

Borehole Drilling – Planning, Contracting & Management

A UNICEF Toolkit



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FOR MORE INFORMATION:

For more information, comments and feedback please contact UNICEF New York headquarters www.unicef.org or Skat Foundation www.skat.ch

AUTHORS:

Dotun Adekile & Kerstin Danert, Skat Foundation, St Gallen, Switzerland; Jose Gestí Canuto, UNICEF, New York, USA; Djani Zadi, Peter Harvey, and Anne Cabrera-Clerget, UNICEF, Copenhagen, Denmark

CONTRIBUTORS:

Fiorella Polo, WASH Specialist, Water and Sanitation Section, UNICEF New York Headquarters, USA; Sue Cavill, Consultant

COVER PHOTO:

Kerstin Danert

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Toolkit Orientation Table

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Module 2	Procurement Considerations for Borehole Drilling Works <ul style="list-style-type: none"> ■ Defines procurement process and responsibilities ■ Provides guidance for risk management ■ Compares two solicitation methods: ITB and RFPS ■ Highlights key considerations during the pre-contractual, contracting and contract administration phases including the evaluation of technical and financial proposals and the payment schedule
Module 3	Borehole Siting and Drilling Supervision Consultancy <ul style="list-style-type: none"> ■ Provides template of Terms of Reference which includes: <ul style="list-style-type: none"> ▪ Description of the assignment ▪ Supervisor's checklist ▪ Deliverables and reporting requirements ▪ Suggested Bill of Quantities for the consultancy services ▪ Completion certificate templates ■ Includes template for UNICEF Agreement for Borehole Siting and Drilling Supervision Consultancy Services
Module 4	Terms of Reference for Borehole Drilling Works and Pump Supply and Installation <ul style="list-style-type: none"> ■ Includes overview of how to select and specify handpumps and assure their quality ■ Provides templates for: <ul style="list-style-type: none"> ▪ Terms of Reference for Borehole Drilling Construction and Development of the Borehole ▪ Terms of Reference for the Supply and Installation of Pumps ■ Provides Technical Specifications for the borehole and a suggested format for the borehole completion record
Module 5	UNICEF Request for Proposal for Services for Borehole Drilling Works <ul style="list-style-type: none"> ■ Follows the UNICEF frame of Request for Proposal for Services in VISION and advises on options and elements ■ Includes template Bill of Quantities for borehole drilling works

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Foreword

While UNICEF has been funding and implementing borehole drilling projects in numerous countries and contexts for many years, until now there have been no official guidelines within the organization specifically targeting both programme and supply staff involved in such complex projects. Feedback from country offices, as well as the general drive to bring uniformity, professionalism and standardization in practices, made the necessity of this work obvious. This Toolkit is the result of intensive work requiring seamless collaboration between various departments of UNICEF (e.g. Programme Division, Supply Division and country offices) and with external experts (Skat Foundation). Its purpose is to act a key reference that will guide staff throughout the different steps of planning, contracting and managing borehole drilling projects. It is the hope of the writers that it will increase the quality, efficiency and effectiveness of drilling programmes and clarify areas where specific expertise is required.

Kelly Ann Naylor, Associate Director – WASH, UNICEF Programme Division, New York

Peter Harvey, Chief - WASH, UNICEF Supply Division, Copenhagen

Borehole Drilling – Planning, Contracting & Management

Introduction to the Toolkit

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Abbreviations and Acronyms

“	Inches
μS/cm	micro Siemens/cm
BAFO	Best and Final Offer
BoQ	Bill of Quantities
CFM	cubic foot per minute
cm	centimetre
CP	Contractual Provisions
CRC	Contract Review Committee
CRT	Constant Rate Test
DIN	German Institute for Standardization
DTH	down-the-hole
EM	electromagnetic
GPS	Global Positioning System
GTC	General Terms and Conditions
ISO	International Organization for Standardization
IT	Information Technology
ITB	Invitation to Bid
ITBS	Invitation to Bid for Services
kg	kilogram
km	kilometre
L	litre
LM	linear metre
LS	lump sum
LTA	Long Term Agreement
m	metre
m ²	square metre
m ³	cubic metre
mm	millimetre
MPa	megapascals
NGO	Non-Governmental Organisation
no.	Number
NTU	Nephelometric Turbidity Unity
PDI	Pre-Delivery Inspection
PPM	parts per million
PVC	polyvinyl chloride
QA	Quality Assurance
Q&A	Questions and Answers
RFP	Request for Proposal
RFPS	Request for Proposal for Services
RFQ	Request for Quotations
RWSN	Rural Water Supply Network
Toolkit	UNICEF Toolkit for Borehole Procurement and Construction
TIP	Technology Information Packages
ToR	Terms of Reference
uPVC	unplasticized polyvinyl chloride
VES	Vertical Electrical Sounding
VISION	Virtual Integrated System of Information (IT system used by UNICEF)
VLOM	Village Level Operation and Maintenance
WASH	Water, Sanitation and Hygiene

Definitions

Adjudicator	The Adjudicator is the person appointed jointly by the Client and the Contractor to resolve disputes in the first instance.
Authorised Representative	The Authorised Representative is any person, whether an officer of the client, or employee of the Designated Supervising Agency, authorized by the Client in writing to carry out inspection or supervision of the Works. The term includes the Project Authority but can also include other representatives with written authority.
Assignment	The assignment refers to the specified task or work that has been assigned to the consultant to undertake, as set out in the Contract Documents.
Bidder	The Bidder is one who makes an offer to the Client to execute or supply certain works, commodities, or services at a given price. In some documents, the bidder is referred to as an <i>offerer</i> or a <i>proposer</i> .
Bill of Quantities	Bill of Quantities means the priced and completed Bill of Quantities forming part of the Bid.
Client	<p>The Client is the organization or agency that is contracting out the borehole construction. The client can be</p> <ul style="list-style-type: none"> ■ UNICEF — In the case of boreholes that are directly contracted by UNICEF, the Client is the UNICEF Country Office ■ Government or NGO — In cases where UNICEF supports National Government or an NGO to contract boreholes, the National Government or NGO is the client
Community	The Community is the primary stakeholder, the end user of the borehole and the final owner. Community members should be included in the entire borehole procurement process, particularly in the siting and design so that the borehole can meet their needs and acceptance.
Completion date	Completion Date is the date of completion of the Works as certified by the Engineer.
Confidential Bill of Quantities	The Confidential Bill of Quantities is a reflection of a fair and reasonable price for the construction work, as determined by a professional (including labour, equipment, materials and a reasonable value for overheads and profit). It can also be referred to as the Engineer's Estimate.
Consultant	The consultant is a person or company that has been engaged or whose bid has been accepted by UNICEF by the client to carry out services such as the design of the project, borehole siting, drilling supervision and final inspection of the works.
Consultant's Representative	The Consultant's Representative is the person authorised by the Consultant to make decisions on the Consultant's behalf for any one site or part of the Works. In the case of a borehole drilling project, the Consultant's Representative will usually be the Supervisor.
Contract	In the context of UN procurement, a contract is a written, legally binding agreement between the organization and a supplier which establishes the terms and conditions, including the rights and obligations of the organization and the supplier. A contract may take many different forms, e.g. agreement, purchase order, memorandum of understanding, letters of assist.

Contractor	Any party to a procurement contract with the organization. A contractor may take various forms, including an individual person, a company (whether privately or publicly held), a partnership or a government agency.
Bid	A bid is an offer submitted in response to an invitation to tender or an offer in response to an electronic auction. The bid is evaluated against the set of criteria that are described in the invitation to tender.
Contract Price	The Contract Price is the price stated in the Letter of Award and is adjusted in accordance with the provisions of the Contract.
Days	Days are calendar days; months are calendar months.
Defect	A defect is any of the works not completed in accordance with the Contract.
Defects Correction Period	The Defects Correction Period is the amount of time that the contractor has to correct any defects in the construction.
Defects liability	Defects liability is the period during which the Drilling Contractor is responsible for repairing or rectifying defects that appear in the Works. The period is named in the Contract and calculated from the Completion Date.
Designated Representative	The Designated Representative is the UNICEF officer designated as representing UNICEF in the contract.
Designated Siting and Supervising Agency	The Designated Siting and Supervising Agency is the consultancy agency engaged by the Client to carry out supervision during the whole life of the project and assist in the contracting procedure and the day-to-day supervision and inspection of the Works.
Delivery Date	Delivery Date is the time the work as defined in the contract is completed at the location(s) indicated for delivery.
District Local Government	The District Local Government is the local government authority. It usually has the responsibility of planning and post-construction monitoring of water facilities and may be involved in monitoring the construction work.
Drawings	Drawings of the Works, as included in this Contract, and any additional and modified drawings issued by (or on behalf of) UNICEF in accordance with this Contract.
Drilling Contractor	The Drilling Contractor is a private company or NGO engaged in the drilling of boreholes. It is the responsibility of the Drilling Contractor to drill the borehole as specified in the contract.
Engineer's Estimate	Engineer's Estimate – a reflection of a fair and reasonable price for the construction work, as determined by a professional (including labour, equipment, materials and a reasonable value for overheads and profit). In UNICEF, this is referred to as the <i>Confidential Bill of Quantities</i> .
Equipment	The Contractor's apparatus, machinery and vehicles used in the execution of the Works.
Final completion certificate	The final completion certificate is issued at the end of the defects liability period provided that there are no defects.

Filter pack	Filter pack is the permeable material that is placed to fill the annular space around the screen and prevent the formation from collapsing onto the screen, as well as filter fine materials from entering the well. A filter pack is used if a well cannot be developed naturally. A filter pack is thicker than a <i>formation stabiliser</i> and needs to be at least 50 to 100mm thick to be effective.
Formation stabiliser	Formation stabiliser is the permeable material that is placed to fill the annular space around the screen and prevent the formation from collapsing onto the screen. A formation stabiliser is used if a well can be <i>developed</i> naturally.
Gravel pack	Gravel pack is the permeable material that is placed around the screen of drilled water well. It is a generic term that refers to both the <i>formation stabiliser</i> and filter pack.
Handover of site	The handover of site is a responsibility transfer work process, giving of care, custody and control of the project to the owner at its final stage, after installation is completed, inspected and tested. The handover includes the completed boreholes, the pumps installed and project documents as specified in the contract.
Handpump	A handpump is an apparatus or machine for raising water by means of a piston, plunger, or washers in a pipe powered using human energy from the hands, arms, or feet.
Handpump Standardisation	Handpump Standardisation is the formal or informal mechanism that governs the types of community handpumps used within a particular country, sometimes including handpump standards. In Mozambique and Madagascar standardisations also include self-supply, household or low-cost (as opposed to community) handpump models.
Handpump Standards	Handpump Standards are design standards for a specific handpump. For public domain pumps the standards can either be specified in a standardisation policy (e.g. Ghana, Nigeria, Uganda and Zimbabwe) or held by a third party such as RWSN. For private domain pumps the standards are held by the private organisations.
Handpump installation team	The Handpump installation team is responsible for the construction and installation of handpumps. The team may be part of the Drilling Contractor's team or a separate organization.
Hydrogeologist	The Hydrogeologist is either a professional consultancy of groundwater specialists or an individual consultant responsible for borehole siting, design, supervision and monitoring.
Initiating unit	The initiating unit is the section within UNICEF requesting the fulfilment of the work to be done.
Inspection	The term inspection refers to the activity of checking products or facilities. An inspection can be an official visit to the works in order to verify that all specifications have been adhered to and that the works are in their proper condition, or measuring, examining, testing or gauging one or more characteristics of a product or service, and comparing the results with specified requirements in order to establish whether conformity is achieved for each characteristic.

Intended Completion Date	The Intended Completion Date is the date on which it is intended that the Contractor shall complete the works. The intended Completion Date may be revised only by the Engineer by issuing an extension of time or an acceleration order.
Offerer	See bidder .
Private Domain	Private Domain refers to product designs held by a private manufacturer protected by patents and/or royalty rights (e.g. Kardia, Vergnet pumps.).
Project Authority	The Project Authority is the individual who shall be responsible for the day-to-day liaison and management of the Agreement. (Note: there will be one Project Authority nominated by UNICEF, who need not be a UNICEF staff member, and one nominated by the consultant.)
Proposer	See bidder .
Pump caretaker	The pump caretaker is responsible for both the regular and routine maintenance and repair of the handpump. They should be trained on the installation, repairs and maintenance of the particular pumps on a project.
Public Domain	Public Domain refers to product designs not protected by patents or royalty rights. Anyone can copy or manufacture the product (e.g. India Mark II and Afridev pumps.).
Laws	Laws are all national legislation, statutes, ordinances and other laws and regulations of any legally constituted public authority.
Material	Materials are products that are used in a particular activity. In the case of this toolkit, materials refer to the consumables used during water well drilling construction and borehole completion such as the casing and screen, filter pack and cement.
Monitoring	Monitoring is the periodic oversight of the implementation of an activity. Monitoring seeks to establish the extent to which work proceeds according to plan and includes recording of progress. Note that monitoring is not the same as supervision.
Quality	Quality means degree of excellence, e.g. the totality of features and characteristics of a borehole and handpump that display their ability to satisfy stated and implied needs.
Quality Control	Quality Control is used for checking a product for its quality against a set of standards or specifications
Site or Sites	The place or places where the Works are to be executed and any other place defined as such in the Drawings and Contract Documents.
Specifications	The Technical Specifications of the Works included in this Contract and any modifications or additions approved by UNICEF.
Sub-contractor	A sub-contractor is any person or company that has been named and sub-contracted by the Consultant of the Supplier with the consent of UNICEF to carry out a specified part of the assignment or works as set out in the contract.
Substantial completion certificate	The Substantial Completion Certificate is issued to the drilling contractor once the borehole is finished and the pumping test is successful. If handpump supply and installation is included in the drilling contract, this must also be completed for the certificate to be issued.

Supervision	Supervision is the action or process of watching and directing what someone does or how something is done. In the case of the toolkit, supervision includes the process of watching and directing the drilling, pad construction and installation of pumps and record keeping, as well as other coordination and reporting tasks. See also supervisor.
Supervisor	The Supervisor is the on-site representative of the Client on the drill site. The Supervisor may either be UNICEF staff or authorised by the Consultant to act as his/her representative on site. The supervisor ensures that the Drilling Contractor adheres to the technical specification, makes all the required measurements, keeps all records accurately and ensures that health and safety procedures are adhered to. The Supervisor gives instructions to the drilling contractor as required for the completion and handing over of the borehole, and ensures that all data and information is collected. The Supervisor may be a hydrogeologist, an engineer, or a technician, and should have been trained in drilling supervision.
Supplier(s)	Suppliers are persons or entities that entered into a Contract directly with the Contractor to supply materials and equipment fabricated specifically for the Works. A supplier can also be known as a vendor.
Toolkit	The Toolkit refers to the publication entitled <i>Borehole Drilling –Planning, Contracting & Management: A UNICEF Toolkit</i> .
Tender	Tender is a generic term for bids, quotations and proposals, received from a Supplier in response to Solicitation Documents.
Works	Works refers to the specified tasks required by the Contract Documents.
Vendor	A vendor is a bidder, a prospective, registered or actual supplier, contractor or a provider of goods, services and/or works to UNICEF. Vendors include private or public companies, whether parent, holding, subsidiary, affiliate, consortium members, or partnership, a government agency or a non-government organization. A vendor can also be known as a supplier. A vendor is considered registered by UNICEF when entered in Vendor Master in VISION.
Village Level Operation and Maintenance (VLOM)	Village Level Operation and Maintenance (VLOM) is the unofficial classification of handpumps that are maintainable at the village level Handpumps specifically classified as VLOM include the Afridev and the Tara.
VISION	VISION is the Virtual Integrated System of Information, which is the Information Technology –IT system used by UNICEF

Background to the Toolkit

In the last half a century, UNICEF has supported National Governments in the provision of water supply in rural and remote places through the drilling of boreholes and supply of ancillary equipment. Over those years, various procurement methods and technical specifications have been used on borehole projects in different countries. Sometimes there is uncertainty about accepted practices and standards. As UNICEF continues to provide support and promotes professionalism in borehole drilling, it is also committed to improving the cost effectiveness of its work in rural communities.

Borehole Drilling – Planning, Contracting & Management: A UNICEF Toolkit (subsequently referred to as the Toolkit) has been developed to bring uniformity to practices and to guide UNICEF staff involved in borehole procurement and the supply of equipment, as well as contracting consultancy services for borehole siting and supervision.

Clarifying responsibilities for (i) borehole siting, (ii) supervision and (iii) the supply and installation of the pump is a vital part of drilling project management. Once the responsibilities have been established, it is essential that all procurement and contract documents clearly specify who is responsible for what, and that there are no contradictions between contracts. In clarifying responsibilities, national policies and practices should be considered. Any differences in approach with what is set out in this Toolkit should be discussed with the government. Once responsibilities have been clarified, efforts are required to ensure that all stakeholders (i.e. community representatives, pump mechanics/pump minters, local government, national government, NGO partners, drilling contractors and consultants) are properly briefed as to what everyone is expected to do. Note that the training of pump mechanics/menders is generally not included in a drilling contract.

The document is based on a review of good practices within UNICEF, lessons from previous projects, the principles in the RWSN [Code of Practice for Cost Effective Boreholes](#)¹ and advice in the [UNICEF Guidance Note on Professional Water Well Drilling](#)² (Box 1). In the case of fast tracking required to deal with emergencies, the tender process can be executed according to the [Exceptions to Competitive Bidding in the Supply Manual Guidance](#)³.

¹ RWSN (2010) **Code of Practice for Cost-effective Boreholes**, Rural Water Supply Network, Available from <http://www.rural-water-supply.net/en/resources/details/128>

² UNICEF/Skat Foundation (2016) **Professional Water Well Drilling: A UNICEF Guidance Note**, UNICEF and Skat Foundation, available from <http://skat.ch/book/professional-water-well-drilling/> and UNICEF et Skat Foundation (2018) **Forage d'eau: vers la professionnalisation d'un secteur: Note d'orientation de l'UNICEF**, UNICEF et Skat Foundation, Available from <http://skat.ch/book/forage-deau-vers-la-professionnalisation-dun-secteur/>

³ See Chapter 6: PROCUREMENT OF SUPPLIES, EQUIPMENT AND SERVICES Section 3: Solicitation Process; 4.0 EXCEPTIONS TO COMPETITIVE BIDDING, available from <https://intranet.unicef.org/Policies/DHR.nsf/6203f70108ece1f685256720005e2bfe/4449c9e5ec472029c1257e62004647e6?OpenDocument>.

What is the Toolkit for?

This **Toolkit** is a support to the “**Project design, implementation and monitoring**” hexagon of the **UNICEF Guidance Note on Professional Water Well Drilling**² (Figure 1).

The **Toolkit** guides both UNICEF programme and supply staff through the life of a project. It follows a logical sequence on UNICEF procurement practices and provides recommendations on processes (Invitation to Bid [ITB] versus Request for Proposal for Services [RFPs]), evaluation criteria, contract provisions, generic bill of quantities, terms of reference and contractual approaches to seek technical services for siting of boreholes, borehole construction and supervision of construction works.

The **Toolkit** should enable readers to identify risks, forecast challenges and follow a strategy to address them. The **Toolkit** is mindful of the fact that technical specifications and all documentation relating to procurement and installation of boreholes and pumps are to be prepared on an impartial basis so as to promote competitive tendering. There should be no over-specification, and quantities should be as realistic as possible.

Box 1 UNICEF Guidance Note on Professional Water Well Drilling

The guidance note is structured around six broad areas of engagement for UNICEF country offices, as illustrated in the figure (right):

The engagement proposed for each area is summarized as follows:

- The **institutional framework** matters – promote initiatives to improve national (or state) policies, regulation, standards and procedures of borehole drilling, including clarification of roles and responsibilities.
- **Groundwater information** is essential – value groundwater data and ensure that drilling records are collected, quality assured and collated. This data, together with information generated from it, should be made readily available to help future borehole siting and design as well as groundwater resources management.
- **Capacity** is fundamental – raise the skills and knowledge of groundwater development and encourage the availability of suitable equipment in the country.
- **Project design, implementation and monitoring** needs to be thorough – improve the design, implementation and monitoring specific borehole drilling or rehabilitation projects, and ensure that documentation of the process and results is readily available.
- **Dialogue & awareness** is crucial – foster dialogue between government agencies (including regulators), drilling contractors and consultants, NGOs, development partners and civil society. Encourage and support efforts that raise awareness of decision-makers and the public about groundwater potential, management and its exploitation.
- **Investment is indispensable** – invest adequate financial resources to improve and sustain professional groundwater development.



Toolkit Formatting

The **Toolkit** provides flexibility so that it can fit the circumstances of a particular project. It should be noted that national laws, standards and codes are to be adhered to, unless otherwise specified. Possibilities for modification to some clauses to suit particular situations are shown with notes are shown in [***bold italics highlighted in grey***]. Advice and key elements (such as relevant principles) to take into consideration are highlighted in blue text boxes throughout the document (e.g. Box X).

Box X Sample box containing advice and key elements that should be taken into consideration

When commencing with an Invitation to Bid, UNICEF procurement.....

Toolkit Modules

The **Toolkit** comprises five modules which follow the logical sequence of a project's life. Modules are interconnected, and it is advisable to initially read them in order to become familiar with the whole process. Subsequently, depending on the information sought, they can be consulted separately for specific guidance.

Module 1 – Principles for Planning, Contracting and the Management of Borehole Drilling Projects — sets out the responsibilities for key stakeholders and presents eight principles for the planning, contracting and management of borehole drilling projects. These principles are applicable to all borehole projects in which UNICEF is involved, either directly as the contracting Client or in support of the National Government or other agencies. The principles are to be used to develop appropriate contracts for borehole projects and are applicable to all boreholes fitted with handpumps⁴. The principles aid decision-making and streamline the procurement process.

Module 2 – Procurement Considerations for Borehole Drilling Works – highlights key aspects to be considered in the procurement process for borehole drilling construction. It should help UNICEF programme and supply staff in the country offices to work together in the project planning, procurement and contract management. The module defines the roles and responsibilities of UNICEF Programme and Supply staff at each stage of the procurement process as well as guidance on risk management. It specifically provides key information for the pre-contractual and contracting phases, including advice for pre-qualification of drilling contractors and a list of the key contract documents. Module 2 provides a clear comparison of the two solicitation methods likely to be used in borehole projects – ITB (invitation to bid) and RFPS (request for proposal for services) and advice on which one to use. Guidance on evaluating the technical and financial proposals is given, including suggested criteria for the evaluation assessment. The payment schedule is described in detail.

Module 3 – Borehole Siting and Drilling Supervision Consultancy provides guidance and advice for the preparation of an agreement for borehole siting and supervision consultancy. The module includes a template for the Terms of Reference (ToR), a UNICEF standard structure of Agreement and templates for other key documents that should be annexed to the contract. Note that the Terms of Reference and Agreement assume that UNICEF is the Client, i.e. that borehole construction, as well as the siting and supervision, is directly contracted by the UNICEF Country Office.

Module 4 –Terms of Reference for Borehole Drilling Works and Pump Supply and Installation provides an overview of contract options, and guidance and advice for the preparation of ToRs for (i) borehole drilling works

⁴ Concerning the pumps to be installed, recommendations throughout the toolkit have specifically been formulated for handpumps.

and (ii) Pump Supply and Installation. These two ToRs define the scope of work and set out the responsibilities of the Drilling Contractor, pump supplier and other stakeholders. Each ToR forms the basis for the preparation of the technical and financial proposals by the bidders, and subsequently becomes an integral part of the contract. The module is structured according to the UNICEF standard structure of ToR, in the form of templates that can be modified to suit local requirements.

Module 5 – Request for Proposal for Services (RFPS) provides guidance on how to customize the RFPS in VISION for the procurement of borehole drilling works. With Terms of Reference (ToR) developed, the RFPS process needs to define the framework of the solicitation and future collaboration with the supplier(s). The contract(s) that will be granted to the successful supplier(s) is (are) extracted from VISION.

Although much of the guidance in the toolkit is for boreholes that are procured and contracted by UNICEF directly, the guidance should also be useful for Governments and NGOs. However, Government will have to adhere to public procurement procedures, and other agencies will use other Information Technology (IT) systems for generating key documents.

Module 1

UNICEF Principles for the Planning, Contracting and Management of Borehole Drilling Projects



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For more information, comments and feedback, please contact UNICEF New York headquarters www.unicef.org or Skat Foundation www.skat.ch

AUTHORS:

Dotun Adekile & Kerstin Danert, Skat Foundation, St Gallen, Switzerland; Jose Gesti Canuto, UNICEF, New York, USA; Djani Zadi, Peter Harvey, and Anne Cabrera-Clerget, UNICEF, Copenhagen, Denmark

CONTRIBUTORS:

Fiorella Polo, WASH Specialist, Water and Sanitation Section, UNICEF New York Headquarters, USA
Sue Cavill, Consultant

COVER PHOTO:

Kerstin Danert

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Toolkit Orientation Table

	Introduction to the Toolkit <ul style="list-style-type: none"> ■ Definition of terms ■ Background to the Toolkit ■ Overview of the five modules
Module 1	UNICEF Principles for the Planning, Contracting and Management of Borehole Drilling Projects <ul style="list-style-type: none"> ■ Clarifies stakeholder responsibilities ■ Presents eight principles for the professionalization of borehole drilling ■ Defines minimum standards and recommends procedures ■ Explains different levels of drilling supervision
Module 2	Procurement Considerations for Borehole Drilling Works <ul style="list-style-type: none"> ■ Defines procurement process and responsibilities ■ Provides guidance for risk management ■ Compares two solicitation methods: ITB and RFPS ■ Highlights key considerations during the pre-contractual, contracting and contract administration phases including the evaluation of technical and financial proposals and the payment schedule
Module 3	Borehole Siting and Drilling Supervision Consultancy <ul style="list-style-type: none"> ■ Provides template of Terms of Reference which includes: <ul style="list-style-type: none"> ▪ Description of the assignment ▪ Supervisor's checklist ▪ Deliverables and reporting requirements ▪ Suggested Bill of Quantities for the consultancy services ▪ Completion certificate templates ■ Includes template for UNICEF Agreement for Borehole Siting and Drilling Supervision Consultancy Services
Module 4	Terms of Reference for Borehole Drilling Works and Pump Supply and Installation <ul style="list-style-type: none"> ■ Includes overview of how to select and specify handpumps and assure their quality ■ Provides templates for: <ul style="list-style-type: none"> ▪ Terms of Reference for Borehole Drilling Construction and Development of the Borehole ▪ Terms of Reference for the Supply and Installation of Pumps ■ Provides Technical Specifications for the borehole and a suggested format for the borehole completion record
Module 5	UNICEF Request for Proposal for Services for Borehole Drilling Works <ul style="list-style-type: none"> ■ Follows the UNICEF frame of Request for Proposal for Services in VISION and advises on options and elements ■ Includes template Bill of Quantities for borehole drilling works

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1.1 Background

The **UNICEF Toolkit for Borehole Drilling – Planning, Contracting and Management** (subsequently referred to as the **Toolkit**) has been developed to bring uniformity to practices and to guide UNICEF staff involved in borehole procurement and the supply of equipment, as well as contracting consultancy services for borehole siting and supervision. The Toolkit comprises five modules (see cover page).

Module 1 sets out the responsibilities for key stakeholders and presents eight principles for the planning, contracting and management of borehole drilling projects. These principles are applicable to all borehole projects in which UNICEF is involved, either directly as the contracting Client or in support of the National Government or other agencies. The principles are to be used to develop appropriate contracts for borehole projects and are applicable to all boreholes fitted with handpumps. The principles aid decision-making and streamline the procurement process.

1.2 Responsibilities of Key Stakeholders

Borehole drilling projects require the collaboration of many different stakeholders. Clarifying the respective responsibilities for everyone involved and making adjustments where necessary is an essential part of the planning process and will improve the chance of the successful completion of the project. The responsibilities of key stakeholders in borehole projects are set out in Table 1.1.

Table 1.1 Stakeholder definitions and responsibilities for borehole drilling projects

Stakeholder	Responsibilities
Community (including community representatives and community drilling trackers)	<p>The community members are the end users of the water supply as identified by the responsible government agency and UNICEF. The responsibilities of the community are:</p> <ul style="list-style-type: none"> ■ Appoint community representatives to liaise with local government, UNICEF, the Supervisor and the Contractor in the entire process (i.e. planning, project meetings, siting, mobilization, construction and completion of the works). ■ Participate in the borehole siting activities including agreement on the exact placement of the borehole site. ■ Appoint two literate and numerate individuals as community drilling monitors to support drilling supervision by tracking the drilling process and recording select information as requested by the supervisor. Note that the community is not responsible for technical or contractual details. ■ Establish a water committee. <p>Should any problems arise, the community should inform the supervisor. In case the problem concerns the supervisor, the community should inform the Consultant or the UNICEF Designated Representative.</p>

Stakeholder	Responsibilities
Local government or authority	<p>Representatives of the local government or authority should:</p> <ul style="list-style-type: none"> ■ attend the pre-mobilization meeting between UNICEF and the Drilling Contractor, ■ attend the introduction meeting with the community, ■ participate in the handing over ceremony. <p>Local government or authority representatives may also support drilling supervision by:</p> <ul style="list-style-type: none"> ■ conducting spot checks to monitor progress, ■ conducting spot checks to ensure that supervision is taking place, ■ attending site meetings, ■ participating in the inspection of works at the site on the dates they are substantially completed, ■ participating in the final inspection. <p>The local government or authority usually has the responsibility of post-construction monitoring of water facilities comprising</p> <ul style="list-style-type: none"> ■ checking functionality ■ checking yield and testing water quality ■ supporting the communities in the maintenance. <p>However, local governments often do not have the resources for adequate monitoring.</p>
UNICEF as Client/contracting Client	<p>The client is the organization or agency that is contracting out the borehole construction. In the case of boreholes that are directly contracted by UNICEF, the Client is the UNICEF Country Office and has the following responsibilities:</p> <ul style="list-style-type: none"> ■ Identifying the specific communities in which the siting and borehole construction will take place. ■ Ensuring that community representatives for the project have been selected and providing their names and contacts to the consultant and driller. ■ Ensuring that all regulatory requirements for the borehole are met. Legal requirements should be established by the Client early on to avoid delays. ■ Managing the contract with the drilling contractor. ■ Managing the contracts with the consultant responsible for siting and supervision or ensuring that supervising staff have clear Terms of Reference and the required equipment and resources to undertake siting and supervision. ■ Ensuring that siting of the borehole is undertaken as per contract. ■ Ensuring that the mobilisation and borehole construction process are supervised according to the contract. ■ Ensuring that any defects are corrected within the defects liability period.

Stakeholder	Responsibilities
Government or NGO as Client/contracting Client	<p>The Client is the organization or agency that is contracting out the borehole construction. In cases where UNICEF supports National Government or an NGO to contract boreholes, the National Government or NGO has the following responsibilities:</p> <ul style="list-style-type: none"> ■ Identifying the specific communities in which the siting and borehole construction will take place. ■ Ensuring that community representatives for the project have been selected and providing their names and contacts to the consultant and driller. ■ Ensuring that all regulatory requirements for the borehole are met. ■ Managing the contracts with the drilling contractor ■ Managing the contracts with the consultant responsible for siting and supervision or ensuring that supervising staff have clear Terms of Reference and the required equipment and resources to undertake siting and supervision. ■ Ensuring that siting of the borehole is undertaken as per contract. ■ Ensuring that the mobilisation and borehole construction processes are supervised according to the contract. ■ Ensuring that any defects are corrected within the defects liability period.
Consultant	<p>The Consultant is the person or company that has been engaged or whose bid has been accepted by the Client to carry out services such as the design of the project, borehole siting, drilling supervision and final inspection of the works. The Consultant's responsibility is to ensure that the drilling contractor adheres to the technical specification, makes all the required measurements, keeps all records accurately and ensures that health and safety procedures are adhered to.</p>
Contractor	<p>The Contractor (or drilling contractor) is a private company or NGO with a procurement contract to engage in the drilling of boreholes. It is the responsibility of the Drilling Contractor to drill the borehole as specified in the contract.</p>
Regulator	<p>The Regulator issues permits or licences for drilling or abstraction.</p>
Supervisor	<p>The Supervisor is the on-site representative of the Client. The Supervisor may either be a UNICEF staff or a nominated representative of the consultant. It is the responsibility of the Supervisor to ensure that the Drilling Contractor adheres to the technical specification, makes all the required measurements, keeps all records accurately and ensures that health and safety procedures are adhered to.</p>
UNICEF Designated Representative	<p>The UNICEF designated representative is the UNICEF officer designated as representing UNICEF as in the contract.</p>

1.3 Principles

UNICEF has eight principles for the planning, contracting and management of borehole projects. These define the minimum standards expected and the procedures to be followed. Table 1.2 explains each principle, and breaks it down into a set of recommendations.

Table 1.2 UNICEF principles for the planning, contracting and management of borehole drilling

Principle	Explanation and sub principles
Principle 1 Professionalization of Borehole Drilling	<p>All persons and organizations to be engaged in borehole drilling projects either as drilling contractors, consultants or equipment suppliers should be certified or registered with the recognised professional bodies.</p> <p>Recommendations:</p> <ul style="list-style-type: none"> ■ The siting, supervision and construction of boreholes and installation of pumps should be carried out by private sector companies or NGOs which are registered nationally. Government agencies should not be engaged to carry out such works except where Government is the only competent agency available. ■ All drilling contractors engaged should be licensed by the national government to engage in the drilling of boreholes and/or be members of the national drillers association. In countries where there is no licensing of drilling contractors or no national drillers association, the contractors shall be selected based on a shortlist from a prequalification exercise that establishes the technical and financial capacity of the contractors to carry out the works. Where there is no licensing of drilling contractors, UNICEF should work with the Government to establish such licensing system. ■ Hydrogeologists and groundwater consultants engaged for siting, supervision and monitoring of boreholes should be licensed by the national government and/or be members of the relevant national association. All consultants should be proven to have the requisite knowledge, skills and experience. The consultants should be selected through an evaluation process with clearly defined evaluation criteria. Where there is no licensing of drilling contractors, UNICEF should work with the Government to establish such licensing system.
Principle 2 Technology choice in borehole construction	<p>The choice of technology for the construction is the most economical for the borehole purpose and is aligned with national standards and community demand. National procurement guidelines shall be followed.</p> <p>Recommendations:</p> <ul style="list-style-type: none"> ■ Borehole dimensions, i.e. depth, diameter, requirements for development and time for pumping test, should be realistic; they should not be over- or under-specified. The borehole design may be modified during drilling based on field realities and hydrogeology. ■ A stepped approach to technology choice should be followed. If feasible, low-cost methods such as manual drilling should be considered first before mechanized drilling. The use of small drilling rigs should be considered first before larger drilling rigs if the borehole requirements can be met. ■ Every completed borehole should have some form of physical identification marker or plate with a number which conforms to the national borehole numbering system.

