



Title of Tender:

Rehabilitation works of water supply system in the **Ruhango** District

Source of funding: USAID

Procuring Entity: Water For People

Tender Reference Number:

Procurement Method: INTERNATIONAL OPEN COMPETITIVE TENDERING

Date of Issue

December 2022

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SECTION I: INSTRUCTIONS TO BIDDERS (ITB)

A General

1. Scope of bid

- 0.1 The Procuring Entity, as defined in the bid Data Sheet, invites bids for the water supply system rehabilitation activities, as described in the BDS. The name and identification number of the project is provided in the BDS.
- 0.2 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) “Day” means calendar day.

2. Source of Funds

Water For People has received funds from USAID to implement the Isoko y’Ubuzima Project. The Isoko y’Ubuzima Project to be implemented from July 2021 to July 2026 by a consortium led by Water For People to improve WASH service delivery. Other members of the consortium are IRC, Vitens Evides International (VEI), CARE International, and African Evangelistic Enterprise (AEE).

The overall goal of Isoko y’Ubuzima is to improve the access to sustainable water and sanitation services which is critical to improved health outcomes, improving the living standards of Rwandan citizens, and achieving Rwanda’s development goals.

Water for People intends to apply part of the funds from the Isoko y’Ubuzima project as defined in the BDS, towards the cost of the Project, to cover eligible payments under the contract for the Works.

3. Ethics and mandatory requirements

Following the spirit of USAID that requires that any bidders, Suppliers, contractors, and Consultants to comply with the ethics and mandatory requirements and reporting obligations of the following USAID Standard Provisions (a copy of which are attached as Exhibit C):

- SP M28 “Conflict of Interest”.
- SP M18 “Non-Discrimination”.
- SP M26 “Mandatory Disclosures”.
- SP M12 “Debarment and Suspension”.
- SP M17 “Equal Participation by Faith-Based Organizations”.
- SP M22 “Pilot Program for Enhancement of Grantee Employee Whistle Blower Protections”.
- SP M27 “Non-discrimination Against Beneficiaries”.
- SP RAA29 “Contract Award Term and Condition for Recipient Integrity and Performance Matters”.

4. Eligible bidders

- 4.1 A bidder, and all parties constituting the bidder, may have the nationality of any country, but in case of an international bidder, he/she must form a joint venture with a company formed in Rwanda which satisfy all the requirements as set in BDS and with a valid trading license.
- 4.2 Any bidder who forges a document will be immediately disqualified and blacklisted.
- 4.3 A bidder who is blacklisted by RPPA will also be disqualified and if he/she intend to apply his/her offer will be rejected.
- 4.4 Rwanda Government-owned enterprises may be eligible only if they can establish that they (i) are legally and financially autonomous, and (ii) operate under commercial law.

5. Qualifications of the bidder

5.1 This document is intended to invite all qualified bidders in the water supply system field and who are categorized by RPPA under Category C or D depending on tender amount as described by RPPA on the following link: https://www.rppa.gov.rw/publications?tx_filelist_filelist%5Baction%5D=list&tx_filelist_filelist%5Bcontroller%5D=File&tx_filelist_filelist%5Bpath%5D=%2Fuser_upload%2FRPPA%2FPublications%2FCompanies_Categorisation%2F&cHash=4fee5a97c4193a0db34980915e06e219

5.2 All bidders are required to provide all the documents listed below as it is stated in BDS.

All bidders participating in this tender shall include the following information and documents with their bids:

1. Full address of company indicating Country, Province, District, Sector, Cell, Village, street number, E-mail, telephone, post office box and bank account details.
2. bid submission Letter (Commitment letter).
3. Copy of Trade License.
4. Written power of attorney of the signatory of the bid to commit the bidder.
5. Certified total monetary value of rehabilitation/construction works performed for each of the last five years; (please attach the contracts).
6. Evidence of relevant experience in the execution of works of a similar nature, including the **nature** and **value** of the relevant contracts for each of the last three years, as well as works in hand and contractually committed.
7. The bidders are required to provide major items of rehabilitation/construction equipment proposed to carry out the contract. The descriptions must demonstrate the bidder's ability to complete the works and the bidder must indicate whether such equipment is owned by him/her, hired or used by subcontractor such as:
 - One dump truck of 5 tons each.

- One concrete mixer.
- One pick-up.
- One concrete vibrator.
- Cutting machine.
- Welding machine.
- Total station.
- GPS.

In case the equipment is hired, the bidder is required to provide a lease agreement between him/her and the owner of the said equipment. However, on the other hand, the owner must provide the evidence that the equipment in leasing is owned by him or her (like yellow cards, purchase invoice or any other related document) fail to this will led to zero based on the score set in evaluation criteria.

On the other hand, if the equipment is owned by the contractor, he/she must also provide the proof of ownership of the said equipment. Fail to this will led to get zero based on the scores set in evaluation criteria.

8. Qualifications and experience of key site management and technical personnel proposed for the contract with their CVs and certified academic testimonials.
9. Information regarding any litigation, current or during the last five years, in which the bidder was/is involved, the parties concerned, and the disputed amounts; and awards.
10. Evidence/proof that the bidder falls in RPPA Category C or D
11. And any other important documents or information not listed above.

5.3 bids submitted by a joint venture of two or more firms in partnership shall comply with the following requirements, unless otherwise stated in the BDS:

- 1) A Joint venture (JV) has its own requirement regarding the technical evaluation – The figures for each of the partners of a JV shall be added together to determine the tenderer's compliance with the minimum qualifying criteria, for a joint venture to qualify, each of its partners must meet at least have 25 percent of minimum criteria 5.2 for an individual tenderer, and the partner in charge at least 40 percent of those minimum criteria. Failure to comply with this requirement will result in rejection of the JV's tender.
- 2) The bid shall include all the information listed in ITB Sub-Clause 5.2 above for each joint venture partner.
- 3) The bid shall be signed to be legally binding on all partners.
- 4) All partners shall be jointly and severally liable for the execution of the contract in accordance with the contract terms.
- 5) One of the partners shall 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.
- 6) The execution of the entire contract, including payment, shall be done exclusively with the partner in charge.

- 7) A copy of the JV Agreement entered into by the partners shall be submitted with the bid; or a Letter of Intent to execute a JV agreement in the event of a successful bid shall be signed by all partners and submitted with the bid, (this is mandatory)
- 8) The bid security must be in the name of the JV instead of one company composing the JV (in case the bid security is under the name of a sole company, this will lead to disqualification of the JV as the bid security is among the mandatory documents)
- 9) In case the JV is successful awarded a contract, the JV must provide below documents:
 - ❖ Notified Partnering agreement (RDB notary only)
 - ❖ The agreement must indicate the lead company
 - ❖ Joint-venture trading licence
 - ❖ Bank account number on the name of JV

5.4 To qualify for financial evaluation, bidders shall meet the following minimum qualifying criteria:

- (a) An average annual financial amount of rehabilitation work over the period specified in the BDS of at least the multiple indicated in the BDS.
- (b) Experience as prime contractor in the rehabilitation of at least the number of works of a nature and complexity equivalent to the Works over the period specified in the BDS (to comply with this requirement, works cited should be at least 70 percent complete);
- (c) Proposals for the timely acquisition (own, lease, hire, etc.) of the essential equipment listed in the BDS;
- (d) Present the key staff with professional qualification and experience as indicated in the BDS (section II); 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 BDS.
- (f) A relevant history of litigation or arbitration awards against the applicant or any partner of a JV may result in disqualification.

6. Bids per bidder

Each bidder may submit more than one bid, either individually or as a partner in a joint venture. However, no bidder shall be awarded more than one contracts that shall be running concurrently.

7. Cost of bidding

The bidder shall bear all costs associated with the preparation and submission of his bid, and the Procuring Entity shall in no case be responsible or liable for those costs.

8. Site Visit

The bidder, at the bidder's own responsibility and risk, must 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 rehabilitation of the Works. The costs of visiting the site shall be at the bidder's own expense. (Refer to the advert for visiting date).

B. Bidding documents

1. Contents of bidding documents

The set of bidding documents comprises the documents listed below, and addenda issued in accordance with ITB Clause 11:

- Tender Notice /Invitation for bids
- Section I Instructions to bidders
- Section II bid Data Sheet
- Section III Evaluation Criteria
- Section IV Technical Specification
- Section V Special Technical Specifications
- Section VI Drawings
- Section VII Bill of Quantities
- Section VIII Forms of Security

2. Clarification of bidding documents

A prospective bidder requiring any clarification of the bidding documents may notify the procuring entity (PE) in writing at the PE's address mentioned in the BDS. The PE shall respond to any request for clarification received earlier than four (4) days prior to the deadline for submission of bids. Copies of the PE's response shall be forwarded to all firms that attended the site visit, including a description of the inquiry, but without identifying its source. (any request for clarification should be sent to rwprocurement@waterforpeople.org)

3. Amendments of bidding documents

- a) Before the deadline for submission of bids, the Procuring Entity (PE) may modify the bidding documents by issuing addenda.
- b) Any addendum thus issued shall be part of the bidding documents and shall be communicated in writing to all bidders. Prospective bidders shall acknowledge receipt of each addendum in writing to the PE.
- c) The procuring entity (PE) may extend the deadline for submission of tenders to give bidders sufficient time to take modifications into account when preparing their tenders.

C. Preparation of bids

1. Language of bids

All documents relating to the bid shall be in the languages **specified in the BDS.**

2. Documents composing the bid

The bid submitted by the bidder shall comprise the following document:

- (a) Qualification Information Form and documents.

- (b) Alternative offers where invited; and any other materials required to be completed and submitted by bidders, as specified in the BDS.

3. Bid Validity

Bids shall remain valid for the period of 120 days as it is specified in the BDS however in exceptional circumstances, the PE 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.

4. Format and signing of the bid

- a. All bids will be submitted online through email rwprocurement@waterforpeople.org , No hard copies will be accepted. The Financial proposal and filled BoQs should be protected by a password and that password will be provided by the bidder during the public opening of the financial bids.
- b. All forms and documents must be signed and stamped by the bidders.
- c. All forms and document must be in PDF. The financial proposal must be submitted in PDF protected format.
- d. The detailed tender documents will be obtained from the link embedded in tender advert. All bidders will be required to answer all questions highlighted in the questionnaire and attach all valid mandatory administrative documents, proof of financial capacity, equipment, as well as key personnel.

5. Deadline for Submission of Bids

The deadline to submit bids is on **16/01/2023 at 05:00 pm**. No late bid will be allowed. In case there is a challenge, bidders are allowed to request for support in the emails highlighted in the tender advert.

6. Late bids

Late submission of bids will not be accepted by Water For People.

7. Withdrawal, Substitution and Modification of Bids

Bidders can withdraw, substitute or modify their bids before the closing of the bid period. No modification can be made after closing the bids.

8. Bid Opening and Evaluation

Financial proposal will be considered only for bidders with successful technical results and with all the administrative documents. Bids will be evaluated by PE and the results will be communicated to bidders via emails from rwprocurement@waterforpeople.org

9. Confidentiality

No information concerning checking, explanation, opinion and comparison of tenders and recommendations concerning the contract award, will be disclosed to bidders or any other person not officially involved in the process until the name of the successful bidders has been announced. Any attempt by a bidder to contact any member of the Evaluation committee directly or indirectly during the evaluation period will be automatically disqualified.

10. Clarification of bids

To assist in the examination, evaluation, and comparison of bids, the PE may, at its discretion, ask any bidder for clarification of the bid through email.

11. Examination of bids and determination of responsiveness

Prior to the detailed evaluation of bids, the evaluation committee shall determine whether each bid meets the eligibility criteria defined in evaluation criteria questionnaire. If a bid is not substantially responsive, it shall be rejected by the evaluation committee, and may not subsequently be made responsive by correction or withdrawal of the nonconforming deviation or reservation.

12. Correction of Errors

The BoQs in Excel will have formulas and be protected. All bidders must fill in only their unit prices, therefore the successful bidder will be awarded on the submitted amount in his or her bid offer. The correction of errors will not be applicable. Any bidder who duplicates or changes the formulas in the BoQ will be disqualified.

13. Evaluation and comparison of bids

- a. The evaluation team will compare all bids in accordance with the evaluation criteria set in the questionnaire.
- b. The PE 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 PE shall not be considered in bid evaluation.
- c. The estimated effect of any price adjustment conditions, during the period of implementation of the contract, shall not be considered in the bid evaluation.

14. Procurement Entity's Right to accept any bid and to reject any or all bids

Water For People 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.

15. Currency for Bid Evaluation

Bids shall be evaluated as quoted in Rwandan Francs.

16. Notification of Award and Signing of Agreement

Before the expiry of the bid validity period and after the evaluation of bidders (both technical and financial), the PE shall simultaneously notify the successful and unsuccessful bidders of the provisional outcome of the bid's evaluation.

The notification must specify that the major elements of the procurement process may be made available to bidders upon request, and they have seven (7) days to lodge a complaint, if any, before a contract is signed with the successful bidder. Financial Proposals of consultants that met the minimum qualifying mark or were considered responsive to the RFP and TOR shall be evaluated after 7 days of technical scores notification.

17. Advance Payment and Security

No advance payments will be given. The contractor shall submit invoices after each phase is completed. No advance payment security is required.

SECTION II: EVALUATION CRITERIA (ANY OTHER REQUIREMENT NOT CITED IN THIS EVALUATION WHICH IS IN THE TENDER DOCUMENT MAY ALSO BE CONSIDERED)

A Administrative documents		
<p><i>NOTE : all major documents Requested must be submitted The bidder to be able to qualify for technical evaluation must provide all mandatory (major) documents</i></p>		
Equipment Descriptions	Mandatory (Major) required to be qualified for technical evaluation	Needed but Minor
Valid clearance RRA certificate	✓	
Valid Contribution RSSB certificate	✓	
Company registration certificate	✓	
Site visit proof	✓	
Proof of RPPA Category C or D	✓	
Performance Guaranty to be provided by the selected successful bidder	✓	
Information regarding any litigation, current or during the last five years, in which the bidder was/is involved, the parties concerned, and the disputed amounts; and awards (This should be citified by the bidder himself)	✓	
VAT Certificate	✓	
Planning of execution of works		✓
Bid Submission Letter		✓
B Technical Evaluation		

A	Key personnel (Attach evidence)	30
1	Project Manager: Ao in Civil Engineer or Water Engineer (Degree Holder) holder in relevant technical field	5
1	5 years of experience and above in related tasks	5
2	Between 3-5 years of experience in related tasks	3
3	Between 0-3 years of experience in related tasks	2
2	Environmentalist: Ao in Environmental sciences or related field with RAPEP as Lead Expert	4
	5 years of experience and above in related tasks	4
	Between 3-5 years of experience in related tasks	3
	Between 0-3 years of experience in related tasks	2
3	Site Engineer: A0 in Civil Engineering or Water supply engineering	5
1	5 years of experience and above in related tasks	5
2	Between 3-5 years of experience in related tasks	3
3	Between 0-3 years of experience in related tasks	2
4	Electrician A0 in Electromechanics (Only for motorised system)	4
1	5 years of experience and above in related tasks	4
2	Between 3-5 years of experience in related tasks	3
3	Between 0-3 years of experience in related tasks	2
5	Surveyor Engineer A1/or Ao in Land Surveying	4
1	5 years of experience and above in related tasks	4
2	Between 3-5 years of experience in related tasks	3
3	Between 0-3 years of experience in related tasks	2
6	Site Foreman, A2 or A1 in rehabilitation or public works or related subject	4
1	5 years of experience and above in related tasks	4
2	Between 3-5 years of experience in related tasks	3
3	Between 0-3 years of experience in related tasks	2
7	Plumber having a certificate from WDA or a recognized company/institutions	4
1	5 years of experience and above in related tasks	4
2	Between 3-5 years of experience in related tasks	3
3	Between 0-3 years of experience in related tasks	2

	<p>Notes :</p> <ol style="list-style-type: none"> 1. All key staff will present an updated Curriculum Vitae duly signed by the staff itself and diploma 2. Statement of exclusivity and availability for each key staff (Mandatory, fail to this will led to Zero based on the score set) 3. If two bidders share/ present the same staff in their offer, the one who will be proved out to have used the other bidder's staff will be disqualified (to be approved by the staff) 	
B	PROOF OF WORKING EXPERIENCE IN THE FIELD	10
B.1	contract ongoing/completed in the last five years (Minimum of THREE water supply system projects)	5
1	At least three (3) contracts or ongoing similar works (construction of <i>water supply systems</i> ,) executed during the last 5 years - <i>At least one out of three constructed projects worth between 400,000,000 RWF to 500,000,000 RWF or above.</i>	5
2	- At least two (2) contracts or ongoing similar works (construction of <i>water supply</i> ,) executed during the last 5 years <i>At least, one out of two constructed projects worth above or equal between 300,000,000 Rwfs to 400,000,000 Rwfs .</i>	4
3	At least one (1) contract or ongoing similar works (construction of water supply systems) executed during the last 5 years - <i>At least, this project worth above or equal between 200,000,000 Rwfs to 300,000,000 Rwfs</i>	3
4	At least one (1) contract or ongoing similar works (construction of water supply systems) executed during the last 5 years <i>-At least, this project worth above or equal between 100,000,000 Rwfs to 200,000,000 Rwfs.</i>	2
5	No completed project above 100,000,000 Rwfs of similar nature	0
B.2	Certificates of Satisfactory Completion Work Duly signed by the master of the work	5
1	3 Certificates of completion for similar works and same complexity of the project (value on the certificate should be equal or greater than the bid amount)	5
2	2 Certificates of completion for similar works and same complexity of the project (value on the certificate should be equal or greater than the bid amount)	3
3	1 Certificates of completion for similar works and same complexity of the project (value on the certificate should be equal or greater than the bid amount)	2

4	No Certificates of completion for similar works and same complexity of the project (value on the certificate should be equal or greater than the bid amount)	0
C	Schedule of contractor's equipment relevant for the project (attach proof of ownership or lease agreement)	25
1	One dump truck of 5tons each,	5
2	One Concrete mixer	5
3	One pick up	5
4	One concrete vibrator	3
5	Cutting machine	2
6	welding machine	2
7	Total Station	3
F	FINANCIAL CAPABILITY	5
	AUDITED FINANCIAL REPORT (last three years)	
	For Category C: Average turnover of the last 5 years in construction works (Water supply systems) 600,000,000-1,000,000,000	5
	For Category D: Average turnover of the last 5 years in construction works (Water supply systems) 250,000,000-600,000,000	5
	Otherwise	0
	Total	70

