63 x 63) mm.	pc.	6		
4.5	Compression Elbow 63 mm x 2 inch (M).	pc.	1		
4.6	Compression Elbow (40 x 40) mm.	pc.	4		
4.7	Compression Adaptor 63 mm x 2 inch (M).	pc.	2		
4.8	Compression Adaptor 63 mm x 1.5 inch (F).	pc.	2		
4.9	Compression Adaptor 40 mm x 1 inch.	pc.	2		
4.10	PVC ball Valve double union threaded 2 Inch (F) (PN 16).	pc.	2		
4.11	Miscellaneous fittings and accessories.	item	1		
	Sub-Total (4)				
5.	Supply and install a pumping unit as in the technical specifications and in the detailed drawings.				
5.1	Centrifugal pump 1.5 HP 1.1 Kw- 220 V 60 Hz - 1" threaded inlet 1" threaded outlet up to 5 m ³ /h with head up to 85 m.	pc.	1		
5.2	Plastic Screen filter assembly 1.25 Inch; Flow: up to 5 m ³ /h – 150 mesh with all their necessary accessories.	pc.	1		
5.3	Ball valve brass 1.25 Inch (PN 20).	pc.	1		
5.4	Strainer Brass 1.25 Inch.	pc.	1		

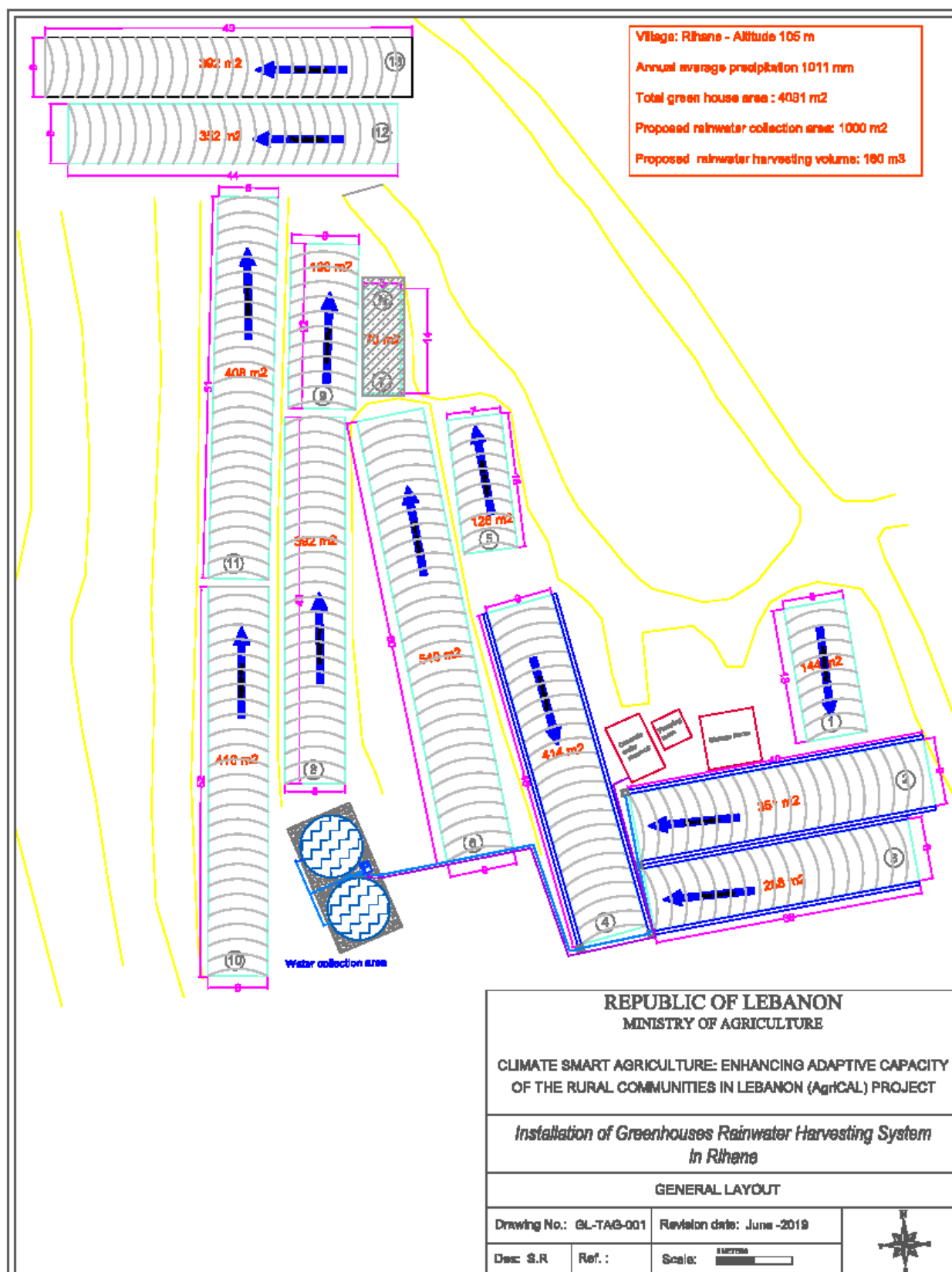