	<p>Where there is no national borehole numbering system, UNICEF should support the Government to initiate such numbering system.</p> <ul style="list-style-type: none"> ■ Where national/sub-national water point databases exist, UNICEF should ensure that all constructed boreholes are included in the database.
<p>Principle 3</p> <p>Borehole siting practice</p>	<p>Siting of boreholes should be professionally and scientifically carried out by competent and experienced groundwater consultants who also have social/community development competence. On projects where more than five boreholes are drilled, and those in difficult groundwater terrains, a hydrogeologist/groundwater specialist should be engaged to carry out the siting. On small projects (i.e. where up to five boreholes are drilled) which are located in areas where the groundwater is easily accessible, the responsibility for siting may be given to the Drilling Contractor.</p> <p>Recommendations:</p> <ul style="list-style-type: none"> ■ The selection of the siting procedure to be used should be based on a conceptual model of groundwater conditions in the project area developed from a desk study of the terrain from maps and other remote sensing tools, aquifer types, groundwater chemistry, climate and recharge potential. ■ From the conceptual model, the risks of drilling a dry borehole should be evaluated and the appropriate siting techniques recommended. It is not in every terrain that the use of geophysical methods should be specified or deemed necessary in siting boreholes. In proven regional, unconsolidated aquifers, the use of geophysics may not be necessary. Geophysical methods should only be specified where they enhance the chances of drilling a successful borehole and are cost-effective. In compacted sediments and crystalline rock terrains, the use of geophysics will often be appropriate. ■ The community, represented by the water users committee, must be involved in the location of the borehole site, and their preference should be given first priority. Where the location selected by the community is inappropriate for technical reasons, the reasons should be clearly explained to them and recorded. Alternative locations should be proposed for consideration by the community. ■ The consultants responsible for the siting of the borehole should be paid even if the boreholes are dry. ■ The ownership of the land selected must be determined. The consent of the owners to use the land for the borehole and allow access perpetually must be set down in writing. If compensations are agreed on, they must be settled before commencement of any work. ■ Sites selected for borehole drilling should not be those that are likely to be polluted or contaminated by potential sources of pollution nor interfere with natural groundwater discharges and other existing wells and boreholes.
<p>Principle 4:</p> <p>Supervision</p>	<p>Effective supervision is essential for sustainable boreholes. The quality of the product is as good as the quality of the supervision. All borehole projects should be supervised by competent personnel who are well trained and experienced in borehole supervision. Supervisors should be properly equipped and have adequate facilitation to undertake the job without dependency on logistics by the drilling contractor.</p> <p>The Client (i.e. UNICEF, National Government or NGO) should aim at providing full-time supervision for the drilling process. In full-time supervision, the Supervisor stays</p>

with the drill team from the pre-drilling inspection to demobilization. Where there are insufficient/inadequate resources for full-time supervision, part-time supervision may be considered in which the Supervisor witnesses critical milestones of the drilling process. The critical milestones must have been stated in the contract document as well as the consequences of not abiding by them. The levels of supervision are defined in the Toolkit Module 1, section 1.3.

Recommendations:

- Supervision of borehole drilling ensures that the boreholes are drilled as specified, safety of the public and drilling personnel are guarded and all the data collected during drilling are accurately recorded and reported to the relevant agency.
- Supervision of borehole drilling requires professional, experienced and qualified personnel. UNICEF should ensure that there are competent personnel to carry out the supervision of borehole projects, and that they are adequately facilitated. Where such personnel are not available in-country, UNICEF will work with the Government to train and develop the capacity of local personnel to carry out drilling supervision prior to the commencement of the project, may arrange mentoring support and will lobby for adequate facilitation. UNICEF may also enter into a contract with a consultancy firm to carry out the supervision.

Principle 5: Water quality and safety

Delivering water that is safe for human consumption is a key accountability for UNICEF. Safety is a measure of the potential risk for humans of drinking water that is harmful to their health. The risk is related to both microbial and chemical contamination.

All completed boreholes will comply with national standards on water quality, or, in the absence of national standards, with WHO guidelines.

Recommendations:

- All boreholes will be sited to minimize the risk of microbial and chemical contamination.
- Following completion of the borehole, drillers (or the designated agency) will facilitate water sample collection, following national standards or recommendations for sampling.
- Water quality tests, both bacteriological and chemical tests, will be carried out by independent institutions, and results will be compared against national drinking water quality standards (or WHO international guidelines, should there be no national standards).
- Should initial tests highlight microbiological contamination above national standards, the driller will be responsible for shock chlorination of the water point. If subsequent tests still detect microbiological contamination, appropriate measures should be implemented by the relevant authorities.
- If tests highlight chemical contamination related to geological conditions (e.g. fluoride or arsenic contamination) beyond national standards, then the Supervisor and the competent authorities will decide on the temporary or definitive closure of the water point.
- Payment for boreholes which result in poor water quality depends on the measures taken by the driller to minimize the risk of contamination. Unless there is evidence that poor water quality is a direct result of the driller's actions, boreholes should be paid for. This is further elaborated in Principle 6.

Principle 6**Payment for boreholes**

Groundwater exploration is an inexact science, and in some terrains there are risks of drilling a dry borehole or encountering groundwater of poor quality irrespective of the experience and qualification of the hydrogeologist who sited the borehole.

Payment for completed boreholes will be according to a bill of quantities based on the recommendations from the siting exercise and the preliminary borehole design, i.e. the probable borehole depth, diameter and lining materials and conditions of geological formations. Payments will be made as per the actual works done and quantities of materials used (rather than as a lump sum).

Where boreholes are declared unacceptable on completion of drilling through inadequate water either in quantity or quality but through no fault of the driller, the driller will be paid according to the measureable quantities of items of work completed up to the point of the borehole being declared unacceptable. This includes boreholes where geophysical surveys have been conducted and where boreholes do not have sufficient yield or safe water quality.

Recommendations:

- The risks of drilling a dry borehole should be evaluated from the desk study and classified as either high, moderate or low (see **Toolkit** Module 1, section 1.4). In areas of high and moderate risks, particular care must be taken in the siting of the boreholes and in the supervision of drilling.
- Where the risks of drilling a dry borehole become apparent during the drilling, particularly from the output during hammer drilling, and the recommended depth has been attained and possibly surpassed, the Supervisor may elect to stop the drilling and declare the borehole unacceptable without installing casing and screens in the borehole. In such circumstances, the driller should be paid for items of work expended until the borehole was declared unacceptable, based on the bill of quantities.
- If the borehole is declared unacceptable due to poor water quality as a result of wrong drilling technique or poor gravel pack, then the driller will not be paid for such boreholes and should be asked to drill another one at their own expense.
- The quantities in the bill of quantities are only indicative. The Contractor will only be paid for the quantities expended.
- All contracts should have a defects liability period of a specified duration as prescribed in the national procurement guidelines. A retention fee will be held by the Client for the duration of the defects liability period. The client (i.e. UNICEF, Government or the NGO) will sensitize users on the need for timely reporting of defects during the liability period.
- Criteria for a successful borehole include: completion of all drilling operations, installation of casing and screen, development works and test pumping, including lowering of borehole assembly with PVC casing, screen and end cap, gravel pack at appropriate intervals and back fill, close near surface water table aquifer, cleaning and development, pumping test, chlorinate borehole, pump installation, construction of apron with drainage and soak away pit and water quality testing, both chemical and biological.
- Where the risks of drilling a borehole that is contaminated by chemical contaminants originating from geological processes (such as arsenic and fluoride) and the recommended depth has been attained and possibly surpassed, the Supervisor may elect to stop the drilling and declare the borehole unacceptable without installing casing and screens in the borehole.

Principle 7
Selection and installation of pumps¹

Selection of pumps to be installed on the boreholes must adhere to national standards or guidelines. Where there are no national standards, the pump selected must be robust and not corrode.

Recommendations:

- Where countries have published or accepted national standards or guidelines for handpumps or standardized particular types of handpump, the Supervisor must ensure that the right tools and procedures for assembling the pump are used, as using the wrong tools and shortcuts can damage the pumps as well as compromise the safety of the installation team.
- In the case of corrosive water (i.e. pH < 6.5), specific measures need to be taken. Galvanised iron (GI) riser pipes must not be installed in water where the pH is less than 6.5. In cases where the pH is close to 6.5, UNICEF and the respective line ministry will provide guidance on what should be installed.
- Handpump installation must be coordinated with the pad construction, and one team will be responsible for the handpump and pad.
- Handpump mechanics or pump minders must be identified and trained in the installation and repair of the particular handpump on the project. Training may be conducted as part of the handpump installation contract or as a separate initiative. The training should be extended to cover individuals involved in any other service delivery models being considered.
- A separate contract for head works construction and handpump installation may be considered on large multiple borehole projects apart from the drilling contract to ease the installation of the handpumps

Principle 8
Monitoring functionality and water safety and quality over time

The functionality and the safety of the water of the completed boreholes shall be monitored on a regular basis and the findings published.

Recommendations:

- Monitoring of the borehole functionality and water safety should be formalized and the facilities inspected at least twice a year by the designated government agency.
- Packages to monitor functionality may include work for more than one year.
- Post-construction monitoring of borehole functionality and water safety and quality is often the responsibility of local government, the communities and the private sector. But often local governments and communities do not have the resources for the monitoring. UNICEF should work with government and other partners to set in place the necessary arrangements for the monitoring process.
- UNICEF and its partners should work with governments and communities to address the underlying causes of poor functionality and poor water quality through e.g.:
 - appropriate service delivery models for the water points,
 - water safety planning and implementation,
 - operational monitoring of water safety measures (=barriers developed to reduce risks of contamination, as per water safety plans) and
 - water quality surveillance systems (independent spot checks on water quality).

¹ Concerning the pumps to be installed, recommendations throughout the toolkit have specifically been formulated for handpumps.

- The report of the monitoring visits (which provides information on the functionality of the borehole, water quality and safety) and the required actions should be shared with the communities and all other relevant entities at the national and local government levels.

1.3 Levels of Supervision and End of Contract Inspection

There are three different levels of supervision, as described in Table 1.3. The supervisor needs to be properly equipped in all cases, but a borehole camera is particularly important for part-time milestone supervision and end-of-contract inspection.

Table 1.3 Levels of drilling supervision

Level	Description
Full time supervision	Supervisor stays with the drilling team throughout the drilling process, from inspection of the equipment and materials to demobilization. On large drilling programmes with multiple rigs, several Supervisors are deployed. While this supervision level is ideal, the resources needed are not always available
Part-time milestone supervision	<p>One Supervisor is responsible for the supervision of several drilling sites and may only witness crucial stages (milestones) of the drilling. The stages that must be carried out in the presence of the Supervisors need to be specified in the contract documents of the Drilling Contractor and Supervisor and the consequences of not abiding by them stated. However, the Supervisor is expected to be promptly on site and should not cause undue delays. The milestones are:</p> <ul style="list-style-type: none"> ■ mobilization ■ site selection (if this is part of the Drilling Contract) ■ termination of drilling ■ lining of the borehole ■ borehole development ■ pumping test ■ demobilization ■ platform construction ■ pump installation (may be delegated depending on the contract) <p>The designated 'Record Keeper' in the drilling contractors' team plays a very important role. He/she is designated to collating the measurements and preparing the forms at all stages of the process set out in the milestones above. This role should be specified in the contract documents.</p> <p>The role of identified community members as monitors to track the drilling construction process can also be very useful for milestone supervision.</p>

End-of-contract inspection is not supervision but rather a visit to the works in order to verify that all specifications have been adhered to and that the works are in their proper condition. On completion of the

Works by the Drilling Contractor, the Supervisor will inspect the boreholes, pads, pumps and surroundings and identify any defects that need to be corrected during the defects liability period. These defects are to be attached to the Certificate of Substantial Completion. A Certificate of Final Completion is only issued if all defects have been corrected.

1.4 Categorisation of Risk of Dry Borehole

In a particular country, or region, it may be possible to classify the drilling potential into three (or more) categories as set out in Table 1.3. Appropriate contracts and payment should be defined for each category. It should be noted that this model is not intended to be prescriptive, but that it illustrates a way of dealing with one of the key challenges of borehole drilling: the risk of dry wells. Ideally, the Client should take responsibility for the siting and pay the contractor for successful and dry holes according to a Bill of Quantities (BoQ) (See Module 4, Annex 4.1).

Table 1.4 Categorisation of dry boreholes

Category	Success Rate*	Actions
A High Success	>75%	No need for geophysical survey. Drilling at any site has a high chance of success. First preference of community is likely to be successful.
B Moderate Success	50-75%	Survey required and may be done by the Contractors within the community preferred area following government guidelines. In some cases, it is advisable to specify minimum drilling depth in the Contract.
C Low Success	<50%	Client to commission independent siting including use of geophysics (resistivity depth sounding and electromagnetic profiling). Sites selected and designed by the consultant should be drilled by the Contractor.

Module 2

Procurement Considerations for Borehole Drilling Works



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AUTHORS:

Dotun Adekile & Kerstin Danert, Skat Foundation, St Gallen, Switzerland; Jose Gestí Canuto, UNICEF, New York, USA; Djani Zadi, Peter Harvey, and Anne Cabrera-Clerget, UNICEF, Copenhagen, Denmark

CONTRIBUTORS:

Fiorella Polo, WASH Specialist, Water and Sanitation Section, UNICEF New York Headquarters, USA
Sue Cavill, Consultant

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Abbreviations and Acronyms

BoQ	Bill of Quantities
CFM	Cubic foot per minute
CP	Contractual Provisions
CRC	Contract Review Committee
DTH	down-the-hole
ITB	Invitation to Bid
ITBS	invitation to Bid for Services
PDI	Pre-Delivery Inspection
RFP	Request for Proposal
RFPS	Request for Proposal of Services
ToR	Terms of Reference

Definitions

Refer to the **Toolkit Introduction** for definition of terms.

2.1 Introduction

The **UNICEF Toolkit for Borehole Procurement and Construction** (subsequently referred to as the **Toolkit**) has been developed to bring uniformity to practices and to guide UNICEF staff involved in borehole procurement and the supply of equipment, as well as contracting consultancy services for borehole siting and supervision. The **Toolkit** comprises five modules (see cover page).

Module 2 – Procurement Considerations for Borehole Drilling Works – highlights key aspects to be considered in the procurement process for borehole drilling construction. It should help UNICEF programme and supply staff in the country offices to work together in the project planning, procurement and contract management. The module defines the roles and responsibilities of UNICEF Programme and Supply staff at each stage of the procurement process as well as guidance on risk management. It specifically provides key information for the pre-contractual and contracting phases including, advice for pre-qualification of drilling contractors and a list of the key contract documents. Module 2 provides a clear comparison of the two solicitation methods likely to be used in borehole projects – ITB (invitation to bid) and RFPS (request for proposal for services) and advice on which one to use. Guidance on evaluating the technical and financial proposals is given, including suggested criteria for the evaluation assessment. The payment schedule is described in detail.

Although Module 2 provides guidance in the preparation of contract documents for boreholes that are procured and contracted by UNICEF directly, the document should also be useful for Governments and NGOs. However, Government will have to adhere to public procurement procedures, and other agencies will use other Information Technology (IT) systems for generating key documents.

It should be noted that throughout Module 2:

- Programme staff refers to WASH Programme Staff in the UNICEF Country Office
- Supply staff refers to Supply Staff in the UNICEF Country Office.

For UNICEF, the contract issued at the end of the procurement process is generated in VISION¹. The preparation of accurate documents (e.g. Terms of Reference, Bill of Quantities and solicitation documents) is essential to ensure that an appropriate and good quality contract is generated. For the procurement and contracting of borehole siting, construction and supervision, it is extremely important to take into account all of the aspects highlighted in this module of the **Toolkit**.

The **Toolkit** provides flexibility so that it can fit the circumstances of a particular project. It should be noted that national laws, standards and codes are to be adhered to, unless otherwise specified. Advice and key elements (such as relevant principles) to take into consideration are highlighted in blue text boxes throughout the document (e.g. Box X).

Box X Sample box containing advice and key elements that should be taken into consideration

When commencing with an Invitation to Bid, UNICEF procurement

¹ VISION is the Virtual Integrated System of Information, which is the Information Technology – IT – system used by UNICEF.

2.2 Procurement Process and Responsibilities

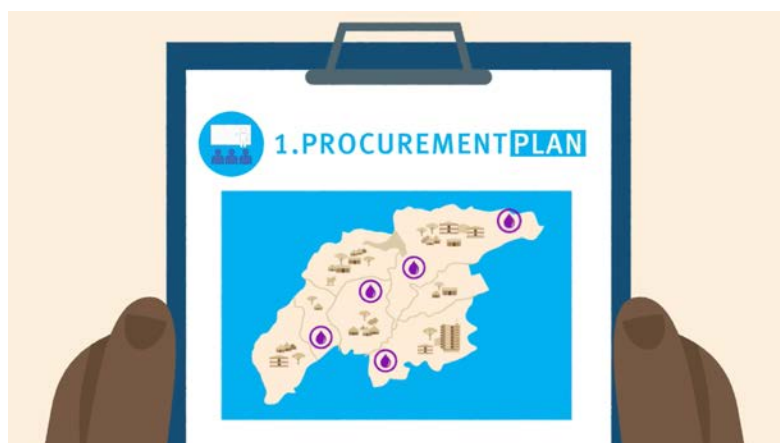
The objective of procurement is the timely acquisition of goods, services and works while addressing guiding principles. The procurement process shall be carried out within the framework of the UN Financial Rules and Regulations as well as the UNICEF Supply Manual. The procurement processes for services and goods follow the same cycle, which can be divided into a series of steps within four phases:

- Pre-contractual phase
- Contracting phase
- Contract administration phase
- Post-construction phase

Clarifying responsibilities from the outset helps everyone to know what they should be doing and when, aids timely delivery, and can enable the procurement process to run smoothly. Table 2.1 sets out the different steps for each of the above phases and the respective responsibilities of UNICEF WASH Programme and Supply staff.

Sections 2.3 and 2.4 of this module highlight specific elements that need particular attention for the acquisition of services the construction of boreholes in the pre-contractual, contracting and contract administration phases of the procurement process.

Figure 2.1 Good procurement planning is essential to ensure that high quality boreholes are constructed.



Full details on the procurement process can be obtained in the following documents:

- [UN Procurement Practitioner's Handbook, Chapter 3: Procurement Process](#)²
- [UNICEF Supply manual](#)³, Chapter 6: PROCUREMENT OF SUPPLIES, EQUIPMENT AND SERVICES, section 7: contracting for services
- The e-course "[Contracting for Services: Case Studies on Institutional Contracts](#)" is available online⁴.

² UNICEF Internal Document available on: <https://intranet.unicef.org/Policies/DHR.nsf/6203f70108ece1f685256720005e2bfe/0df16cc9918d2fa1c1257f2b00415233?OpenDocument>

³ Available on <https://www.ungm.org/Areas/Public/pph/channels/PPH.pdf>

⁴ Available on Agoga - <https://agora.unicef.org/course/info.php?id=1950>

Table 2.1 Overview of procurement phases and responsibilities of UNICEF programme and supply staff

Phase and Steps	WASH Programme Team	Supply Team
Pre-Contractual <ul style="list-style-type: none"> Needs assessment Requirement definition Budget overview Risk analysis Procurement planning and selection of procurement method Pre-qualification and shortlisting of supplies 	<ul style="list-style-type: none"> Where Request for Proposal for Services (RFPS) is the preferred method of solicitation: prepare Terms of Reference (TOR), provide evaluation criteria and Bill of Quantities (BOQ) Where Invitation to Bid (ITB) is used, prepare detailed specifications Prepare Engineers Estimate (Confidential BoQ) and estimate siting and supervision costs Risk analysis 	<ul style="list-style-type: none"> Providing advice on the contract (e.g. payment terms, contracting option, TOR templates)
Contracting <ul style="list-style-type: none"> Sourcing and pre-tender meeting Solicitation of documents Bidding Receipt and opening of bids/offers Clarification Evaluation and award recommendation Awarding and contract finalisation Risk management 	<ul style="list-style-type: none"> Participate in the technical evaluation Manage site visit Review clarifications Participate in kick off meeting 	<ul style="list-style-type: none"> Prepare and publish solicitation documents (RFP, ITB) Organize clarification session Organize Evaluation & Negotiation Prepare Contract Review Committee (CRC) and contract Attend the kick-off meeting after awarding the contract
Contract Administration <ul style="list-style-type: none"> Contract management Payment Risk management 	<ul style="list-style-type: none"> Respect of all parts of the contract Supervise the deliverables Certify all invoices with payment terms Notify provision of any extension or modification of at least three (3) months before the contract expires 	<ul style="list-style-type: none"> Guide programme staff on contract conflict (e.g. General Terms and Conditions – GTC, Contractual Provisions – CP and Payment terms) Modify or cancel the contract to reflect changes Monitor the status of open contracts in VISION (ZMONICON)⁵
Post-contractual <ul style="list-style-type: none"> Monitoring & evaluation Risk management Close out 	<ul style="list-style-type: none"> Performance evaluation (and inform Supply Staff) At the end of the contract, notify the supplier that the activities have been completed and no outstanding payments are due Provisional handover and final handover (releasing guarantees) 	<ul style="list-style-type: none"> Closing contracts at the instigation of the contractor Include assessment of the final performance of the contract in VISION and copy paper on the contract file

⁵ VISION T-code (Transaction code in UNICEF Information Technology –IT System, VISION)

2.3 Risk Management

Risk management mitigates the impact of risks by reducing the likelihood of their occurrence and/or reducing avoidable consequences through planning, monitoring and other appropriate actions. Responses to risk include ignore, reduce, transfer and manage. It is essential to decide which party is most appropriate to manage each of the risks identified. Risks can be clustered in three main groups:

- **Environmental** – includes risks from the political environment, market environment or delivery infrastructure environment, among others.
- **Programme** – risks relating to the complexity associated with the nature of the service to be acquired, among others.
- **Implementation** – risks associated with the implementation unit capacity.

Risk management is undertaken throughout the life of a project. A risk register provides a framework in which problems that threaten the delivery of the anticipated benefits are captured. It comprises a dashboard that records identified risks, their severity, and the actions or steps to be taken. The risk register should be made visible to project stakeholders so that they can see that risks are being addressed. They may also flag risks that have not been identified and propose other options for risk mitigation.

Project Managers (programme staff) and Supply Managers (supply staff) should both use the risk register to identify, assess and manage risks down to acceptable levels and instigate actions to reduce the probability and the potential impact of specific risks. Table 2.2 sets out key questions in the risk management cycle, and Table 2.3 provides an overview of the risks to be monitored and mitigated for projects to procure and construct boreholes. Table 1.3 (**Toolkit** – Module 1) categorises the risk of dry boreholes and implications for siting.

Table 2.2 Key Questions to be asked in the Risk Management Cycle

Component	Key Questions
1. Risk Identification	What are the key risks and opportunities?
2. Risk Assessment	How does the potential impact relate to our risk tolerance? What is the likelihood of a risk event and what would the impact be?
3. Risk Prioritisation	What are the most critical risk issues that demand attention?
4. Taking Action	What is the best course of action? What are our strategies? How will we know that our mitigating actions are effective?
5. Monitoring and Reporting	Are action plans being implemented? Are they effective in mitigating risk? How are we monitoring their implementation?

Table 2.3 Risks that should be monitored and mitigated in borehole drilling projects

Note that additional columns covering the probability, impact and Significance Level should be added to the table.

No.	Risk Title	Description and Root Causes	Potential Impact of Risk	What the office should do to mitigate the risk
Risk Area: Procurement Planning				
1	The whole procurement process is rejected by the local government and has to be restarted.	<ul style="list-style-type: none"> ■ Specific local regulations in relation to borehole drilling are not in place or have not been followed. ■ Roles and responsibilities of different stakeholders <ul style="list-style-type: none"> ■ client, community, contractor, consultant ■ are poorly defined. 	<ul style="list-style-type: none"> ■ Loss of reputation by the procuring entity ■ Additional costs ■ Financial risk: unexpected costs arise. ■ Delay in project completion. 	<ul style="list-style-type: none"> ■ The designated representative should be aware and abide with of all specific national regulations related to procurement of boreholes including e.g. national procurement acts, national water policies, strategic frameworks on rural water supply and sanitation, statutory instruments for water well drilling. ■ The designated representative should closely follow up with governmental partners, for example by hiring a consultant specialised in borehole drilling and its procurement to support the team.
2	Shortlisted suppliers are inexperienced contractors.	<ul style="list-style-type: none"> ■ Imprecise criteria for evaluating the technical proposal at the pre-qualification stage. ■ Lack of capable staff to carry out the procurement process. ■ Lack of transparency in the procurement process. 	<ul style="list-style-type: none"> ■ Delays in the procurement and implementation process. ■ Contractors may have to be invited from locations distant to the project site. 	<ul style="list-style-type: none"> ■ The procurement staff should be persons qualified or trained in the procurement and management of borehole contracts. ■ The pre-qualification process should be based on evaluation of technical and financial capacities of the bidders as well as adherence to national regulations with regard to drilling permits, licensing, membership of national professional associations. ■ Solicitation should only be opened to pre-qualified contractors.
3	Proposals from bidders do not correspond to the field reality.	<ul style="list-style-type: none"> ■ Bidders do not have sufficient time or resources for field visits to base their offer on reality. They thus offer a standard approach that does not reflect all costs and technical necessities. ■ Technical specifications are not clear enough for the bidders to propose a consistent offer. Some terms and conditions are not fully understood by the bidders. ■ Lack of or poorly conducted pre-bid meeting 	<ul style="list-style-type: none"> ■ Rejection of bids leading to rebidding and delays in the procurement process. 	<ul style="list-style-type: none"> ■ Tender documents, technical specifications and drawings should be based on the findings of the borehole siting and design process. ■ A pre-bid meeting should be held at which all the technicalities are explained to the bidders by the procurement staff. ■ Bidders should be advised to visit the project location before preparing their bids.

No.	Risk Title	Description and Root Causes	Potential Impact of Risk	What the office should do to mitigate the risk
4	Inconsistent offers received.	<ul style="list-style-type: none"> ■ Technical specifications are not clear enough for the bidders to propose a consistent offer. Some terms and conditions are not fully understood by the bidders. ■ Inexperience of the bidders. ■ Lack of or poorly conducted pre-bid meeting. 	<ul style="list-style-type: none"> ■ Rejection of bids leading to rebidding and delays in the procurement process. 	<ul style="list-style-type: none"> ■ Tender documents, technical specifications and drawings should be based on the findings of the borehole siting and design process. ■ A pre-bid meeting should be held at which all the technicalities are explained to the bidders by the procurement staff. ■ Bidders should be advised to visit the project location before preparing their bids.
5	Delay in receiving goods and starting the project e.g. where UNICEF provides pumps.	<ul style="list-style-type: none"> ■ Procurement/supply plan does not forecast time for offshore transportation and custom clearance. 	<ul style="list-style-type: none"> ■ Delay in project completion. 	<ul style="list-style-type: none"> ■ A detailed "Procurement/Supply Plan" with origin of goods (type of procurement: offshore or local) and average transit times should be prepared and shared between the supply team and the project manager. ■ Sufficient time for Pre-Delivery Inspection (PDI), transport, custom clearing should be allocated.
6	Project cost is under budgeted.	<ul style="list-style-type: none"> ■ Inadequate budgeting and engineer's estimate. ■ Inexperience or lack of training of the procurement team. 	<ul style="list-style-type: none"> ■ Cancellation of bids. ■ Rebidding required. ■ Delay in project implementation. 	<ul style="list-style-type: none"> ■ Procurement team should comprise trained and experienced staff. ■ A proper engineer's estimate should be made where every project component is identified and the cost estimated. ■ In addition, a market survey of current drilling cost should be carried out to verify the engineer's estimate.
7	The cost per borehole is too high.	<ul style="list-style-type: none"> ■ The unit cost of a borehole is higher than the budget. ■ Inadequate budgeting and engineer's estimate. 	<ul style="list-style-type: none"> ■ Cancellation of bids. ■ Rebidding required. ■ Delay in project implementation. 	<ul style="list-style-type: none"> ■ For borehole drilling projects, a bill of quantities should be used. ■ A proper engineer's estimate should be made where every project component is identified and the cost estimated. ■ In addition, a market survey of current drilling cost should be carried out to verify the engineer's estimate.
8	Unacceptably high mobilisation cost.	<p>Bidders probably seek a much higher mobilisation cost due to one of the following factors.</p> <ul style="list-style-type: none"> ■ Discontinuity in groundwater distribution. ■ Great distances and travelling time between borehole sites. ■ Conflict and insecurity in the project location. 	<ul style="list-style-type: none"> ■ Increase in overall project cost. 	<ul style="list-style-type: none"> ■ Preference should be given to multi-borehole packages in a close geographic area with similar depth and hydrogeology. ■ In addition to facilitating the supervision, this will also facilitate the work of the contractor and allow economy of scale in an area with similar geology requiring identical drilling techniques.

No.	Risk Title	Description and Root Causes	Potential Impact of Risk	What the office should do to mitigate the risk
Risk Area: Contract Award Process				
9	Delays in the procurement process.	<ul style="list-style-type: none"> Consideration has not been given to all the steps in the procurement process, and/or the different stakeholders are not involved. 	<ul style="list-style-type: none"> Delay in project implementation and its benefits to partner communities. Drilling period is pushed into the rainy season and cannot go ahead due to accessibility constraints. Time available for drilling becomes unrealistically short to complete to satisfaction. 	<ul style="list-style-type: none"> Proper project management is required. Consider multi-year contracts.
10	Most qualified contractors do not apply.	<ul style="list-style-type: none"> Bidding process is cumbersome, imprecise and time consuming for bidders. Contract packages too small to attract serious bidders 	<ul style="list-style-type: none"> Delay in the procurement process. 	<ul style="list-style-type: none"> Bidding process and documents should be as simple and short as possible. A pre-bid meeting should be organised to brief the bidders on their role. A hydrogeologist should go through the contract documents to ensure a common understanding of all the salient points.
11	Contract is missing key elements.	<ul style="list-style-type: none"> Contract documents are poorly prepared and/or imprecise. 	<ul style="list-style-type: none"> Delay in the procurement process. 	<ul style="list-style-type: none"> A comprehensive TOR and/or BoQ form the foundation of the tendering process.
Risk Area: Contract Management				
12	Payment is delayed.	<ul style="list-style-type: none"> The contractor claims the work is completed, but verification by the supervisor is delayed. Internal processing time is lengthy. Security does not allow supervisor to visit the site. 	<ul style="list-style-type: none"> Contractor might decide to stop all other activities. Drillers refuse to work with UNICEF on other projects. 	<ul style="list-style-type: none"> Take accessibility constraints into consideration and prepare an evolving travel plan according to work advancement. Consideration should be given to the internal payment processing time.
13	Increased cost of services, unplanned costs and dispute with the contractor for the payment of unforeseen works.	<ul style="list-style-type: none"> The scope of work is ambiguous, leading to various interpretations. 	<ul style="list-style-type: none"> Stoppage of work by the contractor. Delay in implementation. 	<ul style="list-style-type: none"> The Terms of Reference should be clear on the deliverables. Any change in cost of service or of goods should be validated in advance by the UNICEF Designated Representative. As much as possible, responsibilities regarding extra works or expenses such as "dry boreholes" should be clearly identified in advance.

No.	Risk Title	Description and Root Causes	Potential Impact of Risk	What the office should do to mitigate the risk
14	Delay in project implementation or non-completion of works	<ul style="list-style-type: none"> ■ Lack of planning, milestone tracking. ■ Land ownership conflicts cause delays or lead to sites not being suitable. ■ Poor project management. ■ Security situation impedes movement of project staff. 	<ul style="list-style-type: none"> ■ The completion of the improved water source is delayed. ■ Partner communities lose interest in the project. ■ The investments made are wasted. 	<ul style="list-style-type: none"> ■ A clear and detailed project plan with milestones should be developed and validated by UNICEF. This should be provided by suppliers in the ITB/RFP submission. ■ Ensure that all procedures and responsibilities are communicated and understood by partners. ■ A clear reporting schedule should be developed. ■ Regular site visits by UNICEF staff or supervisor. ■ Regular visits to site with the relevant government staff.
15	Poor quality of work	<ul style="list-style-type: none"> ■ Lack of proper supervision. ■ Inexperienced or unprofessional drilling contractor. 	<ul style="list-style-type: none"> ■ Badly constructed boreholes that fail before the designed lifespan. 	<ul style="list-style-type: none"> ■ Competent drilling contractors should be selected. ■ Trained and experienced supervisors should supervise projects. ■ There should be clear TOR for supervision. ■ The work quality should be specified in the TOR.
Risk Area: Monitoring & Reporting				
16	Boreholes are not maintained after completion.	<ul style="list-style-type: none"> ■ Inadequate consultation with partner communities at the planning stage. ■ Nobody accepts ownership/responsibility for the maintenance of the borehole. ■ No proper handover was done. 	<ul style="list-style-type: none"> ■ The borehole/handpump malfunctions and is abandoned. ■ The community reverts to unsafe water sources. ■ The impact of the improved water source is not felt. ■ The investment is wasted. 	<ul style="list-style-type: none"> ■ The community should have been trained in the operation and maintenance of the borehole. ■ The designated representative has to ensure that the driller has complied with all the requirements of the contract, that the installation is working properly and that all the data are collected and submitted. ■ A day should be set aside for handing over the completed borehole to the community and/or the client. ■ A certificate to be signed should be presented.
17	There is no post-construction monitoring	<ul style="list-style-type: none"> ■ In many countries, post construction monitoring is the responsibility of the local government who are expected to: <ul style="list-style-type: none"> ■ inspect the facilities ■ check their functionality ■ check yield, water quality ■ support the communities in the maintenance. 	<ul style="list-style-type: none"> ■ If the borehole/handpump malfunctions, it may be abandoned. ■ The community will revert to unsafe water sources. ■ The impact of the improved water source is not felt. ■ The investment is wasted. 	<ul style="list-style-type: none"> ■ Ideally, a budget should be allocated for this activity in the procurement planning phase. ■ The project should raise awareness of the support required among entities that could provide the support. ■ The report of the monitoring should be submitted to the designated authorities and to all relevant entities at the national level.