Note: The bidder to be able to qualify for financial evaluation must at least obtain a minimum score of 70 out of 100 in the administrative and technical evaluation. However, the marks obtained during the technical evaluation do not influence in any way the financial evaluation. The lowest and responsive bidder included in the financial evaluation will be awarded

SECTION III. BID DATA SHEET (BDS)

A. General
The Procuring Entity PE is Water For People
The Works are Rehabilitation of Nyiramuhebe-Kanzogera-Muyunzwe (10.94km) water supply system, in Ruhango District.
The identification of the contract is: Rehabilitation of Nyiramuhebe-Kanzogera-Muyunzwe (10.94km) water supply system, in Ruhango District.
The expected date of completion of the Works is 4 months calendar after the date of signature of the contract and receipt of the service order.
<i>The project is the execution of distribution of drinking water works</i>
The list of firms debarred from participating in this project is available at: <i>the website of the Rwanda Public Procurement Office www.rppa.gov.rw</i>
The information required from bidders is modified as follows: <i>“none.</i>
The ceiling for sub contractor's participation is: <i>not allowed</i>
The qualification data required from bidders are modified as follows: <i>“none.</i>
Documents submitted by the bidder: <ul style="list-style-type: none">A. <i>Administrative documents as requested in the evaluation criteria table</i>B. <i>Technical Evaluation of bids referring to the requirements in the table for evaluation criteria</i>C. <i>The site visit is mandatory and the delegated member of the company shall be the one who will be in bid documents and is requested to bring the proof of company membership during site visit.</i>D. <i>Planning and execution of work within realistic timelines (presented after the Gantt chart).</i>E. <i>Financial offers of tender</i> <i>The Procuring Entity p will examine the bids to determine whether they are complete. Any bid containing miscalculations or calculation errors will be rejected.</i>
No bidder shall be awarded more than one contracts that shall be running concurrently.
Subcontractors' experience and resources " <i>shall not</i> " be considered.
The Procuring Entity address for clarification is: «Water For People, Procurement Office », KG 7 Ave; House #41, Kigali, Rwanda, rwanda.waterforpeople.org
B. Preparation of bids
The language of the bid is: <i>English</i>
Any additional materials required to be completed and submitted by the bidders are <i>“none”</i> .
The contract <i>“is not”</i> subject to price adjustment.
bidders <i>“are not”</i> required to substantiate the rates and prices.
The bids shall be valid for 120 Days and bidder must clearly that its bids guarantee is valid for this specific period (fail to this will lead to immediate disqualification)

bid variants: NA
The number of copies of the bid to be completed and returned shall be: NA
C. Submission of bids
The warning should read: NA
bids must be submitted only via rwprocurement@waterforpeople.org not later than 16/01/2023 at 05:00 pm . Technical and Financial proposal must be submitted in separate. Financial proposal must be in protected format and its password must be presented by the bidder during the opening session
D. Bid Opening and Evaluation
Bids will be opened in public session on 18/01/2022 at 10AM in Water For People office. And will be evaluated by the PE. After 3 weeks the result will be communicated to bidders via official email.
E. Award of contract
The Standard Form of Performance Security acceptable to the Procuring Entity shall be <i>a Bank Guarantee</i> . A performance security is equal to the contract amount and will be release after successful final handover of the works. <i>[A Bank Guarantee or surety from Financial Institution shall be unconditional (on first demand) (see Section IX: Security Forms).</i>
The Intended Completion Date is four (4) months

SECTION IV: TECHNICAL SPECIFICATIONS & PERFORMANCE REQUIREMENTS

1. Introduction

This manual lays out the technical specifications for the supply and installation of the equipment of this invitation to tender. The numbers that are used in this document refer to the numbering used in the unit prices slip and in the bill of quantities.

Reference is generally made to European (EN) and International (ISO) standards. As some standards have yet to be converted to European (EN) or International (ISO) standards, it is sometimes needed to refer to the producer countries standards, such as the Belgian (NBN), French (NF) or German (DIN) ones. In the event of other standards being used, the bidder shall provide certificates proving that the very standards are equivalent or superior to those referred to in this tender document.

RESPONSIBILITY OF THE CONTRACTOR/SUPPLIER FOR THE MATERIALS TO BE USED WHILE IMPLEMENTING WATER SUPPLY SYSTEM

1. STANDARDS AND SPECIFICATIONS

Standards for materials used to construct water systems are sets of rules that outline specification of dimensions, design of operation, materials, and performance, or describe quality of materials, products or systems. The Standards should cover the performance expectations of the product for particular applications, as well as, in the case of drinking-water contact, the chemicals that may be leached from the product into the water

As water For People is a global organization with a national office, the products procured need to follow both the *national* and *international Standards*.

2. RESPONSIBILITY OF THE CONTRACTOR /SUPPLIER

The supplier is responsible for the quality assurance of all goods and services delivered. The supplier must:

- ✓ Be registered and certified by appropriate International, Regional or National Standards Authority to procure WASH system rehabilitation products.
- ✓ Ensure that the quality and sustainability of rehabilitation materials (such as metals, polymers, brass and alloy materials used to manufacture goods and products) delivered to Water For People WASH Projects meet the required standards.
- ✓ Check all technical and quality specifications of the goods and services supplied to ensure they meet the standards.
- ✓ Provide evidence of quality by providing documentation, analysis, or certifications showing the compliance of the suggested goods and services requested by the WASH project.
- ✓ Ensure that the quality of the product is known and controlled.

3. GLOBAL STANDARD

Globally, various organizations have worked in partnership with other stakeholders to set guidelines and standards for products and services. Most widely known are the International Organization for Standardization (ISO) and National Sanitation Foundation (NSF).

There are two types of materials available for water pipework systems: metallic and non-metallic materials. Of these, the most used materials for drinking-water supply piping are stainless steel, copper, polybutylene, unplasticized polyvinylchloride (uPVC), chlorinated polyvinylchloride (CPVC) and polyethylene (PE). Materials that are mostly used for Water For People in water systems rehabilitation can be grouped as follows:

1. Wells and associated plumbing products: (Hand pumps, pipes, riser pipes, connecting rods etc.). These come in metallic and non-metallic
2. Plumbing materials used for surface-piped water systems – pipes and pumps for mechanized water systems, including water storage tanks. These come in metallic and non-metallic
3. Drilling Fluids (both natural and artificial)
4. Gravel Pack for rehabilitation wells
5. Cement

International bodies that are accredited to offer certification to wetted contact material safety Standards include, American Society of Sanitary Engineering (ASSE International), NSF International, CSA Group, International Code Council (ICC), Underwriters Laboratory (UL), Water Quality Association (WQA), International Association of Plumbing and Mechanical Officials (IAPMO) and ALS Trusdail. For performance of water system products, ASTM International (formerly known as American Society for Testing and Materials) have Standards that cover these areas. Other bodies have been accredited which is determined by product type. The International Plumbing Code (IPC)), IAPMO – UPC and National Plumbing Code of Canada (NRC Codes of Canada) have developed plumbing codes, which are also useful to refer to when procuring and installing water system products.

The International Organization for Standardization (ISO) is an independent, non-governmental international organization with a membership of 164 national standards bodies. The American National Standards Institute (ANSI) has granted accreditation to NSF to develop Standards.

The products and rehabilitation/ Construction materials that meet the requirements of the international and national certification bodies are awarded certification marks and seals of approval. The standards applied to the rehabilitation/ construction materials include:

PIPES

- ✓ NSF/ANSI 61 - Pipes and fittings, valves and coatings water meters, faucets and filters
- ✓ NSF/ANSI 14 - Large diameter pipes, fittings, drain, vent pipes, liners, waste, plastic piping system components and related materials
- ✓ Unplasticized Poly (Vinyl Chloride) (PVC-U) - This applies to pipes used to complete wells and plastic pipes uses to pipe water and Afridev pumps.

1. ISO 1452-1 :2009 - Plastics Piping Systems for Water Supply and for Buried And above-Ground Drainage And Sewerage Under Pressure - Unplasticized Poly (Vinyl Chloride) (PVC-U) - Part 1 : General
2. ISO 1452-2 :2009 - Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure — Unplasticized poly (vinyl chloride) (PVC-U) — Part 2 : Pipes
3. ISO 1452-3 :2009 - Plastics Piping Systems for Water Supply and For Buried And above-Ground Drainage And Sewerage Under Pressure - Unplasticized Poly (Vinyl Chloride) (PVC-U) - Part 3 : Fittings
4. ISO 1452-4:2009 - Plastics Piping Systems for Water Supply And For Buried And above-Ground Drainage And Sewerage Under Pressure - Unplasticized Poly (Vinyl Chloride) (PVC-U) - Part 4: Valves
- ✓ PE Pipes
 1. ISO 4427-1 :2019 - Plastics piping systems for water supply and for drainage and sewerage under pressure — Polyethylene (PE) — Part 1 : General
 2. ISO 11298-2 :2018 - Plastics piping systems for renovation of underground water supply networks — Part 2 : Lining with continuous pipes
 3. ISO 4427-3 :2019 - Plastics piping systems for water supply, and for drainage and sewerage under pressure — Polyethylene (PE) — Part 3 : Fittings
 4. ISO 4427-5:2019 - Plastics piping systems for water supply, and for drainage and sewerage under pressure — Polyethylene (PE) — Part 5: Fitness for purpose of the system

4. QUALITY RECORDS

The contractor/Supplier is responsible for providing the following records for each product and service supplied:

1. The manufacturer references
2. Certificates of analysis
3. Certificates of conformity with the specification
4. Results of the laboratory analysis test for Quality
5. Specified composition on the label

The metric measurement units are used except for the pipes and bolted objects in which case the diameter is generally measured in inches.

The last chapter deals with special technical requirements.

2. General requirements

2.1 Survey of the network

As soon as the contractor receives the instruction to start the works and no earlier than 8 days before the beginning of the works, a survey of the network will be carried out. On this occasion, the contractor will be provided with complementary documents (maps, etc) which might be of help

and available by the engineer. The contractor will then proceed to staking out and marking the area of the works and will oversee their preservation.

2.2 Works programme

2.2.1 General programme

Within 7 days from the contract signature, the contractor shall submit the general works programme to the control office, indicating the location of the works and the area needed for the works facilities as well as the needs in terms of equipment and staff for each type of works. The contractor will set the works programme according to these indications.

2.2.2 Monthly programme

From reception by the contractor of the instruction to start the works, the contractor shall set the detailed works programmes, for each month, and shall hand those into the control office.

The general and monthly programmes will then be permanently kept up to date clearly indicating delays and advances from the initial programme. In the event of a delay from what had been forecast, the contractor shall justify the measures he took to suppress its consequences.

2.2.3 Maximum deadline for implementation

The maximum deadline for works implementation, from the date of instruction to begin the works is set to **4 months**. This timeline includes rain season and is in calendar days.

Documents update and final plans

Complementary to all the drawings he will be provided with, the contractor shall sketch or have sketched all the details drawings or production plans of the special works needed for the works to be carried out.

These drawings, which may include calculations and bill of quantities, will be submitted to the engineer for approval.

The engineer shall not be accountable for the calculation notes and reinforcement drawings, including steel specifications, provided in the sample plans. If he wishes, the contractor may touch up these drawings.

2.3 Public domain use

The contractor will take care in the name of the client to get the police permits and licences to use the public road necessary for the works to be carried out. In the event of an excavation coming across a network of electric lines, transmission of power, lighting, telegraph, telephone, the contractor will, under his own responsibility, comply with the instructions received from the Companies or Administrations running those networks.

The contractor shall get in touch with the competent authorities to get, in due time, the permits that might be needed for the use of heavy works vehicles (lorries, etc) on rural tracks or local roads; he remains responsible of any damage or possible prosecution. In this regard, the contractor shall have a schedule of condition of the roads and tracks carried out before the beginning and after the completion of the works, in the presence of the competent authorities. He/she will directly settle the compensation he/she might be requested for this matter, and the cost therefor is included in the price.

2.4 Area of works

The contractor will be informed by the engineer of the area needed for the works. If needed, the contractor will be freely allowed to use the lands owned by the client for works purposes. All the lands he will occupy for his facilities and for the deposit of materials and which are not owned by the client will be used, acquired or rented on a temporary basis, and the corresponding expenditure will be fully payable by the contractor.

2.5 Site restoration

No later than one month after the provisional acceptance, the contractor shall proceed, at his own cost do the removal of all the equipment clearing the site. In the event of a delay from the contractor, these operations shall be carried out at his expense as of right, after due notice by simple order of the client. The site restoration report should be included in the final report

2.6 Inspection document

Fifteen days before the date of provisional acceptance, the contractor shall provide five hard copies and one electronic version of the post-completion drawings relative to the implemented works.

3. Origin of materials and supplies

3.1 Origin of materials

The origin of materials and products involved in the works (cement, sand, gravels, bricks, quarry stones, wood, sheet metal, ladders, catches) is to be submitted to the technical team made of water For People, District engineers and supervising firm for approval. In this regard, the contractor shall indicate the origin and production place of these materials and products as well as quality tests result of the materials.

It is the contractor's responsibility, who in any event shall be liable in front of the Client, to ensure by the producers that their products comply with the requirements detailed in the contract

3.2 Products delivery

The products needed for works implementation (pipes and hydraulic accessories: sluices, vents, taps, etc.) will be taken to the works site by the contractor. The price of the products includes this delivery, storage, and monitoring of the products.

4. Preparatory work

4.1 Site installation

The contractor shall build for each network or group of networks a service building. The contractor shall be allowed to use it as a works office and storage area for the whole duration of the works.

The building will be built on a place that will be put at the contractor's disposal by the district. The place, with an approximate surface of 300 m² will be prepared and fenced. A description of the building and fencing materials is provided in section VII.

This building will be put back into mint condition by works acceptance.

The contractor is to mount yard boards in a visible place, bearing the following indications: contracting authority, deputy controller of works, name of the project, project administrator, and sources of finances, engineer, and contractor. Prior to its mounting, the format of the board will be approved by the project manager and the engineer.

Moreover, before being able to be paid to 80% of the services of site installation (**price n° ...**) for the batch considered, outside the office building, the contractor will have to prove that it made at least the following provisions:

- Installation of a provisional office building on site, with connection to a water provider (or disposal of a tank minimum 1000 litres capacity) and electricity (or failing this a power generating unit of 5 KVA minimum),
- Installation of a place of storage closed and kept for the supplies and cement,
- Installation of the panel of building site,
- Placed at the disposal of the building sites of the batch concerned of the material requested from BDS IS 5.5 (c), that is to say:
 - A truck bucket of 15 tons
 - A vehicle of connection
 - A concrete-mixer
 - A vibrator for concrete
 - The equipment and tools specific for the assembly of the pipes and accessories
 - Pump and material for testing the pipes

The 20% remaining will be paid after the fold and the repairing of all the sites of the batch considered as indicated to the § 6.

4.2 Organisation and superintendence of the works

The contractor shall provide and install, at his expenses and under his/her sole responsibility, the scaffolding and any other device needed for the whole implementation of the works.

He/she shall permanently hold a works diary on the works site, at the disposal of the engineer and the project manager. This diary will compile all the observations and the instructions prescribed in the field. Prior to being used, the type of diary will be approved by the project manager.

She/he shall bear the expenses linked to the installation and use of his material without claiming any compensation, except in an event of duly justified force majeure.

Access to the whole works area shall be forbidden to the public. Outside and inside the works area, the contractor shall take all the necessary measures in order to:

- Obtain the licence to use the public roads for works,
- Ensure free access to neighbouring residents,
- Ensure traffic security. To this end, excavations will, where appropriate, be surrounded by solid barriers,
- He/she shall particularly implement, at his expenses and under his responsibility, all the provisional works and necessary diversions and shall ensure proper road signalling and supervision according to the regulation in force,
- Ensure the passing of vehicles, unless in the event of absolute impossibility,
- Ensure the free outflow of wastewater (rainwater or other)
- Preserve from any damage the surrounding works, those of the public road such as electric lines, pipes and any type of cable found in the land,
- Keep in working order, for the whole duration of the works the existing cables, pipes and installations.

For all the works being implemented and, in any regard, the contractor shall be entirely responsible for accidents, damage or any loss that might be caused as a result of a lack of precaution or of an error caused by his or her workers or employees, staff, equipment, work, to citizens on the public road, passers-by or neighbouring residents and their possessions and to any person.

The contractor shall also be held responsible for the cables, pipes and any other works found in the land. She/he shall respect them and have them repaired should he damage them and pay for the possible compensation she/he should be requested for service failure of accidents and in a general way, deal with all the complaints issued by public services or private persons.

The contractor shall eventually be responsible for the damage that could arise to neighbouring buildings. Where necessary, bailiffs' reports over the condition of such buildings, before and after the works, will be done at his expenses, as will the repairs of the damage caused, irrespective of their cost. He/she will deal with any complaint in this regard.

It is expressly stipulated that for everything regarding the above-mentioned points, the client, engineer and their agents are exempted from any responsibility. It will be considered that the prices proposed by the contractor in his bid implicitly include all the accessory costs, expenses and

consequences caused by anything resulting from the implementation of the works referred to. The obligations mentioned here above will under no circumstances lead to compensations.

4.3 Staking and implantation

Before the beginning of the works, the contractor is to carry out herself/himself and under her/his sole responsibility the staking of the works. This operation will be carried out with the presence of the engineer or his representative. Prior to that, the contractor will have surveyed the field and will have checked that the information presented on the plans relative to the land inspection is correct.

The contractor will, at his expenses, mark on the site, the reference implantation points. After carrying out the general staking, the contractor will make the final levelling. He/she will put as many dimensioned markers around the layout as necessary for the proper execution of the works.

The contractor will have to look after the protection of those points, to restore them or replace them in case of need, either at their initial location or moving them if requested by the progression of the works, but clearly referencing any modification that was made. The contractor will let any check requested by the engineer be carried out at his/her expenses and will hold all the necessary topographic equipment and skilled staff at the engineer's disposal.

4.4 Specifications of the supplies

The supplies will be transported and stored by the company until they are installed. In the event of supplies not being installed, these will be handed in to the Client by the acceptance of the works.