5.5	Check valve 1.25 Inch.	pc.	1		
5.6	Galvanized 1.25 Inch elbow.	pc.	1		
5.7	Air release valve, Kinetic series, Plastic body 1 Inch.	pc.	1		
5.8	Pressure gauge glycerin 0-10 Atm assembly.	pc.	1		
5.9	Saddle 40 mm x 1 Inch.	pc.	1		
5.10	Electrical cable 2 (wires) x 2.5 mm.	m	150		
5.11	Electrical Breakers and dry contact including all the electrical installation (wiring and conduits between the panel board and the pumps).	item	1		
	Sub-Total (5)				
6.	Supply and install a sign panel as in the technical specifications and in the detailed drawings.				
6.1	Sign panel (90 W x 50 H) cm, minimum thickness 1.5 mm with two round galvanized posts 1.5 inch diameter and 2.5 m length.	item	1		
	Sub-Total (6)				
	Total II (excluding VAT)				

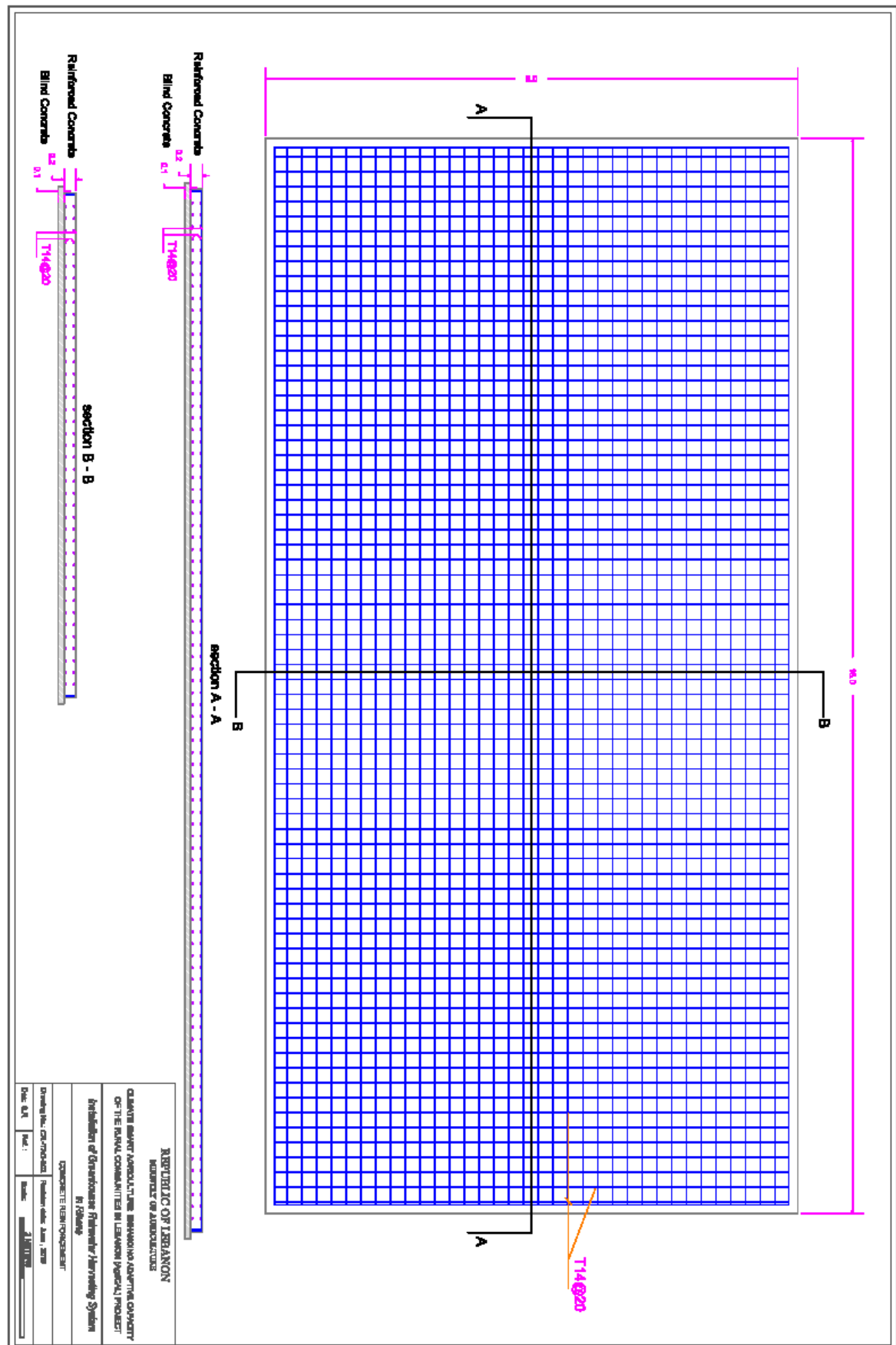
Grand Total = Total I + Total II =

Section 9 – Drawings

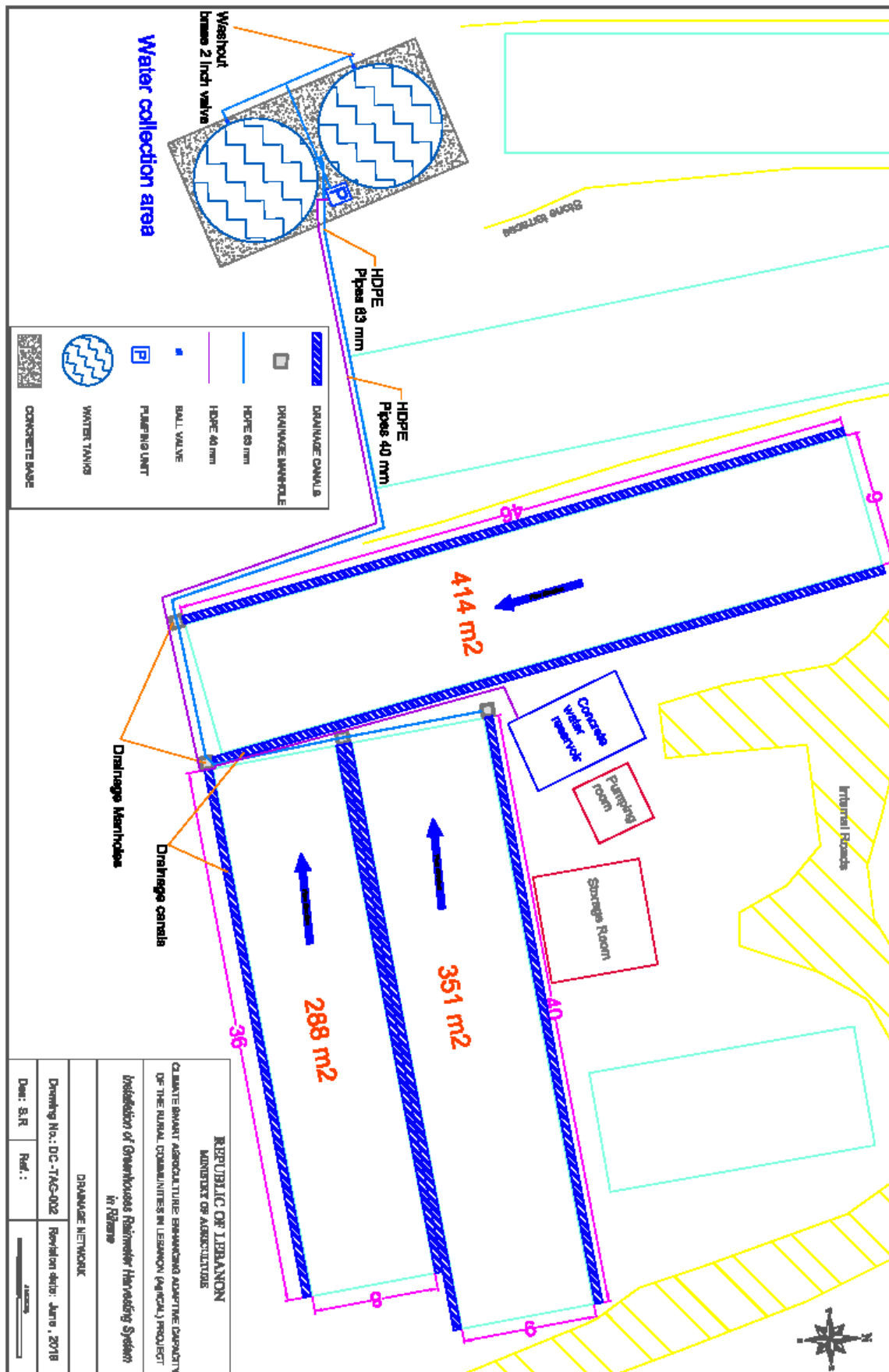
List of Drawings for works in site A (Rihaneh)