No.	Risk Title	Description and Root Causes	Potential Impact of Risk	What the office should do to mitigate the risk
		<ul style="list-style-type: none"> ■ However, local governments often do not have the resources for adequate monitoring. ■ Funds are not available for post-construction facility management and monitoring. 		

2.4 Pre-contractual phase

This section provides a reminder of the international procurement principles that UNICEF is subjected to (as an organisation within the UN system) and explains the special considerations for borehole drilling construction in the pre-contractual phase with respect to the budget, risk management, selection of the solicitation method and the pre-qualification and shortlisting of suppliers (in the case of drilling construction, contractors).

2.4.1 Principles

All UN organisations shall follow the same guiding principles, which are based on the concept of stewardship:

- promotion of objectives of the organisation
- fairness, integrity and transparency through competition
- economy and effectiveness
- best value for money

2.4.2 Budget

As stated in Supply Manual, Chapter 4 (Supply Processes), Section 2 (The Supply Requisition), estimated budget for supply, freight and services need to be included in the service requisition. The creation and approval of the requisition authorises the expenditure and reserves funds for the procurement and delivery of the supplies and services.

Although this module focuses on the procurement for the drilling construction activity, the budget for a drilling project needs to also take into consideration the cost of siting and supervision, as well any oversight required. For budgeting purposes, the preparation of an accurate engineer's estimate (confidential BoQs) for drilling construction is essential, as are realistic estimates for siting and supervision.

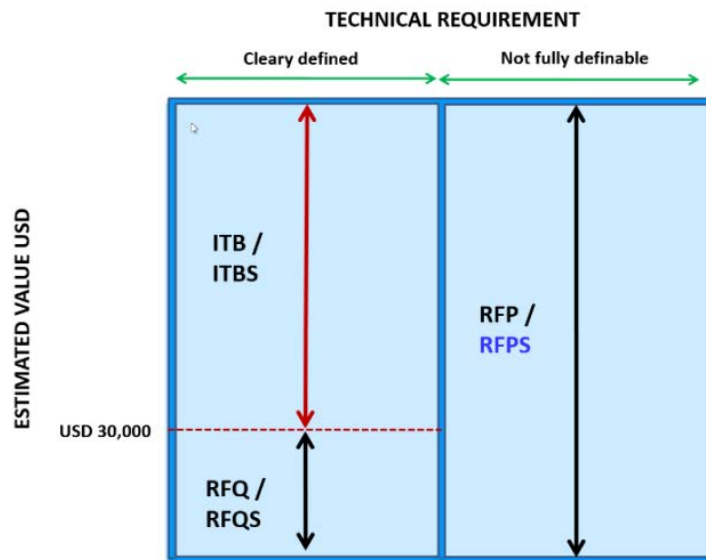
2.4.3 Selection of Solicitation Method

The solicitation method to be used depends on the estimated value and technical complexity of the project as follows, and is illustrated in Figure 2.2 and 2.3

- **Request for Quotations (RFQ):** only possible if the project value is up to USD 30,000. This method can generally not be considered for large-scale borehole drilling projects.
- **Invitation to Bid (ITB)** for goods or for services over USD 30,000 where the technical requirements can be fully specified. Use the ITB only when a relevant and updated list of prequalified contractors or implementing partners is available and when the technical requirements can be fully specified. Remember that there can be no price negotiation with an ITBS.

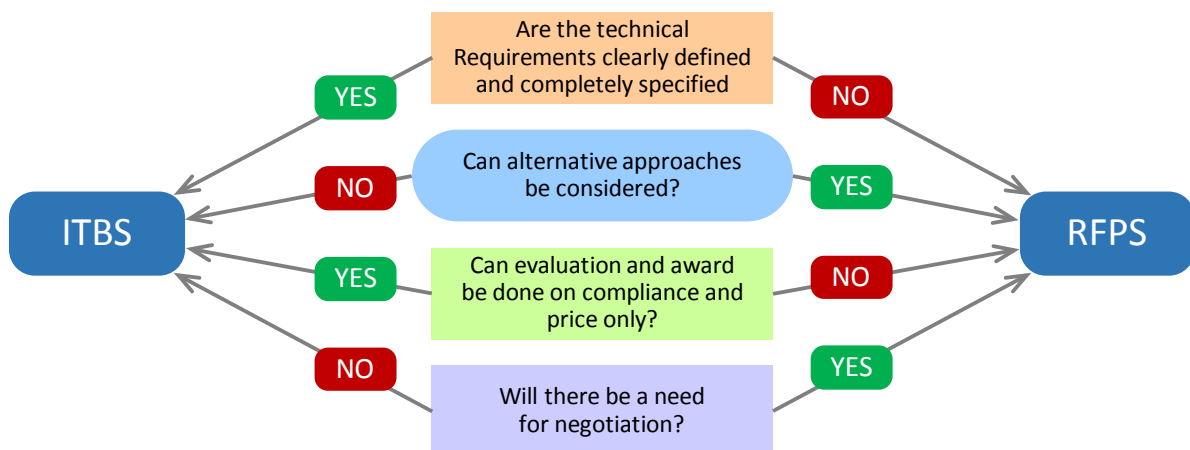
- **Request for Proposal (RFP)** for goods or for services, whereby the technical specifications are not fully defined and when the capacity of the supplier has not been fully assessed (i.e. no pre-qualification). An RFP enables UNICEF to conduct negotiations with suppliers, which can be used for example to fine-tune the timeline and customise to the local conditions but must not undermine the quality of the works. In the RFPS, the capacity assessment of bidders (using mandatory criteria that would be used to pre-quality bidders in an ITB) is included within the technical evaluation.

Figure 2.2 Solicitation Methods



For borehole drilling projects, UNICEF Offices should use the ITBS or RFPS as summarised below and in Figure 2.3, and detailed in Table 2.4.

Figure 2.3 Solicitation Method Decision Tree



UNICEF Offices should avoid using a blended approach for the procurement of borehole construction services as it does not properly combine technical and price factors. A blended approach between the ITBS and RFPS means that the solicitation documents are marked as RFPS but that the award is based on compliance and price alone.

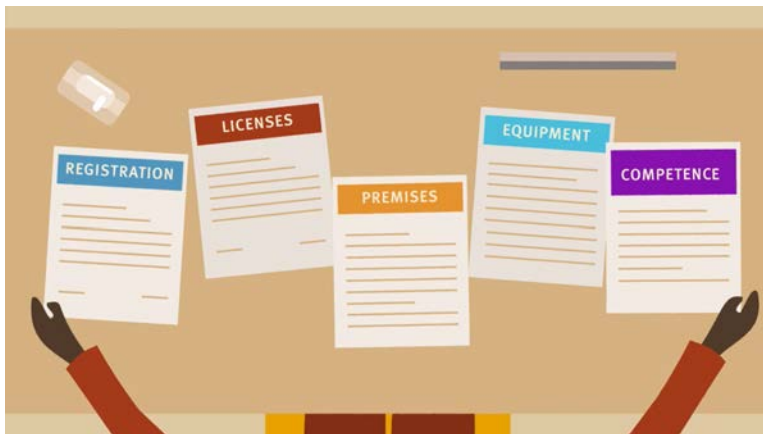
Table 2.4 When to use ITB(S) and RFP(S)?

Aspect	ITB (Invitation To Bid)	RFP (Request For Proposal)
When to use it?	<p>The project is fully defined with detailed specifications as well as bidder qualifications and requirements including:</p> <ul style="list-style-type: none"> ■ technical specifications ■ bill of quantities ■ Project Plan (including schedule and timeline) ■ accurate cost estimate/engineers estimate available 	<p>The requirements (e.g. scope of works, technological options, complexity in terms of logistics, detailed expertise and project plan) cannot be described in the tender documents in a complete or definitive manner, so that this has to be defined by the service provider.</p> <p>Selection will not be made on compliance and price alone, but rather on the best value for money. The technical proposal submitted by the bidders, including their estimated scope of works based on their expertise and experience, can be assessed in the evaluation. All factors analysed are pre-defined in the RFP as evaluation criteria.</p> <p>Bidders are requested to use their expertise and experience to propose the best possible solutions for the project in terms of technology, local materials, work methodology, resources/equipment, team structure and project plan.</p>
Conditions	<p>ITB in borehole drilling should be used in conjunction with a pre-qualification exercise, whereby companies that meet the required criteria (including registration, licences, premises, equipment and competence of the staff) have been cleared and shortlisted. Companies that fulfil the prequalification criteria are invited to submit a financial offer.</p>	<p>Since no pre-qualification process takes place, the checks that the bidder fulfils the mandatory criteria are essential and the technical evaluation needs to be very thorough. This should include a desk review and a check of the company's premises and assets (equipment, machinery, tools), staff and technical resources.</p> <p>A weighting between the technical and financial parts of the evaluation needs to be given, with greater weighting allocated to the former (see evaluation section below). There may be need to define a minimum threshold to pass the technical evaluation in order to eliminate briefcase companies that do not have the equipment and sub-contract to others.</p>
Opening of Bids	<p>Bids are opened publicly, or (in the case of pre-qualification) in front of the pre-qualified suppliers.</p>	<p>No public opening of the proposals received. Receipt of the proposals is only the first step, leading up to the award of a contract. Other steps, including the technical evaluation and cost factors, are taken before selecting the contractor for contract award.</p>
Evaluation & Award	<p>The award is established on the basis of compliance (pass or fail the administrative requirements) and price alone, based on a review of the Bill of Quantities. The company with the lowest acceptable and compliant offer is therefore awarded.</p>	<p>The award is made to the "most responsive offer", which is a combination of the technical and financial offer. The commercial offer is based on a detailed BoQ. Two envelopes are requested and two evaluations performed:</p> <ul style="list-style-type: none"> ■ technical evaluation ■ For those companies that are technically cleared, the financial envelope will be open and evaluated. <p>Points from both steps will be added, and the company with the highest cumulative cost will be considered for the project. 70% (technical) and 30% (financial) is a common weighting, but the financial weighting should not be under 20% (in order to keep some control on costs) and the technical not below 50%.</p>
Negotiation	<p>No negotiation allowed</p>	<p>Negotiations may be undertaken with those service providers whose proposals have been evaluated and determined as meeting the mandatory and minimum requirements. The negotiation process and outcome shall be recorded in the bid file.</p>
Strengths for borehole drilling works	<p>Expedite process, as technical evaluation is not required.</p> <p>Can be used in high-value contracts.</p>	<p>ToR could be adjusted to respond to capacity of vendors (e.g. contract package size).</p> <p>Possibility to negotiate with bidders.</p> <p>No value restrictions.</p>
Limitations for borehole drilling works	<p>Requires pre-qualification of contractors.</p>	<p>Longer process, as technical evaluation is required.</p>

2.4.4 Prequalification & Shortlisting of Suppliers

The purpose of **prequalification** is to include only those bidders that are technically and financially capable to carry out the project in a satisfactory manner in the tender process. The prequalification process should eliminate “briefcase” companies which do not have the required equipment or technical competence. The purpose of **shortlisting** is to reduce the number of bidders for a project, especially a complex one. The aim of the bidding process is to maximise competition (not to maximise the number of bidders). Bidding and bids analysis are costly for the bidders and time-consuming for the analysers. Too many bidders on the shortlist may reduce the interest of some in participating in the tender, and result in interesting bidders dropping out.

Figure 2.4 Pre-qualification of drilling contractors as potential bidders means that the registration, licences, premises, equipment and competence of the staff need to be checked.



2.4.5 Pre-tender meeting

Prior to releasing the tender, it is very important to organise a pre-tender meeting, in which the details and expectations as well as questions from suppliers can be discussed and clarifications made. This is especially important in cases where the capacity of the suppliers to deal with the tender requirements is weak.

2.4.6 Key Documents

The key documents required are the Technical Specifications, Engineers Estimate (referred to in UNICEF as the confidential BoQ), Bill of Quantities (for an ITBS and RFPS), and Terms of Reference (for RFPS only). It should be noted that no parameters other than those specified in the solicitation documents can be considered during the evaluation.

The **Technical Specifications** provide guidelines for physical dimensions of the boreholes and other installations and the technology to be used in the construction and completion of the works (see **Toolkit** – Module 4, Annex 4.1).

The **Bill of Quantities (BoQ)** lists all the main components of the project, including estimated quantities for each line item and information on the way suppliers will be paid (see **Toolkit** – Module 5 – Annex 5.1).

The **Engineer's Estimate/Confidential BoQ** is used as a benchmark for the financial evaluation. Although the estimate simply indicates the probable order of the cost of the works and provides a guide to the eventual contract sum of award, it is important for it to be as accurate as possible. It should take into account the distances and different terrains of the project locations, which can be quite variable and have cost implications. The

engineers estimate follows the format of the BoQs (see **Toolkit** – Module 5 – Annex 5.1). In direct tenders by UNICEF, it should be marked “confidential BoQ” and inserted into the tender box.

When opening the financial offers, the technically cleared bids will be compared to the engineer’s estimate/confidential BoQ. If they offer varies by more than 15%, the bid is at risk of being invalidated. The engineer’s estimate/confidential BoQ can also be used for negotiation.

Box 2.1 Engineer’s Estimate (referred to in UNICEF as the confidential BoQ)

Programme staff are responsible for developing and preparing, the engineer’s estimate/confidential Bill of Quantities and Terms of Reference, including the Bill of Quantities.

In the case of an RFPS, the **Terms of Reference (ToRs)** informs the potential bidders of the technical, financial, commercial, legal, corporate and environmental requirements of the proposal. ToRs are used in administering the contract, including ensuring the timely performance of the supplier. Box 2.1 provides a checklist of questions that can be used to check the quality of the TOR. The UNICEF Supply Section should be consulted to review the draft TOR before signature by the Deputy Representative. The **Toolkit** – Module 4 provides guidance on developing Terms of Reference for Borehole Drilling Works, including a template that can be amended to suit local requirements and needs.

Box 2.1 Checklist of questions to check the quality of the Terms of Reference

1. **What** is the purpose of the TOR? (Objective and boundaries – are they clear unambiguous, without any unexplained acronyms)
2. **What** is the scope of the TOR? (which part of the organisation, approval level, etc.)
3. **What** are the inputs for this TOR? (data, reports, samples etc.)
4. **What** are the outputs of this TOR? (Decisions, budget approval, deliverables, sign-off etc.)
5. **What** are assumptions and resources for this piece of work?
6. **What** are the risks?
7. **Who** does what? (By role, if you need to put names in there then make sure you have contingency owners as well)
8. **What** are the roles and responsibilities? (E.g. organisation, budget owner, technical supervisor, etc.)
9. **How** often does the review happen? **Where** and **When** does the meeting happen?
10. **What** is the Duration of the scope of work?

2.5 Contracting phase

2.5.1 Negotiations and Best and Final Offer (BAFO)

As noted in Table 2.3, negotiations are in principle⁶ only authorised during an RFP. In this case, upon completion of the technical evaluation, the evaluation team may decide to engage in competitive negotiations with all suppliers that have passed the threshold of the technical evaluation. The purpose of negotiations with the suppliers is to clarify ambiguities, correct obvious mistakes, point out weaknesses and deficiencies, and generally seek improvements in both the technical and financial aspects of the offers, for example, regarding lower prices, prolonged warranties, additional discounts, or shorter delivery time.

All suppliers who have attained the best rating/ranking, and provide the best value proposal(s), should be provided with information about the deficiencies in their proposal, and be asked in writing to submit a decisive and final offer by a certain deadline. This is referred to as the Best and Final Offer (BAFO).

The request to submit a BAFO should not contain any information regarding the evaluation, or any information on the chances for contract award. Price increases will not be accepted, however, suppliers may decline to alter the terms of their original proposal. Such a decision will not render them unacceptable. Upon receipt of the BAFOs from the suppliers, the evaluation committee should reconvene and include the new proposals in the technical and financial evaluation, as necessary, and should make a final comparison of the competing offers.

2.5.2 Evaluation Process and Methods for UNICEF Request for Proposal of Services (RPFS)

In the case of RPFS, after the opening of proposals, each proposal will be assessed to see whether it fulfils the mandatory criteria, then on its technical merits and subsequently on its price. UNICEF will set up an evaluation committee composed of technical staff for the technical evaluation. The conclusions from the evaluation committee will be forwarded to the Supply Unit where the financial evaluation will take place. Only proposals that have passed the mandatory criteria and reached the minimum technical score required are thus considered to be technically compliant.

The evaluation is done in 4 stages:

1. Evaluation of mandatory criteria, including administrative evaluation
2. Evaluation of technical proposal
3. Evaluation of financial proposal
4. Overall

In addition to the Technical and Financial Evaluations, UNICEF reserves the right to conduct an independent, administrative validation exercise to ensure that potential Institutions/ contractors meet the minimum legal, financial and structural suitability requirements. Institutions/ contractors that do not meet such requirements could be disqualified.

2.5.3 Mandatory Evaluation Stage

Mandatory criteria are assessed first, and companies failing those will be disqualified at this stage without any further technical or financial proposal review. This stage includes the administrative evaluation, as well as specific criteria for borehole drilling projects as given in Table 2.5, part A.

⁶ For the few exceptions, please refer to Supply Manual, Chapter 6, Section 7

2.5.4 Technical/Financial Weighting

70% (technical) and 30% (financial) is a common weighting for complex project, where the technical aspect might be privileged. For projects where the scope is relatively standard, a bigger weighting can be given to the price, e.g. 60%/40%. The financial weighting should not be under 20% (in order to keep some control on costs), and the technical weighting should not drop to below 50%.

2.5.5 Technical Proposal

The Technical Proposal must contain complete documentation and information required for UNICEF to comprehensively evaluate each Proposal in accordance with the Evaluation Assessment Criteria contained in Table 2.5, part B. No financial/price information should be contained in the technical proposal.

In the case of a 70/30 Technical/Financial weighting, the Technical Proposal has a total possible evaluation value of 700 points. Technical Proposals receiving 490 points (i.e. 70% of 700 points) or higher will be considered technically compliant and the relevant Financial Proposal will be opened. Proposals which are not considered technically compliant and non-responsive will not be given further consideration.

2.5.5 Evaluation Assessment Criteria

Recommended evaluation assessment criteria for borehole construction projects are set out in Table 2.5. Note that the criteria should be reviewed and amended in light of the specific contract requirements. For example, if the lot size is small, this can provide an opportunity for smaller contractors to bid, and should be taken into consideration in revising the criteria.

Table 2.5 Generic Evaluation Assessment Criteria for Borehole Construction Projects⁷

Evaluation Assessment Criteria		
A	Mandatory Criteria	Yes/ No
0.1	Is the company registered in <i>[insert country]</i> ?	
0.2	Does the company have a license from <i>[insert institution]</i> to carry out drilling operations in <i>[insert country]</i> ?	
0.3	Tax registration certificate from <i>[insert institution]</i>	
0.4	Certification of site(s) visit by bidders <i>[clarify which documents are required for this]</i>	
0.5	Does the company have any pending lawsuits, (if no, attach a declaration "no pending law suits")?	
	Proposals which do not fulfil the mandatory requirement will be considered non-compliant and will not qualify to move to next stage.	
B	Technical Proposal	Max. Points
1	Overall response	50
1.1	Signed proposal form completed and attached	20
1.2	Structure of the proposal following evaluation criteria structure	30
2	Company profile/capacity	100
	Company Profile assessment will include but is not limited to an assessment of the documents and other information submitted in the proposal.	

⁷ Note that possibilities for modification to some clauses to suit particular situations are shown with notes are made in ***[bold italics highlighted in grey]***. These criteria are mainly for multiple borehole projects for depths not exceeding 100m and machine drilled. They may have to be modified where single borehole projects or manual drilling are envisaged.

Evaluation Assessment Criteria		
2.1	Company has consolidated annual financial accounts for last two years, copy of the audited financial statements for last two financial years (balance sheet and income statement).	20
2.2	List of major completed and on-going projects in the last two years (only list clients for whom you have drilled [insert number] or more boreholes). For each contract list: year, client name and contact details, contract number, total value of the contract, number of boreholes drilled, number of boreholes rehabilitated.	40
2.3	Has the company drilled boreholes or rehabilitated pump facilities for [insert client] in the last three years? For each contract list: year, project name, contract number, total value of the contract, number of boreholes drilled, number of boreholes rehabilitated,).	20
2.4	Is the company a member of a national [or state] drilling association (list the association and provide a copy of the membership card)?	10
2.5	Copy of Insurance policy (legal liability insurance and insurance coverage for goods under transport).	10
3	Team structure	250
	Company Profile assessment will include but is not limited to an assessment of the documents and other information submitted in the proposal.	
3.1	Organisational structure – organogram; number of employees and organisational chart.	20
3.2	Project leader including CVs (hydrogeologist or drilling engineer with min. of 10 years' experience)	45
3.3	Team leader per site including CVs (hydrogeologist or drilling engineer with min. of 5 years' experience)	30
3.4	Record keeper per site including CV (hydrogeologist or drilling engineer with min of 5 years' experience)	20
3.5	Full list of other team members included in the organogram (with CVs) (sitting , drilling, pump test, civil works, pump installation)	20
3.6	[Qualified / trained person to undertake geophysical surveys for site location (name, qualification, years of experience and attach his or her CV).]⁸	[20]
3.7	Hydrogeologist/ geologist or trained person to prepare and interpret lithological logs, drill time logs and recommend well assembly and proper well development techniques (mention name, highest degree & years of experience).	20
3.8	Experienced trained drillers, to operate drilling rigs, compressors etc. (give numbers, names, qualification, and experience; attach CV of all).	30
3.9	Qualified/ trained mechanic to repair rigs, compressor, etc. (give names, years of experience). Attach CVs).	30
Capacity to carry out pumping test and install pumps.		
3.11.	Team of trained people to carry out pumping tests (list names of team members).	20
3.11.	[Team of trained people to install pumps and construct apron (list names of team members)].	15
4	Equipment	200
	Equipment assessment will include but is not limited to an assessment of the documents and other information submitted in the proposal.	
4.1	Number of rigs (with a capacity to drill to 100 meters at 8" diameter) within the formations indicated that are in good working conditions and owned by the company (List Make and Model). State if the equipment is owned by the company or leased/rented).	40

⁸ If siting is not part of the marks for this item should be redistributed.

Evaluation Assessment Criteria		
4.2	Number of compressors in good working condition owned by company (list make, model and capacity in CFM) – minimum should be 750 CFM. State if the equipment is owned by the company or leased/rented).	40
4.3	List the type, sizes and number of drill bits and hammers you have in stock. Also, include here the temporary steel casings you have, diameter and numbers). State if the equipment is owned by the company or leased/rented).	25
4.4	[Number of mud pumps with a capacity to drill up to 100 metres. State if the equipment is owned by the company or leased/rented).]⁹	25
4.5	[Equipment to undertake foam drilling (Yes/No); mention number of boreholes drilled with foam in last two years.]¹⁰	20
Support Vehicle Capacity		
4.6.	Number of heavy trucks (off-road and all-weather) in good working condition (mention capacity, registration and engine number).	30
4.7.	Number of support vehicles in good working condition (mention capacity, registration number, and engine number).	20
Capacity to carry out development, pumping test and install pumps.		
4.8.	Type of equipment and discharge capacity to undertake development, pumping test and recovery test (maximum in litres/second and minimum yield in litres/second).	20
5	Implementation	100
	Description of implementation of work assignment.	
Work Schedule		
5.1	Detailed work schedule including timing for [siting and borehole design] , mobilisation to base camp, mobilisation between sites and for each site the drilling, development, pumping test, [pump installation] , and demobilisation; and demobilisation from base camp.	40
Availability to Start Work Immediately.		
5.9	Contractor has capacity to mobilise and start work within two weeks from the date of signing contract (mention if there are on-going works, which equipment is in use).	20
Methods		
	Operational methods, i.e. description of how the [siting, drilling, borehole design, development, pumping test and pump installation] will be undertaken, highlighting any differences to the Terms of Reference and innovative practices.	40
Maximum possible technical score		700
TECHNICAL COMPLIANT SCORE TO QUALIFY: For the proposal to be considered technically compliant, the proposer must meet all mandatory criteria and achieve a minimum score of 490 (i.e. 70% x 700) points. Proposals which do not meet the minimum score will be considered technically non-compliant and will not qualify to move to next stage to have their financial proposal opened.		
Maximum Possible Financial Score		300
Maximum Possible Total Score		1000

⁹ Mud pumps are not required in every situation. If it is not included the marks for this item should be redistributed.

¹⁰ Foam is not required in every situation. If it is not included the marks for this item should be redistributed.

2.5.6 Financial Proposal

In the case of a 70/30 Technical/Financial weighting, the total number of points allocated for the Financial Proposal is 300. Points will be awarded on the basis of the best overall value. The Financial Evaluation will consider not only costs, but also review the items listed in the Financial Proposal Evaluation Assessment Criteria (Table 2.5). Institutions/ contractors that incur tax-related expenditure in will be reimbursed such expenses at the time of payment as long as the relevant taxes are listed as a separate item on the Invoice. Presentation, details and clarity of Financial Proposals will influence the final assessment.

The formula for determining the financial score is the following:

$$\text{Financial Score} = \left[\frac{\text{Lowest priced offered in RFPS} \times 100}{\text{Price of Contractor's Offer}} \right] \times 0.30$$

2.5.5 Final Evaluation

The Final Evaluation will be the sum of the Technical and the Financial scores.

UNICEF will award the contract to the vendor whose response is of high quality and clear, and meets the goals of the project with the best overall value, composed of technical merit and price.

2.6 Contract Administration Phase – Payment Schedule

2.6.1 Retention money

Retention is money held by UNICEF as a safeguard against defects which may subsequently develop during the *Defect Liability* Period. The retention money acts as a guarantee for the Contractor to remedy those defects. Retention is usually set at either 5% or 10% of the value of the Works. This percentage is then deducted from all the interim payments made to the Contractor, and released/paid once the defects are corrected.

Part of the Retention Money can be substituted by an appropriate guarantee.

2.6.2 Advance Payment & Advance Payment Guarantee

Advanced payments expose UNICEF to risk as the Contractor could fail to fulfil its obligation. UNICEF authorising officers should, wherever possible, avoid including advanced payments in a contract or agreement. However, an advance payment can be used in an environment where contractors have insufficient cash flow or access to funds / working capital to initiate the Works. For more details, refer to the UNICEF Supply Division Guidance entitled “Bonds and bank guarantees in Construction Contracts”¹¹.

The Financial Circular 33 (Authorization of Advances or Progress Payments for Good or Services) issued by the Division of Financial and Administrative Management (DFAM) states that the Comptroller sets limits on the authority given to UNICEF offices to make advances or progress payments. When these limits are exceeded, offices must contact the Comptroller for approval. Advance payments may be authorised for goods and

¹¹ Available for download on:

[https://intranet.unicef.org/denmark/do/danresourcelibrary.nsf/0/955F63828357E8E7C125806F0041C91A/\\$FILE/8%20Guidelines%20on%20Bonds%20and%20Bank%20Guarantees%20\(2015\).pdf](https://intranet.unicef.org/denmark/do/danresourcelibrary.nsf/0/955F63828357E8E7C125806F0041C91A/$FILE/8%20Guidelines%20on%20Bonds%20and%20Bank%20Guarantees%20(2015).pdf). It can also be accessed under Tools and Resources for Construction on <https://intranet.unicef.org/Denmark/danhomepage.nsf/0/22249BDAA6BC53C3C1258076003DE3D1>

services by “contracting authorities¹²” for amounts not exceeding 30% of the total contract value or \$40,000 or, if advance payments are in line with 'industry standards', for amounts up to 100% of the total contract value or \$70,000.

The **UNICEF Financial and Administrative Policy 5**¹³ states that if the amount of the advance for purchase of goods or services is greater than US\$10,000, it is standard practice to ask for an unconditional guarantee, usually issued by a bank¹⁴ on behalf of the supplier and in favour of UNICEF, to guarantee either delivery according to the contract, or to refund the advance to UNICEF in case of default by the supplier. Any charges for this guarantee must be borne by the supplier. Waiver of this requirement can be requested from the Deputy Director, Division of Financial and Administrative Management (DFAM) with appropriate justification. If approved, the decision will be provided via email. The email approval should be attached to the Purchase Order in VISION.

The contractor shall furnish, no later than five (5) working days following the effective date of the contract, at its own expense, an Advance Payment Guarantee in the form set forth in Annex 2.1, and with such surety or sureties as shall be approved by UNICEF.

2.6.3 Performance Guarantee

The contract must be accompanied by an unconditional Performance Guarantee, cashable on demand of e.g. **[5% (five per cent)]** of the total cost of the services. The Performance Guarantee may be in the form of a bank guarantee in **[currency]** issued by a bank located in **[country]** and acceptable to UNICEF.

The Performance Guarantee shall remain valid for 30 days after the expected Substantial Completion of the works according to the draft timeline. If for any reason the works are delayed, the contractor shall have to submit a new Performance Guarantee valid 30 day after the revised Substantial Completion of the works. This new Performance Guarantee shall have to be submitted at least two months before the expiring date of the original Performance Guarantee.

If the contract allows for taking over of sections or separable parts of the works, the Performance Guarantee shall be valid until the issuance of the last Certificate of Substantial Completion.

The Performance Guarantee shall be released upon issuance of the Substantial Completion Certificate and completion of the Defect Liability Period. Upon request of the Contractor, the financial institution may agree to progressively reduce the guaranteed amount by the amount of interim payments repaid to UNICEF. As evidence, all interim payments certifications from UNICEF shall therefore be submitted to the financial institution.

UNICEF shall have the right to claim payment on the Performance Guarantee in the event that the contractor does not comply with contractual commitment and deliverables.

A sample Performance Guarantee form is provided in the **Toolkit** Module 2 - Annex 2.2.

¹² "contracting authority" – designated positions at Headquarters and Field Offices that are authorised to enter into contractual arrangement with suppliers.

¹³ UNICEF Financial and Administrative Policy 5: Cash Disbursements Supplement 2 – Prepayments, Advances, Deposits and Progress Payments

¹⁴ “This depends on the country context and fiscal space environment whereby reputable banks are not allowed to issue bank guarantee. In such instances, such guarantee can be obtained by internationally rated Financial institutions i.e. AA+ /AAA rated institutions.”

2.6.4 Interest on Guarantees

UNICEF shall not pay any interest on guarantees.

2.6.4 Milestones and Triggers for Payments

Triggers for payment are set out in the contract. In the case of RFPS, these need to be in line with TOR and payment schedule offered by the vendor. Before finalising the contract with the detailed payment schedule, it is good practice to check that the awarded company will have sufficient cash flow to complete the works. Table 2.6 shows the two options to trigger payments, and Table 2.7 sets out an example of milestones for drilling contracts. On small drilling projects, there are usually 3 milestones associated with payment: mobilisation, handing over and end of defects liability period. On larger projects with 50 or more boreholes, there could be provision for monthly or quarterly payment for boreholes completed in that timeline. The retention money is only paid once the Final Completion Certificate has been issued.

Table 2.6 Options to Trigger Payments

Option 1: With Advance Payment Guarantee	Option 2: Without Advance Payment Guarantee
■ Payment 1: Advance payment (max 30%)	■ Payment 1: milestone 1/ accomplishment of xx %
■ Payment 2: milestone 2/ accomplishment of xx %	■ Payment 2: milestone 2/ accomplishment of xx %
■ Payment 2: milestone 2/ accomplishment of xx %	■ Payment 2: milestone 2/ accomplishment of xx %
■ Payment X: milestone X/ accomplishment of xx %	■ Payment X: milestone X/ accomplishment of xx %
■ Final payment: ONLY upon completion of defect liability period	■ Final payment: ONLY upon completion of defect liability period

Table 2.7 Example of Milestones for Borehole Drilling Contract

Milestone No	Milestone Description
1.	Mobilisation
2.	Monthly/Quarterly payment as agreed*
3.	Successful handing over
4.	End of defects liability period and certificate of completion issued

2.6.6 Default by Contractor

In case of default on the part of the contractor in performing any part of the works or in carrying out an instruction issued by the client within a reasonable time, the client will follow relevant contractual clauses (e.g. issue notes, instructions, liquidated damages, contract termination) and eventually shall be entitled to contract employ and pay other persons to carry out the same. Costs consequent thereon or incidental thereto shall be deducted by the client from any monies due or to become due to the contractor.

If the contract is terminated, the Contractor shall issue a certificate for the value of work done and materials ordered less advance payment received up to the date of the issue of the certificate and less the percentage to apply to the value of the work not completed.

Annexes – Toolkit Module 2

Annex 2.1 Advance Payment Guarantee Form

Advance Payment Guarantee

(BANK GUARANTEE)

To: _____ (Name of Employer)

_____ (Address of Employer)

WHEREAS _____ (name and address of Contractor) (hereinafter called “[XX]”) has undertaken in pursuance of Contract No. _____ dated _____ to execute _____ (name of Contract and brief description of works) (hereinafter called “the Contract”).

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish a Bank Guarantee by a recognised bank for the sum specified therein as security for compliance with its obligations in accordance with the Contract.

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee;

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you on behalf of the Contractor up to a total of _____ [amount of guarantee] _____ [in words], such sum being payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of _____ [amount of guarantee] as aforesaid without your needing to prove or to show grounds for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand. We further agree that no change or addition to or other modification of the terms of the contract or of the Works to be performed there under or of any of the Contract documents which may be made between you and [XX] shall in any way release us from any liability under the guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid until the date of issue of the Certificate of Substantial Completion. **No change on content or validity of this Bank Guarantee shall be undertaken by the bank without UNICEF permission.**

Signature and Seal of the Guarantor _____

Name of Bank _____

Address _____

Date _____

Annex 2.2 Performance Guarantee Form

Performance Guarantee

(BANK GUARANTEE)

To: _____ (Name of Employer)

_____ (Address of Employer)

WHEREAS _____ (name and address of Contractor) (hereinafter called "[XX]")
has undertaken in pursuance of Contract No. _____ dated _____ to execute
_____ (name of Contract and brief description of works) (hereinafter called "the
Contract").

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish a Bank
Guarantee by a recognised bank for the sum specified therein as security for compliance with its obligations in
accordance with the Contract.

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee;

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you on behalf of the Contractor
up to a total of _____ [amount of guarantee] _____ [in words], such
sum being payable, and we undertake to pay you, upon your first written demand and without cavil or argument,
any sum or sums within the limits of _____ [amount of guarantee] as aforesaid without your
needing to prove or to show grounds for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with
the demand. We further agree that no change or addition to or other modification of the terms of the contract
or of the Works to be performed there under or of any of the Contract documents which may be made between
you and [XX] shall in any way release us from any liability under the guarantee, and we hereby waive notice of
any such change, addition or modification.