The pipes transported in 20-foot containers will have an overall length of 5.80 metres. The bidder will take this into account in her/his calculations.

All the products must be checked by the producer on a regular basis according to the quality requirements of the European standards (EN), or equivalent, and the ISO 9002 prescriptions.

They might be inspected in the factory by a control body appointed by the project manager. Should that be the case, the expenses linked to those checks will be at the contractor's expenses (fees, transport, accommodation, journey expenses).

The prices indicated are those of the works supplies, including storage and monitoring and laying out in trenches? The payment will be done for 60% after the laying out and 40% after the satisfactory pressure test.

5. *Assembly parts*

The materials and parts necessary for the assembly of the pipes and accessories and hydraulic devices will be delivered in sufficient quantity by the provider. The price of these goods is included in the price of the pipes and accessories. It consists of, but is not limited to:

- Stripping compound for HDPE pipes
- Adhesive bonding for HDPE pipes
- Dope for easy jointing of HDPE pipes

- Lip seals for jointed HDPE pipes, 10% extra parts of each diameter will be delivered
- Yarn and sealing compound for bolted galvanized steel joints
- Welding rod for assembly of tubes and iron parts, including the necessary rust protection products
- Flat gaskets for flanged jointing, 10% extra parts of each diameter will be delivered
- Bolts, swivels and cadmium-plated steel washers needed for flanged assembly, 10% extra parts of each diameter will be delivered
- Any other material needed for assembly, in sufficient quantity

The provider will hand in to the project manager the calculations of the quantities for all the goods for approval before packing them and sending them out for delivery. These goods will be approved like any item being supplied under the contract. Furthermore, the provision and temporary approval of a set of spare parts will create a buffer stock. This equipment will be paid according to the price of the supplies.

For information purpose, this stock will include no less than:

- Pipes of every dimension and type used on the network, at the rate of 1% of the lengths being installed, rounded up to the next number of pipes,
- Wet connections with valves and valve boxes (one of each type being used),
- 3 water meters for drinking fountains
- 10 faucets
- Yarn and sealing compound for bolted galvanized steel joints, equivalent to a hundred 1” joints
- A set of elbows, tees, steel coupling and cast-iron join parts according to the equipment being installed in the network, with corresponding sealing, screws, and bolts

5.1 Pipes and HDPE parts

Pipes and couplings will be made of HDPE (High Density Polyethylene Pipes). They comply with HDPE pipe and fittings Standard Specification ASTM D 3350 and EN 12201, BS 12201.

They are defined by their external nominal diameter (ED) in millimetres and by their maximal pressure in service (PN) expressed in bars: PN 10,16 and 25.

They are made for adhesive bonding for interlocking diameters inferior to 63 mm (ED < 63) and for elastomeric seals coupling for interlocking diameters superior or equal to 63 mm (ED >= 63).

Seals and dope necessary for the assembly are part of the supplies. They will be delivered according to the quantities foreseen by the provider (evidence) and increased by 20%.

The measurement unit is the meter of pipe, measured in effective length (without the jointing part).

5.2 HDPE pipes for adhesive jointing

The pipes comply with the quality requirements of the European standard EN 12201. They are of dark with coloured lines.

All the pipes with external diameter inferior to 63 mm are for male and female joints (adhesive jointing). They are part of the series 10 (PN10) or 6,3 (PN 16).

Their jointing is made by adhesive bonding.

5.3 HDPE pipes to be jointed

Pipes with an external diameter superior or equal to 63 mm are push-fit fittings. Joints are made with lip seals for underground works. Resistance to pressure of pipes and joints is identical.

All the products must be checked by the producer on a regular basis according to the quality requirements of ISO1167-1:2006.

5.4 HDPE parts for adhesive bonding

For diameters inferior to ED 63, coupling parts are of HDPE for adhesive bonding. They comply with standard ISO 1167-1:2006, ASTM F1962 and AWWA M55.

5.5 Cast-iron parts for push fittings

For diameters superior or equal to ED 63, coupling parts are made of cast iron and are fully compliant with standard ISO 2531-1979.

They are made of ductile cast-iron lined (internal and external) in resin coating. The provider will give the same warranties as for pipes. Assembly using threads or flared nipples are forbidden. The diameter of the parts is defined as the main diameter of the part of the largest diameter of the reduction.

All the parts are of the pressure type PN 16.

5.6 Steel and cast-iron pipes

5.6.1 Galvanized steel pipes

The pipes and joints must comply with the standards in force. The tubes are welded with continuous welds, either lengthwise or helix-wise.

The pipes will be pressure tested in factory. Unless otherwise stated, this test will be done with such pressure that the hoop stress induced will not go over 50% of the minimal breaking strength. These tests will be made systematically, and the contractor shall provide all the factory certificates. Seamless pipes are made by hot rolling.

All fittings (elbows, tees, etc.) will be manufactured in factory. For special pieces, final assembling and adjustment will be done with prefabricated parts manufactured in factory. For special pieces, final assembling and adjustment will be done with prefabricated parts manufactured in factory.

All the fittings and couplings will be lined in factory or on the work site with internal and external coatings or additional coating with protection property equivalent to that of the pipes they are coupled with.

5.6.2 Cast-iron pipes

Pipes are made with ductile cast-iron with unlocked lip-seal fitting. Their production complies with standard ISO 9001 and NCN EN 545 and ISO 2531. CAST IRON MUST BE THE TURKEY TYPE. They are 6m long and are lined internally with centrifugal cement mortar. External protection will consist of a layer of epoxy resin.

5.6.3 Threaded parts for galvanized steel parts

Coupling parts are made of malleable iron for screw joints. They are fully compliant with standard ISO 49-1983. The diameter of the parts is defined as the main diameter of the tee or by the largest diameter of the reduction.

5.7 Taps and accessories

Taps parts for the network and for works installation will be supplied with cadmium plated bolts and swivels in sufficient quantity for assembly, including their soft seals. 10% extra parts (bolts, swivels and seals) will be supplied.

5.7.1 Gate-valves

Gate-valves will be made of cast-iron with bolted bonnet and flanged ends, short type. They comply with standard ISO 5996-1984. They will close clockwise. The frame will be made of cast iron, with an epoxy paint interior lining with straight-through flow with no inserted valve seat.

The core part of the lid will be of cast-iron with vulcanised synthetic rubber moulding. The one-piece screw will be stainless steel with a cold moulded knuckle thread. Superior water tightness is made with thoracic collars. The flanges are drilled GN 10. All the gate-valves are of the PN 16 pressure type.

The valves are delivered with separate stem adapter and operation wheel. Furthermore, three plug valve wrenches will be delivered for each network or group of networks.

5.7.2 Ball valves

Cast-iron valve body, rubber-covered shut-off, stainless steel float. They must be designed as to maintain maximum level in the reservoir. No element of the float arm will come above the valve body. For 1" equipment, the ball valve will be made of copper alloy with tapped inlet port.

5.7.3 Flow limiters

The flow limiters are made with a flexible rubber diaphragm. This diaphragm is calibrated and is laid on a metallic circle seat with divergent section downstream.

- Bores 20, 30 and 40 mm are hexagonal in shape and have tapped inlet port and threaded outlet port (series 3380)
- Bores 50, 60, 80 and 100 mm are circles that are to be inserted between two flanges (series 3390).

5.7.4 Non-return valves

Cast-iron body, the hinged disc lies on a bevelled seat allowing free flow when fully open. The shut-off must be designed as to ensure full water tightness at low backpressure and silent working.

5.7.8 Strainers

Strainers are made of cast-iron with cast-iron saddle flanges.

For 1" materials, the strainer is made of stainless steel with a tapped inlet port made of synthetic material so as to avoid any dielectric phenomenon between stainless steel and galvanized steel.

6. Network security equipment

6.1 Vents

The body is made of cast-iron, making up a tank with a connection flange at the bottom. It has a cast-iron bonnet with on the top part a calibrated device for air outlet. The float is spherical and made of a steel sheet body moulded in elastomer. It moves vertically in the tank along the guide ribs. The vents tapped 3/4" are made of copper alloy.

6.2 Water meters

- **Connection meters**

Drinking fountains, private or multiple connections and metering points on the network pipes with flow rate of up to 3litres per second are equipped with single jet dry-dial meters, with pipe roll totaliser readers that can be set in any position.

These readers' ends are threaded. There is a shut-off valve upstream the meters so that the meter and a filter can be dismantled. The drinking fountains and their connections which are exposed to a pressure superior to 5 bars are equipped with a pressure reducing valve tuned for a maximal outlet pressure of 5 bars.

- **Network propeller flow meters**

Propeller flow meters are spools with simple tangential helix. Assembly must be possible horizontally, vertically, and diagonally. The metering device is removable and identical for any diameter. It must be watertight and with magnetic transmission.

Before the beginning of the works the contractor will hand in to the project manager for approval, a draft list of those tools with technical information proving the quality of the equipment proposed.

7. Prescriptions for laying the pipes

7.1 Excavations

7.1.1 Width of works

The width at the contractor's disposal for laying the pipes is 1 m, however due to local conditions (forest, habitations, roads...) this width might be reduced without compensation allowed to the contractor.

District will be responsible for the expropriation and will control the necessity.

7.1.2 Works in a private property

Unless another agreement is reached between the contractor and the landowners of the lands, the workers and vehicles will only commute using a track of land located to the sides of the work site. This track will not exceed 5m in width.

The contractor will be fully responsible the damage caused inside and outside that area. Before the completion of the works, the condition of the ground will be restored and the fences that were taken off will be put back to their original condition.

Where appropriate a site inspection will be carried out in the presence of the coordinator and the project manager.

7.1.3 Excavations

Trenches will be dug to the depth indicated in the long profile. Unless specifically specified by the engineer, the depth will be at least 0.80 m above the upper part of the pipe. Excavated soil will be sorted and laid along the trench so as not to be mixed or transported to a dumping area. If trench is opened in woody area, the area will be cleared, the trees will be cut, the stumps will be removed, and every product will be put in a place approved by the engineer.

When masonry and rocks are met in the trench, it will be removed at least until 0.20 m under the lower part of the pipe and replaced by soft soil. The width of the trench will be wide enough to make the works easy: lay the pipes and fittings, backfill, make the joints, etc. At the bottom, the width will be at least equal to the external diameter of the pipe plus 0.20 m on each part, with a minimal overall width of 60 cm. If necessary, extra width will be dug locally to make easier the works on joints.

For structures and manholes, excavations will be done with an extra-width of 0.50 m considering the actual size of any structure.

The price for the excavations is paid according to the arrangements described above. No additional payment will be given to the contractor for additional unjustified excavation, given that the price in the bill of quantities is understood with all the timbering and sheeting, shoring, etc.

In flooded area the max length of excavation which can stay open before back filling is 100 m.

Any extra unnecessary excavation of the trench will be carefully backfilled with successive layers to the responsibility of the contractor. When implementing the excavation, the contractor will

follow state of the art procedures to ensure the good completion of the works. He/she will take care of the following:

- provide any means for working in compact soil or rocks.
- ensure security of the staff: timbering and sheeting, shoring, draining (the water level of the aquifer will be maintained at least 0.20 m under the bottom of the trench.
- systems to be developed in order to protect structures and wiring, pipes etc.
- diversion, links of pipes, wiring etc... met during the implementation of excavations.

Methods and means to be used are the responsibility of the contractor, but the engineer has the right to refuse anything that he would consider as inappropriate or dangerous.

The contractor will stay responsible for any accident that may occur because of inappropriate timbering, sheeting, drainage, to people or assets of the Client or third party.

All the excavation will be laid in such way that it doesn't disturb the traffic. The responsibility of the contractor is clearly engaged if any accident may occur on the works or nearby and caused by a deficiency of the contractor.

The excavation will be cleared in such way that it will be free of any stones or plant debris. If necessary, a layer of excavated soil carefully cleared and screened, if necessary, will be laid at the bottom of the excavation to serve as laying bed. In case of excavation in hard ground and thus rocky, a layer of loose ground or sand will be laid to this end.

7.1.4 Types of soil

- Loose soil: excavation that can be carried out with a hoe or shovel without great difficulty (default soil, paid by the cubic metre effectively excavated down to a maximal depth of 1.5 metre.),
- Uneven soil: soil with a hard or gravelled surface that must be removed with a pickaxe and jumper bar, the surplus will be paid per m³,
- Hard soil: soil mainly composed of hard rock that must be excavated using a jumper bar, sledgehammer or even explosives; the surplus will be paid per m³.

7.1.5 Bracing and shoring

For trench with more than 2m deep, the contractor will have shore the walls of the trench (semi closed, closed or double walled cribbing) in order to avoid any landslides and protect the workers according to the regulations.

The final arrangements will be decided considering the nature of the ground, the action of the weather (rain) etc., the depth of the trench and loads applied to the soil next to it (constructions, roads, deposit of heavy equipment/materials).

In case of creeping soil, the support will be closed or double-walled. The bracing and shoring will be removed as the trench is being backfilled or cement-filled, taking the hardening of the concretes and mortars into account.

This bracing and shoring can only be abandoned in the excavations with the agreement of the Engineer.

7.1.6 Excavation using mechanical engineering

It is not foreseen to use mechanical engineering for excavations, with the exception of compressors for hard and rocky soil demolition.

7.1.7 Drainage under the pipes and strengthening of the bottom of the trench

If the soil and the laying bed for the pipes and works must be strengthened because of unstable water-bearing soil and risks of scour by water, the contractor will follow state of the art procedures to install the necessary drainage installing drains under the pipes or the works, all of which will be surrounded by a sufficient layer of gravels or filter material.

The engineer may also impose a cement-based subbase with a view to ensuring accurate levelling or bottom slabs in order to strengthen the pipes in rather loose soil.

7.2 Laying the pipes

7.2.1 Pipes storage

Brutal unloading of the pipes is forbidden. A storage area will be foreseen by the works. It will consist of a levelled and flat ground or a wooden floor in order to avoid bending or damaging the pipes. In the event of pipes being stored for a long period of time or in very sunny conditions, the pipes will be protected from direct sunlight. Maximum stack height will be 1.5m unless otherwise stated by the engineer.

7.2.2 Handling of the pipes

The pipes will be handled very cautiously and according to the engineer's instructions.

The pipes are carefully laid on the ground or down the bottom of the trenches and rolling those on rocks or on a rocky ground will be avoided unless rolling tracks using baulks have been previously installed. Any pipe that would have fallen due to mishandling will be considered as suspect and may only be laid after a double check.

7.2.3 Pipe inspection before installation

When being laid, the pipes will be checked inside and carefully freed of any foreign body that could be present. The contractor will be fully responsible for this check and will be accountable for any foreign body that would have been left in the pipe before it is put in operation. All the prescriptions above also apply for joints and accessories.

7.2.4 Cutting of pipes

If necessary, the contractor will cut pipes. However, any precaution shall be taken in order to avoid it. The cut will be done with cut-off wheels or saws in order to achieve a clean cut. The pipe will always be cut on the spigot side and the contractor will carefully take care that the new spigot end is smooth and produces a jointing with the next pipe as strong as a normal end.

7.2.5 Laying of pipes

During the laying of the penstock, the contractor shall use every precaution to prevent damage to the protective coating on pipes and fittings. The pipes will be carefully laid in the trench or on the supports. Alignment will be done by means of temporary wedges. Stones are not allowed.

The engineer will check that the slopes foreseen have been respected. In the event of steep slope, he will instruct to lay anchor blocks. At every stoppage, the pipes' tips will be sealed in order to avoid debris to enter.

It is not allowed to take advantage of the ease between the coupling and the pipe to bend it to an angular value higher than the one allowed by the manufacturer.

7.2.6 Couplings

The pipes will be joined by means of adhesive bonding for HDPE pipes with diameters inferior to 63 mm and by elastomer or rubber seals for any other pipes. For galvanized steel pipes, the threaded ends of the pipes will be joined using threaded couplings for pipes up to 2" in diameter. Ductile cast-iron pipes with diameters of 63mm or more will be joined with express automatic joints and elastomer collar.

Before being installed, the male and female ends will be cleaned. They will be lubricated with an appropriate paste according to the provider's specifications. After the joint is assembled, there will remain longitudinal play inside the jointing between the male and female ends for extension and contraction of the pipes.

Generally speaking, the contractor will strictly follow the recommendations of the manufacturer for the installation of couplings. HDPE pipes and couplings will be assembled with special cast-iron parts using adapters that comply with ISO 3606 or equivalent standards. The installation of the coupling will be done in the trench.

7.2.7 Thrust and anchor blocks

Concrete thrust and anchor blocks may be built in order to avoid using self-anchored joints and to tackle the issue of pipes under pressure:

- At each end of the pipes (blind flanges),
- At each change of direction (elbow or curb),
- At each diversion (tee).

The anchor blocks are determined by the soil reaction on their bearing surface using the following formula:

$$F = K \times P \times S$$

where:

- F is thrust
- P is the testing pressure on the work site, in bar
- S is the surface of the section of pipe, expressed in cm²
- K is a coefficient depending on the geometry of the element in question: 1.0 for a blind flange, 1.4 for a 90° elbow, 0.7 for a 45° elbow and 0.4 for a 22° elbow, etc.

The anchors will leave the joints clear.

Strong point penstocks lay on steep slopes and for aerial sections the penstocks will be anchored in concrete blocks and laid on support blocks. These blocks will be installed behind the jointing of each pipe.

7.2.8 Hydraulic tests

After being laid, the pipes will be tested by section not exceeding 500 m. The joints in the sections in trench will not be buried. The centre of the pipes will also be cleared. The tests will be done in presence of the engineer and a report including pictures will be done and signed by each party.

All the equipment for the tests (pump, meters, manometers, thrusts etc.) will be provided by the contractor. All the system put in place will have to be approved by the engineer.

Manometers will be precise in the appropriate measuring range and the gauges will have a diameter of no less than 15 cm. The pressure will be raised by 5 bars compared to the static pressure at the point of the test. The minimal testing pressure will thus be of at least 15 bars. The length of the test will be 2 hours during which the pressure shall not decrease more than 0.5 bar. While filling, the contractor will check the good working order of the vents.

The costs relating to the pressure tests are included in the "delivery and laying of pipes" prices.

7.2.9 Backfill of the trench

When tests are positive, the backfilling will be authorized by the engineer. Soft soil will be used. Excavation soils can be used as long as the stones and gravel are removed.