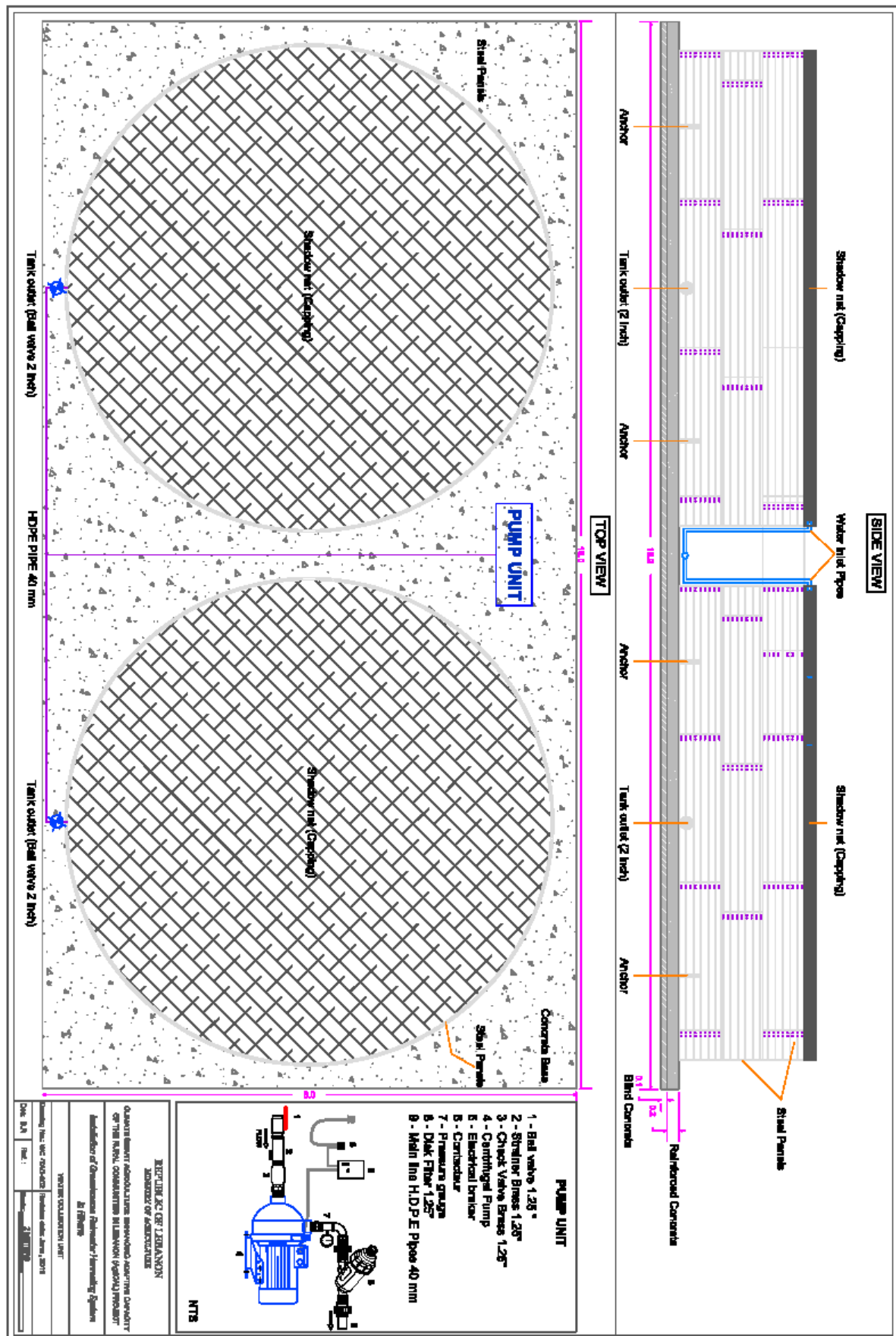
GL-TAG-001	General Layout
CR – TAG-002	Concrete Reinforcement
DC-TAG-002	Drainage Canals
DC-TAG-002	Drainage Network
WC-TAG-002	Water collection Unit
-	Sign details

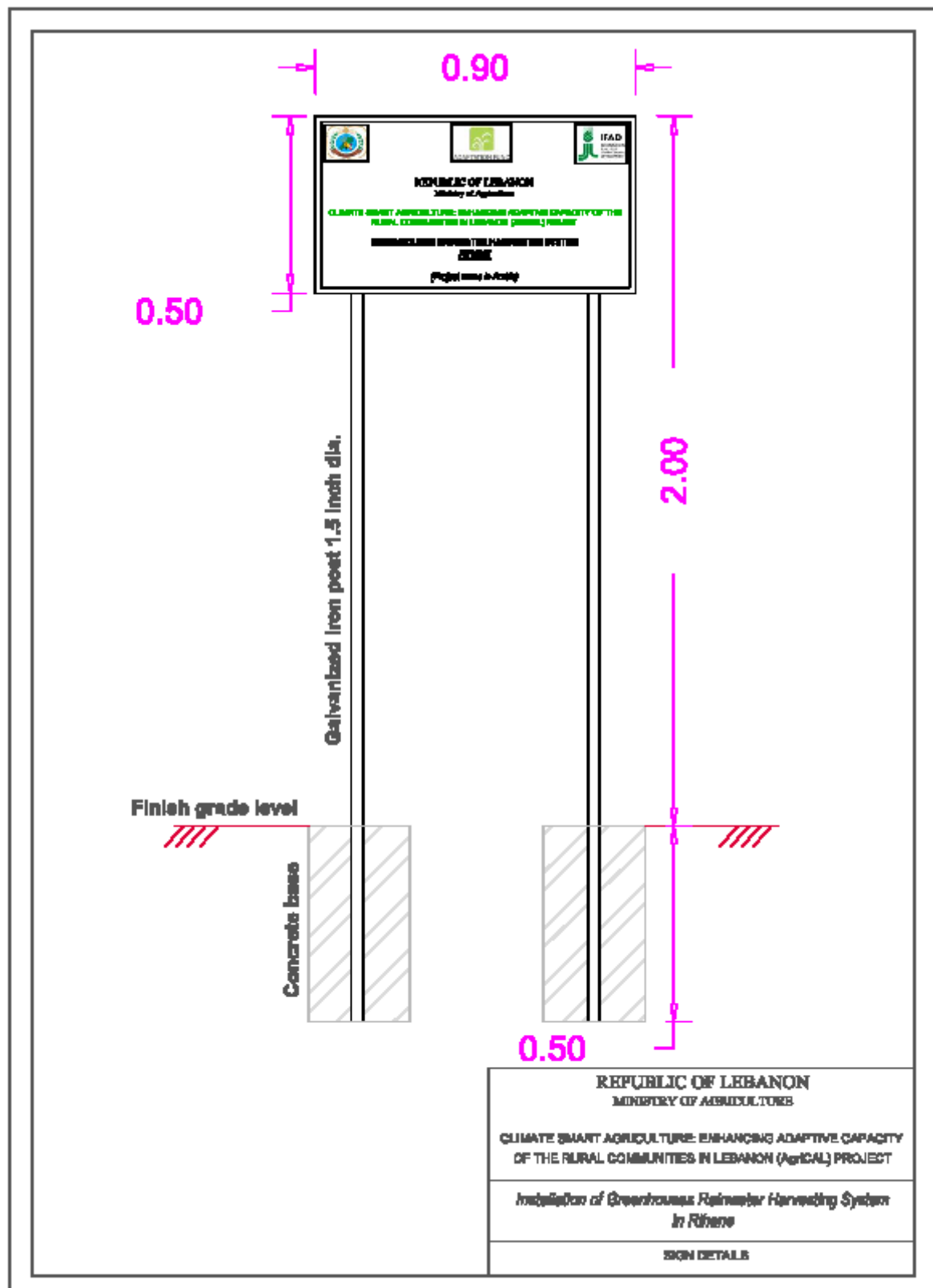












List of Drawings for works in site B (Bentael)

GL-MSG-001	General Layout
DC/DN-MSG-002	Drainage Network
RG-MSG-002	Rainwater Gutters
WC-TAG-002	Water Collection Unit
-	Sign details