This guarantee shall be valid until the date of issue of the Certificate of Substantial Completion. **No change on
content or validity of this Bank Guarantee shall be undertaken by the bank without UNICEF permission.**

Signature and Seal of the Guarantor _____

Name of Bank _____

Address _____

Date _____

Module 3

Borehole Siting and Drilling Supervision Consultancy



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FOR MORE INFORMATION:

For more information, comments and feedback please contact UNICEF New York headquarters www.unicef.org or Skat Foundation www.skat.ch

AUTHORS:

Dotun Adekile & Kerstin Danert, Skat Foundation, St Gallen, Switzerland; Jose Gesti Canuto, UNICEF, New York, USA; Djani Zadi, Peter Harvey, and Anne Cabrera-Clerget, UNICEF, Copenhagen, Denmark

CONTRIBUTORS:

Fiorella Polo, WASH Specialist, Water and Sanitation Section, UNICEF New York Headquarters, USA
Sue Cavill, Consultant

COVER PHOTO:

Kerstin Danert

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Toolkit Orientation Table

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Module 2	Procurement Considerations for Borehole Drilling Works <ul style="list-style-type: none"> ■ Defines procurement process and responsibilities ■ Provides guidance for risk management ■ Compares two solicitation methods: ITB and RFPS ■ Highlights key considerations during the pre-contractual, contracting and contract administration phases including the evaluation of technical and financial proposals and the payment schedule
Module 3	Borehole Siting and Drilling Supervision Consultancy <ul style="list-style-type: none"> ■ Provides template of Terms of Reference which includes: <ul style="list-style-type: none"> ■ Description of the assignment ■ Supervisor's checklist ■ Deliverables and reporting requirements ■ Suggested Bill of Quantities for the consultancy services ■ Completion certificate templates ■ Includes template for UNICEF Agreement for Borehole Siting and Drilling Supervision Consultancy Services
Module 4	Terms of Reference for Borehole Drilling Works and Pump Supply and Installation <ul style="list-style-type: none"> ■ Includes overview of how to select and specify handpumps and assure their quality ■ Provides templates for: <ul style="list-style-type: none"> ■ Terms of Reference for Borehole Drilling Construction and Development of the Borehole ■ Terms of Reference for the Supply and Installation of Pumps ■ Provides Technical Specifications for the borehole and a suggested format for the borehole completion record
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Abbreviations and Acronyms

EM	Electromagnetic
RFP	Request for Proposal
VES	Vertical electrical sounding
WASHCOM	Water and Sanitation Committee

Introduction

The **UNICEF Toolkit for Borehole Drilling – Planning, Contracting and Management** (subsequently referred to as the **Toolkit**) has been developed to bring uniformity to practices and to guide UNICEF staff involved in borehole procurement and the supply of equipment, as well as contracting consultancy services for borehole siting and supervision. The Toolkit comprises five modules (see cover page).

Module 3 – Borehole Siting and Drilling Supervision Consultancy provides guidance and advice for the preparation of an agreement for borehole siting and supervision consultancy. The module includes a template for the Terms of Reference (ToR), a UNICEF standard structure of Agreement and templates for other key documents that should be annexed to the contract. Note that the Terms of Reference and Agreement assume that UNICEF is the Client, i.e. that borehole construction, as well as the siting and supervision, is directly contracted by the UNICEF Country Office.

This module is in line with the UNICEF Toolkit Principle 3, which stipulates community involvement in siting and siting practices, including clarification of land ownership, as well as Principle 4 on supervision.

Module Formatting

Text which describes what should be written is in *italics*. Possibilities for modification to some clauses to suit particular situations are shown with notes made in ***[bold italics highlighted in grey]***.

For ease of referencing across the **Toolkit** contents, Annexes in Module 3 are referred to as Annexes 3.1 to 3.8.

Key Issues for Consideration

Boreholes need to be properly sited by experienced and qualified personnel using scientific methods and established good practices. On projects where more than five boreholes are drilled, and those in difficult groundwater terrains, a hydrogeologist/groundwater specialist should be engaged to carry out the siting. On small projects (i.e. where up to five boreholes are drilled) which are located in areas where the groundwater is easily accessible, the responsibility for siting may be given to the Drilling Contractor.

In order to ensure that boreholes are drilled according to the technical specification, borehole drilling needs to be supervised by competent persons or firms. Experienced hydrogeologists/groundwater specialists shall be engaged to carry out the supervision of borehole drilling. The siting and supervision of a particular borehole should be carried out by the same person or firm.

The Consultants should be selected through an evaluation process with clearly defined evaluation criteria. Suggested bills of quantities for siting and supervision consultancy are given in Annexes 3.1 and 3.2 respectively. Hydrogeologists and groundwater Consultants engaged for siting, supervision and monitoring of boreholes should be licensed by the national government and/or be members of the relevant national association. All Consultants should be proven to have the requisite knowledge, skills and experience. Where there is no licensing of Drilling Contractors, UNICEF should work with the Government to establish such licensing system.

The Terms of Reference template in this module covers both the siting of the boreholes and the supervision of borehole construction. For quality assurance and the avoidance of dispute, the same party should be responsible for the siting and supervision of a particular project. However in instances where the Drilling Contractor is responsible for the siting¹, the Supervisor shall oversee it and ensure that it is carried out as specified.

¹ The **Toolkit** – Module 1, principle 3 infers that on projects of less than five boreholes in areas where groundwater is easily accessible the responsibility for siting may be given to the Drilling Contractor. In all other cases, siting should be undertaken by competent and experienced groundwater Consultants.

Levels of Drilling Supervision

Competent groundwater Consultants who could be either a firm or an individual are to be employed to carry out the supervision of siting, drilling, pad construction and installation of pumps. In cases where such Consultants are not available, UNICEF Country Office will request the deployment of counterpart government staff to the project who would have been trained in drilling supervision to carry out the supervision. The expected level of supervision should be stated clearly in the consultancy agreement, i.e. whether it shall be full-time supervision or part-time/milestone supervision (described below). On completion of the borehole construction and related activities, the Supervisor will carry out a final borehole inspection.

The Supervisor is expected to be totally independent of the Drilling Contractor. In other words, the Supervisor will have his/her own transport and other basic equipment such as a GPS, dip meter, measuring tape, stop watch, magnifying glass, and borehole camera.

Full-time supervision is preferable and should be used where the resources are available. In full-time supervision, the Supervisor is involved and present throughout the drilling process, from the early stages of the procurement process through the pre-tender meeting, pre-contract inspection to siting, mobilisation, drilling, demobilisation and handing over.

Part-time/Milestone Supervision may be used where the resources for full-time supervision are not available. In this case, the Supervisor is present at the procurement stage, pre-tender meeting and pre-contract inspection. Thereafter, he/she will be present at critical stages of the borehole construction which shall be defined in the consultancy agreement. The critical stages are as follows:

- mobilisation
- site selection
- termination of drilling
- lining of the borehole
- borehole development
- pumping test
- pad construction and pump installation
- demobilisation

Some literate community members, recommended by the Water and Sanitation Committee (WASHCOM), should be trained and encouraged to monitor and report on the drilling activity at the times the Supervisor will not be available on site.

Final Borehole Inspection

An inspection is an official visit to the works in order to verify that all specifications have been adhered to and that the works are in their proper condition. On completion of the Works by the Drilling Contractor, the Supervisor will inspect the boreholes, pads, pumps and surroundings and identify any defects that need to be corrected during the defects liability period. The defects will be listed in the Certificate of Substantial Completion which is issued at this stage. The Supervisor will monitor the correction of the defects. When satisfied that the defects have been corrected, the Supervisor, along with UNICEF Designated Representative, will issue a Certificate of Final Completion.

Terms of Reference for Siting and Drilling Supervision – Template

1. Project Background

The general information must describe the background of the requested services, in particular:

- Rationale and key aspects of the overall context of the assignment
- History of activities to date
- Project/assignment related data, e.g. relevant studies, geographical data, target groups, category of services to be rendered and basic documents.

2. Description of the Assignment

2.1 Scope of Work

In order to assist with the implementation of the **[Insert project brief description]**, UNICEF requires the professional services of a qualified firm of groundwater specialists to provide siting and supervision support for up to **[Insert number of boreholes]** boreholes in **[insert the locations]**.

The selected firm (the “Consultant”) will be expected to give attention to the activities as specified. The activities complement community mobilisation, training and preparing stakeholders to operate and maintain the facilities, and the drilling, construction and development of **[Insert number of boreholes]** boreholes in **[insert the locations]** in collaboration with **[insert district local governments]**.

2.2 Operation Modality

The **[insert project title]** shall be under the control of the Designated Representative appointed by UNICEF. The Consultant will collaborate with the Designated Representative in the siting and supervision of the borehole construction and ancillary works, ensuring a common understanding between the Consultant and the UNICEF staff of the preferred construction techniques, materials and quality standards.

The Contract Agreement(s) for Drilling, Construction and Development will be directly between UNICEF and the selected Drilling Contractor.

The Consultant’s Supervisor is nominated as UNICEF’s site representative. The Consultant shall be responsible for the management and direction of the project on site and shall approve all materials supplied, works and measurements carried out by the Drilling Contractor and his/her team of workers on the project.

The Consultant shall be availed of the signed contract between UNICEF and the Drilling Contractor, including all Annexes and a copy of the contractor’s approved comprehensive work schedule. The Consultant will also be expected to work in collaboration with the local community **[insert district local governments]** and other concerned stakeholders as specified.

The Consultant shall have competent staff and equipment and software for carrying out hydrogeological and geophysical surveys and interpreting the data.

2.2 Roles and Responsibilities

The roles and responsibilities with respect to the borehole siting, construction and supervision are:

- The **Community** members are the end users of the water supply. The benefiting communities will be identified by the responsible government agency and UNICEF. **Community representatives** to engage in siting and support supervision should be identified and communicated to the Consultant before he/she undertakes field reconnaissance. The communities will be introduced to the Consultant to commence the

borehole siting.

The community must be involved in the process of siting and design so that the finished water point can meet their needs. The Community can support supervision, by tracking the drilling process and recoding select information, but cannot be responsible for technical or contractual details. If the community is to support drilling supervision, at least two literate individuals should be appointed as **Drilling Monitors** and be given guidance on what to track by the Supervisor. Should any problems arise during the mobilisation or drilling construction phases, the community should inform the site Supervisor. In case the problem concerns the site Supervisor, the community should inform the Consultant or the UNICEF Designated Representative.

- **UNICEF** is the **Client** that is contracting out the siting, supervision and borehole construction. The client is responsible for: selecting the locations *[e.g. specific communities]* of the boreholes; ensuring that community mobilisation and training activities have been completed; identification of the community representatives for the siting, drilling and pump installation activities; clarifying community and other stakeholder roles and responsibilities to operate and maintain the facilities and supporting the establishment of appropriate structures. The client is responsible for ensuring that all regulatory requirements for the borehole are met.
- The relevant **local government** authority should attend the pre-mobilisation meeting as well as the *[hand over]* of the completed works to the community.
- The **regulator** issues permits or licences for drilling or abstraction. Legal requirements should be established by the Client early on to avoid delays.
- The **Consultants'** responsibility is to ensure that the **Drilling Contractor** adheres to the technical specification, makes all the required measurements, keeps all records accurately, including a daily record and makes sure that health and safety procedures are adhered to.
- The Consultant's **Supervisor** is the nominated representative of the Consultant on site.
- The **Drilling Contractor** is the organisation that undertakes the drilling works. The contractor's responsibility is to drill and complete the borehole as specified in the contract with UNICEF.
- The **Pump Supplier** is the organisation that supplies and installs the pump.

2.3 Specific Activities

The work to be undertaken includes all necessary inputs to ensure completion of the drilling and construction of *[Insert number of boreholes]* in *[Insert the locations]* and for the development of the same to be equipped with handpumps and fully finished water abstraction points for the purpose of drinking water supplies. The following activities are expected as part of implementation of this project *[delete activities as required]*:

- Activity 1 Borehole siting and borehole design at *[Insert number of locations]* locations
- Activity 2 Assist UNICEF in the procurement and contract award of the Drilling Contractor
- Activity 3 *[Full-time supervision of mobilisation and borehole construction]* OR *[Milestone supervision of mobilisation and borehole construction]* at *[Insert number of sites]* sites
- Activity 4 Supervision of the supply and installation of the pump at *[Insert number of sites]* sites.
- Activity 5 Final inspection at completed sites *[Insert number of sites]* sites

The specific activities to be undertaken are detailed below: *[Note that these may be modified to reflect the project, or the strategy adopted by the consulting firm(s) awarded the contract].*

Activity 1 Borehole siting and borehole design

Deliverables

- Siting report including borehole design including the contents in Table 1 for each **[Insert number of locations]** locations.
- A summary of the work carried out with recommendations is to be included in the monthly progress report.

Table 3.1 Contents of siting report for each location

For all locations:

- Name and date of the survey
- Results of the desk study, including
 - a description of the topography and geology of the areas and
 - a description of the groundwater potential
- Results of the hydrogeological reconnaissance including
 - an assessment of the access to the community for drilling equipment
 - a route map to the community and sites
 - a description of the survey methods used
 - if geophysical techniques have been used:
 - a map showing the lines of traverses and clearly indicating the VES points for the three probable sites
 - Interpretation of the VESs in terms of the geological layers, estimated thickness of the layers and probable drilling depth.
 - Geophysical data shall be presented in an Excel spread sheet which should list the locations and GPS coordinates for the three places siting was carried out.
 - A recommendation as to whether borehole drilling should be undertaken

For locations with sufficient groundwater potential for a borehole to be installed with a handpump:

- The GPS coordinates and elevations, and description of the locations for:
 - A – the priority site
 - B – the second priority site
 - C – the back-up site
- Borehole design including details of the lining material and the drilling diameter, the probable drilling depth
- Any concerns with the groundwater quality
- Recommendations for pump materials given the water quality

Description of tasks

The siting of the boreholes shall be carried out in the following stages:

- **Desk study:** review of existing data and information on the geology and hydrogeology of the locations, interpretation of remote sensing data collated from aerial photographs, satellite imagery, topographical and geological maps.
- **Reconnaissance survey:** determination of the rock types underlying the locations, their structural disposition, the weathering products and water-bearing potential, an assessment of whether geophysical survey is needed or not. If it is considered necessary to carry out geophysical survey, areas suitable for the geophysical survey shall be identified. The Consultant shall jointly carry out a reconnaissance survey with the community representatives and identify potential areas and preferred locations for the borehole in each community. The community preference shall be given first priority. Only when the site indicated by the community is not feasible shall another one be selected. If a geophysical survey is required, the

Consultant shall carry out geophysical measurements in the areas agreed by the community and the Consultant.

- **Geophysical survey:** The above two stages may or may not be followed by a geophysical survey (Table 2). The Consultant will determine those areas where geophysics will be useful. It is not everywhere that geophysics will be required. In well understood regional unconsolidated aquifers without concerns about salinity or saline intrusion, geophysics should be dispensed with. In compacted sediments and crystalline areas, geophysics will be useful. Geophysical surveys should only be undertaken where the likelihood and costs of drilling an unsuccessful borehole justifies the expense.

Table 3.2 Recommendations for geophysical surveys

In the geophysical survey, electromagnetic (EM) conductivity metering followed by vertical electrical depth soundings (VES) is recommended. Where the recommended method is used, at least two perpendicular EM traverses shall be carried out across the settlement and across observed lineaments. Locations for conducting vertical electrical soundings (VES) shall depend on anomalies detected or readings obtained on the electromagnetic (EM) traverses.

If the Consultant deems that an alternative geophysical technique or strategy will be more appropriate in a particular context, this should be presented to the Designated Representative for prior approval before commencing the survey. All data will be analysed by appropriate software.

[In some localities, the EM technique may not be available. Then the geophysical survey will only consist of resistivity constant separation traversing and VES measurements. The Consultant may have to carry out a minimum of 6VESs in a community from which the most promising 3 shall be selected].

- **Assessment of drilling equipment accessibility:** the accessibility of drilling equipment to the drill sites is to be determined, including the preparation of a route map to the community sites.
- **Locate probable sites:** The Consultant is required to locate at least three probable sites in each community and number them in order of priority, based on the confidence of drilling a successful borehole at that location and siting considerations (Table 3), i.e.
 - A – the priority site,
 - B – the second priority site
 - C – the back-up site

Table 3.3 Borehole siting considerations *[use national standards/guidelines if they have been defined]*

The borehole shall not be sited where it could be flooded or in depressions with poor drainage. The site shall not be liable to erosion. The siting of the borehole shall also follow the recommended minimum distances from potential sources of contamination and other existing water points in line with national standards or guidelines, or as presented below ***[delete as appropriate]***.

Existing structures	Minimum distance from proposed borehole site (m)
Water supply boreholes	50
Hand dug well	30
Latrines/septic tank/soakaway	30
Streams, canals, irrigation ditches	20
Buildings	3
Approved or informal solid waste dump, burial ground, lubricant depot	500
Coastline	100

- **Mark the sites:** Before leaving the community, the siting crew shall clearly mark the sites, show the selected locations to the community members and sign a prepared community agreement form **[Annex 3.5]**.
- **Borehole design:** The Consultant shall design the borehole based on the following parameters:
 - the purpose of the borehole
 - the expected yield from the borehole
 - the probable drilling depth
 - the likely drilling technique
 - the chemistry of the groundwater
 - the pump type

The borehole design will give the details of the lining material and the diameter, the probable drilling depth and any concerns with the groundwater quality. The borehole design shall accompany the siting report.

Where no feasible sites are found in a particular community for a borehole, this shall be stated in the siting report. The Consultant shall report this to the Designated Representative, who will make a decision on whether the community should be taken out of the borehole programme and alternative water supplies recommended.

Activity 2 Assist UNICEF in the procurement and contract award of the Drilling Contractor

Deliverables

[Amend as appropriate]

- Terms of Reference for Borehole Drilling Works for **[Insert number of location]** locations.
- Bills of Quantities for **[Insert number of location]** locations.
- Confidential bill of quantities/engineers estimate for **[Insert number of location]** locations.
- A summary of the work carried out with recommendations is to be included in the monthly progress report.

Description of tasks

The Consultant shall assist UNICEF to **[prepare]** the **[Terms of Reference for Borehole Drilling Works]** based on **[the national standards or guidelines for borehole construction]**, **[UNICEF Principles of Borehole Construction]**² and the **[Template for Terms of Reference for Borehole Drilling Works]**³.

The Consultant shall be available at the:

- Pre-tender meeting – to go through the contract documents with the bidders, explain the geology and the reasons for particular specifications and prepare the minutes of the meeting.
- Bid evaluation, following the procedure as stated in the Request for Proposals (RFPs).

² See Module 1 of *Borehole Drilling – Planning, Contracting and Management: A UNICEF Toolkit*

³ See Module 3 of *Borehole Drilling – Planning, Contracting and Management: A UNICEF Toolkit*

Activity 3 Supervision of mobilisation and borehole construction

Deliverables

- File with copies of all communications on the project in respective folders
- Copies of sketch of the proposed assemblage of casing and screen for each completed location
- Copies of signed borehole completion record for each completed location as submitted by the Drilling Contractor to the **[Insert appropriate authority]**.
- A summary of the work carried out with recommendations is to be included in the monthly progress report.

Description of tasks

The Consultant shall be responsible for the supervision of the drilling contract. The Consultant shall undertake the following tasks:

1. Develop filing system
2. Project meetings for **[Insert number of sites]** sites
3. Supervision (including approval of schedule; checking drilling equipment; checking drilling materials; engaging community to track drilling process, safety, drilling, final borehole design, installation of casing and screen, borehole development and site completion, sanitary seal, pumping test, water quality testing and borehole disinfection).
4. Issue certificate of Substantial Completion for all boreholes that have been substantially completed **[Annex 3.7]**.

The duties are further detailed below:

Activity 3.1 Filing system

The Consultant shall develop a filing system for all communication on the project. For ease of retrieval it shall include separate folders for:

- Correspondence with the client
- Correspondence with the Drilling Contractor (including regular updates of programme of works)
- Community liaison data which shall include minutes of meetings with each community, training provided for the community, siting data, supervision checklists, borehole construction, pump testing and pump installation records.
- Notice and minutes of meetings
- Invoices and payments

And any other folders that the contract may require.

Activity 3.2 Project meetings

The Consultant shall develop a schedule of project meetings and give timely notice to the Drilling Contractor and all expected participants. At each site, the meetings shall include:

- **Pre-mobilisation meeting:** the Consultant shall hold a meeting with the Drilling Contractor and the UNICEF **[Designated Representative]** before the Contractor mobilises to the **[basecamp/site]** to go over the technical specifications and procedures for each step in the contract, so that there is a common understanding of all the issues among all the parties. The roles and responsibilities of all parties will be

made clear at this meeting. The format to be used by the driller for data collection, as set out in the Contract between UNICEF and the Drilling Contractor, shall be verified⁴.

- **Introduction meeting with community:** to introduce the Supervisor and the Drilling Contractor's representatives to the community representative and inform the community of the start date of the project in the community. Explain that should any problems arise, the community should inform the Supervisor. The Consultant should complete Supervision Checklist Part 1 as set out in Section 3 of the [Toolkit Module 3] Terms of Reference.
- **Site meetings:** where the progress of the works will be reviewed.

Activity 3.3 Supervision [select full-time or part-time/milestone supervision as appropriate]

Full-time supervision

The Consultant's Supervisor shall be present on the drill site and stay with the drill team throughout the drilling. The main responsibilities of the Supervisor are:

- ensure that the borehole construction and completion work is carried out as specified in the contract between the contractor and UNICEF
- ensure that all measurements and observations are systematically and accurately taken, recorded and submitted to the appropriate authority according to the contract between the contractor and UNICEF,
- ensure that safety standards are maintained at all times during the execution of the project.

The tasks to be executed by the Supervisor at the different stages of the project are as follows:

a) Approve programme for completion of works

Prior to mobilisation to the base camp or first drilling site, the Drilling Contractor shall be required to submit the programme for the completion of the works in a Gantt chart of weekly activities as specified in the drilling contract. The Consultant is tasked with checking and approving the programme of works and ensuring that it is updated at least monthly.

b) Check drilling equipment

Prior to mobilisation to the base camp, or first drilling site, the Consultant shall check the drilling equipment and ensure that it is adequate for the project and in good working condition. The Consultant should complete Supervision Checklist Part 2 as set out in Section 3 of the [Toolkit Module 3] Terms of Reference.

c) Check drilling materials

The Drilling Contractor is required to submit samples of all the materials to be used on the project (i.e. casings, screens, drilling fluids, gravel pack, aggregate cement, formwork, steel reinforcement) to the Supervisor. The Supervisor shall check the sample materials and ensure that they are adequate for the project. The Supervisor shall ensure that the casings and screens supplied are new, there is no discolouration due to prolonged exposure to sunlight and conform to the specification. If in doubt, the diameter and the wall thickness shall be measured with callipers. The Supervisor should complete Supervision Checklist Part 3 as set out in Section 3.

d) Engaging community to track of drilling process

⁴ [Module 4 – Annex 4.3 of the Toolkit provides a suggested format for the borehole completion record].

The Supervisor should try to involve the community to track the drilling process by providing guidance to two community **drilling monitors** regarding the stages that they should observe and record. The drilling monitors must both be literate, be able to do basic arithmetic and have a watch. It should be noted that the community drilling monitors are no substitute for the record keeper of the Drilling Contractor, or record keeping by the Supervisor, but can provide a check on data recorded. Table 4 sets out the type of information that can be tracked and recorded by the community.

Part-time/Milestone Supervision

Where Part-time or Milestone Supervision is employed the Supervisor will also carry out the functions labelled a), b), c) and d) under full-time supervision above.

Table 3.4 Information to be collected by community drilling monitors (daily report)

	Start of Drilling
Date & Time	Drilling Observations
	1 st drill pipe inserted
	2 nd drill pipe
	3 rd drill pipe
	4 th drill pipe
	5 th drill pipe
	<i>[add as required]</i>
Date & Time	Borehole development Observations
	Borehole development started
	Borehole development completed
	<i>[add as required]</i>
Date & Time	Pumping test Observations
	Date and time pumping test started:
	Date and time pumping test completed:
	<i>[add as required]</i>
Date & Time	Pump Platform, Drainage and Soakaway Observations
Date & Time	Pump Installation Observations

e) Safety

The Supervisor shall ensure that the Drilling Contractor takes all precautions for the safety of the personnel, the public and the equipment on the drill site. The Supervisor shall check and ensure that the Drilling Contractor has a properly equipped first aid kit on site and has adequate preparation for dealing with emergencies. All personnel on the site, both the Supervisor and the drilling crew shall put on protective clothing, proper boots, hard hats and gloves. The Supervisor shall be constantly vigilant to prevent accidents, and to minimise injuries should accidents occur. Spectators must be kept behind a clearly defined barrier and prevented from staring at the welding arc where welding is carried out.

f) Drilling

Rig position: The Supervisor shall ensure that the rig is positioned exactly over the pegged site and away from any potential hazards such as overhead electrical cables.

Monitoring drilling depth, penetration rate and drill cutting samples: The Supervisor shall constantly monitor the drilling depth, the depth penetration rate and the collection of drill samples. The Supervisor shall ensure that the Drilling Contractor complies with the depth interval for collection of samples as specified in the Drilling Contract or agreed otherwise. A photograph of the samples will be taken as a permanent record. The Supervisor shall prepare a graphic strata log of the borehole which will form part of the final borehole report.

The Supervisor shall instruct the Drilling Contractor to stop drilling when the appropriate depth is reached. The decision to end drilling will depend on the information gathered in the course of drilling which will include:

- the depth specified in the Contract
- depth of the aquifer
- static water levels
- the estimated yield from the borehole

The Supervisor should complete Supervision Checklist Part 4 as set out in Section 3 of the [Toolkit Module 3] Terms of Reference.

Where the risks of drilling a dry borehole becomes apparent during the drilling, particularly from the output during hammer drilling, and the recommended depth has been attained and possibly surpassed, the Supervisor may elect to stop the drilling and declare the borehole unacceptable without installing casing and screens in the borehole. In such circumstances, the driller should be paid for items of work expended until the borehole was declared unacceptable, based on the bill of quantities.

g) Final borehole design

The Supervisor shall instruct the Drilling Contractor on the final borehole design, i.e. the depth interval to be screened, the slot size of the screen, the gravel pack depth interval and grain size of the material.

Installation of casing and screen

Once the depth of the borehole and the depth interval for screening are decided, the Supervisor shall make a sketch of the proposed assemblage of casing and screen. The casings and screens will be laid out according to the sketch and measured individually, totalled and checked that they conform to the sketch. The Supervisor will take a photograph of the layout for the record.

The Supervisor shall ensure that joints between lengths of casings are strong enough to support the entire weight of the casing during installation. Threads should be intact. Both male and female threads will be properly cleaned with a wire brush and cloth before they are joined. Where non-threaded couplings are used, they should be cleaned and joined together by the solvent cement or glue recommended by the manufacturer, and time

recommended for it to set should be observed. Where steel casings and screens have to be welded, the Supervisor shall ensure that the welding is fully penetrating and continuous.

h) Borehole development and site completion

The Supervisor shall ensure that borehole development is undertaken according to the specifications in the drilling contract. At the end of the development the water coming out from the borehole is clear of mud and is sand-free. Samples of the water shall be collected in a clear container and checked to see that there are no sediments collecting at the bottom of the container.

i) Sanitary seal

The Supervisor shall ensure that a sanitary seal is placed in the top **[6m]** to prevent surface water which may be polluted from flowing down the borehole annulus into the aquifer. **[The sanitary seal will be cement slurry in the mixture of 25l of water to 50kg of neat cement, or bentonite].**

j) Pumping test

The Supervisor shall ensure that the Drilling Contractor conducts the pumping test as specified in the drilling contract, whether it is only a constant discharge rate test or step test followed by constant rate test and the recovery rate measurement.

The Supervisor shall analyse the data collected from the Pumping Test for the specific capacity of the borehole. The Supervisor shall determine whether or not the specific capacity is sufficient for the borehole to serve as a potable water supply based on the requirements specified in the Drilling Contract. The Supervisor will make recommendations on the pumping regime of the borehole.

k) Water quality testing

The Supervisor shall ensure that the Drilling Contractor conducts collects samples and undertakes water quality testing as specified in the drilling contract. The water quality testing form to be completed by the drilling contractor shall be approved by the Supervisor. The Supervisor shall ensure that the Drilling Contractor uses a portable test kit to measure the pH, conductivity and temperature of the water sample on site. The samples sent to the laboratory shall be tested for the parameters as set out in the Drilling Contract.

From the results of the water quality analysis, the Supervisor shall determine whether or not the chemical and bacteriological quality of the water is adequate to serve as a potable water supply based on the National Drinking Water Quality Standards or the WHO Guidelines where there are no national standards.

In the case of corrosive water (i.e. pH < 6.5), specific measures need to be taken. Galvanised iron (GI) riser pipes and pump rods are not to be installed in water where the pH is less than 6.5. The Supervisor shall ensure that appropriate materials, as specified in the pump supply contract and installation contract, are installed. **[amend as necessary]**.

l) Borehole disinfection

The Supervisor shall ensure that the completed borehole is disinfected by the Drilling Contractor as specified in the Drilling Contract.

m) Demobilisation

On completion of the works, the Drilling Contractor shall submit all the required documentation as specified to the client, restore the site back to its former state and demobilise from the site.

Part-time or Milestone Supervision

Where part-time supervision is employed, the Supervisor shall ensure that activities e) to l) in 3.3 above are carried out either directly by him/herself at the stages that have been specified that he/she must be on site, or by community members that have been trained to support him/her whilst not on site.

Activity 3.4 Verify borehole completion report

The Supervisor shall verify that the drillers' borehole completion report complies with the Drilling Contract for each borehole drilled (including boreholes that were aborted).

In the case of (an) abortive borehole(s), the Supervisor shall submit to the Designated Representative in writing the account of the steps in the drilling process up to the point of the borehole(s) being declared unacceptable and abortive and the particular reason for the borehole(s) being so declared abortive. The Designated Representative shall determine if this is due to an action or inaction of the Drilling Contractor or due to the failure or incompetence of the Supervisor. If it is due to the Drilling Contractor, the Drilling Contractor shall be instructed to re-drill the borehole at his own cost. If it is due to the Supervisor, the responsibility lies with him/her to undertake corrective measures if possible. If it is the fault of the Supervisor, the individual consultant/company is responsible, which could ultimately result in termination of the contract or withholding of payment.

Activity 3.5 Inspection and issue of certificate of substantial completion

On being satisfied that the works have been completed and all the required data and documentation have been completed, a certificate of substantial completion shall be issued by the Supervisor **[Annex 3.7]**.

Activity 4 Supervision of the pad construction, and the supply and installation of the pump

Deliverables

- Signed certificates of Substantial Completion for all boreholes that have been substantially completed.
- A summary of the work carried out with recommendations is to be included in the monthly progress report.

Description of tasks

Activity 4.1 Inspection of materials for pad construction

Samples of all materials to be used for the concrete pad, i.e. the aggregates, cement, water, formwork; steel reinforcement shall be approved by the Supervisor before delivery to the site.

Activity 4.2 Supervision of pad construction

The Supervisor shall ensure that the pad construction is as specified in the contract. The concrete mix shall be in the right ratio and allowed to cure for the specified period. The construction of the concrete pad, drainage and soakaway shall be coordinated with the installation of the handpump stand.

The Supervisor shall ensure that the data about the borehole are either inscribed in the wet concrete or installed on a brass plate **[delete as appropriate]** as specified in the drilling construction contract.

Activity 4.3 Pump inspection

The above ground and below ground pump components of the handpump (i.e. pump head assembly, handle assembly, rod hanger assembly, stand assembly, cylinder assembly, plunger and foot valve, rising main pipes with centralisers) to be installed on the borehole shall be inspected by the Supervisor to verify that they are as specified, new, and have been procured from the approved supplier as per specifications validated by UNICEF.

Activity 4.4 Supervision of pump installation

The Supervisor shall instruct the **[Contractor/Pump Mechanic]** on the depths at which to install the pump. The installation shall be carried out in accordance with the standard installation instructions provided by the manufacturer. All components introduced into the borehole shall be disinfected using a chlorine solution. After installation, the pump will be subjected to a one-hour continuous pumping.

On occasions when the pump installation is the responsibility of the community pump mechanics/minders, the Supervisor shall similarly instruct them on the depths at which to install the pump and that the installation is carried out in accordance with the standard installations provided by the manufacturer. The disinfection and continuous pumping will be carried out as stated in the preceding paragraph.

Activity 4.5 Inspection and issue of certificate of substantial completion

On being satisfied that the works and all the required data and documentation have been completed, a certificate of substantial completion shall be issued by the Supervisor **[Annex 3.7]**.

Activity 5 Defects liability and final Inspection

Deliverables

- Condition report for each borehole
- Signed Certificates of Final Completion for all boreholes that have met all of the final inspection criteria as specified in the Drilling Contract.

Description of tasks

The Supervisor shall check and monitor the performance of the items of work completed by the Drilling Contractor during the defects liability period. The Supervisor will notify the Drilling Contractor of any defects found and instruct they be put right. If they are not put right within the defects liability period, the Drilling Contractor shall forfeit the amount retained for that borehole.

A final inspection of the works shall be carried out by the Supervisor **[and UNICEF]** in the presence of the Drilling Contractor's representative. The final inspection is to ensure that all the Drilling Contractor's obligations are complete. Final inspection will be conducted when the Defects Liability Period is over, i.e. **[Insert the period]** months after Substantial Completion. The Consultant will:

- Undertake an inspection of the borehole, pad, drainage, soakaway and handpump for each site and prepare a condition report for each site.
- Inform the contractor of the defects that are to be rectified.
- Issue a Certificate of Final Completion for the sites that meet the specifications as set out in the Drilling Contract.
- Set aside a date for the handing over.

3. Supervisor's Checklist

The table below provides a checklist for the drilling Supervisor and should be available in hard copy for each drill site. The checklist should be used on site, and as a reference when preparing the reports for the Client. Hard copies of these checklists should be kept by the individual/firm undertaking the supervision for a minimum of five years from the date of contract completion.