The backfilling will be done by layers not exceeding 0.20 m. The excess excavation will be levelled or evacuated following the instruction of the engineer.

Good drainage of runoff must be always effective. Gutters must be cleaned after backfilling. Backfill around structures wiring etc. will be especially careful.

The contractor is responsible until the final acceptance of any defect on the backfilling. She/he will ensure maintenance of the works if required by the project manager or the road administration.

7.2.10 Sterilization of the pipes

Before being put into service, the whole network will be sanitized using sodium or calcium hypochlorite or any other substance approved by the engineer according to the following prescriptions: before being sanitized the pipes will be cleaned with water amounting to three times the volume of the pipes. The disinfectant water must contain 30g of chlorine per m³ of water (in case of sodium hypochlorite). During sterilization, taps and valves will be operated several times. After disinfection the pipes will be flushed with at least twice their volume of water.

Disinfection time is 24 hours. The contractor will receive no compensation for disinfection. Its cost is included in the bill of quantities relative to "operation starting". Provisional acceptance will not take place before disinfection.

8. Prescriptions relative to civil engineering works

8.1 Foundations excavation

For dry or wet excavation, the contractor will be solely responsible for the stability of the slopes and for taking the necessary measures (sloping or shoring). In the event of dewatering, its cost will be payable by the contractor.

The contractor must ensure foundation land quality. Depending on the geophysical soil tests, modified foundation dimensions might be needed. Should that be the case he will submit foundation dimensions in a written proposal to the control office. He/she will not be able to make any claim in the event of faulty works stability if he submitted no written proposal to the control office. The surplus excavation will be deposited by the work site (200 m max.) with the engineer's approval.

8.2 Hydraulic binders

8.2.1 Origin and storage of the cement

All the cements will come from factories approved by the engineer and should be of class CPA 325. Approved cements will be delivered in 50 kg bags made of strengthened and waterproof paper.

The contractor will have to provide the date of bagging of the cements. During delivery and transportation, the bags of cement are permanently protected against water and humidity.

Cement bags will not be laid on the ground or in open air, unless for a short period of time while loading and unloading, and only under favourable weather conditions. The delivery of cement is included in the bill of quantities.

On the work site, the bags of cement will be stored in a depot or warehouse that will be dry and away from draughts. The bags will be laid on wooden platforms. They will be bound with no empty space between them and will not lie against exterior walls. Storage of cements will under no circumstance exceed six (6) months after date of manufacture. Dust shall not be reused.

8.2.2 Cement quality

Portland cement of class 325 (CPA 325) will be used. Any other type of cement will require the engineer's approval. The engineer may ask the contractor for the results of the manufacturer's inspection. The engineer will have the possibility to request that all the cement coming from a network or group of networks be delivered in one batch and submitted to tests in an accredited laboratory on the contractor's cost.

Should that be the case, three samples will be collected from a batch of maximum 10 tons. For the whole duration of the laboratory tests the cement bags will be locked in a closed place. Only the engineer will have a key and it will be under the supervision and responsibility of the contractor. When the outcome of the test is issued, all the bags will be permanently marked and according to the results, either they will be allowed for use on the work site or they will be refused and removed.

The cement will have the following properties:

- Initial set no earlier than after 3 hours, final set no later than after 6 hours,
- Expansion to heat inferior to 3 mm,
- Mechanical strength at 7 and 28 days.

If chemical composition of the soil and water require it, Portland cement might be replaced with a binder with guaranteed resistance to the identified weathering agents.

8.2.3 Admixtures

The use of admixtures will be submitted to the engineer for approval. Only approved admixtures shall be used. They will be used according to the product approval document, namely regarding the maximum dosing, precautions, and contra-indications.

8.3 Aggregates for mortars and concretes

8.3.1 Source and storage

The origin, use and quality of the aggregates comply with international ISO standards. Sands and gravels will either be sourced from quarries or riverbeds. They will be used either naturally or crushed. They will be screened and might be washed at the request of the engineer. They will be free of any animal or plant debris.

The final decision will be down to the engineer depending on the outcome of the tests. This decision will have no impact on the price paid to the contractor for concretes and mortars.

Aggregates from different categories will be stored separately to avoid mixing them. The layout of the storage areas will be done accordingly, and particular care will be taken to avoid segregation during storage or resumption and prevent any accumulation of mud at the bottom.

In case of necessity these storage areas will be drained and covered with a layer of concrete or black-top pavement in order to ensure that the site remains clean. No compensation or additional payment will be paid for this. The areas will require the engineer's approval.

8.3.2 Quality

Sands must comply with the following properties:

- Natural sands will be screened with a 5 mm sieve so that they are cleared of large elements and unsuitable materials,
- Sand equivalent will be no less than 75 %,
- Grain size between $D < 5$ mm and $d > 0.1$ mm (undersize on D is less than 10%, oversize on d is less than 5%),
- Proportion of solids will be less than 1 %.

Natural and crushed gravels will have the following properties:

- Los Angeles coefficient should be less than 35,
- Oversize on the largest D diameter less than 10 %,
- Undersize on $d < 5$ mm should be less than 5%,
- Proportion of solids will be less than 1 %,
- Gravels will have a regular shape, neither long nor flat. Percentage of flat and long admixture will be less than 15% of the total weight. Gravels of regular shape are described as follows:
 - Length should be no more than 3 times the width,
 - Length + width should be no more than 6 times the thickness.
- The grain size of the admixture will be separated in sand (0/5) and two fractions of gravels. The grain size distribution curve will be decided according to the study of the concretes.

The grain size curves here under are given for information purpose:

Sieve Opening	0/8	0/16	0/31,5
	undersize %	undersize %	undersize %
31,5			100 – 100
16,0		100 - 100	80 – 62
8,0	100 – 100	76 - 60	62 – 38
4,0	74 – 61	56 - 36	47 – 23
2,0	57 – 36	42 - 21	37 – 14
1,0	42 – 21	32 - 12	28 – 8
0,5	25 – 11	20 - 8	20 – 6
0,25	11 – 5	8 - 3	8 – 2

Special care will be taken to remove the materials that would have been altered in such way that their mechanical, physical, or chemical resistance is reduced (kaolinization of aggregates from granite origin, for example)

The sieve and any aggregate control device will be put at the engineer's disposal by the contractor.

8.3.3 Mixing water

The water to be mixed with concrete will contain no more than 0.2% suspended load in weight and no more than 0.3 % dissolved load in weight. It will contain no organic matter, either suspended or dissolved. Doubtful water will be subject to chemical analysis. The cost of the analysis will be payable by the contractor.

8.4 Steel for reinforcement

8.4.1 Source and storage

Steel will be sourced from recognized and approved factories. Their delivery will be payable by the contractor. Upon the owner's request the contractor will provide the certificates of origin and the factory or foundry tests certificates.

Use of welded bars is strictly forbidden. There is no item for steel transportation on the bill of quantities. No particular remuneration is foreseen. Storage duration and condition of the steel will be submitted to the engineer for approval. Steel will be stored at least on a floor 0.3 m above ground level and protected from the rain. The different steel batches will be clearly separated.

8.4.2 Quality

Reinforced concrete will be made with steels with the following characteristics:

- High bond steel, minimum elasticity of 4 200 kg/cm² and tensile strength 5 000 kg/cm². After a folding test of 180° by temperature of 20°C the metal will show no sign of tear according to the approval certificate and to standard NBN A24-302. Folding and unfolding is forbidden.
- Smoothed round reinforcing steel, minimum elasticity 2 200 kg/cm² and tensile strength 3 400 kg/cm². A 90° bend done cold must be possible without producing any tear in the metal.
- Type of reinforcement mat must be approved.

8.4.3 Miscellaneous steel

Steel sheets, flat bars, extruded bars and steel tubes will be made of soft non-brittle malleable steel, free of scales, scratches, cracks, snowflake or blow hole. The dimensions and quality will be compliant with the standards in force. Parts that require a layer of zinc protection will be hot dip galvanized. Zinc will not weigh less than 200 g per square meter (single side).

8.5 Masonry

8.5.1 Burnt bricks

Minimum tensile strength relative to the gross surface of the bricks will be:

- Average minimum strength = 40 kg/ cm²
- Minimum strength = 32 kg/ cm²

Bricks must be burnt in ovens approved by the engineer. After being unloaded, the bricks will be strictly checked. Improperly burnt bricks will be discarded as they soak up water and are less resistant.

Bricks of poor quality can be identified by the hollow sound they produce when they are hit. When hit, bricks of good quality make a clear sound and soak up very little water. The bricks will not show systematic flaws such as cracks, breaks, deformity, blistering or tears.

8.5.2 Cement blocks

Cement blocks will have mechanical characteristics at least equal to those of bricks. The blocks will be made in metallic moulds using approved release agents (drain oil is forbidden). They will be vibrated. They will be made under the monitoring of the engineer and possibly on the work site.

8.5.3 Stones

Besides bricks, different rocks (rubble) may be used for masonry. The proportion of bonding mortar for rubble remains the same as for masonry with baked bricks. The rubble must have no cracks, breaks, deformity, blistering or tears. It will be hard and free of gangue or mud and will be clean. Rubble used for masonry and pitching will be at least 10 cm (ten) thick and have a tail of 20 cm (twenty). The quarries where the rubble is sourced must be visited and approved by the engineer.

0.3 8.6 Casing and formwork

Casing will be made of timber wood or metal, mortar proof and enough rigid to prevent deforming under the weight of concrete or any other stress inherent in construction.

The casing is built and maintained in such way as to avoid twisting and dismantling when the wood is removed. The casing and formwork must be solid and will not be prone to slump. They will be drawn in such way that the concrete complies with the appropriate dimension and outline. The study of the casing will consider the effect of vibration of the concretes when they are put into place.

Before installing the formwork, ground resistance will be carefully checked. For visible surfaces, the casings will be made of surfaced lumber of regular thickness, with or without sleeve and will be of an approved type.

Unless otherwise stated in the drawings or unless another instruction is received from the engineer, all the apparent edges and corners in the concrete will be chamfer trimmed to 45 degrees with 2 cm on each side of the square.

The fasteners or metallic anchors inside the casing will be laid in such a way as to be removable to a depth of at least 5 cm from the surface and without damaging the concrete. Should fasteners made of steel wires be allowed as soon as the casing has been removed all the wires will be cut at minimum 1 cm from the face of the concrete with a chisel or pincers.

When the concrete is fresh, pincers will be mandatory. All the metallic fasteners will be of such type as to leave the smallest possible cavity after the fasteners have been removed. The cavities will be filled with cement mortar and the surface will be left in good and smooth condition. The colour will be the same and uniform.

When or before the concrete is being implemented, if the casings are not satisfying in any way, the engineer will give the instruction to stop the works until the flaws have been fixed up.

When casings are being reused, their shape, strength, rigidity, tightness, and the smoothness of their surface must be ensured.

Wood that is out of shape or curved will be discarded. In case of narrow walls where the bottom of the casing is not accessible, some play will be left to the planks at the bottom of the casing so that it is possible to move these planks to remove foreign matter just before placing the concrete.

All the casings will be oiled, or water soaked. The use of drain oil is strictly forbidden. For parts with visible faces, the casings will be treated with oil or varnish approved against concrete adhesion. No material that can adhere to concrete or that may fade it will be used. The casings will be regularly sprayed with cold water in order to decrease concrete temperature.

The casing and shoring will be removed with the engineer's approval after the concrete has hardened enough for it to stand its own weight and external stress without damage. The casings will be removed after 72 hours for walls and 7 days for slabs provided that the concrete has 75 % of its strength at 28 days.

Out of plumb and alignment tolerance on a length of 2.5 m is 2 mm. Total out of plumb will not exceed 5 mm. Alignment tolerance between shells is 5 mm and flatness tolerance on a slab floor is 2 mm.

8.7 Shaping and placing of steel

Reinforcement steel will be shaped and cut according to the approved implementation drawings. The bending will be done mechanically and never hot in order to reach the foreseen bend radius. When being placed, the steel will be clean, free of non-adherent rust, traces of mud, paint, grease or any other harmful matter. They will be installed according to the implementation drawings. They will not be moved during concreting.

Steel stands, made of steel, mortar or any other matter must be rigid and stable before and during concreting. Folding and unfolding high bond steel in stock is forbidden.

Semi-hard and hard steel, deformed bars or cold worked steel will always be bent using a mandrel of the appropriate diameter, described in the table below, for semi-hard and hard steel:

Nominal diameter of the bars [mm]		5	6	8	10	12	14	16	20	15
Minimum diameter of the mandrels [mm]	Pins and frames	25	30	40	60	80	No bending			
	Anchorage	50	60	80	100	120	140	160	200	
	Elbows				140	170	200	250	320	400

The lengths of restraint and overlap length stated on the plans will be strictly respected. Welding two crossing or following reinforcement parts is only allowed if the weld does not decrease the mechanical characteristics of the steel.

Undefined distance between reinforcement steel and the closest casing wall is 5 cm for walls in contact with water or in corrosive condition; it is 3 cm in other cases.

Reinforcement steel will be submitted for approval before concreting.

8.8 Concrete composition and strength

The following concretes will be used:

Type	Designation	Concrete proportioning PCA 325	Strength after 7 days	Strength after 28 days
B1	Neatness concrete	150 kg/m ³	--	--
B2	Filler concrete	250 kg/m ³	110 kg/cm ²	180 kg/cm ²
B3	Reinforced concrete	350 kg/m ³	200 kg/cm ²	270 kg/cm ²
B4	Watertight reinforced concrete	400 kg/m ³	220 kg/cm ²	300 kg/cm ²

Thirty days before first concreting, the contractor will submit a study of the concretes regarding proportions and strengths to the engineer for approval.

The study will state the volume proportion to make the concrete on the work site. Should there be additives, they will be submitted to the engineer for approval.

Gravels for B1 and B2 will be of classes 5-8, 8-16 et 16-32. For B3 and B4 concretes different formula will be studied:

- Thickness of the element < 10 cm: gravel of class 5-8,
- Thickness of the element 10-15 cm: gravel of class 5-8 and 8-16,
- Thickness of the element > 15 cm: gravel of class 5-8, 8-16 and 16-32.

8.9 Production and installation of the concretes

8.9.1 Production of the concrete

Concrete will be made mechanically by mixing all its constituents together. It will contain the minimum quantity of water strictly necessary for appropriate concreting and proper compression. To this end the proportion of water put in the mix will be measured using a precise measurer.

The tools must make it possible to measure out the admixture and bonding with a margin of error inferior to 5 %.

Humidity of the admixture will be considered when determining the quantity of water needed for mixing.

The water proportion will be monitored by the contractor at least twice a day and the result, as well as concrete composition, will be stored in the works diary. Any input of water after mixing is forbidden.

The use of additives will be submitted to the engineer for approval, as is the case for the outcome and conditions of concreting.

The concrete will be transported in appropriate conditions that do not lead to the segregation of the elements or to the setting of the concrete before it is installed.

Manual production of the concrete is not allowed barring special written derogation from the engineer. This derogation will be granted for one work at a time and will be justified by the difficulty to take a concrete mixer to the site.

For small work and with the engineer's approval, the contractor may make concrete on site with an adequate engine and a volumetric measurement.

When bagged cement is used, the quantity of admixture for each batch will be proportionate to one or more full bags of cement. No batch with fractions of cement bags will be allowed.

The study will state the volume proportions for mixing with full cement bags and will foresee gauged containers for each fraction of admixture.

Representative samples of each admixture will be taken, and the content of humidity will be determined for each category of admixture, namely for the fraction 0/5 and the proportion of water will be calculated accordingly.

The concretes will be closely mixed in a mixer with approved type and dimension. It will ensure uniform mixing of the materials in the bulk. The mixer will have a device for precise measurement of the water inserted in each batch.

Batching time of all the concretes will not be less than 2 minutes after the introduction of all the ingredients in the mixer, including the water. The first load of material for concrete put in the mixer will contain an excess of cement, sand and water in sufficient quantity so as to cover the inside of the drum without reducing the content of mortar needed for the mix.

8.9.2 Preparation before installing the concretes

While preparing concreting, the inside of the casings will be cleared of any sawdust, chips and any other waste and foreign matter. The casings will be wetted before concreting.

8.9.3 Concretes installation method

While concreting, care will be taken to avoid material segregation and moving the reinforcement bars. The use of chutes, slopes and piping for transportation from the mixer to the casings will only be allowed with written agreement of the engineer. In the event of lower quality concrete due to

such transportation, the engineer may give the instruction to stop their use and implement another satisfying method of concreting.

Chutes and open-air slopes will be made of metal or covered in metal; where rigid slopes are requested; the slopes will be equipped with chicanes or there will be short straights in the opposite way to the movement of gravity of the concretes.

All the chutes, slopes and pipes will be kept clean and free of hardened concrete by flushing them with a batch of water after each concreting operation. The water used for cleaning will be discarded far from the work site.

When the concreting operations consist of spilling the concrete from more than 2 m of height, it will be done using metallic foil piping or other approved piping. Whenever possible the pipes will be kept full of concrete while it is being installed and the bottom end will be drowned in the fresh concrete already in place.

8.9.4 Compaction and vibration of the concretes

All the concretes when being installed and just after installation will be carefully compacted. Barring concretes installed under water or unless a contrary authorisation is granted from the engineer, concretes will be compacted by mechanical vibration according to the following instructions:

- Internal vibration unless special authorization granted from the engineer to use other methods.
- The vibrators will be able to transmit the vibrating motion to the concrete with frequencies that will not be under 4,500 cycles per minute.
- The contractor will provide enough vibrators as to compact effectively each batch immediately after it has been laid in the casings.
- The vibrators will be handled in such way as to get all the reinforcement bars and other parts entirely embedded in concrete. Furthermore, concrete will be in perfect contact with all the angles and corners of the casing.
- The vibration will last for long enough and will be of sufficient intensity to compact the concrete entirely, but it will not be continued until causing segregation. The vibration will not be continued in any place until creating areas of liquid mortar.
- The vibrators will be put in service in places uniformly spaced and separated between them by a distance no larger than twice the effective area of the vibration ray.
- The vibration will be completed with a spading tool if necessary, in order to ensure that the surfaces are smooth and the concrete is dense along the casing walls and in the corners and places impossible to reach with vibrators.

8.9.5 Resumption joints

The rehabilitation joints will be made only on the places represented on the plans unless other instruction by the engineer. If they are not detailed on the plans or in the event of an emergency, the resumption joints will be located according to the engineer's instructions.