Table 3.5 Supervisors' Checklists

General – for each borehole		
Water Well/Borehole Reference No:		Use: <input type="checkbox"/> Community <input type="checkbox"/> Household/Private Compound <input type="checkbox"/> Health Facility <input type="checkbox"/> Education Facility <input type="checkbox"/> Company Premises <input type="checkbox"/> Test Well <input type="checkbox"/> Other
Location:		Owner Name:
		Owner Address:
Coordinates/ GPS Reference:	Grid Ref: Long. E Lat. N	
Financing Programme/Project/Private:		
Well Permit No:	Date Issued:	Issuing Authority:
Name of Drilling Enterprise:		Driller's License No:
Address of Drilling Enterprise:		

Part 1 - Roles and responsibilities, contracts and logistics clarified	
Activity	Checklist
<input type="checkbox"/> 1. Contracts	<input type="checkbox"/> Contract between UNICEF and Drilling Contractor Signed <input type="checkbox"/> Contract between UNICEF and Consultant Signed
<input type="checkbox"/> 2. Data collection forms	<input type="checkbox"/> Format of data entry forms agreed (should be in Drilling Contract)
<input type="checkbox"/> 3. Programme of work	<input type="checkbox"/> Programme of work submitted and approved
<input type="checkbox"/> 4. Community liaison	<input type="checkbox"/> Explain details of drilling process.
	<input type="checkbox"/> Community member roles, contributions and responsibilities explained
	<input type="checkbox"/> Exchange details of main contact persons or community representatives.
	<input type="checkbox"/> Driller's representative introduced to the Community
	<input type="checkbox"/> Supervisor introduced to the Community

Supervisor's Checklist Part 2 – Drilling Equipment

Activity	Checklist
<input type="checkbox"/> Drilling rig	Year of Manufacture:
	Manufacturer:
	Lifting capacity:
	<input type="checkbox"/> Raise mast.
	<input type="checkbox"/> Start and run for an hour without problem.
	<input type="checkbox"/> Check for oil leaks and get any fixed before giving approval.
<input type="checkbox"/> Compressor	Year of Manufacture:
	Manufacturer:
	<input type="checkbox"/> Start and run for an hour without problem.
<input type="checkbox"/> Mud pump and generator	<input type="checkbox"/> Check rating against estimated borehole depths.
	<input type="checkbox"/> Test pumps and generator.
<input type="checkbox"/> Water tanker	<input type="checkbox"/> Check for leaks.
<input type="checkbox"/> Support trucks	<input type="checkbox"/> Check that the Driller has the necessary working support vehicles.
<input type="checkbox"/> Drill pipes appropriate and in working condition	<input type="checkbox"/> Drill rods are adequate.
	<input type="checkbox"/> Check that there are adequate lengths of drill pipes to drill the deepest hole.
<input type="checkbox"/> Drill bits (and hammer depending on the type of drill rig)	<input type="checkbox"/> Correct diameter.
	<input type="checkbox"/> Right drill bits available for likely ground conditions.
	<input type="checkbox"/> Check condition.
	<input type="checkbox"/> Hammers and bits are of the right diameter (measure).
<input type="checkbox"/> Temporary casing	<input type="checkbox"/> Temporary casing diameter is correct.

Supervisor's Checklist Part 3 – Materials

Activity	Checklist
<input type="checkbox"/> 1. Samples of materials meet with technical specifications	<input type="checkbox"/> Drilling fluid
	<input type="checkbox"/> Sample box
	<input type="checkbox"/> Casing and screen (measure length and diameter)
	<input type="checkbox"/> Filter pack and gravel materials
	<input type="checkbox"/> Screen

Supervisor's Checklist Part 4 – Drilling

Activity	Checklist
<input type="checkbox"/> 1. Health and safety	<input type="checkbox"/> Rig set up away from traffic hazards and power transmission lines.
	<input type="checkbox"/> Rig and support vehicle not positioned on a steep slope.
	<input type="checkbox"/> Public safety barrier (bright-coloured tape).
	<input type="checkbox"/> Drilling team wearing personal protective clothing: boiler suits, hard hats, boots, eye protection and gloves.
	<input type="checkbox"/> Inflammable items such as petrol or chlorine, etc., should be kept in approved containers, properly marked and stored away from sources of heat.
	<input type="checkbox"/> Mast not raised during thunderstorm (lightning strike risk).

	<input type="checkbox"/> Lifting of very heavy or bulky loads which could lead to back strain should be avoided. Lifting should be done using the legs and not with the back.
	<input type="checkbox"/> Equipment should be kept in good working order.
	<input type="checkbox"/> Area around the drilling rig is kept tidy.
	<input type="checkbox"/> Borehole should be securely capped on completion to prevent tools and other debris falling into the hole and children throwing stones and corn stalks into it, which could render it useless.
	<input type="checkbox"/> On completion, the site should be restored as far as possible to what it was before the drilling, with mud pits filled in and compacted.
	<input type="checkbox"/> Drill crew should regularly drink plenty of fluid to prevent dehydration, which can lead to poor judgement.
	<input type="checkbox"/> First Aid kit checked.
	<input type="checkbox"/> Emergency procedure in case of major injury and need for hospitalisation.
<input type="checkbox"/> 2. Rig position	<input type="checkbox"/> Rig positioned over pegged site.
	<input type="checkbox"/> Rig drill mast vertical (checked with spirit level).
	<input type="checkbox"/> Check ground stability for softness that could entrap the rig or cause it to tilt during drilling.
<input type="checkbox"/> 3. Drilling depth	<input type="checkbox"/> Depth measurements being conducted and logged properly.
<input type="checkbox"/> 4. Penetration rate	<input type="checkbox"/> Penetration rates being measured properly.
<input type="checkbox"/> 5. Drilling fluid	<input type="checkbox"/> Type of drilling fluid being used:
	<input type="checkbox"/> Driller using Marsh funnel to measure drilling fluid viscosity.
<input type="checkbox"/> 6. Drill cutting samples	<input type="checkbox"/> For Rotary mud-flush drilling, check that the circulation mud pits (or portable tanks) have a volume that is at least three times the volume of the borehole.
	<input type="checkbox"/> Ensure that the Driller prevents sample contamination due to poor circulation, borehole erosion or caving.
	<input type="checkbox"/> Ensure that mud pits are kept clean to prevent re-circulation of cuttings.
	<input type="checkbox"/> Samples taken at regular intervals and properly washed, bagged, labelled, logged and stored in sample box.
	<input type="checkbox"/> Photograph samples
<input type="checkbox"/> 7. Strata Log	<input type="checkbox"/> Use samples to prepare a Strata Log.
<input type="checkbox"/> 8. Final borehole depth	<input type="checkbox"/> Water table depth (m):
	<input type="checkbox"/> Final borehole depth (m):
<input type="checkbox"/> 9. Drill Report	<input type="checkbox"/> Daily drilling log signed by rig operator and Supervisor.
	<input type="checkbox"/> Record necessary data and information required to complete a Casing and Well Completion Form .
Supervisor's Checklist Part 5 – Drill Camp	
Activity	Checklist
<input type="checkbox"/> <i>Drill Camp / Satellite Fly Camp layout</i>	<input type="checkbox"/> Location of vehicle and rig parking <input type="checkbox"/> Maintenance garage <input type="checkbox"/> Site office and living accommodation <input type="checkbox"/> Fuel storage and spillage control measures <input type="checkbox"/> Water supply source <input type="checkbox"/> Sanitation facilities <input type="checkbox"/> PVC casing and screens protected from direct sunlight

Supervisor's Checklist Part 6 – Drilling Contractor

Personnel	Checklist
<input type="checkbox"/> Drilling manager	Years of experience: Experience of similar assignments:
<input type="checkbox"/> Hydrogeologist	Qualifications: Years of experience: Experience of similar assignments:
<input type="checkbox"/> Rig operator	Years of experience:
<input type="checkbox"/> Driver	Years of experience:
<input type="checkbox"/> Mechanic	Years of experience:
<input type="checkbox"/> Rig assistants	Number of assistants: Years of experience:
<input type="checkbox"/> Record Taker	Years of experience:

4. Deliverables and Reporting Requirements

Payment for services will be based on deliverables and reports acceptable to the client given set out below and in line with the payment schedule in Section 8. A summary of the work carried out with recommendations is to be included in the monthly progress report to UNICEF, which requires approval to go ahead to the next stage. The progress reports shall provide details of the staff and equipment input and reimbursable consumables for the particular period and the signed timesheets of all the staff members. The rates on the invoice shall be the same as in the Consultancy agreement.

Report/Deliverables	Format	Due
Inception report including initial understanding of the tasks to be carried out, work plan and any problems and challenges that are anticipated.	2 hardcopy Email or Flash Drive softcopy	Within 2 weeks of signing contract
Monthly progress report including summary of all administrative and field activities carried out, progress on siting, meetings held, progress on drilling activities, updated work plan and recommendations and any changes to staffing.	2 hardcopy, Email or Flash Drive softcopy	End of each month
End of Project report including summary of all administrative and field activities carried out, siting, meetings held, drilling activities, lessons learned and records and summary of any changes to staffing.	2 hardcopy, Email or Flash Drive softcopy	2 weeks after last Final Completion Certificate is issued
Activity 1 – Borehole Siting and Borehole Design: <ul style="list-style-type: none"> Siting report including borehole design for [Insert number of locations] locations. 	Annexed to monthly reports and end of project report	

Report/Deliverables	Format	Due
Activity 2 – Assist UNICEF in the procurement and contract award of the Drilling Contractor: <ul style="list-style-type: none"> ■ Terms of Reference for Borehole Drilling Works for [Insert number of location] locations. ■ Bills of Quantities for boreholes in [Insert number of location] locations. ■ Confidential bill of quantities/engineers estimate for [Insert number of location] locations. 	Annexed to monthly reports and end of project report	
Activity 3 – Supervision of mobilisation and borehole construction: <ul style="list-style-type: none"> ■ File with copies of all communications on the project in respective folders. ■ Sketch of the proposed assemblage of casing and screen for each completed location. ■ Copy of borehole completion report for each borehole drilled (including boreholes that were aborted). 	Annexed to monthly reports and end of project report	
Activity – 4 Supervision of the pad construction, and the supply and installation of the pump <ul style="list-style-type: none"> ■ Signed certificates of Substantial Completion for all boreholes that have been substantially completed. 	2 hardcopy, Email or Flash Drive softcopy And annexed to end of project report.	One (1) week after substantial completion of the borehole
Activity 5 – Defects liability and final inspection <ul style="list-style-type: none"> ■ Condition report for each borehole. ■ Signed Certificates of Final Completion for all boreholes that have meet all of the final inspection criteria as specified in the Drilling Contract. 	2 hardcopy, Email or Flash Drive softcopy, and annexed to end of project report.	Two (2) weeks after final completion of the borehole

Provision should also be made for regular meetings with the UNICEF Designated Representative and a monthly Project Coordination Meeting to be held at UNICEF's office, throughout the project.

5. Locations and Duration

The consultancy Agreement is expected to be awarded on _____ **[e.g. 30 December 2018]**, and all work under the Agreement, including Final Inspections, will need to be concluded by _____ **[e.g. 30 December 2019]**.

6. Evaluation Process and Methods

This section of the ToRs should be prepared by programme staff working in collaboration with supply staff. It needs to include the following:

- *Solicitation method (i.e. ITB or RFP)*
- *Description of flow of the evaluation process and sequence of key stages*
- *Description of the overall evaluation approach*
- *Technical proposal*
- *Financial proposal*
- *(For RFPS) the weighting allocated between the technical and financial proposal*
- *Detailed evaluation assessment criteria*
- *Final evaluation*

Note that no financial/price information should be contained in the technical proposal. Presentation, details and clarity of the proposals will influence the final assessment.

7. Project Management

Instructions

The Consultant shall carry out instructions of the Designated Representative of the Client which comply with the applicable law where the project is located.

Designated Representative Decision

Except otherwise specifically stated, the Designated Representative shall decide contractual matters between the Client and the Consultant in the role of representing the Client.

Delegation

The Designated Representative may delegate any of her/his duties and responsibilities to other persons, particularly the Consultant after notifying the Contractor, and may cancel any delegation after notifying the Contractor.

Communication

Communication between parties in the contract shall be in writing and is only effective when delivered.

Management meetings

Either the Designated Representative or the Consultant may require the other to attend a management meeting. The business of the management shall be to review progress of the work and review plans for the remaining work and to deal with matters raised in accordance with early warning.

8. Payment

UNICEF shall make periodic payments upon completion of the deliverables set out in the Terms of Reference. The Consultant shall be paid ***[Insert monthly or quarterly or milestone achievement]*** on submission of the invoice and ***[Insert monthly or quarterly]*** report. The price for the works shall become payable to the Consultant in accordance with the chosen payment schedule ***[examples in Table 3.6 and Table 3.7 below – noting that milestones may be adjusted to take the size of the contract into consideration with provisions for monthly or quarterly payments for boreholes sited, supervised and inspected. Where a number of sites are involved, payments may be split among the number of sites delivered or half completed to facilitate cash flow payment.]***

Table 3.6 Example of Milestones for Borehole Siting and Drilling Supervision Consultancy – Option for Small Contracts

Milestone No.	Milestone Description
1.	Inception Report
2.	Monthly/Quarterly payments as agreed
3.	End of Project Report

Table 3.7 Example of Milestones for Borehole Siting and Drilling Supervision Consultancy – Options for Larger Contracts

Milestone No.	Milestone Description
1.	Inception Report
2.	Activity 1 – Submission of siting reports for <i>[insert number of boreholes]</i> boreholes
3.	Activity 1 – Submission of siting reports for <i>[insert number of boreholes]</i> boreholes
4.	Activity 2 – Completion of procurement and contract award process
5.	Activities 3 & 4 – Submission of borehole completion reports for <i>[insert number of boreholes]</i> boreholes and certificates of substantial completion
6.	Activities 3 & 4 – Submission of borehole completion reports for <i>[insert number of boreholes]</i> boreholes and certificates of substantial completion
7.	Activity 5 – Condition reports and final completion certificates for <i>[insert number of boreholes]</i> boreholes
8.	End of project report

Annexes – Toolkit Module 3

Annex 3.1 Suggested Bill of Quantities for Consultancy Services for Siting

Item	Description	Unit	Quantity	Rate	Amount
1	Staff Cost				
1.1	Project Management (include provision for reporting and regular meetings with UNICEF Designated Representative, monthly project coordination meetings at UNICEF's office as well as scheduled and ad-hoc meetings with stakeholders)				
1.2	Siting Crew Leader 1	Day			
1.3	Siting Crew Leader 2	Day			
1.4	Field assistant 1	Day			
1.5	Field assistant 2	Day			
	<i>Add as required</i>				
1.6	Office support staff	Day			
2	Equipment Cost				
2.1	Resistivity meter	Day			
2.2	Electromagnetic conductivity meter	Day			
2.3	GPS, dip meter, conductivity meter, pH meter, callipers, camera	Day			
3	Travel, accommodation & allowance				
3.1	International travel and visas (if applicable)	Unit			
3.2	Vehicle rental (inclusive of driver, insurance)	Day			
3.3	Fuel and lubricants	Km			
3.4	Field accommodation for staff	Day			
3.5	Field allowance for staff	Day			
4	Office support				
4.1	Rental of functional office including laptops and printers as required	Day			
4.2	Access and collation of hydrogeological data and information	Unit			
4.3	Communication – email, internet, courier	Unit			
4.4	Office consumables – paper, toner, binding comb	Day			
	Total				

Notes

1. Staff listed may not be required on every project; this depends on the size of the project.
2. The Consultant will keep a time sheet of all personnel deployed and details of equipment used which shall be submitted in the monthly and final reports.

Annex 3.2 Suggested Bill of Quantities for Consultancy Services for Supervision

Item	Description	Unit	Quantity	Rate	Amount
1	Staff				
1.1	Team Leader/Project manager/Supervisor 1 (include provision for reporting and regular meetings with UNICEF Designated Representative, monthly project coordination meetings at UNICEF's office as well as scheduled and ad-hoc meetings with stakeholders)	Day			
1.2	Assistant/Team Leader/Project manager/Supervisor 2	Day			
1.3	Supervisor 3	Day			
1.4	<i>Add as required</i>	Day			
1.5	Pump/pad inspector	Day			
1.6	Office support staff	Day			
2	Equipment				
2.1	Hard hat	Day			
	Dip meter				
	Measuring tape				
	GPS				
	Conductivity meter				
	Spirit level				
	pH meter				
	Calliper				
	Digital camera				
	Mobile phone				
	Stop watch				
	First aid kit				
2.2	Borehole camera	Day			
3	Travel, accommodation & allowance				
3.1	International travel and visas (if applicable)	Unit			
3.2	Vehicle rental (inclusive of driver and insurance)	Day			
3.3	Fuel and lubricants	Km			
3.4	Field accommodation for staff	Day			
3.5	Field allowance for staff	Day			
4	Office support and communication				
4.1	Rental of fully furnished functional office including laptops and printers as required	Day			
4.2	Access and collation of hydrogeological data and information	Unit			
4.2	Communication – email, internet, courier	Lump sum			
4.3	Office consumables – paper, toner, binding comb	Lump sum			
	Total				

Annex 3.3 Personnel & Sub-Consultants and Organogram

Position	Name of Allocated Person	State whether staff of firm or sub-contractor
Siting		
Project Manager – Siting		
Siting Crew Leader 1		
Siting Crew Leader 2		
Field assistant 1		
Field assistant 2		
<i>Add as required</i>		
Office support staff		
Supervision		
Project Manager – Supervision		
Assistant Team Leader/ Supervisor 2		
Supervisor 3		
<i>Add as required</i>		
Pump/pad inspector 1		
Pump/pad inspector 2		
Office support staff		

Note: Changes in nominated staff will only be accepted on the basis of a similar, or better, qualified & experienced person for the role and function. The Consultant is to submit CVs of proposed replacements for the approval of UNICEF prior to field placement. All staff changes are to be reported in the monthly report and summarised in the end of project report.

Annex 3.4 Performance Guarantee/Advance Payment Guarantee Form

Performance Guarantee/Advance Payment Guarantee (BANK GUARANTEE)

To: _____ (Name of Employer)

_____ (Address of Employer)

WHEREAS _____ (name and address of Contractor) (hereinafter called "[XX]") has undertaken in pursuance of Contract No. _____ dated _____ to execute _____ (name of Contract and brief description of works) (hereinafter called "the Contract").

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish a Bank Guarantee by a recognised bank for the sum specified therein as security for compliance with its obligations in accordance with Contract.

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee;

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you on behalf of the Contractor up to a total of _____ [amount of guarantee] _____ [in words], such sum being payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of _____ [amount of guarantee] as aforesaid without your needing to prove or to show grounds for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand. We further agree that no change or addition to or other modification of the terms of the contract or of the Works to be performed there under or of any of the Contract documents which may be made between you and [XX] shall in any way release us from any liability under the guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid until the date of issue of the Certificate of Substantial Completion.

No change on content or validity of this Bank Guarantee shall be undertaken by the bank without UNICEF permission.

Signature and Seal of the Guarantor _____

Name of Bank _____

Address _____

Date _____

Annex 3.5 Community Agreement Form

Agreement between UNICEF and the Community for the Release and Preservation of the Borehole Site

[Insert title of the project]

THIS AGREEMENT is made this _____ day _____ **[Insert month and year]**

BETWEEN

UNICEF [Insert address]

AND

Representatives of [Insert community name and address]

UNICEF is supporting **[Insert community name]** with the provision of a borehole for safe water supply and has appointed a Consultant to carry out the siting and supervision of construction of the borehole. **[X]** possible sites have been located for the construction of the borehole within the community jointly by the Consultant and representatives of the Community.

The Community hereby agrees that

1. It shall release the located sites for the drilling of the borehole for the use of the community into perpetuity
2. It shall preserve the locations and the markings of the locations from this day until the borehole is drilled
3. It shall allow access to the sites by the Drilling Contractor and all the workers
4. It shall allow access to the completed borehole site by all the community members
5. The content of this agreement has been discussed with the entire community and is understood by all

Signed by

The Community

Representative 1 Name _____
Signature and date _____

Representative 2 Name _____
Signature and date _____

UNICEF Representative

Name _____
Signature and date _____

Consultant

Name _____
Signature and date _____

Annex 3.6 Certificate of Substantial Completion

Date:

Contract No.:

Project Name:

Contractor:

Location:

This is to advise that in accordance with ClauseofContract, the above project has reached the stage of substantial completion.

Thehas been inspected and all works specified in the scope of works have been completed to this stage.

Please find attached the substantial defect list with defect liability period 1 year.

Date of 'Substantial Completion':

Certified as 'Substantial Completion'

Acceptance

Confirmed as 'Final

Supervisor

Implementing entity

Designated Representative*

***Designated Representative:** The UNICEF officer designated as representing UNICEF in the contract

Copy No 1	To (original) Contractor
Copy No 2	To construction unit UNICEF
Copy No 3	To Programme section UNICEF
Copy No 4	To entity responsible for quality assurance

Annex 3.7 Certificate of Final Completion

Date:

Contract No.:

Project Name:

Contractor:

Location:

This is to advise that the Defect Liability Period has been reached, and all defects found in the Final Inspection have been corrected. Therefore, the final payment to the Contract No. _____ can be issued in accordance with Clause _____ (Page __) of the above mentioned Contract.

Date of 'Final Completion':

Certified as 'Final Completion'

Supervisor

Acceptance

Implementing entity

Confirmed as 'Final Completion'

Designated Representative*

***Designated Representative:** The UNICEF officer designated as representing UNICEF in the contract.

Copy No 1	To (original) Contractor
Copy No 2	To construction unit UNICEF
Copy No 3	To programme section UNICEF
Copy No 4	To Supervisor

Annex 3.8 Template – UNICEF Agreement for Borehole Siting and Drilling Supervision Consultancy Services

THIS AGREEMENT FOR CONSULTANT SERVICES IN BOREHOLE SITING AND DRILLING SUPERVISION OF the drilling and construction of [Insert number of boreholes] in [insert districts] and for the development of the same to be equipped with handpump and fully finished water abstraction points for the purpose of drinking water supplies (together with the schedules and attachments hereto, this "Agreement") is made on [Insert date].

BETWEEN: UNICEF, THE UNITED NATIONS CHILDREN'S FUND ("UNICEF"), an international inter-governmental organisation established by the General Assembly of the United Nations by resolution No. 57(1) of 11 December 1946 as a subsidiary organ of the United Nations, having its headquarters at UNICEF House, Three United Nations Plaza, New York, New York, 10017, U.S.A. and having an office at [insert address].

AND: [Insert name of the Consultant] (the "Consultant"), organised and existing under the laws of [insert country] and having its principal offices at [insert address]; together with UNICEF the "Parties" and each a "Party".

WHEREAS:

- A. UNICEF works with governments, civil society organisations and other partners world-wide, including the Government of [insert country] (the "Government"), to advance children's rights to survival, protection, development and participation, and is guided by the Convention on the Rights of the Child.
- B. WHEREAS, in accordance with the Basic Cooperation Agreement between UNICEF and the Government dated [Insert date] the ("Basic Cooperation Agreement"), UNICEF has agreed to support the Government in a programme developed by the Department of [insert the name of the department] to build the physical water supply infrastructure of [insert details].
- C. By [insert bidding document number here] the ("Request for Proposal"), UNICEF invited proposals for the provision of professional services of a qualified groundwater consultancy firm to site and supervise the drilling and construction of [insert number of boreholes] in [insert the Districts] and the development of the same to be equipped with handpumps and fully finished water abstraction points for the purpose of drinking water supplies.
- D. By way of the [Insert the name of the documents, e.g. Terms of Reference and Financial Proposal dated XXXX, No, as amended by the Clarification of Proposal dated XXXX], among others, together the Consultant responded to the Request for Proposal and represented that it is qualified, capable and willing to provide the required provision of siting and supervision services and that if selected to undertake this assignment it would work in collaboration with [Insert the name of the joint venture partners if any].
- E. UNICEF wishes to engage the Consultant to undertake the work described in the Terms of Reference (Annex [Insert Annex number]) to this Agreement (the "Work"), all on the terms and conditions set forth in this Agreement; and the Consultant represents that it is qualified, ready, able and willing to carry out the work on the same terms and conditions.

NOW, THEREFORE, the Parties hereto mutually agree as follows:

1. Agreement Documents

1.1 This document and all annexes⁵hereto, together with the following named documents, which are incorporated herein by reference, constitute the entire Agreement between UNICEF and the Consultant in connection with the Work:

- (a) Terms of Reference **[Template in Module 3 of the Toolkit]**⁶
- (b) Personnel & Sub-Consultants **[Annex 3.3 in Toolkit Module 3]**
- (d) Schedule of Payment **[Section 8 in the Terms of Reference in Toolkit Module 3]**
- (e) Financial proposal **[See Annex 3.1 and 3.2 Toolkit Module 3 for guidance]**
- (f) Performance Guarantee/Advance Payment Form **[Annex 3.4 in Toolkit Module 3]**
- (g) Community Agreement Form **[Annex 3.5 in Toolkit Module 3]**
- (h) Certificate of Substantial Completion **[Annex 3.6 in Toolkit Module 3]**
- (i) Certificate of Final Completion **[Annex 3.7 in Toolkit Module 3]**
- (j) The Request for Proposal of Services; and*
- (k) The Proposal.*

[*Note: Model documents for a RFP and Proposal are not set out in this [module] document, but are still a requirement of the Agreement to be made various parts missing?!!! available at the Country or Regional level].

1.2 The Agreement documents are to be taken as complementary of one another, but in case of ambiguities, discrepancies or inconsistencies among them, the Agreement shall be interpreted on the basis of the following order of priority:

- (a) this document;
- (b) Annexes **[insert Annex numbers]**,
- (c) the Request for Proposal of Services; and
- (d) the Proposal, as clarified.

1.3 The Agreement represents the entire and integrated agreement of the Parties with regard to the subject matter hereof and supersedes all prior agreements, negotiations and representations, either written or oral.

2. Definitions

In this Agreement, the following terms shall have the following meanings:

- 2.1 **Project Authority:** : The individual who shall be responsible for the day-to-day liaison and management of the Agreement. (Note: there will be one Project Authority nominated by UNICEF, who need not be a UNICEF staff member, and one nominated by the Consultant.)
- 2.2 **Designated Representative:** The UNICEF officer designated as representing UNICEF in the contract.
- 2.3 **Authorised Representative:** Any person, whether UNICEF officer or employee of the Designated Supervising Agency, authorised by UNICEF in writing to carry out inspection, supervision, etc. of the

⁵ The agreement template refers to Annexes which will need to be numbered. For ease of referencing across the **Toolkit** contents, the Annexes are referred to with their respective Module number, i.e. Annexes 3.1 for Module 3.

⁶ Delete information in **[]** when amending this template for a contract.

Works. The term includes the Project Authority but can also include other representatives with written authority.

- 2.4 **UNICEF:** Means the contractual party as set out in the preamble to the General Conditions of Agreement. When used in connection with inspections, supervision, etc., the term shall include any Authorised Representative.
- 2.5 **Designated Siting and Supervising Agency:** The consultancy agency engaged by UNICEF to carry out supervision during the whole life of the project and assist in the contracting procedure and the day-to-day supervision and inspection of the Works.
- 2.6 **Consultant:** The company or person whose bid has been accepted by UNICEF to carry out the **Assignment** as set out in the Terms of Reference
- 2.7 **Sub-contractor:** Any person or company that has been named and sub-contracted by the Consultant with the consent of UNICEF to carry out a specified part of the assignment as set out in the Terms of Reference.
- 2.8 **Consultant's Representative:** The person authorised by the Consultant to make decisions on the Consultant's behalf for any one site or part of the Works. The Consultant's Representative will usually be the Supervisor.
- 2.9 **Supervisor:** The person authorised by the Consultant to act as his/her representative on the drill site, to collect all the required data and information and give instructions to the Drilling Contractor as required for the completion and handing over of the borehole.
- 3.0 **Completion date** is the time the work as defined in Annex **[insert Annex number]** is completed at the location(s) indicated for delivery.
- 3.1 **Defects Liability** is the period during which the Drilling Contractor is responsible for repairing or rectifying defects that appear in the Works. The period is named in the Contract and calculated from the Completion Date.
- 3.2 The **assignment** refers to the specified task or work that has been assigned to the consultant to undertake, as set out in the Contract Documents.
- 3.3 Works refers to the specified tasks required by the Contract Documents for drilling works and pump supply and installation.

4. General Rights and Obligations of the Consultant

- 4.1 The Consultant shall be responsible for completing the Work. The Consultant shall perform its obligations under this Agreement with all reasonable skill and care and in conformity with sound professional, administrative and financial practices. It is understood and agreed that the Consultant shall undertake the Work in collaboration with **[Insert the name of the joint venture partners if any]** provided however that the Consultant shall remain fully liable to UNICEF for completion of the Work in accordance with this Agreement.
- 4.2 The Consultant shall have qualified personnel and appropriate equipment and software for the collection and analysis of hydrogeological and geophysical data where appropriate for the siting of the boreholes.
- 4.3 The Consultant shall provide supervision services during all the life of the project and supervision support with involvement of the local community.
- 4.4 The Consultant shall assist UNICEF in the identification and pre-qualification of the Drilling Contractor, preparing bidding documents and tender procedures for UNICEF's approval.
- 4.5 The Consultant shall ensure full-time supervision through a resident Supervisor.

- 4.6 The Consultant ensures that all materials used in the course of these Works shall be new and proper for their use. No reusable materials coming from the Site shall be used unless permitted by UNICEF. Other materials shall be stored on Site until the end of the Works. All materials, equipment and products shall be installed in accordance with the written recommendations of the manufacturer.
- 4.7 The Consultant shall have the right to review samples of construction materials and fixtures. The Drilling Contractor shall submit such samples, and relevant information, in sufficient time for the Consultant to complete review of samples. Each sample shall be labelled as to origin and intended use in the Works.
- 4.8 The Consultant ensures the completion of the Works in accordance with the schedule of works as provided by the Drilling Contractor and approved by UNICEF and the technical specifications of the drilling contract.

5. General Rights and Obligations of UNICEF

- 5.1 UNICEF shall make periodic payments upon completion of the deliverables as set out in the Terms of Reference.
- 5.2 The Consultant must allow unlimited access to the Designated Representative, or to her/his authorised representatives, to monitor the Works. The Representative is entitled to review the type, quantity and quality of materials and workmanship used in the Works to ensure compliance with the Agreement Documents and the standards defined by these.
- 5.3 UNICEF will issue all certificates upon satisfaction of conditions necessary for the issuance of such certificates and supply all necessary information and written instructions for the Consultant to carry out the siting and supervision of the Works properly.
- 5.4 To the extent it is able, UNICEF shall give to the Consultant right of access to, and possession of, the Site within such times as is required to enable the Consultant to proceed in accordance with this Agreement.
- 5.5 UNICEF shall have the right to issue, and the Consultant shall comply with, additional instructions. Such additional instructions shall complement and/or clarify the Agreement Documents and shall have no effect on the definition of the Works, the Prices and/or the Substantial Completion Dates. Such instructions may take the form of technical specifications, drawings, samples, models or instructions. All such instructions shall be issued in writing.

6. Term of Agreement

- 6.1 From the Effective Date of the Agreement, specified in Article 53, the Agreement shall remain in force for a period of **[Insert duration e.g. 12 months]** by the end of which period the Consultant shall have fulfilled all of its obligations under the Agreement, unless earlier terminated in accordance with the terms of the Agreement.

7. Project Authority

- 7.1 UNICEF and the Consultant shall each nominate a Project Authority who shall be responsible for the day-to-day liaison and management of the Agreement.

8. Schedule for Completion of the Work

- 8.1 The Consultant shall commence and complete the assignment to UNICEF's satisfaction in accordance with the schedule of works as provided by the Drilling Contractor and approved by UNICEF and in any event no later than **[Insert duration e.g. twelve 12]** months period from the effective date of this Agreement.
- 8.2 The Consultant shall keep a work diary at the Site and maintain it daily. This diary shall describe all works started and completed each day and shall be checked periodically by UNICEF.

9. Substantial and Final Completion

- 9.1 The Works will be deemed substantially completed when they are completed in accordance with the Agreement Documents and the standards defined by this Agreement or when they are effectively used for the purpose for which they are intended.
- 9.2 UNICEF and the Consultant shall inspect the Works at the Site on the date they are substantially completed, and UNICEF will issue a certificate of substantial completion (the "Certificate of Substantial Completion") provided that the Works are satisfactory according to the Agreement Documents and the standards defined by this Agreement. The Certificate of Substantial Completion shall list all Defects that must be remedied by the Drilling Contractor within 20 days.
- 9.3 After issued Certificate of Substantial Completion and within the Defects Liability Period, UNICEF, the Consultant and the Drilling Contractor shall perform quarterly joint inspections to each site to verify any defects resulting from "defective materials or poor workmanship". The Consultant shall consolidate a report of defects, if any. The parties shall agree on the period for remedial of all defects described in the report.
- 9.4 UNICEF will carry out a final inspection at each Site (the "Final Inspection") **[Insert duration e.g. six (6) months]** after the issuance of the Certificate of Substantial Completion for the Site. The Works shall be deemed to be completed when all Defects listed on the Certificate of Substantial Completion, and all Defects that have become apparent after the issuance of the Certificate of Substantial Completion, have been remedied by the Drilling Contractor and UNICEF considers the Works to be satisfactory according to the Agreement Documents and the standards defined by this Agreement. UNICEF will then issue a Certificate of Final Completion.
- 9.5 Upon signing of the Certificate of Final Completion at each Site, the Site and Works shall be taken over by the local authorities and beneficiaries.

10. Agreement Price

- 10.1 The total price for the Assignment (for activities 1 to 5 inclusive) as set forth in **Annex [insert Annex number]** to the Agreement is **[Insert the price]** (the "Price"). The schedule of payment is set out in the Terms of Reference.
- 10.2 The Consultant shall not perform any work or services or provide equipment, products, materials or supplies which may result in the Price being exceeded without a prior written agreement by both Parties.
- 10.3 The price is not subject to any adjustment or revision because of price or currency fluctuations, the actual costs incurred by the Consultant in the performance of its obligations hereunder or modifications to this Agreement or the Contract Documents. Price adjustment or revision shall be agreed by duly signed amendment in accordance with Article 33.1 of this Agreement.

11. Inspection and Acceptance

- 11.1 UNICEF shall have a reasonable time after completion of the Works or part of the Works, and before issuance of the Certificate of Substantial Completion, to inspect the Works and to reject and refuse acceptance of Works not conforming to the Agreement. Inspection prior to completion of Works does not relieve the Consultant from any of its obligations under this Agreement.
- 11.2. Payment for services pursuant to this Agreement shall not be deemed an acceptance of the services.

12. Invoicing Instructions

- 12.1 Invoices must refer to the Agreement and clearly indicate prices for each Agreement item number. The Consultant shall submit the original invoice to the following address:

United Nations Children's Fund (UNICEF) Office at

[Insert address]

13. Payment

- 13.1 Payment shall be made in accordance with this Agreement upon acceptance of an invoice. Invoices and supporting documents shall be submitted upon completion of the activities and are due no later than five (5) working days in line with the schedule of payments in the Terms of Reference.
- 13.2 Subject to clause 10 of this Agreement, UNICEF shall, on fulfilment of the delivery terms, make payment within thirty (30) days of receipt of the invoice.
- 13.3 UNICEF shall make the payments in accordance with the schedule of payments in the Terms of Reference.
- 13.4 UNICEF shall within two (2) weeks notify the Consultant of any dispute or discrepancy in the content or form of the invoice. The value of such disputed items as per the Agreement shall be deducted from the invoice(s) in which they appear, and the balance will be processed for payment. UNICEF and the Consultant shall consult in good faith to promptly resolve any dispute with respect to any invoice or portion thereof.
- 13.5 All payments made by UNICEF into the bank account specified in the Agreement will have liberating effect and be considered as effectively made.
- 13.6 The total amount of the interim payments shall be **[Insert percentage of total price applicable]** of the value of the Agreement of the Remuneration Only. The cost of services under Defect Liability related to the construction work on sites is included in the Agreement price.
- 13.7 UNICEF shall not be liable for any payment exceeding the Agreement price which has not been agreed by UNICEF in writing prior to the expenditure.
- 13.8 UNICEF may make an advance payment for mobilisation when the Consultant submits a guarantee as established in Article 13.

14. Advance Payment Guarantee

- 14.1 The Consultant shall, no later than five (5) working days following the effective date of this Agreement, at its own expense furnish an Advance Payment Guarantee for the advanced amount in the form set forth in Annex **[inset Annex number]** – Performance Guarantee, and with such Surety or Sureties as shall be approved by UNICEF.
- 14.2 The Consultant shall ensure that the Guarantee is valid and enforceable until the advance payment has been repaid. The advance payment shall be repaid through percentage deductions in the invoices. Advance payment shall be deducted as follows:
 - a. UNICEF shall commence deducting advance payment from the first accepted invoice in accordance with the Payment Schedule.
 - b. Deduction shall be made at the amortisation rate of one quarter (25%) of the amount of each invoice (excluding the advance payment and deductions and repayment of retention) until such time as the advance payment has been repaid.
- 14.3 Any remaining balance from the advance payment shall be repaid prior to the Certificate of Substantial Completion or prior to termination as established in Article 43 or Force Majeure as established in Article 42.

15. Site Inspection by The Consultant

- 15.1 The Consultant shall have inspected and examined the Site, its surroundings, data on geological, hydrogeological and hydrological conditions and other environmental aspects. The Consultant shall ensure that the Contractor performs the works in accordance with the drawings and technical specifications.

16. Tax Exemption

- 16.1 Section 7 of the Convention of the Privileges and Immunities of the United Nations provides inter-alia that the United Nations, including its subsidiary organs, is exempt from all direct taxes, except charges for utilities services, and is exempt from customs duties and charges of a similar nature in respect of articles imported or exported for its official use. In the event any governmental authority refuses to recognise UNICEF's exemption from such taxes, duties or charges, the Consultant shall immediately consult with UNICEF to determine a mutually acceptable procedure.
- 16.2 Accordingly, the Consultant authorises UNICEF to deduct from the Consultant's invoice any amount representing such taxes, duties or charges, unless the Consultant has consulted with UNICEF before the payment thereof and UNICEF has, in each instance, specifically authorised the Consultant to pay such taxes, duties or charges under protest. In that event, the Consultant shall provide UNICEF with written evidence that payment of such taxes, duties or charges has been made and appropriately authorised.

17. Legal Status

- 17.1 The Consultant shall be considered as having the legal status of an independent Consultant vis-à-vis UNICEF. The Consultant's personnel and sub-contractors shall not be considered in any respect as being the employees or agents of UNICEF.

18. Consultant's Personnel

- 18.1 The Consultant shall be fully responsible for all work performed by its employees, agents, servants and sub-contractors under the Agreement and shall only select individuals who are professionally and technically competent to perform the work, with appropriate training as may be required. The Consultant shall take all reasonable measures to ensure that all personnel conform to the highest standards of moral and ethical conduct and that they respect local customs which are not otherwise inconsistent with the Consultant's responsibilities under the Agreement.
- 18.2 The Consultant shall have a team of experienced groundwater personnel who will be led by a team leader with ideally 10 years' experience in borehole siting and supervision and preferably with a Master's degree in hydrogeology. The rest of the team shall be geologists and engineers trained in borehole siting and supervision.
- 18.3 The Consultant shall not assign any replacement person to perform any managerial or Supervisory function under this Agreement unless UNICEF has given its prior written approval to the selection of such person. The Consultant shall ensure that all personnel engaged to perform work under this Agreement are medically fit to perform the work and adequately covered by insurance for any work related illness, injury, disability or death. The Consultant shall submit proof of such insurance satisfactory to UNICEF before commencing any work under this Agreement.
- 18.4 UNICEF shall not be liable for any action, omission, negligence or misconduct of the Consultant's employees, officers, agents, servants and sub-contractors, nor for any insurance coverage which may be necessary or desirable for the purpose of this Agreement, nor for any costs, expenses or claims associated with any illness, injury, disability or death of such personnel performing work under this Agreement.

19. Replacement of Consultant's Personnel

- 19.1 UNICEF may request at any time the replacement of any person assigned by the Consultant to perform any work under this Agreement if that person has in UNICEF's view breached the UNICEF Code of Conduct, a copy of which has been provided to the Consultant. Any such request by UNICEF shall not be deemed a termination of this Agreement. The Consultant shall, at its own expense, replace such person forthwith, subject to UNICEF's prior written approval of the replacement if the replacement is for a managerial or Supervisory position.
- 19.2 If key personnel become unavailable, for any reason, for work under the Agreement, the Consultant shall (i) notify the UNICEF Project Authority at least fourteen (14) days in advance, and (ii) obtain the UNICEF Project Authority's approval prior to making any substitution of key personnel. Key personnel are designated as follows:
- (a) Personnel identified in the proposal as key individuals (as a minimum, senior geologists, engineers and managers) to be assigned for participation in the performance of the Agreement; and
 - (b) Individuals who are designated as key personnel in Annex **[insert Annex number]** – Personnel & sub-Consultants organogram.
- 19.3 In notifying the project authority, the Consultant shall provide an explanation of circumstances necessitating the proposed replacement(s) and submit a justification for and the qualifications of the replacement personnel in sufficient detail to permit evaluation of the impact on the Agreement.
- 19.4 Acceptance of a replacement person by the UNICEF Project Authority shall not relieve the Consultant from responsibility for failure to meet the requirements of the Agreement.

20. Sub-Contracting

- 20.1 In the event the Consultant requires the services of additional sub-Consultants, the Consultant shall obtain the prior written approval and clearance of UNICEF for all sub-Consultants. The approval of UNICEF of a sub-Agreement shall not relieve the Consultant of any of its obligations under this Agreement. The terms of any sub-Agreement shall be subject to and in conformity with the provisions of this Agreement.

21. Source of Instructions

- 21.1 The Consultant shall neither seek nor accept instructions from any authority external to UNICEF in connection with the performance of its services under this Agreement. The Consultant shall refrain from any action that may adversely affect UNICEF or the United Nations and shall fulfil its commitments with the fullest regard to the interests of UNICEF.

22. Confidential Nature of Documents

- 22.1 All records, maps, drawings, photographs, mosaics, plans, reports, recommendations, estimates, documents and all other data compiled by or received by the Consultant under this Agreement shall be the property of UNICEF, shall be treated as confidential and shall be delivered only to the UNICEF-authorized officials on completion of work under this Agreement. Unless specified otherwise in national regulations, UNICEF has the responsibility of ensuring that the relevant documents are also handed over to government.
- 22.2 The Consultant may not communicate at any time to any other person, Government or authority external to UNICEF any information known to it by reason of its association with UNICEF which has not been made public except with the authorisation of UNICEF; nor shall the Consultant at any time use such information to private advantage. These obligations do not lapse upon termination of this Agreement with UNICEF.

23. Title to Equipment

- 23.1 Title to any equipment and supplies which may be furnished by UNICEF shall rest with UNICEF, and any such equipment shall be returned to UNICEF at the conclusion of this Agreement or when no longer needed by the Consultant. Such equipment when returned to UNICEF shall be in the same condition as when delivered to the Consultant, subject to normal wear and tear.

24. Copyright, Patents and Other Proprietary Rights

- 24.1 UNICEF shall be entitled to all intellectual property and other proprietary rights including but not limited to patents, copyrights and trademarks, with regard to documents and other materials which bear a direct relation to or are prepared or collected in consequence or in the course of the execution of this Agreement. At UNICEF's request, the Consultant shall take all necessary steps, execute all necessary documents and generally assist in securing such proprietary rights and transferring them to the UNICEF in compliance with the requirements of the applicable law.

25. Encumbrances/Liens

- 25.1 The Consultant shall not cause or permit any lien, attachment or other encumbrance by any person to be placed on file or to remain on file in any public office or on file with UNICEF against any monies due or to become due for any work done or materials furnished under this Agreement, or by reason of any other claim or demand against the Consultant.

26. Indemnification

- 26.1 The Consultant shall indemnify, hold and save harmless and defend, at its own expense, UNICEF, its officials, agents, servants and employees, from and against all suits, claims, demands and liability of any nature or kind, including their costs and expenses, arising out of the acts or omissions of the Consultant or its employees, officers, agents, servants and sub-contractors in the performance of this Agreement.
- 26.2 This provision shall extend, inter alia, to claims and liability in the nature of workmen's compensation, product liability and liability arising out of the use of patented inventions or devices, copyrighted material or other intellectual property by the Consultant, its employees, officers, agents, servants or sub-Consultants.
- 26.3 The obligations under this Article do not lapse upon termination of this Agreement.

27. Insurance and Liabilities to Third Parties

- 27.1 The Consultant shall provide and thereafter maintain insurance against all risks in respect of its property and any equipment used for the execution of this Agreement.
- 27.2 The Consultant shall provide and thereafter maintain all appropriate worker compensation and liability insurance, or its equivalent, with respect to its employees to cover claims for death, bodily injury or damage to property arising from the execution of this Agreement. The Consultant represents that the liability insurance includes sub-contractors.
- 27.3 The Consultant shall also provide and thereafter maintain liability insurance in an adequate amount to cover third party claims for death or bodily injury, or loss of or damage to property, arising from or in connection with the provision of work under this Agreement or the operation of any vehicles, boats, airplanes or other equipment owned or leased by the Consultant or its agents, servants, employees or sub-contractors performing work or services in connection with this Agreement.
- 27.4 Except for the workmen's compensation insurance, the insurance policies under this Article shall:
- a) Include a waiver of subrogation of the Consultant's rights to the insurance carrier against UNICEF.

- b) The Consultant shall, upon request, provide UNICEF with satisfactory evidence of the insurance required under this Article.

28. Late Delivery

- 28.1 Without limiting any other rights or obligations of the parties hereunder, if the Consultant will be unable to perform its work by the delivery date stipulated in the Agreement and subject to the reason for the delay is not caused by UNICEF or its contractors or a third party outside the reasonable control of the Consultant, the Consultant shall (i) immediately consult with UNICEF to determine the most expeditious means for completing its works and (ii) use an expedited means of delivery, at the Consultant's cost, if reasonably so requested by UNICEF.
- 28.2 No grant of time to the Consultant to cure a default hereunder, nor any delay or failure by the United Nations to exercise any other right or remedy available to the United Nations under this Agreement, shall be deemed to prejudice any rights or remedies available to the United Nations under this Agreement or constitute a waiver thereof.

29. Rate Progress

- 29.1 If, at any time:
 - a) actual progress is too slow to complete within Time for Completion, and/or
 - b) progress has fallen (or will fall) behind the proposed schedule.
- 29.2. The Consultant shall inform UNICEF and propose a revised schedule as well as a report describing the revised methods which the Consultant proposes to adopt in order to expedite the progress and complete within the time of completion. Additional cost shall be approved by UNICEF in addition to the delay damages provided that justifications are deemed acceptable for UNICEF.

30. Supply of information

- 30.1 UNICEF shall supply the Consultant promptly with any information and/or documentation at its disposal which may be relevant to the performance of the Agreement.
- 30.2 UNICEF shall as far as possible cooperate with the Consultant to provide information that the latter may reasonably request in order to perform the Agreement.

31. Modifications and Amendments

- 31.1 Modification of the terms and conditions of this Agreement, including but not limited to any modification of the scope of the Services and/or of the Agreement Price, may only be made by means of an addendum in writing, which shall be mutually agreed and signed by the Parties.
- 31.2 If the request for an amendment comes from the Consultant, it must submit such a request to UNICEF at least thirty (30) days before the amendment is intended to enter into force, except in cases which are duly substantiated by the Consultant and accepted by UNICEF.
- 31.3 Any modification to the Agreement which has not been made in the form of an addendum shall be considered null and void.

32. Variations

- 32.1 Prior to any instructions by UNICEF for variation in the Services (the "Variation"), the Project Authority shall notify the Consultant of the nature and form of such Variation. As soon as possible, after receiving such notice, the Consultant shall submit to the Project Authority a written document containing a

description of the activities and tasks to be performed and/or the measures to be taken and a programme for execution of the Variation; and

- 32.2 Where a Variation is necessitated by a proven default or breach of Agreement by the Consultant, any additional cost attributable to such Variation shall be borne by the Consultant.
- 32.3 Following the receipt of the Consultant's proposal, the Project Authority shall decide as soon as possible whether or not the Variation shall be carried out. If the Project Authority decides that the Variation shall be carried out, the Project Authority shall issue the instructions in writing to the Consultant stating that the Variation shall be carried out under the conditions given in the Consultant's proposal or as modified by the Project Authority.
- 32.4 On receipt of the instructions requesting the Variation, the Consultant shall proceed to carry out such Variation according to the terms and conditions of the Agreement.

33. Conflict of interest

- 33.1 The Consultant shall take all necessary measures to prevent or end any situation that could compromise the impartial and objective performance of the Agreement. Such conflict of interests could arise in particular as a result of economic interest, political or national affinity, family or emotional ties, or any other relevant connection or shared interest. Any conflict of interests which could arise during the performance of the Agreement must be notified in writing to UNICEF without delay.
- 33.2 UNICEF reserves the right to verify that such measures are adequate and may require additional measures to be taken if necessary. The Consultant shall ensure that its staff, including its management, are not placed in a situation which could give rise to conflict of interests. The Consultant shall replace, immediately and without compensation from UNICEF, any member of its staff exposed to such a situation.
- 33.3 The Consultant shall refrain from any contact which would compromise its independence or that of its personnel. If the Consultant fails to maintain such independence, UNICEF may, without prejudice to compensation for any damage which it may have suffered on this account, terminate the Agreement forthwith, after due notification and prove thereof.
- 33.4 The Consultant shall, after the conclusion or termination of the Agreement, limit its role in connection with the project to the provision of the Services. Except with the written permission of UNICEF, the Consultant and any other sub-Consultant with whom the Consultant is associated or affiliated shall be disqualified from the execution of works, supplies or other services for the project in any capacity, including tendering for any part of the project.
- 33.5 Civil servants and other agents of the public administration of the beneficiary country, regardless of their administrative situation, shall not be recruited as experts in contracts financed by UNICEF in the beneficiary country unless the prior written approval has been granted by UNICEF.
- 33.6 The Consultant and anyone working under its authority or control in the performance of the Agreement or on any other activity shall be excluded from access to UNICEF financing available under the same project.

34. Code of conduct

- 34.1 The Consultant shall at all times act loyally and impartially and as a faithful adviser to UNICEF in accordance with the rules and/or code of conduct of its profession as well as with appropriate discretion. It shall, in particular, refrain from making any public statements concerning the project or the services without the prior approval of UNICEF, and from engaging in any activity which conflicts with its

obligations towards UNICEF under the Agreement. It shall not commit UNICEF in any way whatsoever without its prior written consent, and shall, where appropriate, make this obligation clear to third parties.

- 34.2 For the period of execution of the Agreement, the Consultant and its personnel shall respect human rights and undertake not to offend the political, cultural and religious practices prevailing in the beneficiary country.
- 34.3 If the Consultant or any of its sub-Consultants, personnel, agents or servants offers to give or agrees to offer or to give or gives to any person, any bribe, gift, gratuity or commission as an inducement or reward for doing or forbearing to do any act in relation to the Agreement or any other Agreement with UNICEF, or for showing favour or disfavour to any person in relation to the Agreement or any other Agreement with other organisations of the United Nations, then UNICEF may terminate the Agreement, without prejudice to any accrued rights of the Consultant under the Agreement.
- 34.4 The payments to the Consultant under the Agreement shall constitute the only income or benefit it may derive in connection with the Agreement and neither it nor its personnel shall accept any commission, discount, allowance, indirect payment or other consideration in connection with, or in relation to, or in discharge of, its obligations under the Agreement.
- 34.5 The Consultant shall not have the benefit, whether directly or indirectly, of any royalty, gratuity or commission in respect of any patented or protected article or process used in or for the purposes of the Agreement or the project, without the prior written approval of UNICEF.
- 34.6 The Consultant and its staff shall maintain professional secrecy for the duration of the Agreement and after completion thereof. In this connection, except with the prior written consent of UNICEF, neither the Consultant nor the personnel employed or engaged by it shall at any time communicate to any person or entity any confidential information disclosed to them or discovered by them, or make public any information as to the recommendations formulated in the course of or as a result of the services. Furthermore, they shall not make any use prejudicial to UNICEF of information supplied to them and of the results of studies, tests and research carried out in the course and for the purpose of performing the Agreement.
- 34.7 The execution of the Agreement shall not give rise to unusual commercial expenses. If such unusual commercial expenses emerge, the Agreement will be terminated. Unusual commercial expenses are commissions not mentioned in the Agreement or not stemming from a properly concluded Agreement referring to the Agreement, commissions not paid in return for any actual and legitimate service, commissions remitted to a tax haven, commissions paid to a recipient who is not clearly identified or commission paid to a company which has every appearance of being a front company.
- 34.8 The Consultant shall supply to UNICEF on request supporting evidence regarding the conditions in which the Agreement is being executed. UNICEF may carry out whatever documentary or on-the-spot checks it deems necessary to find evidence in case of suspected unusual commercial expenses.

35. Verification by UNICEF bodies

- 35.1 The Consultant will allow UNICEF and UNICEF's auditors to verify, by examining the documents by means of on-the-spot checks of original / copies documents, the implementation of the project and conduct a full audit, if necessary, on the basis of supporting documents for the accounts, accounting documents and any other document relevant to the financing of the project. These inspections may take place up to one (1) year after the final payment.
- 35.2 Documents must be easily accessible and filed so as to facilitate their examination. The Consultant must inform UNICEF of their precise location.

36. Records

- 36.1 The Consultant shall keep full accurate and systematic records and accounts in respect of the services in such form and detail as is sufficient to establish accurately that the number of working days and the actual incidental expenditure identified in the Consultant's invoice(s) have been duly incurred for the performance of the Services.
- 36.2 Being a fee-based Agreement, timesheets recording the days worked by the Consultant's personnel must be maintained by the Consultant. If required, the Project Authority or any person authorised by UNICEF may examine the timesheets at any given time. The amounts invoiced by the Consultant must correspond to these timesheets. In the case of long-term experts, these timesheets must record the number of working days worked. In the case of short-term experts, these timesheets must record the number of days worked. Time spent traveling exclusively and necessarily for the purpose of the Agreement may be included in the numbers of working days, as appropriate, recorded in these timesheets.
- 36.3 Such records must be kept for a one (1) year period after the final payment made under the Agreement. Keeping of soft copies by scanning documents is allowed, but the Consultant should keep the original documents for verification purposes. These documents comprise any documentation concerning income and expenditure and any inventory, necessary for the checking of supporting documents, including timesheets, plane and transport tickets, pay slips for the remuneration paid to the experts and invoices or receipts for incidental expenditure. Failure to maintain such records constitutes a breach of Agreement and will result in the termination of the Agreement.

37. Interim and final reports

- 37.1 The Consultant must draw up interim reports and a final report during the period of execution of the Agreement. These reports shall consist of a narrative section and a financial section. For the sequence of such reports see the Terms of Reference.
- 37.2 All invoices must be accompanied by an interim or final report. All invoices must also be accompanied by an up-to-date financial report. The structure of the interim or final financial report shall be the same as that of the contractually approved budget according to the Payment Schedule (see Terms of Reference). This financial report shall indicate, at a minimum, the expenditure of the reporting period, the cumulative expenditure and the balance available
- 37.3 Immediately prior to the end of the period of execution of the Agreement, the Consultant shall draw up a Final End of Project Report which must include, if appropriate, a critical study of any major problems which may have arisen during the performance of the Agreement.
- 37.4 This Final End of Project Report shall be forwarded to the Project Authority not later than thirty (30) days after the end of the period of execution of the Agreement. Such report shall not bind UNICEF.
- 37.5 Where the Agreement is performed in phases, the execution of each phase shall give rise to the preparation of a Final End of Project Report by the Consultant. Such report shall not bind UNICEF.

38. Approval of reports and documents

- 38.1 Where applicable, the approval by the Project Authority of reports and documents drawn up and forwarded by the Consultant shall certify that they comply with the terms of the Agreement.
- 38.2 Where applicable, UNICEF shall, within thirty (30) days of receipt, notify the Consultant of its decision concerning the documents or reports received by it, giving reasons should it reject the reports or documents, or request amendments. If UNICEF does not give any comments on the documents or reports within the time limit, the Consultant may request written acceptance of them. The documents or reports

shall be deemed to have been approved by UNICEF if it does not expressly inform the Consultant of any comments within thirty (30) days of the receipt of this written request.

- 38.3 Where applicable, where a report or document is approved by UNICEF subject to amendments to be made by the Consultant, UNICEF shall prescribe a period for making the amendments requested.
- 38.4 Where applicable, where the Agreement is performed in phases, the execution of each phase shall be subject to the approval, by UNICEF, of the preceding phase except where the phases are carried out incrementally.

39. Recovery of debts from the Consultant

- 39.1 The Consultant shall repay any amounts paid in excess of the final certified value due to UNICEF within forty five (45) days of receiving a request to do so.
- 39.2 Should the Consultant fail to make repayment as shown in 40.1 above, UNICEF may increase the amounts due by adding interest at the rediscount rate applied by the **[Insert the name of the national bank]**, on the first day of the month in which the deadline expired, plus seven percentage points. The late-payment interest shall apply to the time which elapses between the date of the payment deadline (exclusive), and the date on which the Consultant's account is debited (inclusive). Any partial payments shall cover the interest thus established.
- 39.3 Amounts to be repaid to UNICEF may be offset against amounts of any kind due to the Consultant.
- 39.4 Bank charges arising from the repayment of amounts due to UNICEF shall be borne entirely by the Consultant.

40. Assignment and Insolvency

- 40.1 The Consultant shall not, except after obtaining the written consent of UNICEF, assign, transfer, pledge or make other dispositions of the Agreement, or any part thereof, of the Consultant's rights or obligations under the Agreement.
- 40.2 Should the Consultant become insolvent or should control of the Consultant change by virtue of insolvency, UNICEF may, without prejudice to any other rights or remedies, terminate the Agreement by giving the Consultant written notice of termination.

41. Force Majeure, Other Changes in Conditions

- 41.1 In the event of and as soon as possible after the occurrence of any cause constituting force majeure, the Consultant shall give notice and full particulars in writing to UNICEF of such occurrence or change if the Consultant is thereby rendered unable, wholly or in part, to perform its obligations and meet its responsibilities under this Agreement. The Consultant shall also notify UNICEF of any other changes in conditions or the occurrence of any event that interferes or threatens to interfere with its performance of the Agreement. On receipt of the notice required under this Article, UNICEF shall take such action as, in its sole discretion, it considers as appropriate or necessary in the circumstances, including the granting to the Consultant of a reasonable extension of time in which to perform its obligations under the Agreement.
- 41.2 If the Consultant is rendered permanently unable, wholly, or in part, by reason of force majeure to perform its obligations and meet its responsibilities under this Agreement, UNICEF shall have the right to suspend or terminate this Agreement on the same terms and conditions as are provided in the provisions below under the heading "Termination", except that the period of notice shall be seven (7) days instead of thirty (30) days.

- 41.3 Force majeure as used in this Article means acts of God, war (whether declared or not), invasion, revolution, insurrection or other acts of a similar nature or force.

42. Termination

- 42.1 If the Consultant fails to deliver any or all of the deliverables within the time period(s) specified in the Agreement, or fails to perform any of the terms, conditions, or obligations of the Agreement, and following an agreed period required to rectify the failure, or should the Consultant be adjudged bankrupt, or be liquidated or become insolvent, or should the Consultant make an assignment for the benefit of its creditors, or should a Receiver be appointed on account of the insolvency of the Consultant, UNICEF may, without prejudice to any other right or remedy it may have under the terms of these conditions, terminate the Agreement, forthwith, in whole or in part, upon thirty (30) days' notice to the Consultant.
- 42.2 UNICEF reserves the right to terminate without cause this Agreement at any time upon thirty (30) days prior written notice to the Consultant, in which case UNICEF shall reimburse the Consultant for all reasonable costs incurred by the Consultant and prior to receipt of the notice of termination.
- 42.3 In the event of any termination, no payment shall be due from UNICEF to the Consultant except for work and services satisfactorily performed in conformity with the express terms of this Agreement.
- 42.4 Upon the giving of such notice, the Consultant shall have no claim for any further payment, but shall remain liable to UNICEF for reasonable loss or damage that may be suffered by UNICEF for reason of the default. The Consultant shall not be liable for any loss or damage if the failure to perform the Agreement arises out of force majeure.
- 42.5 Upon termination of the Agreement, UNICEF may require the Consultant to deliver any finished work which has not been delivered and accepted, prior to such termination and any materials, or work-in-process related specifically to this Agreement. Subject to the deduction of any claim UNICEF may have arising out of this Agreement or termination, UNICEF will pay the value of all such finished work delivered and accepted by UNICEF.
- 42.6 The initiation of arbitral proceedings in accordance with Clause 50 "Settlement of Disputes" below shall not be deemed a termination of this Agreement.

43. Child Labour

- 43.1 The Consultant represents and warrants that neither it nor any of its affiliates is engaged in any practice inconsistent with the rights set forth in the Convention on the Rights of the Child, including Clause 35 thereof, which, inter alia, requires that a child shall be protected from performing any work that is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral or social development.
- 43.2 Any breach of this representation and warranty shall entitle UNICEF to terminate the Agreement immediately upon notice to the Consultant, without any liability for termination charges or any other liability of any kind of UNICEF.

44. Mines

- 44.1 The Consultant represents and warrants that neither the Consultant's company, nor any of its affiliates, nor any subsidiaries controlled by its company, is engaged in the sale or manufacture of antipersonnel mines or of components utilised in the manufacture of anti-personnel mines. The Consultant recognises that a breach of this provision will entitle UNICEF to terminate this Agreement.

45. Use of United Nations and UNICEF Name and Emblem

- 45.1 The Consultant shall not use the name, emblem or official seal of the United Nations or UNICEF or any abbreviation of these names for any purpose.

46. Officials Not to Benefit

- 46.1 The Consultant warrants that no official of UNICEF or the United Nations has received or will be offered by the Consultant any direct or indirect benefit arising from this Agreement or the award thereof. The Consultant agrees that breach of this provision is a breach of an essential term of the Agreement.

47. Prohibition on Advertising

- 47.1 The Consultant shall not advertise or otherwise make public that the Consultant is furnishing goods or services to UNICEF without specific permission of UNICEF.

48. Privileges and Immunities

- 48.1 Nothing in or related to the Agreement shall be deemed a waiver of any of the privileges and immunities of the United Nations, including its subsidiary organs.

49. Settlement of Disputes

- 49.1 The Parties shall use their best efforts to settle amicably any dispute, controversy or claim arising out of, or relating to the Agreement or the breach, termination or invalidity thereof. Where the Parties wish to seek such an amicable settlement through conciliation, the conciliation shall take place in accordance with the UNCITRAL Conciliation Rules then in force, or according to such other procedure as may be agreed between the Parties.

50. Arbitration

- 50.1 Unless any such dispute, controversy or claim between the Parties arising out of or relating to the Agreement or the breach, termination or invalidity thereof is settled amicably under the preceding paragraph of this Section within sixty (60) days after receipt by one Party of the other Party's request for such amicable settlement, such dispute, controversy or claim shall be referred by either Party to arbitration in accordance with the UNCITRAL Arbitration Rules then in force. The Parties shall be bound by an arbitration award rendered as a result of such arbitration as the final adjudication of such dispute. The costs of the procedure shall be shared equally by the Parties. In no event shall UNICEF be liable for incidental, indirect or consequential damages or for lost revenues or profits. The arbitral tribunal shall have no authority to award punitive damages. The Tribunal shall have no authority to award interest in excess of four per cent (4%), and such interest shall be simple interest only. As used herein, the term "UNCITRAL" means the United Nations Commission on International Trade Law.

51. General Provisions

- 51.1 Any notice, request or consent required or permitted to be given or made pursuant to this Agreement will be in writing, and addressed and sent by registered mail or confirmed facsimile transmission as follows:

If to UNICEF:

UNICEF _____

[insert address, telephone number and fax]

If to the Consultant:

[insert name, address, telephone number and fax]

- 51.2 Notices will be deemed to be effective as follows: in the case of registered mail, seven (7) days after posting; in the case of facsimiles, twenty-four (24) hours following confirmed transmission.
- 51.3 Nothing contained in the Agreement shall be construed as establishing a relation of master and servant or of principal and agent between the Parties or any of them.
- 51.4 The Agreement may be altered, modified or amended only by written instrument duly executed by all Parties in accordance with the procedure provided in Article 37 of this Agreement.

52. Effective Date

- 52.1 This Agreement shall become effective as of **[insert date]** (e.g. 17 December 2017), when both Parties have signed the Agreement.

IN WITNESS THEREOF, the Parties hereto have executed the Agreement on the day first above written.

THE CONSULTANT

UNICEF, the United Nations Children's Fund

By: _____

By: _____

President, Director

Resident Representative, UNICEF

Module 4

Terms of Reference for Borehole Drilling Works and Pump Supply and Installation



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FOR MORE INFORMATION:

For more information, comments and feedback please contact UNICEF New York headquarters www.unicef.org or Skat Foundation www.skat.ch

AUTHORS:

Dotun Adekile & Kerstin Danert, Skat Foundation, St Gallen, Switzerland; Jose Gestí Canuto, UNICEF, New York, USA; Djani Zadi, Peter Harvey, and Anne Cabrera-Clerget, UNICEF, Copenhagen, Denmark

CONTRIBUTORS:

Fiorella Polo, WASH Specialist, Water and Sanitation Section, UNICEF New York Headquarters, USA
Sue Cavill, Consultant

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GIFT WANANGWA

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Toolkit Orientation Table

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Module 1	UNICEF Principles for the Planning, Contracting and Management of Borehole Drilling Projects <ul style="list-style-type: none"> ■ Clarifies stakeholder responsibilities ■ Presents eight principles for the professionalization of borehole drilling ■ Defines minimum standards and recommends procedures ■ Explains different levels of drilling supervision
Module 2	Procurement Considerations for Borehole Drilling Works <ul style="list-style-type: none"> ■ Defines procurement process and responsibilities ■ Provides guidance for risk management ■ Compares two solicitation methods: ITB and RFPS ■ Highlights key considerations during the pre-contractual, contracting and contract administration phases including the evaluation of technical and financial proposals and the payment schedule
Module 3	Borehole Siting and Drilling Supervision Consultancy <ul style="list-style-type: none"> ■ Provides template of Terms of Reference which includes: <ul style="list-style-type: none"> ■ Description of the assignment ■ Supervisor's checklist ■ Deliverables and reporting requirements ■ Suggested Bill of Quantities for the consultancy services ■ Completion certificate templates ■ Includes template for UNICEF Agreement for Borehole Siting and Drilling Supervision Consultancy Services
Module 4	Terms of Reference for Borehole Drilling Works and Pump Supply and Installation <ul style="list-style-type: none"> ■ Includes overview of how to select and specify handpumps and assure their quality ■ Provides templates for: <ul style="list-style-type: none"> ■ Terms of Reference for Borehole Drilling Construction and Development of the Borehole ■ Terms of Reference for the Supply and Installation of Pumps ■ Provides Technical Specifications for the borehole and a suggested format for the borehole completion record
Module 5	UNICEF Request for Proposal for Services for Borehole Drilling Works <ul style="list-style-type: none"> ■ Follows the UNICEF frame of Request for Proposal for Services in VISION and advises on options and elements ■ Includes template Bill of Quantities for borehole drilling works

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Abbreviations

ITB	Invitation to Bid
NGO	Non-Governmental Organisation
QA	Quality Assurance
RFP	Request for Proposal
RFQ	Request for Quotation
TIP	Technology Information Packages
ToR	Terms of Reference
uPVC	unplasticised polyvinyl chloride
VLOM	Village Level Operation and Maintenance
WASH	Water, Sanitation and Hygiene

See **Toolkit Introduction** for definition of terms.

Introduction

The UNICEF Toolkit for Planning, Contracting and Management Borehole Drilling (referred to as the **Toolkit**) has been developed to guide UNICEF staff involved in the procurement of borehole construction and the supply of equipment, as well as contracting consultancy services for siting and supervision to bring uniformity to practices.

Module 4 provides an overview of contract options as well as guidance and advice for the preparation of Terms of Reference (ToR) for (i) borehole drilling works and (ii) Pump Supply and Installation. These two ToRs define the scope of work and set out the responsibilities of the Drilling Contractor, Pump Supplier and other stakeholders. Each ToR forms the basis for the preparation of the technical and financial proposals by the bidders, and subsequently becomes an integral part of the contract. The module is structured according to the UNICEF standard structure of ToR, in the form of templates that can be modified to suit local requirements.

In order to avoid any ambiguities from the pre-contractual phase to the execution of services, it is extremely important to have clear ToR. These will guide the supplier(s) in the proposal preparation, provide the basis for a smooth implementation of the project and limit the risks of misunderstanding and, consequently, of disputes and claims. When developing ToR it is advisable to consult widely to make sure that they are accurate, realistic and include realistic targets.

As noted in the **Toolkit – Introduction** and **Toolkit – Module 1**, there are two options for the client (i.e. the organization or agency that is contracting out the borehole construction):

- UNICEF as Client – in the case of boreholes that are directly contracted by UNICEF, the Client is the UNICEF Country Office
- Government or NGO as Client – in the case where UNICEF supports National Government or an NGO to contract boreholes the client is the respective National Government or NGO.