Reinforced structures laid on a slope will be used in certain places where necessary in order to transmit shear strength or to link the two sections together.

The surface of the hardened concrete will be cleared of loose gravel parts. It will then be retouched with a hammer and chiselled on a depth of 1 cm and then cleaned with a wire brush in order to get a smooth and rough surface totally cleared of foreign matter.

The joint will be soaked in water for 24 hours before restarting concreting. The first batch of concrete will be made with fine aggregate 0/8.

8.9.6 Works interruption

When concreting is interrupted temporarily, the concrete, after it is firm enough, will be considered as if there was resumption joint. The steel structures and casings will be cleaned and freed of any mortar.

8.9.7 Concretes cleaning

Unless other instruction, the concretes will be cleaned with water. Formworks of vertical elements will be permanently wetted until they are removed, and the fresh concrete will be stripped at the engineer's request until 7 days after concreting.

The contractor may propose another cleaning method that will be submitted to the engineer for approval.

8.9.8 Surface finishing

The finished surfaces will be straight and smooth and will have no "potholes" or other irregularity. Right after removing the formworks all the irregularities will be retouched down to the hard concrete, wire brushed, soaked with water for 24 hours and filled with concrete made with fine aggregate 0/8 or mortar 0/5. The visible surfaces will then be treated with abrasive stone. The surfaces will be uniform and straight, to the engineer's approval.

8.9.9 Leakage tests

After sealing the works (water tanks, manholes ...), they will be progressively filled, and a 48-hour-leakage test will determine that they are properly watertight. The exterior surfaces will remain visible.

After a check has been carried out by the engineer, the authorisation to refill will be given. In the event of leaks or oozing during the tests, the works will be drained, repaired and tested again. The contractor will take care of the water provision and delivery.

8.9.10 Tolerance for concrete works

The dimension tolerances will never exceed 0.5 cm. The holes, cable pipes or embedded elements will be located with a tolerance of 0.5 cm unless otherwise stated on the working drawings.

All the dimensions will be checked for equipment and electrical devices installation before works delivery. The contractor will immediately fix up all the flaws. In the event of dimensions not being respected he will be held responsible for the consequences and possible modifications to be made.

8.9.11 Checks and concretes strength

The concretes will be submitted to strength tests. At least three test specimens will be taken while concreting from each batch chosen by the engineer. Strength tests will be payable by the contractor. Depending on the test result, the demolition of part or all the work made with unsatisfying concrete may be requested. The demolition and rehabilitation of the work will be at the contractor's expense.

8.10 Mortars composition

Depending on its use the mortar will have the following proportions:

- Mortar M 250 : for masonry jointing
 - Cement: 250 kg
 - sand 0,1 - 2 mm: 1 000 l
- Mortar M 300 : for sealing, smooth finish, screed
 - Cement: 300 kg
 - sand 0,1 - 2 mm; 1 000 l

The binder used for mortar will be:

- Blast furnace Portland cement 85 or pozzolanic blast-furnace cement or works in contact with aggressive water,
- Portland cement for works that are not in contact with aggressive water.

8.10.1 Production of mortar

The mortar will be mixed mechanically. Exceptionally and at the engineer's approval the ingredients may be dry mixed on a flat and levelled area made of planks, iron sheets or concrete until the mix is perfectly homogenous. Water will be added progressively. The mix will be ground until the mortar is perfectly homogenous and binds properly. The mortar will be used as soon as it is ready. Any discarded mortar should never be mixed with fresh mortar.

Adding additives to the mortar will require the engineer's approval. The same applies to the choice of product.

8.10.2 Coatings

The surfaces to be coated will be clean, free of dust, product, or form oil. They must be rough so that the coating binds properly. If the surface is not rough enough, it will be improved by wire brushing, stabbing, roughening, etc. The substrate must be wetted in order to be humid inside but wipe in order to be dry on the surface when the coating is being applied.

There are two types of coatings: standard coatings and sealing coatings that are applied to walls in contact with water. The difference between these two types is the addition of a waterproofing agent.

The coatings are made of three layers:

1. The first layer, the base coat ensures proper binding. It consists of applying with a trowel a thin layer of rather coarse mortar. It will be left rough without paying attention to flatness.
2. The second layer, the core coat, has the following purposes:
 - Create a flat surface parallel to the end finish,
 - Give uniform absorption properties to the binding surface; this condition that is necessary in order to get uniform colour and prevent the underlying masonry joints from reappearing implies a thickness of 15 mm,
 - Ensure water tightness of the coating by adding a waterproofing agent (only applicable to sealing coatings). Mortar will be very densely compacted and applied in two or more layers depending on thickness, leaving enough time between layers to decrease the effect of shrinkage.
 - The core coat is laid when the base coat has partly shrunk.
3. The third layer or « finish coat » gives the final aspect to the surface. It must be free of cracks. When a uniform colour is not particularly sought after, this layer will be laid 2 to 8 days after the core coat, and 8 to 15 days when colour uniformity is important. Its thickness will range from 5 to 7 mm.

The different layers or coating will be as follows:

- 1st layer (base coat) of mortar M 300
- 2nd layer (core coat) of mortar M 400
- 3rd layer (finish) of mortar M 600

The accepted tolerances will be:

- Flatness < 1 mm under a 1 m hawk and no more than 3 mm under a 3 m hawk.
- Uprightness < 3 mm over 3m of height.

8.10.3 Standard screed

The screed covering the floor concrete, flooring, landings etc. will be made of a layer of at least 2 cm of mortar M 400 compacted and smoothed many times in order to avoid hairline cracks.

If needed, the roughening will be done when the mortar is starting to set. The built-in screeds will be laid at the moment of concreting the substrate and will be vibrated or installed in any way that ensures such compactness that laitance comes out; it will then be surfaced with a ruler or a hawk.

8.11 Paints

The contractor will submit the source of the paints, the way they must be laid and their characteristics to the control office. The colours will be set by the engineer.

8.11.1 Paint on concrete and coatings

On this type of support a resin-based paint formulation in accordance with ISO international standards will be applied inside and outside, with fungicide additive.

Surfaces previously finished or coated will be brushed or flushed clean and free of dust or any deposit.

Paint will be applied on a substrate that has been drying for at least 15 days; it will be of the prescribed shade and will be applied in two layers.

8.11.2 Paint on ferrous metal

If the metal shows signs of oxidation, the raw oxide parts will be scratched and cleaned with a wire brush in order to remove any trace of rust.

All the metallic parts (metal millwork, checker plates, gates, etc.) will receive two coats of lead paint, one of which will be put in factory and two layers of gloss glycerophthalic paint.

Faces in contact with metallic parts will be painted with one-layer-minimum before assembly.

Metallic parts in contact with water will be treated with paint that is non-toxic harmless for the food chain.

8.11.3 Bituminous coating

Parts in contact with the ground will be covered in bituminous coating and 10 cm higher. This coating will be applied with a brush on clean and masonry. Refilling will only take place after the coating is completely dry and hard.

8.12 Prefabricated parts

The contractor may prefabricate all the concrete or reinforced concrete parts involved in the works. She/he will nonetheless submit to the engineer for approval, the working drawings with all the precise characteristics of elements that are frequently used and whose characteristics are very close to those requested for the works. She/he will also submit to the engineer their production and implementation method.

8.13 Mortared stonework

Mortared stonework will be sourced from the best quarries or ore beds. They will be made of stones regular in shape and with dimensions between 20 and 30 cm.

They will be laid on a 10cm thick bed of fine concrete 0/8 with a batching of 300 kg/m³ so that the fine concrete fills in the joints. The final jointing will be done with mortar.

8.14 Protection gabions

Gabions will have a mesh of around 100 mm, in galvanized wires of 3 mm. The stones will be sourced from the best quarries or ore beds and will have dimensions between 20 and 30 cm. They will be placed as instructed by the engineer.

8.15 Riprap

Riprap will be sourced from the best quarries or ore beds. They will be made of stones of at least 50 kg and will be larger than 30 cm.

8.16 Protective shafts

At each difficult location (road, river, swamp ...) where it is foreseen to lay HDPE pipes, protections will be needed, either:

- Replacing HDPE pipes with cast iron pipes of the equivalent diameter on the necessary length (2 m at each side of roads, 4 m for rivers and swamps);
- Passing the HDPE pipes in galvanized steel pipes (same lengths as above). The galvanized steel pipes will be assembled with threaded couplings.

For river or swamp crossing the shafts will be firmly anchored in stone masonry structures when they cross in open air. Otherwise, they must be buried 1 m deep.

Laying the shafts must not hamper traffic in any way. This operation and the provision of the shafts will be included in the item "miscellaneous" of the bill of quantities.

The pipes will be attached to the bridges by steel collars anchored to a main beam of the work, at a rate of one fixing per meter. Fixing will be done by rot resistant ankles. The collars will have a minimal thickness of 3 mm and will be closed and tightened by bolting. A rubber part 5 mm thickness at least will be posed between the pipe or the shaft and the collar.

8.17 Trapdoors

Access hatches will be made of steel and installed at every concrete or masonry reservoir, manhole and tank. They will all be painted with 3 layers, including one anti-rust coat. They will be anchored in such way as to ensure that the catch is firmly attached to the work. Closing is ensured by a simple system that will involve no lock or padlock.

The hatches are equipped with a venting system made of a 2" steel tube covered with a protection cone on top of it. It is closed by a rot-proof screen gauze.

Three keys opening the catches will be handed in for each network to the control office. The catches to be provided by the contractor are described in the standard plans.

The trap door used for masonry tanks will be equipped with legs in order to be attached to the ladder.

9. *Miscellaneous works*

9.1 Supplies and others

This contract also includes the provision and installation by the contractor of the following equipment:

- Collars: steel collars are used to improve the stability of aboveground penstocks around masonry works. The collars are embedded in masonry. Their dimensions vary and depend on the diameter of the pipes (1", 1½", 2", 3" and 4").
- Steel rungs: the rungs are made of steel (concrete steel 20 mm). They are located in manholes and allow access to the works. Their shape and number are described in the standard plans. They are protected with a layer of non-toxic anti rust paint.
- A metallic ladder made of angle iron and round bars of galvanized steel will be installed in masonry tanks ($V \geq 25 \text{ m}^3$). It will be laid on the bottom of the reservoir using a weight

distribution shoe plate and will be bolted to the catch via retaining brackets installed to this end.

(i) Equipment quality

All the materials, supplies and miscellaneous accessories provided by the contractor will be brand new and of high-grade quality, professionally produced and will apply with the latest technical progress in order to propose, in terms of industrial concern, the best of possible safety and running services.

Equipment will be proportioned so that their high safety factor will be guaranteed in all respects. They will apply with the specifications given by the provider. Moreover, the project manager will have to give his consent when choosing any equipment. They must apply with working conditions while bearing the changing of load, pressure, temperature as well as climate variations and changing in the quality of the liquid to be carried. In working order, the material will not show neither any sign of unusual wear nor unusual overheating.

Equipment must be high-class ones; the project manager reserves the right to refuse any inadequate material and to impose, in particular cases and in the aim of standardisation, the equipment of a particular brand and type.

The running will be as quiet as possible and there will be no vibrations. The elements that could be prone to wear will be equipped with wear parts easily removable.

The equipment will be protected against oxidation and humidity: windings will be vacuum-impregnated, bolts and clamping screws will be either stainless or protected by galvanising, cadmium plating or other equivalent process.

The material will be set up to support, without damage and in the worst conditions, the electrodynamic efforts due to short-circuit. The insulation voltage will be sufficient enough to avoid any risk of sparkover or court-circuit in the worst conditions.

The operating safety will be totally guaranteed in the limits of voltage variations of the continuous and alternative accessories, the extreme limits being permanently supported without harmful overheating. The operating safety will also have to be guaranteed under any ambient temperature likely to occur, and the contractor will have to make arrangements accordingly.

The contractor will take the suitable precautions and arrangements in order to avoid condensation, water and dust entering the material and its accessories.

Bolts and screws will not be able, under no circumstances, to loosen at an untimely moment in running order. Connections will be made so as to avoid any galvanic couple effect between different materials.

(ii) Storage and monitoring

The material will be stored in easily accessible areas, well-equipped, delimited and identified accordingly. The contractor will make sure the different equipment is neatly categorised so that the identification will be easier and any mix-up in the identity will be avoided.

The contractor is fully responsible for the monitoring.

9.2. water quality assurance plan

The water Quality testing should be done by the contractor at each new water source before construction to ensure that water will not have negative effect on human health as well as on pipe material, to be on safe side, it is recommended that per each sample three tests be carried out and the mean of them will be taken as the result of the sample. The recommended elements to be tested are: PH, Turbidity, Temperature, Total Coliforms, E. Coli, Faecal Coliform, Hardness, Arsenic, fluoride, Chloride, Nitrate, Electro-conductivity, Total dissolved solids (TDS), Iron, Phosphates, Copper, Manganese, Aluminium, Ammonia nitrogen. The contractor should perform water quality testing before and after completion of the works.

SECTION V : SPECIAL TECHNICAL SPECIFICATIONS

B Introduction

Water supply system is planned to be rehabilitated in **Ruhango** District as detailed in the related bill of quantities attached.

1 Site Installation and withdrawal

1.1 Access

The contractor prepares all access path and roads to the site at his expense.

1.2 Local office

A local office shall be established by the contractor and shall be placed in a place agreed upon by the client. The shape and materials in the office shall be approved by the engineer, this office shall provide good working environment as all documents relating to the present tender and reports on the progress of work on the site shall be consulted from here by the client, besides this site meetings shall be held here.

1.3 Shelter for workers, toilets and site shed

The contractor shall construct an appropriate shelter that can be closed and locked; it shall be made of materials accepted by the engineer. This shelter shall not be used as a store of materials it shall be used by the workers as a resting shelter and must be supplied with temporary sanitary equipment. All shall be done to keep to the local hygienic standards. All workers will be required to utilize this sanitary equipment for their needs.

Areas for storage of material shall be well prepared in order to avoid their contact with unwanted materials.

1.4. Site sign board

The contractor shall put in place a site sign board of the following dimensions (base width = 1.2 m; height = 2.0 m) having the approved text by the client.

2. Catchments' works

2.1 Catchments' works preparation

Surface prospecting will determine a discharge point or area. The catchment's works in themselves will start with an excavating down to the level of the spring in the aquifer. This phase will make it possible to decide where to locate the drains, the flow-control overflow systems.

Catchment's works preparation will include:

- Hanging side level and thickness survey. This will preferably be done digging wells in the slope upstream the discharge point. These wells will show the nature of the surface ground and of the aquifer and also the level and thickness of the latter.
- As far as possible the wells will reach the lower confining bed.

- Site survey may be done by trenches, but it has the downside of draining the aquifer and modifying its behaviour before the water is caught.
The elevation number of the discharge at the moment of the lowest water level will be determined as accurately as possible.

2.2 Catchment's devices

To prevent the risk of exhausting the water reserve and dry up a reservoir that might be limited, care must be taken not to catch more than what the aquifer can naturally provide. To this end, the yield must be set according to the gauged flow measured before starting to catch the water.

As of principle, water must be caught at a sufficient depth under the level of the aquifer and at least 1.00 m under the lowest water level. Furthermore, a pressure in the drains higher than the natural pressure existing in the ground before catchments' will not be acceptable. Indeed, lateral or even vertical leaks might appear and there would be a risk of the spring going out of control.

Care will be taken that the level of water in the envelope treatment (made of rounded river gravel), above the catchments' drains is always lower than the level of the aquifer before catchment. This level will be set in such way that the yield in low water period never exceeds the natural flow of the aquifer. An overflow will be installed at the level of the tank in order to evacuate the exceeding flow during high water toward the river downstream.

In the event of successive aquifers stemming from pervious rocks superimposed on less pervious rocks, care will also be taken not to put the aquifer under pressure downwards as it would force the ground water through the underlying rocks. Each aquifer will be caught separately using a system of gravity-fed drains where the water flows without any dam. The water will flow through a water flow collector. It will collect all the successive discharge areas and lead the water to the main tank of the network.

Some isolated emergence points coming out of the rock will simply be concreted in order to avoid infiltration of surface water in the spring. The water will be gravity-led, without pressurizing the spring site, using a free-flow collector, until the main tank or departure tank of the network.

For any intervention of the catchment area, the contractor will refer to the instructions given by the engineer according to each case.

2.3 Technical characteristics of the drains

Drains will be made of non-toxic HDPE pipes PN 10, splinted lengthwise and screened with cross slits of 0.5 or 1 mm. The total opening percentage of the drains compared to the surface of the drains will be at least 6% for 0.5 slits and 10 % for 1 mm slits. The drains will be round, with no gutter and the slits will be spread all around the drains.

The size of the slit will be relative to the nature of the aquifer. By definition its exact nature is only known when the trench or the discharge points are opened. In view of the yield and the diameter

chosen for the drains, 0.5 slits will be the default measure. 1 mm slits will be used for rocky aquifers or exceptional cases of important flows.

2.4 Installation of the drain

Between the aquifer and the drain, filtrating gravel calibrated on the slit of the screen and the grain-size distribution of the ground.

The characteristics of the filtrating gravel change depending on the grain-size distribution of the sand in the string, as described in the table below:

Screen slot Filtrating gravel	0,5 mm Very thin sand	1,0 mm Medium sand
0,25 to 0,5 mm	10%	
0,5 to 1,0 mm	40%	10%
1,0 to 2,0 mm	40%	45%
2,0 to 5,0 mm	10%	45%

Rounded river gravel (never crushed gravel) will be used to make the envelope treatment. The “filtrating” gravel will be made out of the screened sands (0.25 to 0.5 mm), (0.5 mm to 1.00 mm) and (1.00 mm to 2.00 mm) and gravels (2.00 to 5.00 mm)

The drainage trench will be at least 1.2 m deep under the aquifer at the low water period. They must not be more than 0.70 m wide. The bottom of the drain will lie at least 1.4 m under the top of the aquifer at the low water period on a bed of 0.10 m filtrating gravel, or directly on the top of the lower confined bed, if there is one.

The sheet of polyethylene will be carefully laid on top of the gravels. It will be 150 micrometer thick and will be directly covered in clay. The latter will be pure, quality, free of any organic matter and it contain water in such quantity as to be plastic enough to be laid in thin layers of 25 to 50 mm on the downstream wall of the drainage trench and in layers 100 mm thick on top of the plastic sheet. Clay to be approved by the engineer.

For any intervention regarding the installation of the drains and envelope treatment, the contractor will refer to the instructions given by the engineer according to each case.

2.5 Catchment protection

For single tanks, the protection of the works will be ensured by a concrete slab. For drains, the catchment will be protected with a plastic film and backfill made of compacted clay up to the area where the aquifer is protected by soil more than 3 m thick. The area will be fenced immediately around the catchment area by barbed wire doubled with a hedge.

The fence will be made of wood posts treated against pest, laid every 3 m, pitched in the ground 40 cm deep and 1.25m high above the ground. Three parallel barbed wires will be tightened between the posts at around 35, 70 and 1.05 m above the ground. Furthermore, barbed wire will be tightened diagonally between the top and the bottom of the posts in order to improve their stability and protection against intrusions. The angle posts will be strengthened with braces.

The fence will be doubled with a euphorbia hedge or any other plant better suited. The hedge will be planted under the fence with 10 seedlings per meter of fence. The site will be closed with a 80 cm wide gate made of an extended wire net, tightened on a metallic frame that is attached, articulated and closed on two metal posts fixed to the ground via a concrete base. The gate will be equipped with a latch making it possible to install a padlock. All the metallic parts will be treated against rust and covered with an enamel layer whose colour will be decided by the project.

Beyond this zone, the protection to be implemented depends on appropriate soil or tree cover.

Should the surface water head toward the catchment's system, it will be diverted using shallow trapezoidal ditches covered in grass and in strong slope or using masonry gutters down the downstream the catchments.

For any intervention regarding installation of the fences and protections, the contractor will refer to the instructions given by the engineer, according to each case.

Clearing the site and removing the stumps consist in cutting the trees, shrubs and groves, eliminating any cultivation, removing stumps and disposing of the plant debris away from the site.

The surface which will have been altered and cleared during the works will be covered with short-rooted plants of the type PASTORIS after the completion of the works. Plantation will be done by staking out 100 plants per square meter. This plant cover will help protect the surface against erosion without damaging the catchments.

A sketch of these works is to be found in the standard plans

2.6 Clearing the site

- Start from the tanks and dig trenches in order to follow the pipes up to the catchment's (drain, envelope treatment, etc.),
- Carry out the works during the dry season in order to avoid or reduce the risk of landslide,
- Most of the discharge points are located at the junction between the valley slopes and the bottom of the valley,
- Existing catchments may have identifiable leaks. It may be considered to start from those leaks and follow the water up to the discharge point,
- It may be easier to locate the discharge points with the help of the local population (farmers or other people in charge of the Public taps), who may have witnessed the previous works,
- Embankments may be very large,
- The bottom of the excavation where the draining trench will be installed must be in the water-bearing deposit. The land must then be cleared down to that point,

2.7 Filtrating gravel

- Production of filtrating gravel (via successive screening of rounded river gravel) is a crucial step. Ideally the company should start producing this gravel long before clearing the discharge points. The gravels must be cleaned before it is laid.
- Each fraction of the gravel must be prepared individually. The mix of the various fractions is made afterwards according to the nature of the soil and the cross slits (refer to table in the SPR of the tender book). The ready-made mix is stored in bags that will later be taken to the catchment's site according to the needs,

- After it has been installed, the filtrating gravel is sanitized with a hypochlorite solution. When sodium hypochlorite is being used, the disinfecting water must contain 30 g of chlorine for 1m³ of water.

3. Tanks

3.1 Tanks of 10 m³ and 15 m³

Tanks of 5 m³ will be made of a 50 cm-thick circle wall of stone masonry, based on a reinforced concrete slab with circumferential RC beam. The work will be closed by a slab of reinforced concrete slab equipped with one inspection hatch. The equipment of these tanks will be made of 1" galvanized steel. The hatch will be locked with a padlock.

The interior of the work will be accessed via a removable aluminium ladder that will be provided with the service building. A #1.00 m manhole will contain the inlet and outlet valves as well as a limiting device of pressure intended to protect the fragile equipment such as the float valve and the flow control valve.

4. Manholes

Three types of manholes will be used depending on the size of the equipment to be protected. They are made of stone or baked brick masonry. The exterior face will be parged; the interior will be left quarry-faced. The parts that are buried in the ground will be protected with a bituminous coating. Bleeding manholes for will be equipped with an outlet block.

The dimensions refer to the interior dimensions of the works

4.1 Manhole # 1.50 m

This square manhole will have sides of 1.5 m and will be 1.5 m deep. Its equipment will be laid on pipes no smaller than ED 63: valves, outlet, vents, meters, etc.

A concrete base will be foreseen for the installation of heavy equipment, anchorages will be added if necessary. The manhole is equipped with rungs made of 20 mm concrete reinforcing bars embedded in the wall.

4.2 Manhole # 1.00 m

This square manhole will have sides of 1.00 m and will be 1.25 m deep. Its equipment will be laid on pipes of ED 32 and ED 50: valves, outlet, vents, meters, etc.

A concrete base will be foreseen for the installation of heavy equipment, anchorages will be added if necessary. The manhole is equipped with rungs made of 20 mm concrete reinforcing bars embedded in the wall.

4.3 Manhole # 0.50 m

This small square manhole will have sides of 1.50 m and will be 0.5 m deep. It will contain the equipment for House connections. The cut-off valve will be located outside this manhole, in a valve box. The equipment in this manhole (meter, isolation valve and filter) will be laid diagonally under the catch in order to be accessible.

5. Chambers

Chambers are watertight manholes which contain water. They are made of rubble or baked bricks masonry. The outer faces are repointed, and the inner faces are covered in a 3-cm thick waterproofing agent.

The parts that are buried in the ground will be protected with a bituminous coating. Each chamber is completed by a "discharge nozzle" (000/PT/12) where all the outlet and overflow pipes end. The end of the outlet is sealed with a plain plate mounted on a flange. The dimensions refer to the interior dimensions of the works.

5.1 Departure or surge chamber (1 inlet)

The surge chamber is a cube of 1.00 m sides. It collects water from one single pipe. It has only one access trap. Considering how little deep it is, no rungs are foreseen.

This chamber only feeds one outlet.

The standard equipment is made of DN 60 cast iron.

In case of specific equipment, the chamber is considered as "unequipped" and the equipment is taken separately.

5.2 Departure chamber or collection chamber (2 inlets)

The surge chamber is a cube of 1.00 m sides. It collects water from two pipes. It has only one access trap. Considering how little deep it is, no rungs are foreseen.

This chamber only feeds one outlet. The standard equipment is made of DN 60 cast iron.

In case of specific equipment, the chamber is considered as "unequipped" and the equipment is taken separately.

5.3 Departure chamber or collection chamber with 2 inlets and pH correction

The departure chamber is rectangular (2.00 m X 1.00 m X 1.00 m deep). It is split in two equal parts by a wall. The two parts are linked by drains in order to ensure appropriate water circulation. The tanks are filled with dolomite gravel (5 to 10 mm).

The aim of this rehabilitation is collecting water from catchments. When put in contact with dolomite, the water is neutralized to acceptable pH value (no less than 6.5). The chamber is equipped with two access catches. Considering how little deep it is, no rungs are foreseen.

This chamber only feeds one outlet.

The equipment laid is made of DN 60 cast iron.

5.4 Distribution chamber

The surge chamber is a cube of 1.00 m sides. Its aim is to receive water from one single pipe. It has only one access trap. Considering how little deep it is, no rungs are foreseen.

This chamber feeds two outlets. The equipment is made of DN 60 cast iron.

This chamber can split water into two parts of the network.

Should that be the case, separation walls will be built inside the tank and a special splitting device is foreseen according to the type of split that is needed.

6.1 Public tap stand with 2 taps

The basic public tap stand will be equipped with one or two taps depending on circumstances. It is equipped with a water meter and a pressure reducing valve if necessary. The body is made of bricks masonry. The hydraulic equipment is located in the cavity, which is padlocked.

The base is a Telford type base made of stones equalized with lean concrete and covered in a waterproof coating. The valve box allowing access to the cut-off valve is embedded in it. A sump filled with rocks aims at collecting the lost water and rainwater collected by the waterproof surface. This device prevents the formation of puddles or slough making the site unhealthy. In primary schools and health centres, such a public tap stand will be built but without a water meter.

SECTION VI: DRAWINGS

All drawings will be obtained from a separate link.

SECTION VII: BILL OF QUANTITIES

BILLS OF QUANTITIES IN FIGURES

Bills of quantities in a protected excel sheet will be obtained from a separate link

General Conditions and content of the unit prices

The entrepreneur is reputed to have a perfect knowledge of all vassalages imposed for the execution of works and all local conditions susceptible to influence on this execution, among others:

- Of the nature and the quality of soils and lands,
- Of the conditions of transportation and access to the building sites,
- Of the régime of waters and rains in the region,
- Of the possibilities of food in waters and electricity of the building site,
- Of the relative particular conditions to the present Building site.

He/she won't be able to raise any complaint having for basis of the difficulties or unforeseen vassalages, with the exception of the case of absolute necessity.

The unit prices of the present works consist of the entrepreneur's expenses without exception in order to achieve the totality of works foreseen to the present contract, the profit as well as the rights, taxes and various expenses (except the rights and taxes that, according to arrangements of the Convention of Lomé, must not be supported by the entrepreneur), general expenses, incidentals, and broadly speaking, all expenses, to Rwanda, that results from works and notably;

All expenses of main-d'œuvre (wage, overheads holidays etc.) supplies, renting, amortization, working and maintenance of the material, the expenses for the edible matters bought to Rwanda or abroad, tooling, installation of Building site and careers, insurances of all nature, general expenses, tax and profits, incidentals of all natures, all vassalages of planning and maintenance of the temporary tracks for deviations, access to the characters, loans and points of water, all expenses of laboratory and secondary prospecting, all supplies of water, the logistical support provided to the control, the preparation of areas of storage of materials, all vassalages dragged by the maintenance of the circulation during the execution of works,.

The prices also consist of all services out of Rwanda as freight, aerial, maritime transportation, by road etc.

The prices also consist of the expenses of various studies of establishment, working and fold of the building site, all expenses dragged by the obtaining of the supplementary lands which enterprise could have need for his/her/its bases except free discount possibility by the administration.

The prices consist then of all royalties or renting, all expenses of control necessary to the receipt of works, of accidental damages to the cultures, of access, extraction of the materials, purification with regard to the lodgings etc.

In a general manner, all expenses imposed to the entrepreneur for the correct execution of works, that are explicitly or non-foreseen in the section of technical prescriptions, are to his expenses and the entrepreneur is perfectly reputed to know them for himself in to be given personally account on the land before bidding.

Broadly speaking, the prices consist of all expenses resulting from the included or quoted documents in the pieces written, administrative and technical sections of the present bidding

document for the execution of all works foreseen to the Project, based on the economic and fiscal conditions in force to the month preceding the notification of the offers.

The prices also consist of the installation and the working of the entrepreneur's facilities as well as the stake at the disposal of the Mission of supervision and control, of the offices and the laboratory for material, the prices consist of the transportation, the harbour expenses, brought it until the places of intervention as well as repatriation at the end of Building site and all vassalages. In a general manner, the unit prices consist of the cost of the materials of setting in work, the transportation of type until the building site, the handover of work and other inherent expenses to the realization of the work.

SECTION VIII: FORMS OF BID, QUALIFICATION INFORMATION

Contractor's bid

1. Proposal Submission Form

[*Location, Date*]

To: [*Name and address of the Procuring Entity*]

Ladies/Gentlemen:

We, the undersigned, offer to provide the construction of ...WSS in accordance with your Request for Proposal dated [*Date*] and our Proposal. We are hereby submitting our Proposal, which includes this Technical Proposal, and a Financial¹ Proposal attached here.

Our financial offer is equal to**Rwandan Francs**"

If negotiations are held during the period of validity of the Proposal, i.e., before [*Date*] we undertake to negotiate based on the proposed staff. Our Proposal is binding upon us and subject to the modifications resulting from contract negotiations.

We understand you are not bound to accept any Proposal you receive.

We remain,

Yours sincerely,

Name and Title of Signatory:

Name of bidder:

Address:

¹ In Quality-Based Selection, the proposal may include only a Technical Proposal. If this is the case, delete: "and a Financial Proposal sealed under a separate envelope."

2. Bidder's references

Relevant Services Carried Out in the Last Five Years that Best Illustrate Qualifications

Using the format below, provide information on each assignment for which your consultant/entity, either individually as a corporate entity or as one of the major companies within an association, was legally contracted.

#	Project Name	contract amount	Start Date (Month/Year): Completion Date (Month/Year	Name of the Procuring Entity:
1				
2				
3				

Consultant's Name and legal status:

Authorized Signature:

3. Team Composition and Task Assignments

Professional Staff				
Name of Staff	Consultant	Area of Expertise	Position Assigned	Task Assigned

4. Curriculum Vitae (CV) for Proposed Professional Staff (this format is not required but the information should be provided)

1. Proposed Position [*only one candidate shall be nominated for each position*]:

2. Name of Consultant [*Insert name of Consultant proposing the staff*]:

3. Name of Staff [*Insert full name*]:

4. Date of Birth: _____ **Nationality:** _____

5. Education [*Indicate college/university and other specialized education of staff member, giving names of institutions, degrees obtained, and dates of obtainment*]:

6. Membership of Professional Associations:

7. Other Training [*Indicate significant training since degrees under 5 - Education were obtained*]:

8. Countries of Work Experience: [*List countries where staff has worked in the last ten years*]:

9. Languages [*For each language indicate proficiency: good, fair, or poor in speaking, reading, and writing*]:

10. Employment Record [*Starting with present position, list in reverse order every employment held by staff member since graduation, giving for each employment (see format here below): dates of employment, name of employing organization, positions held.*]:

From [Year]: _____ To [Year]: _____

Employer: _____

Positions held: _____

<p>11. Detailed Tasks Assigned</p> <p><i>[List all tasks to be performed under this assignment]</i></p>	<p>12. Work Undertaken that Best Illustrates Capability to Handle the Tasks Assigned</p> <p><i>[Among the assignments in which the staff has been involved, indicate the following information for those assignments that best illustrate staff capability to handle the tasks listed under point 11.]</i></p> <p>Name of assignment or project:</p> <p>Year:</p> <p>Location:</p> <p>Client:</p> <p>Main project features:</p> <p>Positions held:</p> <p>Activities performed:</p>
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13. Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes myself, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.

_____ Date: _____
[Name and Signature of staff member or authorized representative of the staff]

a. Activity (Work) Schedule

	<i>[1st, 2nd, etc. are months from the start of assignment.]</i>												
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10 ^t h	11 ^t h	12 th	
Activity (Work)													

b. Form of Performance Guarantee

Bank or any other financial institution

Performance Bank Guarantee (Unconditional)

[The bank providing the Guarantee shall fill in this form in accordance with the instructions indicated in brackets, if the Procuring Entity requires this type of security.]

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

Beneficiary: [insert name and address of Procuring Entity]

Date: [insert date]

PERFORMANCE GUARANTEE N°: [insert Performance Guarantee number]

We have been informed that [insert name of contractor] (hereinafter called "the contractor") has entered into contract N° [Insert reference number of the contract] dated 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]), 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.

This guarantee shall expire no later than thirty days from the date of issuance of the Taking-Over Certificate, calculated based on a copy of such Certificate which shall be provided to us, or on the [insert number day of [insert month], [insert year], whichever occurs first. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

Date:

Name:

Address:

Position:

Signature:

Seal:

NOTE:

- bidders are required to submit Administrative, technical proposals documents and Financial offer
- bids shall be laid out in order or formats as per BDS. bids not laid out in the required formats will be disqualified.
- Water For People reserves the right to accept or reject any bid and is not bound to give reasons for its decision.
- Blacklisted companies by government of Rwanda & Water For People Rwanda will be disqualified.
- Water For People and USAID Standard Terms and General Conditions shall apply (encl.)
- The selected firm will be contractually required to comply with Water For People's Vendor Code of Conduct <https://www.waterforpeople.org> Vendor-Code-of-Conduct and will be required to deliver a Conflict-of-Interest Certificate prior to execution of the contract. The Conflict-of-Interest Certificate requires the disclosure of any potential or actual conflicts of interest with Water For People employees or their relatives including past, current or proposed business transactions, employment or offers of employment, or certain gifts or entertainment. Water For People will evaluate any disclosures of conflicts of interest; if Water For People determines it cannot waive or mitigate the conflict of interest it will result in the disqualification of the selected proposer.

a. Exhibit C – USAID Standard Provisions for non-U.S. contractors

contractor shall comply with the standard USAID requirements specified in this Appendix. The term “contractor” shall also mean “Recipient”, “Organization” or “Grantee” and the term “Agreement” shall also mean “contract”, “Award” or “Grant” for the purposes of these requirements.

The contractor’s obligations are to Water For People. As such in all instances of notification, submission of documentation, and the requesting of approvals and disclosures as required in the provisions below, the contractor’s obligations are to Water For People and not to USAID. The contractor will communicate with the individual identified in the section 6. Communication and Cooperation of the contract. This is applicable to all instances that reference USAID in the Provisions below except Standard Provision M.28, Mandatory Disclosures, which requires disclosures to be submitted to both Water For People and USAID.