Module 4 of the **Toolkit** is intended for the option of UNICEF as client, although it can also be used as a guide for other organizations. The term client, rather than UNICEF, is used throughout the template ToR. The term Designated Representative is used to refer to the officer that is designated to represent the client in the contract.

Module Formatting

The **Toolkit** provides flexibility so that it can fit the circumstances of a particular project. It should be noted that national laws, standards and codes are to be adhered to, unless otherwise specified. Options for modification to some clauses to suit particular situations are shown with notes in **[bold italics highlighted in grey]**. Advice and key elements (such as relevant principles) to take into consideration are highlighted in blue text boxes throughout the document (e.g. Box X).

Box X Sample box containing advice and key elements that should be taken into consideration

When commencing with an Invitation to Bid, UNICEF procurement

Borehole Numbers

The ToR Template (section 2.9.4, 2.11.4, 2.14.2 and Table 4.1) refers to borehole numbers. Where there is no national borehole numbering system, UNICEF should initiate a system of numbering based on the 1:100,000 topographic map sheets. Each number will consist of the appropriate sheet number followed by the quadrant (NW, NE, SW, or SE), which is followed by a serial number, e.g. 101 SE 1 stands for borehole no. 1 on topographic map sheet no. 101 SE. It can subsequently be mapped on the topographic sheet by its GPS coordinates.

Contract Options

Boreholes need to be properly sited by experienced and qualified personnel using scientific methods and established good practices. As stated in the **Toolkit** – Module 1, Principle 3 (Borehole siting practice), for projects where more than five boreholes are drilled or that take place in difficult groundwater terrains, UNICEF should separately contract a hydrogeologist/groundwater to carry out borehole siting. Siting is further detailed in Module 3 of the **Toolkit** (including a template Terms of Reference). On small projects (i.e. where up to five boreholes are drilled), located in areas where the groundwater is easily accessible, the responsibility for siting may be given to the Drilling Contractor. In such cases, the Terms of Reference for drilling works set out in Module 4 need to be adjusted accordingly.

In order to ensure that boreholes are drilled according to the technical specification, borehole drilling should be supervised by competent persons or firms. Experienced hydrogeologists/groundwater specialists shall be engaged to carry out the supervision of borehole drilling. Supervision is further detailed in Module 3 of the **Toolkit** (including template Terms of Reference for Supervision). The siting and supervision of a particular borehole should be carried out by the same person or firm.

The supply and installation of the pump can be undertaken by the Drilling Contractor/partner NGO, or Pump Supplier. Requirements for the supply and installation of the pump and training are set out in the **Toolkit**, Module 4 – Terms of Reference for Pump Supply and Installation. If these activities are to be taken by the Drilling Contractor, Terms of Reference and Bill of Quantities need to be adjusted accordingly.

If boreholes specifications are not followed or borehole designs do not take the prevailing geological and groundwater conditions into account, the borehole may work for the first few weeks, or even up to the end of the defects liability period, but can silt up slowly, and prematurely fail, be prone to contamination, or pump components can corrode. In order to provide the foundation for sustainability of the supply, UNICEF needs to select the appropriate contract option and properly manage it as outlined in the **Toolkit** Module 2, ensuring that adequate resources for a high quality borehole to be constructed are provided.

In the past, UNICEF country offices have tended to use turnkey contracts in which the siting, drilling and pump installation is combined into one contract. Since the Drilling Contractor is responsible for the siting, he/she is usually only paid for productive, or so-called “wet” boreholes. While this means that UNICEF can claim to only be paying for successful boreholes, the reality is that:

- (i) estimating drilling costs that account for the risk of a dry borehole is extremely challenging for UNICEF (and can lead to unrealistic engineers’ estimates/confidential Bills of Quantities);
- (ii) estimating the costs and preparing quotes is extremely challenging for the Drilling Contractor (which can lead to unrealistic quotations in the bid); and
- (iii) the Drilling Contractor has to recover the costs of non-productive boreholes somehow.

The Drilling Contractor can address point (iii) by:

- a) charging the client more for successful boreholes;
- b) underpaying (and thus demoralising) staff;
- c) cutting corners with respect to materials used or development (and undermining quality and longevity of the borehole);
- d) siting boreholes in areas that are more likely to be successful but are further from the community, such as near swamps, wetland or river banks, and are in danger of contamination in floods.

None of the above are desirable.

While turnkey contracts, if used at all, *should* pay the contractor a fixed sum for the work done as per his/her quotation in the tender, there are cases of clients not paying for non-successful boreholes *and* only paying for the actual work done on successful boreholes. For example, if a borehole is drilled shallower than in the Drilling Contractor's quote, only the depth drilled is paid. This is a double-blow to the contractor, as it becomes practically impossible to recover the costs of any dry boreholes, and so savings *must* be made elsewhere, as noted in a), b) and c) above.

Turnkey contracts tend to be combined with some monitoring of progress and a final inspection. But there is no professional full-time or part-time/milestone supervision. While this may appear to reduce the cost of the borehole, the reality is that there is no control over the materials used (e.g. casing and screen, gravel pack), and no checks are made to ensure that all steps are properly followed during the construction process (e.g. length and positioning of screen, borehole development, pumping test, sanitary seal). The final inspection becomes extremely critical, and needs to follow rigorous criteria or a checklist as well as the deployment of a borehole camera to verify the borehole design and depth. The pumping test will most likely also have to be repeated.

So while turnkey contracts seem advantageous to the client as they are simpler to administer, they are risky, and depend entirely on the capability and integrity of the Drilling Contractor (even if he/she will make a loss as a result), as well as the willingness of the contractor to take a gamble on the risk of drilling a dry borehole.

The alternative to the aforementioned turnkey contracts is to issue separate contracts for (i) siting/supervision, (ii) drilling (which may or may not include pump supply and installation). Ideally, the siting is completed first, with the borehole designs availed in full in the procurement of the Drilling Contractor. While this makes it much easier for the Drilling Contractor to prepare estimate the costs and logistical implications when preparing the tender, it means that two rounds of tendering are required. If tendering only takes place once a year, it may be advantageous to site in one year, and tender the drilling in the following year. Likewise, if the siting is tendered at the same time as the drilling, the Drilling Contractors do not have the full details they require, and have to make considerable guesses when preparing their bids.

With separate contracts, Drilling Contractors should be paid for the work done according to a bill of quantities. The disadvantage of this method is that UNICEF has to openly acknowledge that there is need to pay for boreholes that, despite being sited professionally, do not yield sufficient water. This needs to be communicated to the donors, who have to understand that there are risks associated with borehole drilling, and that, rather than hiding them by passing them to the Drilling Contractor, with this method, they are being set out in the open.

The advantage of separate contracts for siting/supervision and drilling is that:

- (i) borehole designs are more realistic and
- (ii) supervision enables UNICEF to pay only for the work done, which is fairer to the Drilling Contractor and to UNICEF.

As the Drilling Contractor is paid for the work done, there is no need for him/her to cut corners to recover losses associated with dry boreholes. However, skilled Supervisors are required, which may call for additional efforts to raise in-country capacity. Also, Supervisors need to be properly remunerated and available on-site.

Having separate contracts for siting/supervision and drilling but not supervising properly is no better than using a turnkey contract.

In order to prevent the method of separate contracts and payment according to bills of quantities from being abused, (e.g. through collusion between the Drilling Contractor and the Supervisor) it is important that there is quality control of the siting process and the drilling supervision. National regulation of the groundwater consultants can help. And thorough inspection of the completed borehole by third party monitors who have been trained and use a checklist is advisable.

Last but not least, the pump supply and installation can either be included in the drilling contract or be a separate contract. Administratively, it seems easier to put the drilling contract and pump supply/installation together. However, given the challenges of assuring the quality of pump components being imported into many countries, there is needed to certify Pump Suppliers. If there are numerous Drilling Contractors, it becomes difficult to ensure that every contractor is installing pumps from the certified Suppliers.

A separate contract for the supply and installation of pumps should make it easier for the client to control the quality of the pumps. However, it is important that the project is managed well to ensure that there are not substantial delays between the borehole completion and the pump installation (which can lead to vandalism and loss of the hole). In addition, the construction of the platform (by the Drilling Contractor) needs to be coordinated with the installation of the handpump stand (by the Pump Supplier). An alternative approach is to contract the construction of the concrete platform, drainage channel and soak-pit to the Supplier.

The advantages and disadvantages of different contract mechanisms, including siting, supervision pump supply and installation activities, are further detailed in Annex 4.1.

Handpump Guidance

Selecting and Specifying Handpumps

This **Toolkit** focuses on handpumps with standard RWSN and/or India Bureau of Standards specifications¹ plus two commonly used private domain pumps (Volanta and Vergnet Hydropump 60). It is intended to enable users to specify the exact pump they have chosen, with all available options, to prepare the corresponding Bill of Quantities and define procedure to assure handpump quality.

While worldwide, hundreds of different handpump types are used, most governments and UNICEF adhere to handpump standardization policies (defined above) and thus install a relatively small set of public and private domain handpumps within their programmes.

The benefits of handpump standardization include familiarity, availability of spare parts and, backup through trained mechanics tend to outweigh any negative aspects. A familiar, established technology supported by efficient after-sales and repair services is often a better choice than the least expensive option in terms of cost of the hardware alone. Governments, project planners and decision-makers should be aware that their selection of technology has to fit within the prevailing handpump standardisation mechanisms of the respective country. Any deviation from standardisation policies/guidelines should have clear justification and should occur only with the written agreement of the national government.

¹ A huge variety of handpumps – especially suction and low lift pumps – are produced in small workshops. Their designs depend on the local availability of materials and are constantly changing. These pumps serve an important role in households that have not been reached with community water supply. However, since very little information on these designs is available they are not included.

Box 4.1 Handpump Standardisation in sub-Saharan Africa in 2015

“In a handful of countries, handpump standardisation includes standard handpump designs. With over a million handpumps in sub-Saharan Africa and new installations every day, handpump standardisation is still vital for the policy and practices of governments and implementing organisations. While rural water practitioners are polarised about the future of formal standardisation, the extent of informal standardisation is of significant importance to the sustainability of handpumps across the continent. Of the countries in sub-Saharan Africa using handpumps, formal standardisation has emerged in fifteen through regulations (nine countries), and endorsements (six countries). However in the remaining countries, informal standardisation determines what handpumps are installed where, either through recommendations (fourteen countries), or de facto standardisation (six countries).” (McArthur, 2015²)

A great variety of handpumps for water lifting are available, but in reality the feasible technology options are usually limited. Hydrogeological conditions, strategic decisions at national level, project execution policies and government decisions to standardize may restrict the choice. The final choice of technology should rest with communities themselves, since they are normally responsible for the management of their water supply system.

In areas with aggressive/acidic groundwater (i.e. with a pH value < 6.5), it is essential to ensure that pumps are corrosion-resistant. Pumps that corrode are generally not accepted, because they produce iron-tainted water that tastes bad and stains food and clothing.

Some pumps were designed as a family pump to serve small user groups. These pumps are generally simple and cheap. However, they are not robust enough to serve large user groups. For groups of more than 100 users, it is essential to use community pumps designed for large groups of people.

Shallow well applications allow simple suction pumps, which can only be used to a pumping lift of a maximum of 7 metres or direct action pumps, which can be used to a pumping lift of a maximum of 15 metres (that is, the depth of the wells must be less than 7 m and 15 m respectively). Deep well pumps can cover the complete range of installations, but they are an unnecessary and very expensive option for shallow sources. For more details on pumping methods, see Annex 4.4.

The simplicity of making the most common repairs, (replacing seals, replacing fulcrum and handle bearings, removing of piston and foot valve) affects the ease of repair. Village-level operation and maintenance (VLOM) is possible in cases where handpumps require only a few low-cost tools, and that maintenance and repair can be carried out by village mechanics or communities themselves. Heavy and complex tooling makes motorized central maintenance teams necessary. This affects the cost of repairs and the time that the pump is out of service.

An open-top cylinder design allows the retrieval of piston and foot valve without the need for lifting the rising mains. This makes this type of pump more suitable for repairs by the community. Users prefer pumps that have a high yield. In addition, the look and feel of a pump can affect its acceptability. In some cases, cultural aspects like pumping position are important factors in users' preference.

² MACARTHUR, J. (2015) *Handpump Standardisation in Sub-Saharan Africa: Seeking a Champion*. RWSN Publication 2015-1, RWSN, St Gallen, Switzerland, Available on <http://www.rural-water-supply.net/en/resources/details/652>

Box 4.2 Matrix overview of commonly used pumps for community water supplies

Lift (m)	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	Corrosion resistance	User group	VLOM	Yield
No. 6 Handpump																					☆☆☆	★	☆☆☆☆	☆☆☆☆
Jibon Pump																					☆☆☆	★	☆☆☆☆	☆☆☆☆
Tara Pump																					☆☆☆	★★★	☆☆☆☆	☆☆☆☆
Malda Pump																					☆☆☆	★★★	☆☆☆☆	☆☆☆☆
Nira AF-85																					☆☆☆	★★★	☆☆☆☆	☆☆☆☆
Rope Pump																					☆☆	★	☆☆☆☆	☆☆☆☆
Walimi Pump																					☆☆☆	★★★	☆☆☆☆	☆☆☆☆
India Mark III - 63.5mm Cyl																					☆	★★★	☆☆☆☆	☆☆☆☆
India Mark III - 50mm Cyl																					☆	★★★	☆☆☆☆	☆☆
India Mark II Pump																					☆	★★★	☆☆	☆☆☆☆
U3M Pump																					☆☆☆	★★★	☆☆☆☆	☆☆
Afridev Handpump																					☆☆☆	★★★	☆☆☆☆	☆☆☆☆
Indus Kabul Pamir																					☆☆	★★★	☆☆☆☆	☆☆☆☆
Bush Pump																					☆	★★★	☆☆	☆☆☆☆
Volanta Pump																					☆☆☆	★★★	☆☆☆☆	☆☆
Vergnet Hydropump 60																					☆☆☆	★★★	☆☆☆☆	☆☆

Legend:
 Recommended Range
 Possible Range
 ☆☆☆ Fully resistant
 ☆☆☆ Affected
 ☆ not resistant
 ★★☆☆ 150-300 persons
 ★☆☆ 50-150 persons
 ★ Family Pump
 ☆☆☆ Easy to repair
 ☆☆☆ Requires skills
 ☆☆☆ Requires tools and skills
 ☆☆☆ High Yield
 ☆☆☆ Medium Yield
 ☆☆☆ Low Yield

UNICEF Supply Division has two sources of information dedicated to the selection and specification of handpumps as follows:

1. [UNICEF WASH Technology Information Packages \(TIPs\)](#)³ – available on the Internet
2. [The Supply Catalogue](#)⁴ – available on the UNICEF Intranet

The UNICEF WASH TIP 1 (out of 5) is dedicated to handpumps and offers useful information on selection criteria for handpumps, pumping methods, and proposes a handpump selection tool to help decision-making regarding appropriate technology choice. The Supply Catalogue references commonly procured handpumps, and for each reference, it has instructions for use and recommendations.

UNICEF's approach provides flexibility to select pumps with quantity and type of connecting rods/riser pipes suitable to a particular water condition and the well depth. It is essential that the client has a good technical understanding of the handpump technology, to thus avoid selecting the wrong combination of components to make one complete handpump, or components that are not in line with the requirements (such as non-corrosive materials).

³ Available at: https://www.unicef.org/supply/index_54301.html

⁴ Available at: [https://supply.unicef.org/unicef_b2c/app/displayApp/?cpgsz=0&layout=7.0-12_1_66_68_115_2&uiarea=2&care=536941D1FDDF0B6FE10000009E710FC1&cpnum=1&item=536941D1FDDF0B6FE10000009E710FC14EBAFE42BBC20F68E10000009E71143E\)/.do?rf=y](https://supply.unicef.org/unicef_b2c/app/displayApp/?cpgsz=0&layout=7.0-12_1_66_68_115_2&uiarea=2&care=536941D1FDDF0B6FE10000009E710FC1&cpnum=1&item=536941D1FDDF0B6FE10000009E710FC14EBAFE42BBC20F68E10000009E71143E)/.do?rf=y)

Quality Assurance of Handpumps and Spare Parts

The aim of Quality Assurance is to ensure that handpumps supplied are of acceptable quality as defined in the handpump specifications. In order to assure quality, there is need for country offices to optimize the process of handpump inspections and testing. This process evaluates the quality of the product, the quality assurance procedure employed by the Supplier and the performance history of the company or product.

Annex 4.5 provides criteria to categorize hand pumps into High Risk or Low Risk and evaluate the technical performance of handpumps and spare parts. Criteria for inspection, product and supplier are defined, and specific information about applicability of the criteria is provided. Annex 4.5 also provides information related to handpumps, to assess current in-country quality assurance mechanisms to contribute to adequate Quality Assurance systems and support governments and other development partners to ensure good-quality hand pumps. The guidance aims to assist country offices in the preparation, choosing and managing of quality inspections and testing. A description of country office responsibilities and elements that should be reviewed in the evaluation and approval process for quality assurance inspection and/or testing agencies is presented.

Ordering Handpumps

To assist in the selection of the pump and for easy specification and procurement, an approach using a full package of a handpump for a particular well depth is recommended. A specification for handpumps should always be broken into a set of components, as shown in the example below for a Standard Deepwell Pump or India Mark II handpump.

It is recommended that adequate sets of Standard Tools and Special Tools for Installation and Maintenance be ordered for installation and maintenance of the handpumps⁵. The actual numbers being ordered will depend on the density of handpumps in a given area, the installation and maintenance infrastructure and other local conditions. The number of the tool sets being ordered could vary between one set of each type of tools for every 50 pumps to 250 pumps. Similarly, sets of fishing tools for retrieving dropped below-ground components and platform shuttering set and masonry tool set could be ordered at the rate of one each of these items per 250 to 500 handpumps, depending on local conditions.

Box 4.3 Example of specification for a complete Standard Deepwell Pump to be installed to a maximum depth of 30m in water with pH > 6.5

General Description:

Standard Deepwell Pump complete (as per IS 15500:2004 of the Bureau of Indian Standards) or India Mark II (as per RWSN/SKAT specifications Rev. 2, 2007) with 30 metres of galvanised iron riser pipe and connecting rods

Supplied with:

- 1 No. Head assembly (with Handle assembly).
- 1 No. Water Tank – Standard
- 1 No. Third Plate
- 1 No. Telescopic Stand⁶ – Standard
- 1 No. Cylinder assembly – Standard
- 10 Nos. Connecting rods (mild steel, electro-galvanised, 12 mm diameter, 3 m long, with M12 threaded ends and couplers).
- 10 Nos. Riser pipes (MS, hot dipped galvanised, 32 mm ND, 3 m long).
- 1 set Spare part kit sufficient for 2 years of operation (optional –Depending on the approach to supply chains for spare parts the spares may be supplied through other channels

⁵ For a standard deepwell pump/India Mark II Special Tools are set out in Annex D, Clause 1.3 of Part 8, Table D1, IS 15500:2004.

⁶ For installation on bore wells of 150 mm diameter, the Telescopic Stand – Standard should be used. The Normal Stand –Standard is suited for wells in the range of 100 mm to 125 mm diameter casing pipe.

The UNIEF WASH TIP provides information sheets for developing technical specifications and bills of quantities for the following pumps:

- No.6 Handpump
- Rope Pump, Nicaragua and Madagascar
- Malda Pump
- Nira AF85 Pump
- Tara Pump
- Jibon Pump
- Walimi Pump
- India Mark II
- India Mark III
- U3M Pump
- Afridev
- Indus, Kabul, Pamir
- Bush Pump
- Volanta Pump
- Vergnet Hydropump HPV 60 / HPV 100

Terms of Reference for the Drilling Construction and Development of the Borehole – Template

Abbreviations

“	inches
cm	centimetre
DTH	down-the-hole
GPS	Global Positioning System
LTA	Long Term Agreement
m ³	cubic metre
m	metre
mm	millimetre
no.	Number
NTU	Nephelometric Turbidity Unity
PPM	parts per million
RFP	Request for Proposal
RFPS	Request for Proposal for Services
ToR	Terms of Reference
uPVC	unplasticized polyvinyl chloride

1. Project

Background

The general information must describe the background of the requested services, in particular:

- *Rationale and key aspects of the overall context of the assignment*
- *History of activities to date*
- *Project/assignment related data, e.g. relevant studies, geographical data target groups, category of services to be rendered and basic documents.*

2. Description of the Assignment

2.1 Scope of Work

The Contract to be established is for the drilling, construction and development of **[Insert number of boreholes]** boreholes in **[Insert the Districts]**. **[Insert the number of boreholes that will be on each of the different geological terrains envisaged, e.g. number in the crystalline basement complex terrain; number on compacted sediments; the number on unconsolidated sedimentary terrain; number that shall be in alluvial deposits]**. The boreholes are to be completed with nominal **[insert diameter]** uPVC casing and screens. The Drilling Contractor shall be responsible for drilling, installation of casings and screens, gravel pack, sanitary seal borehole development, pumping test, water quality testing, and construction of aprons, drainage and soakaways. Where access conditions are difficult, it is expected that the Drilling Contractor shall make allowances for this as part of the drilling cost.

[Insert duration and expected started time of the project]

The project shall be under the control of the Designated Representative appointed by the client. The Designated Representative shall appoint one or more Supervisors who shall be responsible for the management and direction of the project on site and shall approve all materials supplied, works, and measurements carried out by the Drilling Contractor and his team of workers on the project.

2.2 Work Schedule

The bidder shall submit a comprehensive work schedule within his proposal which should fall within the period specified in the Terms of Reference. The work schedule shall include setting up the base camp, moving the drilling units and support equipment from one drill site to the next within the area of the project. It shall also include the pre-mobilisation meeting.

Once the contract is awarded, and prior to mobilisation to the base camp, or first drilling site the Drilling Contractor shall be required to submit the schedule for the completion of the works in a Gantt chart of weekly activities as specified in the Terms of Reference. This schedule shall be checked and approved by Consultant. The schedule is to be updated at least monthly.

2.3 Mobilization

Prior to mobilization to the site, the representatives of the Drilling Contractor shall, in the company of the Supervisor or Designated Representative **[Delete as applicable]**, visit the beneficiary communities to plan take-over of the sites and to agree the start-up date of the project.

Mobilization shall start with the Drilling Contractor establishing a base camp for housing the Drilling Contractor's staff, storage and maintenance of plant and machinery, supplies and all other equipment required to launch and execute the project. The Drilling Contractor shall make his own arrangement to acquire or lease the land necessary for the establishment of the base camp and safety for all the staff and the community. However, the location of the base camp shall require approval of the Supervisor.

[Delete the following paragraph if not applicable, such as on small projects where no base camp is required].

The Drilling Contractor shall submit a plan and layout of the proposed base camp for the approval of the Supervisor with provisions for the following:

- Office and residential accommodation and catering facilities for the contractor's staff
- Sufficient storage for the Drilling Contractor's equipment and supplies including
 - fuel storage tanks
 - equipment repairs facilities
 - covered storage for uPVC casings and screens

The contractor shall, with due care and diligence, execute and maintain the works and provide all labour, materials, equipment, transportation and other facilities necessary to substantially complete the works by the planned completion date, and in accordance with the requirements, documents and the standards defined by it.

The contractor shall take full responsibility for the adequacy, stability and safety of all site operations and methods of drilling, construction and development of boreholes and pump installation and for the security of the site itself, including the security of all materials stored or used on the site.

2.4 Inspection of Materials and Equipment

The Drilling Contractor shall present to the Supervisor the list of equipment and samples of materials to be used on the project as well as relevant information, in sufficient time for the client to complete review of samples. Each item shall be labelled as to origin and intended use in the works.

All materials used in the course of these works shall be new and proper for their use. No reusable materials coming from the site shall be used unless permitted by the client. Other materials shall be stored on site until the end of the works.

All materials, equipment and products shall be installed in accordance with the written recommendations of the manufacturer/supplier. The Drilling Contractor is not allowed to start work until the Supervisor has checked and approved the equipment and materials.

2.5 Traffic & Protection of Roads, Properties & Services

The Drilling Contractor shall carry out all work in connection with the contract so as not to interfere unnecessarily or improperly with the convenience of the public and with access to, use and occupation of roads, footpaths, public services or property not in the contractor's possession.

The Drilling Contractor shall use every reasonable means to prevent damage to roads, bridges and services, and shall select routes and limit extraordinary traffic to avoid unnecessary damage or injury.

Where necessary to divert or control traffic, the contractor shall, in cooperation with traffic control authorities if required, provide all necessary facilities and resources at his own cost.

The contractor shall be responsible for and shall pay the cost of any strengthening or improvement of routes to the site, in order to facilitate movement to site of equipment, temporary works, materials and personnel. This shall apply to all necessary relocation of services.

The above shall also apply to any waterborne traffic required for the works, in so far as it may affect, for example, docks, jetties or sea walls.

The contractor shall bear all costs and charges for special or temporary permits required in connection with access to site.

2.6 Drilling Contractor's Personnel, Drilling Equipment and Safety Equipment

2.6.1 Personnel

The Drilling Contractor shall provide capable and experienced personnel to perform the work. The Drilling Contractor's project manager shall be a hydrogeologist or drilling engineer with at least 10 years of drilling experience who shall be responsible for site operations. At each drill site, the Drilling Contractor shall also provide a hydrogeologist **[Specify degree, diploma or certificate]** or drilling engineer with at least 5 years' experience and other suitable staff **[to be more specific in this section]** to perform the work. Changes in personnel during the execution of the contract shall be done subject to the approval of the Supervisor or Designated Representative **[Delete as applicable]**. The Drilling Contractor shall be fully operational, with the drilling unit and installation crew working within two weeks of commencing borehole construction.

[The years of experience and qualification of the Drilling Contractor's staff may be modified because in some countries, such personnel may not be available]

2.6.2 Safety measures and equipment

The Drilling Contractor shall take all reasonable precautions to prevent any injury to persons or death. These precautions shall include, but not be limited to, providing his employees with safety helmets, hard-toed boots and gloves, protection glasses during welding and ensuring that all tools and equipment are in a safe condition and that his employees adopt safe working methods. The Drilling Contractor shall further ensure that his workers have access to an adequate first aid kit.

The Drilling Contractor shall ensure that the site is not accessed by any unauthorized persons. A perimeter barrier must be set up around the drill site to prevent unauthorized access to the drilling site. The Drilling Contractor shall also ensure that children and other onlookers are not allowed to watch any welding, in order to prevent eye damage.

The client shall not be liable for any damages or compensation as a result of accident or injury to any workers employed by the Drilling Contractor, any sub-contractor or any unauthorized persons unless such accidents or injury are caused by an act or default of the client or of nominated representatives of the client.

2.6.3 Fuel and lubricants

The Drilling Contractor shall comply with authorized regulations applicable to the use and storage of diesel, petrol and lubricating oil used at the work site or stored at the base camp, and shall ensure that adequate precautions are taken against fire and environmental contamination. No fuel or lubricant must be transported with any item to be installed in the borehole, in particular the gravel pack, the casings and screens. No leakage of fuel or lubricants that can contaminate surface or groundwater shall be permitted.

2.6.4 Fire prevention

The contractor shall be responsible for fire prevention on the site where the works are being performed. Fire fighting equipment shall be kept on site and under the control of the contractor at all times during the period when works are taking place on the site and during rest breaks. The contractor shall ensure that his employees and sub-contractors can operate the fire fighting equipment. All fire fighting equipment must be in good working condition. The contractor's employees and sub-contractors shall carry out any operations requiring exposed flame or welding in a careful and safe manner.

2.7 Borehole Drilling

The following section assumes rotary and/or down-the-hole (DTH) drilling. ***[Where cable percussion or manual drilling is proposed, the document should be amended accordingly]***

2.7.1 Drilling Methods

The Drilling Contractor shall ensure that the rig is set up at the exact point indicated by the Supervisor. The Drilling Contractor shall be responsible for selecting the appropriate drilling procedure for the geology of each of the project locations. The diameter of the drill hole must be adequate to accommodate the final borehole casing diameter as instructed by the Supervisor plus a minimum annular space of 50 mm. The Drilling Contractor may choose to either drill a hole of adequate diameter on the first pass or to drill a small diameter test hole, then ream to the desired size. Regardless of the procedure adopted by the Drilling Contractor, payment shall only be for the drilled hole at the appropriate size, i.e. additional payment for reaming shall not be made.

The drilling method, drilling rig, drilling fluids and fluid additives are subject to approval of the Supervisor or as stated in the tender documents or national standards. The Drilling Contractor may use any drilling technique he considers suitable to achieve the depth and diameter required, provided that the techniques used are those specified in his tender or are approved by the Supervisor.

The drilling fluids and additives shall consist of water, bio-degradable drilling mud, weight materials (barite or equivalent), fluid loss control materials and foam. The selection, supply and use of drilling additives shall be the responsibility of the Drilling Contractor. Where there are national standards guiding the use of drilling materials, this should be followed. Toxic or unsuitable substances that may adversely affect the quality of the water shall not be added to the drilling fluid. The use of cow dung or bentonite shall be avoided, except where otherwise approved by the Supervisor.

The Drilling Contractor shall be responsible for maintaining the quality of the drilling fluid to assure the protection of the aquifer and other potential water-bearing formations and ensure that good representative samples of the formation material are obtained.

The Drilling Contractor must have the necessary accessories, including sufficient working casings and drill bits to drill through the various formations. In areas of alluvial deposits, drilling through the unstable upper section must be of sufficient diameter to allow the installation of temporary casing which will allow the borehole to be completed at the specified diameter.

2.7.2 Verticality and alignment

The Drilling Contractor shall continuously monitor the weight on the drilling bit to ensure that the boreholes are drilled and cased straight and vertical. The Drilling Contractor shall furnish all labour, tools and equipment to carry out a test for verticality as may be instructed by the Supervisor. Payment shall be on the unit rate as in the bill of quantities.

If so required by the Supervisor, the Drilling Contractor shall demonstrate the verticality and alignment of any borehole by lowering a cylindrical dummy 3 m in length with two metal disks with a diameter of 75 mm at each end, throughout the whole length of the section being tested. Should the dummy fail to move freely throughout this section, or should the deviation from the vertical exceed two thirds of the minimum diameter of the section, the Drilling Contractor shall be obliged to correct the verticality and straightness of the borehole or drill a replacement borehole at his/her own expense.

2.7.3 Protection casings

It is the responsibility of the Drilling Contractor to start drilling at a diameter which will allow the hole to be completed at the specified diameter. Extra casing of a larger diameter to achieve the depth is considered to be part of the contractor's unit rate for drilling.

Temporary protection steel casing shall be installed in every borehole where needed to protect the walls from caving, either suspended by a ground-bearing bracket or correctly anchored in the underlying rock.

Protection steel casing shall have screwed flush joints. The Drilling Contractor shall ensure that it is of sufficient diameter to enable drilling of the complete borehole at the required diameter, together with installation of the permanent borehole casing and screen, and for placing the gravel pack.

For successful boreholes, the protection casings in the soft formations shall be removed from the hole as soon as the borehole has been completed, unless, based on the nature of the geological formation, the Supervisor instructs the Drilling Contractor to do otherwise.

Temporary protection casing must be priced into the drilling cost. It shall not be a separate item on the bill of quantities.

2.7.4 Borehole Sampling

The Drilling Contractor shall collect representative samples of the formation penetrated at 2 m intervals except otherwise directed by the Supervisor. Drilling shall be stopped when the bottom of the sampling interval (that is every 2 m) is reached for such time as is required for all the cuttings to move from the last drilled section of the hole to the sampling point. Samples shall be caught in a bucket placed in the drilling fluid flow at the top of the surface casing and the samples allowed to settle out.

The drill cuttings shall be placed in sample containers. Sample containers shall be steel boxes, divided into compartments approximately 100 mm by 100 mm and 100 mm deep. At each drill site, the Drilling Contractor shall have sufficient sample containers to accommodate all of the samples

Alternatively, the samples may be laid out in rows of ten from left to right, packed and stored in thick polythene bags and accurately labelled with the name of the community, borehole number, date and depth of sampling.

2.7.7 Penetration Rate

The Drilling Contractor shall maintain an accurate record of drilling penetration rate. The Drilling Contractor's record keeper shall use a stop watch to record the penetration rates. The drilling method at the time of the measurement shall be recorded whether drilling is by mud rotary or pneumatic hammer drilling. The format of the records shall be approved by the Supervisor.

2.7.8 Interim Yield Measurements in Crystalline Aquifers

As the drilling progresses in crystalline terrains where pneumatic hammer drilling is used, the amount of water issuing out of the borehole shall be monitored after the first water strike. The yield may be measured using a V notch weir or any other means approved by the Supervisor.

2.7.9 Final Drilling Depth

The final depth of the borehole shall be determined by the Supervisor from the results of the hydrogeological and geophysical survey and analysis of drill cuttings on site.

Where the risks of drilling a dry borehole becomes apparent during the drilling particularly from the output during hammer drilling and the recommended depth has been attained and possibly surpassed, the Supervisor may elect to stop the drilling and declare the borehole unacceptable without installing casing and screens in the borehole.

In such circumstances the Drilling Contractor will be paid for items of work expended until the borehole was declared unacceptable based on the bill of quantities.

2.7.10 Daily Driller's Report

During the drilling, completion and development of each borehole, the Drilling Contractor shall maintain a detailed daily driller's report. The report shall give a complete description of all formations encountered, number of meters drilled, number of hours spent drilling, shut down due to breakdown, length and type of casing and screen set, and such other pertinent data as requested by the Supervisor. The Drilling Contractor shall submit a copy of the daily driller's report to the Supervisor which shall be duly signed by both the contractor's project manager and the Supervisor him/herself. In addition, the Drilling Contractor shall measure and monitor during the drilling:

- the depth of the borehole as it progresses
- the static water or mud level in the borehole
- the different depths of water strikes and aquifers
- the penetration rates at various strata or change of tools

The Drilling Contractor's record keeper shall record all the required data. The data shall be presented in a format previously approved by the Supervisor and provided as they become available.

For site supervision of the drilling work, the contractor shall assign a drilling Supervisor. He shall keep a "Daily Record of Progress", which will include the details of depth of reached, the materials used, the remaining work to be done and the expected date of completion.

2.7.11 Payment for drilling

The Drilling Contractor shall be paid unit prices per metre in accordance with the actual depth drilled on the ratios as set out in the bill of quantities. The unit prices per metre shall include all costs associated with the drilling, drilling water, drilling additives, surface casing and collection of drill cuttings, gravel packing and development, and preparation of daily drilling reports. The depths given in the bill of quantities are indicative only.

2.8 Borehole Design

The borehole design should be in accordance with national specifications ***[delete if not appropriate]***.