M12. DEBARMENT AND SUSPENSION (JUNE 2012)

a. The recipient must not transact or conduct business under this award with any individual or entity that has an active exclusion on the System for Award Management (SAM) (www.sam.gov) unless prior approval is received from the Agreement Officer. The list contains those individuals and entities that the U.S. Government has suspended or debarred based on misconduct or a determination by the U.S. Government that the person or entity cannot be trusted to safeguard U.S. Government funds. Suspended or debarred entities or individuals are excluded from receiving any new work or any additional U.S. Government funding for the duration of the exclusion period. If the recipient has any questions about listings in the system, these must be directed to the Agreement Officer.

b. The recipient must comply with Subpart C of 2 CFR Section 180, as supplemented by 2 CFR 780. USAID may disallow costs, annul or terminate the transaction, debar or suspend the recipient, or take other remedies as appropriate, if the recipient violates this provision. Although doing so is not automatic, USAID may terminate this award if a recipient or any of its principals meet any of the conditions listed in paragraph c. below. If such a situation arises, USAID will consider the totality of circumstances—including the recipient’s response to the situation and any additional information submitted—when USAID determines its response.

c. The recipient must notify the Agreement Officer immediately upon learning that it or any of its principals, at any time prior to or during the duration of this award:

- (1) Are presently excluded or disqualified from doing business with any U.S. Government entity;

(2) Have been convicted or found liable within the preceding three years for committing any offense indicating a lack of business integrity or business honesty such as fraud, embezzlement, theft, forgery, bribery or lying;

(3) Are presently indicted for or otherwise criminally or civilly charged by any governmental entity for any of the offenses enumerated in paragraph c.(2); or (4) Have had one or more U.S.-funded agreements terminated for cause or default within the preceding three years.

d. Principal means—

(1) An officer, director, owner, partner, principal investigator, or other person within a participant with management or supervisory responsibilities related to a covered transaction; or

(2) A consultant or other person, whether or not employed by the participant or paid with Federal funds, who—

(i) Is in a position to handle Federal funds;

(ii) Is in a position to influence or control the use of those funds; or,

(iii) Occupies a technical or professional position capable of substantially influencing the development or outcome of an activity required to perform the covered transaction.

e. The recipient must include this provision in its entirety except for paragraphs c.(2)-(4) in any subawards or contracts entered into under this award.

[END OF PROVISION]

M14. PREVENTING TRANSACTIONS WITH, OR THE PROVISION OF RESOURCES OR SUPPORT TO, SANCTIONED GROUPS AND INDIVIDUALS (MAY 2020)

a. In carrying out activities under this award, except as authorized by a license issued by the Office of Foreign Assets Control (OFAC) of the U.S. Department of Treasury, the recipient will not engage in transactions with, or provide resources or support to, any individual or entity that is subject to sanctions administered by OFAC or the United Nations (UN), including any individual or entity that is included on the Specially Designated Nationals and Blocked Persons List maintained by OFAC (<https://www.treasury.gov/resource-center/sanctions/SDN-List/Pages/default.aspx>) or on the UN Security Council consolidated list (<https://www.un.org/securitycouncil/content/un-sc-consolidated-list>).

b. Any violation of the above will be grounds for unilateral termination of the agreement by USAID.

c. The Recipient must include this provision in all subawards and contracts issued under this award.

[END OF PROVISION]

M17. EQUAL PARTICIPATION BY FAITH-BASED ORGANIZATIONS (JUNE 2016)

a. Faith-Based Organizations Encouraged

Faith-based organizations are eligible, on the same basis as any other organization, to participate in any USAID program for which they are otherwise eligible. Neither USAID nor entities that make and administer subawards of USAID funds shall discriminate for or against an organization on the basis of the organization's religious character or affiliation. Additionally, religious organizations shall not be disqualified from participating in USAID programs because such organizations are motivated or influenced by religious faith to provide social services, or because of their religious character or affiliation.

Decisions about awards of USAID financial assistance must be free from political interference or even the appearance of such interference. Awards must be made on the basis of merit, not the basis of the religious affiliation of an applicant, or lack thereof. A faith-based organization may continue to carry out its mission, including the definition, development, practice, and expression of its religious beliefs, within the limits contained in this provision. For more information, see the [USAID Faith-Based and Community Initiatives Web site](#) and [22 CFR 205.1](#).

b. Explicitly Religious Activities Prohibited.

(1) Explicitly religious activities include activities that involve overt religious content such as worship, religious instruction, prayer, or proselytization.

(2) The recipient must not engage in explicitly religious activities as part of the programs or services directly funded with financial assistance from USAID. If the recipient engages in explicitly religious activities, the activities must be offered separately, in time or location, from any programs or services directly funded by this award, and participation must be voluntary for beneficiaries of the programs or services funded with USAID assistance.

(3) These restrictions apply equally to religious and secular organizations. All organizations that participate in USAID programs, as recipients or subawardees, including religious ones, must carry out eligible activities in accordance with all program requirements and other applicable requirements governing USAID-funded activities.

(4) Notwithstanding the restrictions of b.(1) and (2), a religious organization that participates in USAID-funded programs or services:

(i) May retain its independence and may continue to carry out its mission, including the definition, development, practice, and expression of its religious beliefs, provided that it does not use direct financial assistance from USAID to support or engage in any explicitly religious activities or in any other manner prohibited by law;

(ii) May use space in its facilities, without removing religious art, icons, scriptures, or other religious symbols; and

(iii) May retain its authority over its internal governance, and may retain religious terms in its organization's name, select its board members on a religious basis, and include religious references in its organization's mission statements and other governing documents.

c. Implementation in accordance with the Establishment Clause: Nothing in this provision shall be construed as authorizing the use of USAID funds for activities that are not permitted by Establishment Clause jurisprudence or otherwise by law.

d. Discrimination Based on Religion Prohibited: The recipient must not, in providing services, discriminate against a program beneficiary or potential program beneficiary on the basis of religion or religious belief, refusal to hold a religious belief, or a refusal to attend or participate in a religious practice.

e. A religious organization's exemption from the Federal prohibition on employment discrimination on the basis of religion, set forth in Sec. 702(a) of the Civil Rights Act of 1964, 42 U.S.C. 2000e-1 is not forfeited when the organization receives financial assistance from USAID.

f. The Secretary of State may waive the requirements of this section in whole or in part, on a case-by-case basis, where the Secretary determines that such waiver is necessary to further the national security or foreign policy interests of the United States.

g. This provision must be included in all subawards under this award.

[END OF PROVISION]

M18. NONDISCRIMINATION (JUNE 2012)

No U.S. citizen or legal resident shall be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination on the basis of race, color, national origin, age,

disability, or sex under any program or activity funded by this award when work under the grant is performed in the U.S. or when employees are recruited from the U.S.

Additionally, USAID is committed to achieving and maintaining a diverse and representative workforce and a workplace free of discrimination. Based on law, Executive Order, and Agency policy, USAID prohibits discrimination, including harassment, in its own workplace on the basis of race, color, religion, sex (including pregnancy and gender identity), national origin, disability, age, veteran's status, sexual orientation, genetic information, marital status, parental status, political affiliation, and any other conduct that does not adversely affect the performance of the employee. In addition, the Agency strongly encourages its recipients and their subrecipients and vendors (at all tiers), performing both in the U.S. and overseas, to develop and enforce comprehensive nondiscrimination policies for their workplaces that include protection for all their employees on these expanded bases, subject to applicable law.

[END OF PROVISION]

M20. LIMITING CONSTRUCTION ACTIVITIES (AUGUST 2013)

***APPLICABILITY:** In accordance with the policy at ADS 303.3.30, AOs must include this provision in all solicitations and awards. When no construction activities are contemplated under the award, the AO must insert "Construction is not eligible for reimbursement under this award" in section d) of this provision. If the award permits construction activities based on the policy above (or as authorized by waiver), the AO must insert the description and location(s) of the specific construction activities in section d) of this provision. The AO must not make a general reference to the Program Description. The AO must also ensure that there is a specific line item for construction activities in the award budget.*

LIMITING CONSTRUCTION ACTIVITIES (AUGUST 2013)

- a) Construction is not eligible for reimbursement under this award unless specifically identified in paragraph d) below.
- b) Construction means —construction, alteration, or repair (including dredging and excavation) of buildings, structures, or other real property and includes, without limitation, improvements, renovation, alteration and refurbishment. The term includes, without limitation, roads, power plants, buildings, bridges, water treatment facilities, and vertical structures.
- c) Agreement Officers will not approve any subawards or procurements by recipients for construction activities that are not listed in paragraph d) below. USAID will reimburse allowable costs for only the construction activities listed in this provision not to exceed the amount specified in the construction line item of the award budget. The recipient must receive prior written approval from the AO to transfer funds allotted for construction activities to other cost categories, or vice versa.

d) Description

[*Type of construction and location(s)*]

e) The recipient must include this provision in all subawards and procurements and make vendors providing services under this award and subrecipients aware of the restrictions of this provision.

[END OF PROVISION]

M22. PILOT PROGRAM FOR ENHANCEMENT OF GRANTEE EMPLOYEE WHISTLEBLOWER PROTECTIONS (SEPTEMBER 2014)

The requirement to comply with and inform all employees of the "Pilot Program for Enhancement of contractor Employee Whistleblower Protections" is retroactively effective for all assistance awards and subawards (including subcontracts) issued beginning July 1, 2013.

The Grantee must:

1. Inform its employees working under this award in the predominant native language of the workforce that they are afforded the employee whistleblower rights and protections provided under 41 U.S.C. § 4712; and
2. Include such requirement in any subaward or subcontract made under this award.

41 U.S.C. § 4712 states that an employee of a Grantee may not be discharged, demoted, or otherwise discriminated against as a reprisal for "whistleblowing." In addition, whistleblower protections cannot be waived by any agreement, policy, form, or condition of employment.

Whistleblowing is defined as making a disclosure "that the employee reasonably believes" is evidence of any of the following:

- Gross mismanagement of a Federal contract or grant;
- A gross waste of Federal funds;
- An abuse of authority relating to a Federal contract or grant;
- A substantial and specific danger to public health or safety; or
- A violation of law, rule, or regulation related to a Federal contract or grant (including the competition for, or negotiation of, a contract or grant).

To qualify under the statute, the employee's disclosure must be made to:

- A Member of the U.S. Congress, or a representative of a U.S. Congressional Committee;
- A cognizant U.S. Inspector General;
- The U.S. Government Accountability Office;

-
- A Federal employee responsible for contract or grant oversight or management at the relevant agency;
 - A U.S. court or grand jury; or,
 - A management official or other employee of the Grantee who has the responsibility to investigate, discover, or address misconduct.

[END OF PROVISION]

M24. PROHIBITION ON REQUIRING CERTAIN INTERNAL CONFIDENTIALITY AGREEMENTS OR STATEMENTS (MAY 2017)

(a) Definitions.

“contract” has the meaning given in 2 CFR Part 200.

“contractor” means an entity that receives a contract as defined in 2 CFR Part 200.

“Internal confidentiality agreement or statement” means a confidentiality agreement or any other written statement that the recipient requires any of its employees or subrecipients to sign regarding nondisclosure of recipient information, except that it does not include confidentiality agreements arising out of civil litigation or confidentiality agreements that recipient employees or subrecipients sign at the behest of a Federal agency.

“Subaward” has the meaning given in 2 CFR Part 200.

“Subrecipient” has the meaning given in 2 CFR Part 200.

(b) The recipient must not require its employees, subrecipients, or contractors to sign or comply with internal confidentiality agreements or statements that prohibit or otherwise restrict employees, subrecipients, or contractors from lawfully reporting waste, fraud, or abuse related to the performance of a Federal award to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information (for example, the Agency Office of the Inspector General).

(c) The recipient must notify current employees and subrecipients that prohibitions and restrictions of any preexisting internal confidentiality agreements or statements covered by this provision, to the extent that such prohibitions and restrictions are inconsistent with the prohibitions of this provision, are no longer in effect.

(d) The prohibition in paragraph (b) of this provision does not contravene the requirements applicable to Standard Form 312 (Classified Information Nondisclosure Agreement), Form 4414 (Sensitive Compartmented Information Nondisclosure Agreement), or any other form issued by a Federal department or agency governing the nondisclosure of classified information.

(e) In accordance with section 743 of Division E, Title VII, of the Consolidated and Further Continuing Appropriations Act, 2015, (Pub. L. 113-235), and its successor provisions in subsequent appropriations acts (and as extended in continuing resolutions) use of funds appropriated (or otherwise made available) is prohibited, if the Government determines that the recipient is not in compliance with the requirements of this provision .

(f) The recipient must include the substance of this provision, including this paragraph (f), in subawards and contracts under such awards.

[END OF PROVISION]

M25. CHILD SAFEGUARDING (June 2015)

(a) Because the activities to be funded under this award may involve children, or personnel engaged in the implementation of the award may come into contact with children, these activities could raise the risk of child abuse, exploitation, or neglect within USAID-funded programs. The organization agrees to abide by the following child safeguarding core principles:

- (1) Ensure compliance with host country and local child welfare and protection legislation or international standards, whichever gives greater protection, and with U.S. law where applicable;
- (2) Prohibit all personnel from engaging in child abuse, exploitation, or neglect;
- (3) Consider child safeguarding in project planning and implementation to determine potential risks to children that are associated with project activities and operations;
- (4) Apply measures to reduce the risk of child abuse, exploitation, or neglect, including, but not limited to, limiting unsupervised interactions with children; prohibiting exposure to pornography; and complying with applicable laws, regulations, or customs regarding the photographing, filming, or other image-generating activities of children;
- (5) Promote child-safe screening procedures for personnel, particularly personnel whose work brings them in direct contact with children; and
- (6) Have a procedure for ensuring that personnel and others recognize child abuse, exploitation, or neglect; mandating that personnel and others report allegations; investigating and managing allegations; and taking appropriate action in response to such allegations, including, but not limited to, dismissal of personnel.

(b) The organization must also include in their code of conduct for all personnel implementing USAID-funded activities the child safeguarding principles in (a) (1) through (6).

(c) The following definitions apply for purposes of this provision:

(1) Child: A child or children are defined as persons who have not attained 18 years of age.

(2) Child abuse, exploitation, or neglect: Constitutes any form of physical abuse; emotional ill-treatment; sexual abuse; neglect or insufficient supervision; trafficking; or commercial, transactional, labor, or other exploitation resulting in actual or potential harm to the child's health, well-being, survival, development, or dignity. It includes, but is not limited to: any act or failure to act which results in death, serious physical or emotional harm to a child, or an act or failure to act which presents an imminent risk of serious harm to a child.

(3) Physical abuse: Constitutes acts or failures to act resulting in injury (not necessarily visible), unnecessary or unjustified pain or suffering without causing injury, harm or risk of harm to a child's health or welfare, or death. Such acts may include, but are not limited to: punching, beating, kicking, biting, shaking, throwing, stabbing, choking, or hitting (regardless of object used), or burning. These acts are considered abuse regardless of whether they were intended to hurt the child.

(4) Sexual Abuse: Constitutes fondling a child's genitals, penetration, incest, rape, sodomy, indecent exposure, and exploitation through prostitution or the production of pornographic materials.

(5) Emotional abuse or ill treatment: Constitutes injury to the psychological capacity or emotional stability of the child caused by acts, threats of acts, or coercive tactics. Emotional abuse may include, but is not limited to: humiliation, control, isolation, withholding of information, or any other deliberate activity that makes the child feel diminished or embarrassed.

(6) Exploitation: Constitutes the abuse of a child where some form of remuneration is involved or whereby the perpetrators benefit in some manner. Exploitation represents a form of coercion and violence that is detrimental to the child's physical or mental health, development, education, or well-being.

(7) Neglect: Constitutes failure to provide for a child's basic needs within USAID-funded activities that are responsible for the care of a child in the absence of the child's parent or guardian.

(d) The recipient must insert the provisions in (a) and (b) in all subawards under this award.

[END OF PROVISION]

M26. MANDATORY DISCLOSURES (July 2015)

Consistent with 2 CFR §200.113, applicants and recipients must disclose, in a timely manner, in writing to the USAID Office of the Inspector General, with a copy to the cognizant Agreement Officer, all violations of Federal criminal law involving fraud, bribery, or gratuity violations potentially affecting the Federal award. Subrecipients must disclose, in a timely manner, in writing to the USAID Office of the Inspector General and to the prime recipient (pass through entity) all violations of Federal criminal law involving fraud, bribery, or gratuity violations potentially affecting the Federal award.

Disclosures must be sent to:

U.S. Agency for International Development
Office of the Inspector General
P.O. Box 657
Washington, DC 20044-0657
Phone: 1-800-230-6539 or 202-712-1023
Email: ig.hotline@usaid.gov
URL: <https://oig.usaid.gov/content/usaid-contractor-reporting-form>

Failure to make required disclosures can result in any of the remedies described in 2 CFR §200.338 Remedies for noncompliance, including suspension or debarment (See 2 CFR 180, 2 CFR 780 and 31 U.S.C. 3321).

The recipient must include this mandatory disclosure requirement in all subawards and contracts under this award.

[END OF PROVISION]

M27. NONDISCRIMINATION AGAINST BENEFICIARIES (November 2016).

(a) USAID policy requires that the recipient not discriminate against any beneficiaries in implementation of this award, such as, but not limited to, by withholding, adversely impacting, or denying equitable access to the benefits provided through this award on the basis of any factor not expressly stated in the award. This includes, for example, race, color, religion, sex (including gender identity, sexual orientation, and pregnancy), national origin, disability, age, genetic information, marital status, parental status, political affiliation, or veteran's status. Nothing in this provision is intended to limit the ability of the recipient to target activities toward the assistance needs of certain populations as defined in the award.

(b) The recipient must insert this provision, including this paragraph, in all subawards and contracts under this award.

[END OF PROVISION]

M28. CONFLICT OF INTEREST (August 2018)

a. A conflict of interest in the award, administration, or monitoring of subawards arises when an employee, officer, or agent, any member of his or her immediate family, his or her partner, or an organization which employs or is about to employ any of these parties, has a financial or other interest in or a tangible personal benefit from a non-federal entity considered for a subaward. The officers, employees, and agents of the non-federal entity may neither solicit nor accept gratuities, favors, or anything of monetary value from subrecipients or parties to subawards. However, pass-through entities may set standards for situations in which the financial interest is not substantial or the gift is an unsolicited item of nominal value. The standards of conduct must provide for disciplinary actions to be applied for violations of such standards by officers, employees, or agents of the pass-through entity

b. The recipient must maintain written standards of conduct covering conflicts of interest and governing the actions of its employees engaged in the selection, award, and administration of subawards. The standards must prohibit employees from using their positions for a purpose that constitutes or presents the appearance of a conflict of interest.

c. The non-federal entity must also maintain written standards of conduct covering organizational conflicts of interest. Organizational conflicts of interest means that because of relationships with a parent company, affiliate, or subsidiary organization, the non-federal entity is unable or appears to be unable to be impartial in conducting a subaward action involving a related organization.

d. The recipient must have a system or systems in place to identify, address, resolve, and disclose to USAID any conflicts of interest as described in this provision that affect any subaward, regardless of the amount funded under this award.

e. The recipient must disclose any conflict of interest and the recipient's approach for resolving the conflict of interest to the cognizant Agreement Officer for the award within 10 calendar days of the discovery of the conflict of interest.

f. Upon notice from the recipient of a potential conflict of interest and the approach for resolving it, the Agreement Officer will make a determination regarding the effectiveness of the recipient's actions to resolve the conflict of interest within 30 days of receipt of the recipient's notice, unless the Agreement Officer advises the recipient that a longer period is necessary.

g. The recipient cannot request payment from USAID for costs for transactions subject to the conflict of interest pending notification of USAID's determination. Failure to disclose a conflict of interest may result in cost disallowances.

h. For conflicts of interest, including organizational conflicts of interest, involving contracts, the recipient must follow 2 CFR 200.318, general procurement standards.

i. The recipient must insert the substance of this provision, including paragraph (i), in all subawards under this award, at any subaward tier.

[END OF PROVISION]

**RAA6. UNIVERSAL IDENTIFIER AND SYSTEM OF AWARD MANAGEMENT
(NOVEMBER 2020)**

***APPLICABILITY:** This provision is required in accordance with 2 CFR 25, Universal Identifier And System of Award Management. Agreement Officers (AOs) must include this provision in all assistance solicitations and all awards, unless the AO exempts an organization from compliance with the provision under one of the following exceptions, from paragraph d. below:*

***Exceptions.** The requirements of this provision to obtain a Data Universal Numbering System (DUNS) number and maintain a current registration in the System of Award Management (SAM) do not apply, at the prime award or subaward level, to:*

(1) Awards to individuals

(2) Awards less than \$25,000 to foreign recipients to be performed outside the United States (based on a USAID determination)

(3) Awards where the AO determines, in writing, that the Agency must protect entity information from disclosure due to national security or foreign policy interests of the United States or that these requirements would cause personal safety concerns.

**UNIVERSAL IDENTIFIER AND SYSTEM OF AWARD MANAGEMENT (NOVEMBER
2020)**

a. Requirement for System of Award Management (SAM). Unless you are exempted from this requirement under 2 CFR 25.110, you as the recipient must maintain current information in the SAM. This includes information on your immediate and highest level owner and subsidiaries, as well as on all of your predecessors that have been awarded a Federal contract or Federal financial assistance within the last three years, if applicable, until you submit the final financial report required under this Federal award or receive the final payment, whichever is later. This requires that you review and update the information at least annually after the initial registration, and more frequently, if required by changes in your information or another Federal award term.

b. Requirement for Data Universal Numbering System (DUNS) numbers. If you are authorized to make subawards under this Federal award, you:

(1) Must notify potential subrecipients that no entity (see definition in paragraph c. of this award term) may receive a subaward from you until the entity has provided its Unique Entity Identifier to you.

(2) May not make a subaward to an entity unless the entity has provided its Unique Entity Identifier to you. Subrecipients are not required to obtain an active SAM registration, but must obtain a Unique Entity Identifier.

c. Definitions. For purposes of this award term:

(1) System of Award Management (SAM) means the Federal repository into which an entity must provide information required for the conduct of business as a recipient. Additional information about registration procedures may be found at the SAM Internet site (currently at www.sam.gov).

(2) Unique Entity Identifier means the identifier assigned by SAM to uniquely identify business entities.

(3) Entity includes non-Federal entities as defined in 2 CFR 200.1 and also includes all of the following, for purposes of this part:

- a. A foreign organization;
- b. A foreign public entity;
- c. A domestic for-profit organization; and
- d. A Federal agency.

(4) Subaward has the meaning given in 2 CFR 200.1.

(5) Subrecipient has the meaning given in 2 CFR 200.1.

ADDENDUM (NOVEMBER 2020):

d. Exceptions. The requirements of this provision to obtain a Unique Entity Identifier and maintain a current registration in the SAM do not apply, at the prime award or subaward level, to:

(1) Awards to individuals

(2) Awards less than \$25,000 to foreign recipients to be performed outside the United States (based on a USAID determination)

(3) Awards where the Agreement Officer determines, in writing, that the Agency must protect entity information from disclosure due to national security or foreign policy interests of the United States or, that these requirements would cause personal safety concerns.

e. This provision does not need to be included in subawards.

[END OF PROVISION]

**RAA7. REPORTING SUBAWARDS AND EXECUTIVE COMPENSATION
(NOVEMBER 2020)**

APPLICABILITY: This provision is required in accordance with 2 CFR 170, Award Term for Reporting Subawards and Executive Compensation. AOs must include this provision in all assistance solicitations and all awards expected to equal or exceed \$30,000, unless an exemption applies under paragraph d. of the provision or the exemptions listed below in this applicability statement. If the AO determines that an exemption applies, the AO must provide guidance to the recipient on reporting with generic information.

Exemptions.

(1) The requirements to report under this provision do not apply to:

(i) Awards to individuals

(ii) Awards less than \$30,000

(2) When the AO determines, in writing, that these requirements would cause personal safety concerns, reporting under this provision can be accomplished using generic information.

REPORTING SUBAWARDS AND EXECUTIVE COMPENSATION (NOVEMBER 2020)

a. Reporting of First-Tier Subawards.

(1) Applicability. Unless you are exempt as provided in paragraph d. of this award term, you must report each action that equals or exceeds \$30,000 in Federal funds for a subaward to a non-Federal entity or Federal agency (see definitions in paragraph e. of this award term).

(2) Where and when to report.

(i) You must report each obligating action described in paragraph a.(1) of this award term to www.fsrs.gov.

(ii) For subaward information, report no later than the end of the month following the month in which the obligation was made. (For example, if the obligation was made on November 7, 2010, the obligation must be reported by no later than December 31, 2010.)

(3) What to report. You must report the information about each obligating action that the submission instructions posted at www.fsrs.gov specify.

b. Reporting total compensation of recipient executives for non-Federal entities.

(1) Applicability and what to report. You must report total compensation for each of your five most highly compensated executives for the preceding completed fiscal year, if –

(i) The total Federal funding authorized to date under this Federal award equals or exceeds \$30,000 as defined in 2 CFR 170.320;

(ii) In the preceding fiscal year, you received—

(A) 80 percent or more of your annual gross revenues from Federal procurement contracts (and subcontracts) and Federal financial assistance subject to the Transparency Act, as defined at 2 CFR 170.320 (and subawards); and

(B) \$25,000,000 or more in annual gross revenues from Federal procurement contracts (and subcontracts) and Federal financial assistance subject to the Transparency Act, as defined at 2 CFR 170.320 (and subawards); and

(iii) The public does not have access to information about the compensation of the executives through periodic reports filed under section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m(a), 78o(d)) or section 6104 of the Internal Revenue Code of 1986. (To determine if the public has access to the compensation information, see the U.S. Security and Exchange Commission total compensation filings at www.sec.gov/answers/excomp.htm.)

(2) Where and when to report. You must report executive total compensation described in paragraph b.(1) of this award term:

(i) As part of your registration profile at www.sam.gov.

(ii) By the end of the month following the month in which this award is made, and annually thereafter.

c. Reporting of Total Compensation of Subrecipient Executives.

(1) Applicability and what to report. Unless you are exempt, as provided in paragraph d. of this award term, for each first-tier non-Federal entity subrecipient under this award, you must report the names and total compensation of each of the subrecipient's five most highly compensated executives for the subrecipient's preceding completed fiscal year, if

(i) In the subrecipient's preceding fiscal year, the subrecipient received—

(A) 80 percent or more of its annual gross revenues from Federal procurement contracts (and subcontracts) and Federal financial assistance subject to the Transparency Act, as defined at 2 CFR 170.320 (and subawards); and

(B) \$25,000,000 or more in annual gross revenues from Federal procurement contracts (and subcontracts), and Federal financial assistance subject to the Transparency Act (and subawards); and

(ii) The public does not have access to information about the compensation of the executives through periodic reports filed under section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m(a), 78o(d)) or section 6104 of the Internal Revenue Code of 1986. (To determine if the public has access to the compensation information, see the U.S. Security and Exchange Commission total compensation filings at www.sec.gov/answers/excomp.htm.)

(2) Where and when to report. You must report subrecipient executive total compensation described in paragraph c.(1) of this award term:

(i) To the recipient.

(ii) By the end of the month following the month during which you make the subaward. For example, if a subaward is obligated on any date during the month of October of a given year (for example, between October 1 and 31), you must report any required compensation information of the subrecipient by November 30 of that year.

d. Exemptions.

If in the previous tax year you had gross income, from all sources, under \$300,000, you are exempt from the requirements to report:

(1) Subawards, and

(2) The total compensation of the five most highly compensated executives of any subrecipient.

e. Definitions.

For purposes of this award term:

- (1) Federal Agency means a Federal agency as defined at 5 U.S.C. 551(1) and further clarified by 5 U.S.C. 552(f).
- (2) Non-Federal entity means all of the following, as defined in 2 CFR 25:
 - (i) A governmental organization, which is a State, local government, or Indian tribe;
 - (ii) A foreign public entity;
 - (iii) A domestic or foreign nonprofit organization; and
 - (iv) A domestic or foreign for-profit organization.
- (2) Executive means officers, managing partners, or any other employees in management positions.
- (3) Subaward:
 - (i) This term means a legal instrument to provide support for the performance of any portion of the substantive project or program for which you received this award and that you as the recipient award to an eligible subrecipient.
 - (ii) The term does not include your procurement of property and services needed to carry out the project or program (for further explanation, see 2 CFR 200.331).
 - (iii) A subaward may be provided through any legal agreement, including an agreement that you or a subrecipient considers a contract.
- (4) Subrecipient means a non-Federal entity or Federal agency that:
 - (i) Receives a subaward from you (the recipient) under this award; and
 - (ii) Is accountable to you for the use of the Federal funds provided by the subaward.
- (5) Total compensation means the cash and noncash dollar value earned by the executive during the recipient's or subrecipient's preceding fiscal year and includes the following (for more information see 17 CFR 229.402(c)(2)):
 - (i) Salary and bonus.

(ii) Awards of stock, stock options, and stock appreciation rights. Use the dollar amount recognized for financial statement reporting purposes with respect to the fiscal year in accordance with the Statement of Financial Accounting Standards No. 123 (Revised 2004) (FAS 123R), Shared Based Payments.

(iii) Earnings for services under nonequity incentive plans. This does not include group life, health, hospitalization, or medical reimbursement plans that do not discriminate in favor of executives, and are available generally to all salaried employees.

(iv) Change in pension value. This is the change in present value of defined benefit and actuarial pension plans.

(v) above-market earnings on deferred compensation which is not tax-qualified.

(vi) Other compensation, if the aggregate value of all such other compensation (for example, severance, termination payments, value of life insurance paid on behalf of the employee, perquisites or property) for the executive exceeds \$10,000.

[END OF PROVISION]

RAA28. CONTRACT PROVISION FOR DBA INSURANCE UNDER RECIPIENT PROCUREMENTS (DECEMBER 2014)

APPLICABILITY: The following provision is required when the recipient is expected to procure services to be performed overseas.

DEFENSE BASE ACT (DBA) WORKERS' COMPENSATION INSURANCE FOR PROCUREMENT CONTRACT (DECEMBER 2014)

All contracts made by the recipient under this award for services to be performed overseas must contain the following provision, as applicable.

Workers' Compensation Insurance (Defense Base Act)

(a) The contractor must--

(1) Before commencing performance under this contract, establish provisions to provide for the payment of disability compensation and medical benefits to covered employees and death benefits to their eligible survivors, by purchasing Defense Base Act (DBA) insurance pursuant to the terms of the contract between USAID and USAID's DBA insurance carrier unless the contractor qualifies as a self-insurer under the Longshore and Harbor Workers' Compensation Act (33 U.S.C. 932) as extended by the Defense Base Act (42 U.S.C. 1651, et seq.), or has an approved retrospective rating agreement for DBA. The contractor must continue to maintain

these provisions to provide such Defense Base Act benefits until contract performance is completed.

(2) If USAID or the contractor has secured a waiver of DBA coverage in accordance with AIDAR 728.305-70(a) for contractor's employees who are not citizens of, residents of, or hired in the United States, the contractor agrees to provide such employees with worker's compensation benefits as required by the laws of the country in which the employees are working, or by the laws of the employee's native country, whichever offers greater benefits. The Department of Labor has granted partial blanket waivers of DBA coverage applicable to USAID-financed contracts performed in countries listed in the DEFENSE BASE ACT (DBA) WAIVER LIST.

(3) Within ten days of an employee's injury or death or from the date the contractor has knowledge of the injury or death, submit Form LS-202 (Employee's First Report of Injury or Occupational Illness) to the Department of Labor in accordance with the Longshore and Harbor Workers' Compensation Act (33 U.S.C. 930(a), 20 CFR 702.201 to 702.203).

(4) Pay all compensation due for disability or death within the timeframes required by the Longshore and Harbor Workers' Compensation Act (33 U.S.C. 914, 20 CFR 702.231 and 703.232).

(5) Provide for medical care as required by the Longshore and Harbor Workers' Compensation Act (33 U.S.C. 907, 20 CFR 702.402 and 702.419).

(6) If controverting the right to compensation, submit Form LS-207 (Notice of Controversion of Right to Compensation) to the Department of Labor in accordance with the Longshore and Harbor Workers' Compensation Act (33 U.S.C. 914(d), 20 CFR 702.251).

(7) Immediately upon making the first payment of compensation in any case, submit Form LS-206 (Payment of Compensation Without Award) to the Department of Labor in accordance with the Longshore and Harbor Workers' Compensation Act (33 U.S.C. 914(c), 20 CFR 702.234).

(8) When payments are suspended or when making the final payment, submit Form LS-208 (Notice of Final Payment or Suspension of Compensation Payments) to the Department of Labor in accordance with the Longshore and Harbor Workers' Compensation Act (33 U.S.C. 914 (c) and (g), 20 CFR 702.234 and 702.235).

(9) Adhere to all other provisions of the Longshore and Harbor Workers' Compensation Act as extended by the Defense Base Act, and Department of Labor regulations at 20 CFR Parts 701 to 704.

For additional information on the Longshore and Harbor Workers' Compensation Act requirements see <http://www.dol.gov/owcp/dlhwc/lbdba.htm>.

The contractor must insert the substance of this clause including this paragraph (c), in all subcontracts to which the Defense Base Act applies.

[END OF PROVISION]

RAA29. AWARD TERM AND CONDITION FOR RECIPIENT INTEGRITY AND PERFORMANCE MATTERS (April 2016)

APPLICABILITY: This provision must be incorporated into awards if the total federal share of the award may include more than \$500,000 over the period of performance.

AWARD TERM AND CONDITION FOR RECIPIENT INTEGRITY AND PERFORMANCE MATTERS (APRIL 2016)

A. Reporting of Matters Related to Recipient Integrity and Performance

1. General Reporting Requirement

If the total value of your currently active grants, cooperative agreements, and procurement contracts from all Federal awarding agencies exceeds \$10,000,000 for any period of time during the period of performance of this Federal award, then you as the recipient during that period of time must maintain the currency of information reported to the System for Award Management (SAM) that is made available in the designated integrity and performance system (currently the Federal Awardee Performance and Integrity Information System (FAPIIS)) about civil, criminal, or administrative proceedings described in paragraph 2 of this award term and condition. This is a statutory requirement under section 872 of Public Law 110-417, as amended (41 U.S.C. 2313). As required by section 3010 of Public Law 111-212, all information posted in the designated integrity and performance system on or after April 15, 2011, except past performance reviews required for Federal procurement contracts, will be publicly available.

2. Proceedings About Which You Must Report

Submit the information required about each proceeding that:

- a. Is in connection with the award or performance of a grant, cooperative agreement, or procurement contract from the Federal Government;
- b. Reached its final disposition during the most recent five year period; and
- c. Is one of the following:
 - (1) A criminal proceeding that resulted in a conviction, as defined in paragraph 5 of this award term and condition;
 - (2) A civil proceeding that resulted in a finding of fault and liability and payment of a monetary fine, penalty, reimbursement, restitution, or damages of \$5,000 or more;
 - (3) An administrative proceeding, as defined in paragraph 5. of this award term and condition, that resulted in a finding of fault and liability and your payment of either a monetary fine or penalty of \$5,000 or more or reimbursement, restitution, or damages in excess of \$100,000; or
 - (4) Any other criminal, civil, or administrative proceeding if:
 - (i) It could have led to an outcome described in paragraph 2.c.(1), (2), or (3) of this award term and condition;
 - (ii) It had a different disposition arrived at by consent or compromise with an acknowledgment of fault on your part; and
 - (iii) The requirement in this award term and condition to disclose information about the proceeding does not conflict with applicable laws and regulations.

3. Reporting Procedures

Enter in the SAM Entity Management area the information that SAM requires about each proceeding described in paragraph 2 of this award term and condition. You do not need to submit the information a second time under assistance awards that you received if you already provided the information through SAM because you were required to do so under Federal procurement contracts that you were awarded.

4. Reporting Frequency

During any period of time when you are subject to the requirement in paragraph 1 of this award term and condition, you must report proceedings information through SAM for the most recent five year period, either to report new information about any proceeding(s) that you have not reported previously or affirm that there is no new information to report. Recipients that have Federal contract, grant, and cooperative agreement awards with a cumulative total value greater than \$10,000,000 must disclose semi-annually any information about the criminal, civil, and administrative proceedings.

5. Definitions

For purposes of this award term and condition:

- a. Administrative proceeding means a non-judicial process that is adjudicatory in nature in order to make a determination of fault or liability (e.g., Securities and Exchange Commission Administrative proceedings, Civilian Board of contract Appeals proceedings, and Armed Services Board of contract Appeals proceedings). This includes proceedings at the Federal and State level but only in connection with performance of a Federal contract or grant. It does not include audits, site visits, corrective plans, or inspection of deliverables.
- b. Conviction, for purposes of this award term and condition, means a judgment or conviction of a criminal offense by any court of competent jurisdiction, whether entered upon a verdict or a plea, and includes a conviction entered upon a plea of nolo contendere.
- c. Total value of currently active grants, cooperative agreements, and procurement contracts includes—
 - (1) Only the Federal share of the funding under any Federal award with a recipient cost share or match; and
 - (2) The value of all expected funding increments under a Federal award and options, even if not yet exercised.

B. [Reserved]

[END OF PROVISION]

[END OF STANDARD PROVISIONS]

Done at Kigali, on...

Eugene DUSINGIZUMUREMYI
Country Director
Water For People