The borehole design may be in accordance with either Drawing Nos. 1 or 2 ***[delete as necessary]*** ([Annex 4.2 Technical Specifications](#)), depending on the formation.

[Drill depth and position of screen all need to be specified. The specifications will depend on the local conditions and should be determined as part of the siting].

The borehole design is subject to on-site modification to suit the conditions encountered during drilling for accurate positioning of screens and type of gravel pack. The on-site design modifications shall be approved by the Supervisor.

2.8.1 Depth

The final depth of the borehole and all other relevant depths involved in the design of the borehole shall be determined from measurements made by the Drilling Contractor and the Supervisor. The Supervisor shall instruct the Drilling Contractor on the depth at which to terminate the hole, the intervals to be cased and screened, the appropriate screen slot opening and the gravel pack size to ensure completion of a borehole which is free of fine materials.

2.8.2 Drilling diameter

The drilling diameter must accommodate the gravel pack (formation stabilizer or filter pack) and borehole lining as specified.

2.8.3 Borehole lining (casing and screen)

Boreholes up to a depth of 100-120 m shall be lined with high impact-resistant unplasticised polyvinyl chloride (uPVC) casings and screens. At depths greater than 100-120 m, steel casing should be used.

The casing and screen should be in adherence with national standards *[specify standards]* and have a wall thickness of *[insert]* mm. *[Box 4.4 provides an example of uPVC casing and screen dimensions and wall thickness].*

Box 4.4 Example PVC casing and screen dimensions⁷

Indication of installation depth m*	Outside x inside diameter	Wall thickness in mm
50 – 75	110 x 103.4 mm (3½" nominal)	3.3
75 – 100	110 x 101.6 (3½" nominal)	4.2
200 – 300	113 x 96.6 (4" nominal)	8.2
50 – 75	125 x 117.6 (4½" nominal)	3.7
75 – 100	125 x 115.4 (4½" nominal)	4.8
* Depths of installations mentioned are based on practical experience and may vary with ground conditions.		

The internal diameter of the casing needs to accommodate the pump cylinder (as specified in 2.5).

The casing and screens shall have a uniform colour. The casing and screens shall be new and intact and should not have been directly exposed to the sun for long periods. Screen slot sizes shall range from 0.25 to 0.5 and 1 mm and are subject to approval by the Supervisor. The Drilling Contractor may order factory-slotted screens. Making the screens on site is subject to the approval of the Supervisor.

In fine sand terrain, the Supervisor may instruct the Drilling Contractor to cover the screens with specially made geotextile material to prevent the incursion of the fine sand or mica into the hole. The Drilling Contractor shall present the price of such additional material for the approval of the Supervisor, and it shall be included in his final invoice.

2.8.4 Joints

The joints between the lengths of casing and screen must be strong enough to support the entire weight of the casing and screen during installation. The casings and screens shall have screwed flush joints. The threads must be sturdy, either curved or angular and intact, with no eccentricity to allow for easy handling. Both male and female threads must be properly cleaned with a brush and cloth before joining.

⁷ Source: Manufacturer Boode b.v Netherlands

Where non-threaded couplings are used, they should be cleaned and joined together by the solvent cement recommended by the manufacturer. The recommended time for the cement to set and form a water-tight seal must be adhered to.

[Sometimes, threaded casing and screens are not available, hence the use of non-threaded casings glued together with solvent cement]

2.8.5 Bottom plug

The bottom of the casing shall be closed with a bail plug as designed in Drawings Nos. 1 and 2 ([Annex 4.2 Technical Specifications](#)). The use of a concrete plug shall not be allowed. The bottom plug should be a dedicated unit glued to the bottom of the first casing.

2.8.6 Sump

Every borehole design shall incorporate a sump made from plain casing. In unconsolidated formations, the sump should be 6 m. In a consolidated formation, the sump should be 3 m.

2.8.7 Gravel pack (formation stabilizer or filter Pack)

The Drilling Contractor shall install *gravel pack* in the borehole as in Drawings No. 1 and 2 ([Annex 4.2 Technical Specifications](#)). If the well can be developed naturally, a *formation stabilizer* will be sufficient. If the well cannot be developed naturally, a *filter pack* needs to be installed. This prevents the formation from collapsing onto the screen and also keeps fine materials from entering the well.

The formation stabilizer material shall consist of rounded quartz grain (coarse sand or well-graded river gravel), ranging in size from 1 mm to 4 mm. Under no condition should rock chippings or angular gravel be used. The gravel pack material must be free from shale, mica, clay, dirt or organic impurities of any kind. The thickness of the formation stabilizer should be ***[insert]*** mm. The formation stabiliser should be carefully introduced into the hole by means of a tremie pipe to avoid bridging. Alternatively, the required volume of gravel is calculated and then trickled down the annulus using a funnel. The funnel is moved round the casing so that there is some even distribution. The top of the gravel is measured before the development and then measured after development. The development process allows the gravel to settle and is then topped up.

In fine-grained, unconsolidated formations where the well cannot be developed naturally or the appropriate screen slot size cannot be found, a filter pack shall be installed. The filter pack material shall consist of rounded quartz grain (coarse sand or well-graded river gravel). The grain size of the filter pack material shall be selected in relation to that of the formation material to ensure that it is coarser and more permeable than the formation sand ***[usually 2 mm to 4 mm grain size, but can be specified]*** and approved by the Supervisor. The filter pack should have a minimum thickness of ***[insert]*** mm ***[usually 50 to 100 mm]*** and shall cover the entire screen length and rise to a minimum of 6m above the top of the screen. The filter pack should be carefully introduced into the hole by means of a tremie pipe to avoid bridging. Alternatively, the required volume of gravel is calculated and then trickled down the annulus using a funnel. The funnel is moved round the casing so that there is some even distribution. The top of the gravel is measured before the development and then measured after development. The development process allows the gravel to settle and is then topped up. As stated in 2.8.3 (Borehole lining), the Drilling Contractor may alternatively be instructed to use geotextile material.

The gravel pack shall be installed within the borehole annulus using methods approved by the Supervisor. The gravel pack shall be topped up as necessary to maintain the prescribed level and also after development, in accordance with the instructions from the Supervisor. The level of the gravel pack shall be measured before grouting.

Where temporary casing is installed to a considerable depth, the gravel pack must be inserted into the annulus between the temporary casing and the borehole casing. The installation of the pack should be carried out at 3 m intervals, whilst gradually withdrawing the temporary casing, to prevent the collapse of the formation onto the borehole casing and screen.

2.8.8 Back filling and grouting

The Drilling Contractor shall place an impervious clay plug, 1 m thick, directly on top of the gravel or filter pack. The annular space on top of the clay plug shall be backfilled with the drill cuttings up to 6 m below ground level. Surface soil shall not be used for backfilling. The backfill may be placed by pouring the material down from the surface, taking due caution to prevent bridging.

The last 6 m of annular space shall be filled with cement grout to form the sanitary seal. The grout shall consist of one part water to two parts cement by weight, e.g. 25 kg or litres of water to 50 kg of cement. The grout shall be placed outside the casing, using a grout pump and pipe, in one continuous operation, from the bottom upwards.

[The depth of the grout sanitary seal will depend on the geology. In areas of karst, it may be as deep as 10 m. In some countries the practice is to set the grout first at 8-9 m depth, backfill and set the grout again at 4 m to the surface. In a number of countries, neat Portland cement is used for the grouting. The essential thing is to keep contaminated surface water from entering the borehole through the annulus.]

No activity that can affect the grouting shall be undertaken until the sample is hardened. The grout shall be allowed to set for 24 hours. No work shall be carried out on the borehole during this time.

2.8.9 Borehole capping

The borehole casing shall protrude 1 m above ground surface and be temporarily capped and locked if necessary with a suitable capping device approved by the Supervisor.

2.9 Borehole Development

2.9.1 Method of development

The Drilling Contractor shall develop the borehole by a combination of jetting with water and surging with air, simultaneously rotating the jetting tool and slowly raising and lowering it through the length of all the screens. The jetting tool shall consist of four perpendicular nozzles. The development shall continue until the borehole is judged by the Supervisor to be clear and free of sand.

The Drilling Contractor shall develop the boreholes with great care to avoid any damage to the casings, the screens or the formation resulting from application of excessive pressures or inappropriate techniques during the development.

2.9.2 Pumping Test

The Drilling Contractor shall conduct a pumping test on the completed borehole for a duration of ***[Insert the duration as specified and whether both a step test and constant rate are to be carried].***

Immediately after the constant rate test has been completed, the Drilling Contractor shall measure water-level recovery in the borehole over a minimum period of ***[Insert the duration]***, unless the water level has recovered to the original level in less than that time.

In case of a breakdown of the equipment during the pumping test, the borehole shall be allowed to recover for at least 6 hours or to the previous static water level before repeating the pumping test.

During the pumping test, the Drilling Contractor shall make arrangements for disposal of all water arising from the tested borehole by means of an impermeable pipe, flume or lined trench to a point at least 50 metres down slope from the tested borehole in order to minimize the risk of recharging the well.

2.9.3 Measuring drawdown and recovery

During the pumping and recovery periods, the Drilling Contractor shall measure the water level in the borehole using a calibrated electronic sensing device. The water level measurements are to be taken in accordance with the schedule indicated by the Supervisor. The Drilling Contractor shall analyse the results of the pumping test for the specific capacity of the borehole and report the results on forms supplied by the Supervisor.

2.9.4 Water quality test

The Drilling Contractor shall take due caution to prevent contamination of the borehole. If the borehole becomes contaminated because of an action or inaction on the part of the Drilling Contractor, the latter shall bear the responsibility for disinfection of the borehole and, if necessary, the construction of a new borehole at his/her own cost.

The Drilling Contractor shall provide portable on-site test kits and shall measure the pH, turbidity, conductivity and temperature of the water sample on site.

During the pumping test, the Drilling Contractor shall collect water samples in sterile, securely sealed and suitably labelled **[specify size]** containers from the borehole, as indicated by the approved laboratory. The samples shall be collected from the pump flow directly into the container, without being allowed to settle first. All sample bottles shall be filled completely and closed tightly. Each label shall indicate the name of the Contractor, borehole number, and date and time of sampling. Blanks of sterile water should also be included in the samples sent to the laboratory as a check on the work of the laboratory.

The samples shall all be kept in a cool box or refrigerator at approximately 5 degrees Celsius until they are delivered at the laboratory. The samples shall be taken to the approved laboratory within the time stipulated. Where high arsenic content is detected the Drilling Contractor shall collect samples of the water which should be acidified and forwarded to the client for subsequent laboratory analysis. The samples thus collected should reach the authorized water testing laboratory within 6 hours from the time of collection from the borehole and the analysis carried out within 24 hours. Otherwise, fresh samples shall be taken. A qualified chemist must certify the results of the analysis.

The Drilling Contractor shall have tests carried out in a laboratory approved by the Client to determine select parameters below **[amend as necessary]**:

- | | | |
|------------------------------|--|------------------------------|
| ■ Colour | ■ Chloride | ■ Nitrate (NO ₃) |
| ■ Odour | ■ Fluoride | ■ Nitrite (NO ₂) |
| ■ Taste | ■ Hardness as CaCO ₃ | ■ Sulphate |
| ■ Turbidity | ■ Hydrogen sulphide (H ₂ S) | ■ Faecal coliforms |
| ■ Electric conductivity (EC) | ■ Iron (II) | ■ Total coliform count |
| ■ pH | ■ Iron (III) | |
| ■ Arsenic | ■ Manganese | |
| | ■ Magnesium | |

Water quality test results obtained in-situ and from the laboratory (both chemical and bacteriological) are required from the contractor in the specified format as approved by the Supervisor.

From the results of the water quality analysis, should initial tests highlight microbiological contamination above national standards the Drilling Contractor will be responsible for disinfection of the water point using shock chlorination. If subsequent tests still detect microbiological contamination, appropriate measures should be implemented by the relevant authorities. If tests highlight chemical contamination related to geological conditions (e.g. fluoride or arsenic contamination) beyond national standards, then the Supervisor and the competent authorities will decide on the temporary or definitive closure of the water point. Where high arsenic is content is detected, the Drilling Contract may be requested by the Supervisor to collect additional samples which should be acidified and forwarded to the client for subsequent laboratory analysis.

2.9.5 Corrosive water

In the case of corrosive water (i.e. pH < 6.5), specific measures need to be taken. Galvanised iron (GI) riser pipes must not be installed in water where the pH is less than 6.5. In cases where the pH is close to 6.5, the Client will provide guidance on what should be installed. **[amend as necessary]**.

2.11.6 Disinfection

Based on the outcome of the certified water quality report, each successful borehole must be chlorinated following completion. The Supervisor shall provide the procedure for chlorination of the completed borehole and the concentration of chlorine based on the volume of water in the borehole after completion. The contractor will disinfect the borehole using a chlorine solution to produce a minimum concentration of 200mg/l of active chlorine within the borehole. Surging of the water should be carried out to ensure that the chlorine solution is evenly distributed throughout the borehole. At least 12 hours of contact time shall be allowed. The disinfection shall be undertaken immediately prior to the pump installation so that the disinfecting solution is removed from the borehole during the pump test.

2.11.7 Borehole completion record

After completion of each construction activity, the Drilling Contractor must submit a borehole completion record **[see [Annex 4.3 Suggested Format for Borehole Completion Record](#)]** and ensure that the certificate of substantial completion **[see [Toolkit Module 3](#)]** are signed correctly. ToR – [Section 4 – Reporting Requirements](#) provides more details of the record, which includes data from the drilling of each borehole, with the GPS coordinates, and subsequent activities must be made].

2.12 Criteria for Successful Boreholes

Boreholes meeting the following criteria shall be accepted as successful and those not meeting them declared abortive and abandoned. The Drilling Contractor may be requested to re-drill abortive boreholes if the reasons for being abortive are due to actions or inactions of the Drilling Contractor.

2.12.1 Borehole minimum yield

Unless otherwise agreed by the Supervisor, the minimum acceptable yield from a borehole to be fitted with a handpump shall be 1 m³/hour sustained over a four-hour pumping test period.

Provided the contractor has followed the appropriate procedures in the siting and the completion of the borehole, and having been so certified by the Supervisor, the Drilling Contractor shall not be held responsible for the abandonment of a borehole because of inadequate yield. However, if failure to obtain an adequate yield is caused by actions or inactions on the part of the Drilling Contractor, then the contractor will be responsible for reconstructing the borehole in the proper manner at his own cost.

Where possible, the Drilling Contractor shall endeavour to maximize the yield from the boreholes. Failure to properly exploit the aquifer potential through, for example, insufficient development or inadequate aquifer

penetration and screening even when the yield of the completed borehole exceeds the minimum may be cause for rejecting the borehole and requiring the Drilling Contractor to reconstruct the borehole at his/her own cost.

2.12.2 Sand content

The sand content of the water shall not be more than 10 parts per million (ppm) by volume. The Drilling Contractor shall be responsible for ensuring that the borehole meets the criteria for sand content. If a borehole must be abandoned because of excessive sand content, the Drilling Contractor shall be responsible for constructing another borehole at his/her own cost.

2.12.3 Turbidity

The turbidity of the water shall not exceed 25 Nephelometric Turbidity Units (NTU). In some circumstances, excessive turbidity may be due to the characteristics of the water-bearing formation and thus beyond the control of the Drilling Contractor. It may also be due to inadequate development, in which case the Supervisor will instruct the Drilling Contractor to re-develop the borehole.

2.12.4 Verticality and alignment

The borehole should be straight and vertical. It should not drift from the vertical more than 0.3 m in 30 m. The Drilling Contractor shall furnish all labour, tools and equipment to carry out a test for verticality as may be instructed by the Supervisor. Where a borehole is found to be out of alignment that the pump cannot be installed, the borehole shall be declared abortive and the Drilling Contractor shall drill a replacement borehole at his/her own expense.

2.13 Abandoned boreholes

After the development of the borehole or the pumping test, a borehole may be abandoned for reasons not resulting from any action or inaction of the Drilling Contractor. This may occur because of inadequate yield, poor water quality or excessive depth of the water level, inappropriate use or vandalism. Abandoned boreholes shall be backfilled and the site restored to its previous state.

2.14 Construction of concrete platform, drainage channel and soak-pit

2.14.1 Site Cleanliness

The site shall be kept clean of debris at all times. Progressively and at the end of the works, the contractor shall, according to the instruction of the client, clean and keep the site clean.

2.14.2 Design of Concrete Platform, Drainage Channel and Soak Away/Soak-Pit

The contractor shall construct a concrete platform, drainage channel and soak-pit (soak away) around the borehole casing protruding above the ground. The construction of the platform shall be coordinated with the installation of the handpump stand. The platform shall as much as practicable take advantage of the natural slope of the area such that the pump outlet and the drainage channel are aligned along the slope.

The platform shall adhere to national/local standards or guidelines **[add description and specifications if they exist]**.

[There are several designs of pump platforms, some being circular and others being rectangular. Some incorporate drinking troughs for animals, others a wash pad for laundry. Thus the section below can be modified to suit the situation.]

[If there are no national standards, the description below, and Drawing No. 3 (see [Annex 4.2 Technical Specifications](#)) provides an example of circular platform design. It is taken from Skat and RWSN (2008)⁸].

The platform shall be circular with a radius of 1.5m around the casing, continuous with a rectangular operator's platform 1 m x 1 m. The foundation for the platform shall be dug 0.4 m into the ground and filled with concrete in the ratio 1:2:4, i.e. 1 part of cement: 2 parts of fine aggregate or coarse sand: 4 parts of coarse aggregate. This shall be allowed to set, and then the reinforced mesh of 3 mm rod shall be placed on top of the foundation within the formwork. The pump stand shall then be placed over the protruding casing at the specified height and secured vertically, making sure that the pump stand flange is facing the right direction. Concrete mix in the ratio 1:2:4 shall then be poured to fill the formwork to a height of 12cm. The surface of the slab shall have a gradient of 1:10 towards the drainage channel.

The drainage channel shall be 10 m long, 150 mm wide and 15 mm deep, and shall terminate in a soak away. The foundation shall be constructed from compacted stone mixed with 1 bag (50 kg) of cement and sand.

The soak pit/soak-away (Drawing 4, ([Annex 4.2 Technical Specifications](#)) shall consist of a pit 400 mm x 400 mm with sidewalls lined with 100 mm sandcrete blocks with weep holes. The depth of the pit shall be 400 mm. The pit shall be filled with hard stones of 50-75 mm diameter.

All concrete works shall be protected from rapid drying for 21 days by covering with polyethylene sheets or similar and watered daily.

When the platform is being cast, the following data about the borehole shall be inscribed in the wet concrete:

1. Date of completion
2. The project name
3. Borehole number
4. Depth of the borehole
5. Static water level

Alternatively, a brass plate 80 mm x 200 mm as in Drawing No 5 ([Annex 4.2 Technical Specifications](#)), with the borehole number professionally engraved into it may also be cast into the concrete pad so as to be visible when the pump has been installed. The Supervisor shall provide the borehole numbers.

2.14.3 Quality of materials

Samples of all materials to be used for the concrete pad i.e. the aggregated, cement, formwork, steel reinforcement shall be approved by the Supervisor before delivery to the site.

Aggregates

Coarse aggregates shall consist of crushed rock or other approved materials of similar characteristics having clean, hard, strong, durable, uncoated grains free from dust, soft or flaky particles of shale, alkali and organic matter. The coarse aggregates shall be well graded and have grain sizes in the range 9.5 mm and 40 mm.

Fine aggregates shall consist of grains in the size range 0.15 mm to 9.5 mm. They shall be free of soil, clay, organic matter and other impurities and shall contain no more than 5 % silt. The contractor shall locate the required material before the commencement of drilling.

⁸ Skat and RWSN (2008) **Platform Design for Boreholes Construction Guidelines** (Revision 1-2008), Skat and the Rural Water Supply Network, Available on www.rural-water-supply.net

Water

Water to be used for mixing concrete and for curing shall be obtained from borehole or well sources and shall be equal to potable water in physical and chemical properties.

Cement

Cement shall be normal Portland cement delivered in 50 kg bags. The bag shall be in perfect condition when delivered to the site and shall be not more than 3 months old at the time of use. All broken bags or bags showing signs of dampness or caking shall be immediately removed from the site. Reuse of spilled cement shall not be permitted.

Only certified cement of known quality shall be used. If cement is sourced outside the established project area, proof of quality must be supplied before purchase and must be approved by the Supervisor.

Steel reinforcement

The steel reinforcements shall be prepared using wire mesh of 3 mm mild steel, free from loose rust. If there is rust, it has to be removed with a steel brush.

2.14.4 Quality of formwork

Formwork shall have a maximum deviation from straightness of 10 mm, measured over a length of 2 m. Formwork shall be made in such a way that it presents smooth and clean surfaces. Sharp edges should be chamfered.

2.15 Demobilization, handing over and defects liability

2.15.1 Handing over

On completion of the works at each site, the Drilling Contractor shall remove all of their equipment and materials from the site, cover all settlement pits, seal all abandoned boreholes, and as much as possible restore the site to its original state before construction started. An inspection of the works shall be carried out by the Supervisor and the community representative in the presence of the Drilling Contractor's representative. On being satisfied that the works carried out are in accordance with the contract agreement and technical specifications, and submission of all listed reports, drilling data and borehole completion log to the client and relevant authorities, a substantial completion certificate shall be issued and signed by the Supervisor and community representative, and the site handed over to the community.

2.15.2 Defects liability

The Supervisor shall check the contractor's work as appropriate and notify the contractor of any defects that he/she finds. Such checking does not affect the contractor's responsibilities. The client may also instruct the contractor to search for a defect and to uncover and test any work that may be considered as having a defect.

[Defects liability and correction period varies from country to country. In some southern African countries it is 12 months. This can be modified to suit the national procurement guidelines]

The defects liability period shall be ***[insert months – amend to be in line with national procurement regulations]*** from the date of handing over to the community, upon the issuance of the substantial completion certificate. During this period, any defects on the functioning of the works shall be put right by the Drilling Contractor at his/her own expense. ***[Insert percentage of the contract depending on national standards]*** of the total contract sum shall be retained by the client until the defects liability period is over. The Defects Correction Period is ***[Insert no. of days]***. Provided that there are no defects a final completion certificate will be issued at the end of the defects liability period, and the contractor shall be paid the amount retained. If, however, the Drilling Contractor

fails to put right any defects on the works as instructed by the Supervisor or Designated Representative, no final completion certificate will be issued, and the amount retained will be forfeited.

3. Deliverables

The drilling and construction of **[Insert number of boreholes]** in **[Insert the Districts]** and for the development of the same to be equipped with hand pumps and fully finished water abstraction points for the purpose of drinking water supplies. The table below provides details on the location of the borehole **[may include this as an Annex]**.

Table 4.1 Allocation of Boreholes *[amend as necessary]*

Locations for Borehole drilling					
Lot	Province/State	District	County	Community	No.
Lot [#...]					
Lot [#...]					

4. Reporting Requirements

The contractor shall provide regular reports detailing the progress of the works, costs incurred and estimate of time and costs to completion. Reports shall be submitted on a **[insert frequency]** basis in a format to be mutually agreed upon by the Parties within ten (10) days after signing of this contract.

The contractor shall maintain records and receipts for the purchase of all materials and remuneration of labour used in the works and shall make such records and receipts available for inspection by the designated representative, upon request.

The presentation of the borehole completion record/report as specified (see [Annex 4.2 Suggested Format for Borehole Completion Record](#)) is required for payment. If training, installation of pump and supply of tools to the community is part of the contract, this also needs to be reported on. Table 4.2 provides a description of the different components of the recording and frequency of reporting to the client.

Table 4.2 Recording and Reporting for Borehole Construction

Name	Description	Frequency and when to report
Sketch map showing the drilling plan [see Module 4 – Annex 4.2– 1. General]	A table showing the location name, borehole number, distances in km from the last drilling location and sequence in which the drilling will progress – along with a sketch map illustrating the above and route to be taken by the rig.	Once, before the starting of drilling operations.
Strata log, penetration rate Log and location of main strikes. [see Module 4- Annex 4.3– 2. Drilling Operation and 6a Lithological Logging]	<p>An accurate record of strata passed through and the depths at which strata were intercepted; also progressive measured (V-notch) airlifted yields after reaching water. An accurate record of the penetration rates achieved in minutes for each metre drilled, together with type, size and grade of bit.</p> <p>An accurate record of time spent each day on different phases of drilling, to include rig down time, with causes.</p> <p>A record of depth at which the water zones were struck during the drilling. This information can be combined with strata log and penetration log.</p>	<p>Recorded daily as drilling progress.</p> <p>Submitted to client with invoices for payment.</p>
Pumping test data and recovery test results [see Module 4 - Annex 4.3 – 7. Pumping Test Details]	A detailed report on the pump test, including the data of draw down with time and recover test, specific yield and draw-down, recommendations on hand pump installation.	<p>Once, recorded during pump test.</p> <p>Submitted to client with invoices for payment.</p>
Construction log [see Module 4 - Annex 4.3 – 3. Casing and Well Completion]	An accurate record and a figure showing the details of well construction- position of all casing, slotted casing, sand trap, end cap placed in the borehole, their quantities, hand pump installation – position of cylinder, number of connecting rods and riser pipes.	<p>Recorded for each borehole after completing borehole construction.</p> <p>Submitted to client with invoices for payment.</p>
Water quality	Report of water quality analysis as specified. Sampling is undertaken after the pumping test.	Report for each borehole.
Invoices for works done.	Invoices in same form in which rate schedules were quoted for each borehole and a summary sheet of all invoices.	Once after completion of all works.
Substantial completion certificate	The Substantial Completion Certificate is issued to the Drilling Contractor once the borehole is finished and the pumping test is successful. If handpump supply and installation is included in the drilling contract, this must also be completed for the certificate to be issued.	Submitted to client with the invoices.
[If siting is undertaken by the Drilling Contractor] Results of siting and geophysical surveys	<p>A table showing the location by District, borehole number, GPS coordinates and results of siting (including geophysical survey if undertaken showing geology type, type of resistivity sounding curve with the thickness of interpreted layers and their thickness, recommended depth to be drilled.</p> <p>Detailed report on resistivity surveys on each borehole with: i) sketch map showing the locations of three sites investigated , ii) data collection sheet for Vertical Electrical Sounding(VES); iii) VES curves with interpretation on a log-log paper showing thickness and resistivity and recommendations for drilling. (A sample report will be provided)</p>	<p>Once after the completion of geophysical survey.</p> <p>Submitted to client before drilling commences.</p> <p>Once – one report for each district.</p> <p>To be submitted along with the invoices for final payment.</p>

Name	Description	Frequency and when to report
Final completion certificate	The final completion certificate is issued at the end of the defects liability period provided that there are no defects.	Submitted to client with the invoices after the defects liability period.

5. Location and Duration

The Drilling Contractor, on acceptance of the contract, shall submit a comprehensive work schedule which should fall within the agreed period of contract execution to the Designated Representative or Supervisor **[delete as appropriate]** for approval before mobilization of staff, materials and equipment to site. The work schedule shall include:

- The pre-mobilisation meeting.
- Setting up the base camp.
- Moving the drilling units and support equipment from one drill site to the next within the area of the project.
- Siting, drilling, design, development, pump supply and demobilization site by site.

This schedule shall be subject to the approval of the Designated Representative or Supervisor **[delete as appropriate]**.

Prior to mobilization to the site, the Drilling Contractor's representatives shall, in the company of the Designated Representative or Supervisor **[delete as appropriate]**, visit the beneficiary communities to take over the sites and to agree the start-up date of the project.

6. Evaluation Process and Methods

This section of the ToRs should be prepared by programme staff working in collaboration with supply staff. It needs to include the following:

- Solicitation method (i.e. ITB or RFP)
- Description of flow of the evaluation process and sequence of key stages
- Description of the overall evaluation approach
- Technical proposal
- Financial proposal
- (For RFPS) the weighting allocated between the technical and financial proposal
- Detailed evaluation assessment criteria
- Final evaluation

Note that no financial/price information should be contained in the technical proposal. Presentation, details and clarity of the proposals will influence the final assessment.

The **Toolkit – Module 2: Procurement Considerations** provides details of different procurement options that can be used. It provides more details on solicitation for the initiating unit. The recommendations for the evaluation process and methods in the **Toolkit – Module 2: Procurement Considerations – Section 2.6** apply to UNICEF, but can be amended for use by other clients. Roles and responsibilities of UNICEF Programme and Supply Staff are described in the **Toolkit– Module 2 – Section 2.3**.

7. Project Management

Instructions

The contractor shall carry out instructions of the Designated Representative of the client which comply with the applicable law where the project is located.

Designated Representative Decision

Except otherwise specifically stated, the Designated Representative shall decide contractual matters between the client and the contractor in the role of representing the client.

Delegation

The Designated Representative may delegate any of her/his duties and responsibilities to other persons, particularly the Consultant after notifying the contractor, and may cancel any delegation after notifying the contractor.

Communication

Communication between parties in the contract shall be in writing and is only effective when delivered.

Management meetings

Either the Designated Representative or the contractor may require the other to attend a management meeting. The business of the management shall be to review progress of the work and review plans for the remaining work and to deal with matters raised in accordance with early warning.

8. Payment

The price for the works shall become payable to the contractor in accordance with the chosen payment schedule (Table below). On small drilling projects, there are usually 3 milestones associated with payment: mobilization, handing over and end of defects liability period. However, on larger projects with 50 or more boreholes, there could be provision for monthly or quarterly payment for boreholes completed in that timeline. At the issuance of the Final Completion Certificate, the remainder of the retention money shall be paid.

Table 4.3 Example of Milestones for Borehole Drilling Contract

Milestone No	Milestone Description
1.	Mobilization
2.	Monthly/Quarterly payment as agreed*
3.	Successful handing over and issue of substantial completion certificate
4.	End of defects liability period and final completion certificate issued

Terms of Reference for the Supply and Installation of Pumps - Template

Abbreviations

FRP	fibre reinforced plastic
GI	galvanised iron
HDPE	high density poly ethylene
m	metre
mm	millimetre
MS	mild steel
no.	Number
NB	nominal bore
PVC-HI	Polyvinyl Chloride (high impact)
RFP	Request for Proposal
RFPS	Request for Proposal for Services
SS	Stainless Steel
ToR	Terms of Reference
uPVC	unplasticized polyvinyl chloride

1. Project Background

The general information must describe the background of the requested services, in particular:

- Rationale and key aspects of the overall context of the assignment
- History of activities to date
- Project/assignment related data, e.g. relevant studies, geographical data target groups, category of services to be rendered and basic documents.

2. Description of the Assignment

2.1 Scope of Work

The Contract to be established is for the supply and installation of handpumps in **[Insert number of boreholes]** boreholes in **[Insert the Districts]** for the purpose of drinking water supplies and the supply of **[Insert number]** special tools for operation and maintenance and **[Insert number]** of borehole fishing tools. The objective of the pump supply contract is to obtain reliable and maintainable water supply that can deliver water at the rate and pumping lift specified in the Technical Specifications when operated by users with reasonable power input and applied force.

[Insert the type of pump], as specified in **[insert specification document or link to annex]** shall be installed on all the boreholes.

In the case of corrosive water (i.e. pH < 6.5), Galvanised Iron (GI) riser pipes should not be installed. For depths of less than 40m, uPVC or stainless-steel riser pipes can be used. For depths of over 40m, stainless steel riser pipes are to be installed **[amend as appropriate]**.

There may be minor changes in the exact number of pump types depending on site conditions. This will be decided in close consultation with the Supervisor. Where access conditions are difficult, it is expected that the supplies shall make allowances for this as part of the estimate.

[Insert duration and expected started time of the project]

The project shall be under the control of the Designated Representative appointed by the client. The Designated Representative shall appoint a Consultant who will deploy one or more Supervisors who shall be responsible for the management and direction of the project on site and shall approve all materials supplied, works and measurements carried out by the Supplier and his/her team of workers on the project.

2.2 Work Schedule

The bidder shall submit a comprehensive work schedule within his proposal which should fall within the period specified in the scope of work. Once the contract is awarded, this schedule shall require approval by the Designated Representative.

2.3 Mobilization

Prior to mobilization to the site, the representatives of the Drilling Contractor shall, in the company of the Supervisor or Designated Representative ***[Delete as applicable]***, visit the beneficiary communities to plan the installation of the pumps.

The Supplier shall, with due care and diligence, execute and maintain the works and provide all labour, materials, equipment, transportation and other facilities necessary to substantially complete the works by the planned completion date, and in accordance with the requirements, documents and the standards defined by it.

The Supplier shall take full responsibility for the adequacy, stability and safety of all site operations and methods of pump installation and for the security of the site itself, including the security of all materials stored or used on the site.

2.4 Inspection of Pumps

The Supplier shall present to the Supervisor samples of pumps to be installed as well as relevant information in sufficient time for the client to complete review of samples. Each item shall be labelled as to origin and intended use in the works.

All materials used in the course of these works shall be new and proper for their use. No reusable materials coming from the site shall be used unless permitted by the client.

Pumps shall be installed in accordance with the written recommendations of the manufacturer. The Supplier is not allowed to start work until the Supervisor has checked and approved the equipment and materials.

2.6 Traffic & Protection of Roads, Properties & Services

The Supplier shall carry out all work in connection with the contract so as not to interfere unnecessarily or improperly with the convenience of the public and with access to, use and occupation of roads, footpaths, public services or property not in the contractor's possession.

The Supplier shall use every reasonable means to prevent damage to roads, bridges and services, and shall select routes and limit extraordinary traffic to avoid unnecessary damage or injury.

Where necessary to divert or control traffic, the Supplier shall, in cooperation with traffic control authorities if required, provide all necessary facilities and resources at his/her own cost.

The Supplier shall be responsible for and shall pay the cost of any strengthening or improvement of routes to the site, in order to facilitate movement to site of equipment, temporary works, materials and personnel. This shall apply to all necessary relocation of services.

The above shall also apply to any waterborne traffic required for the works, in so far as it may affect, for example, docks, jetties or sea walls.

The Supplier shall bear all costs and charges for special or temporary permits required in connection with access to site.

2.7 Corrosive water

In the case of corrosive water (i.e. pH < 6.5), specific measures need to be taken. Galvanised iron (GI) riser pipes must not be installed in water where the pH is less than 6.5. In cases where the pH is close to 6.5, the client will provide guidance on what should be installed **[amend as necessary]**.

2.8 Supply and Installation of Pumps

2.8.1 Specifications

All technical specifications are detailed in drawings ([Annex 4.2 Technical Specifications](#)).

2.8.2 Installation of pumps

The contractor shall install the pumps at depths instructed by the Supervisor, based on the e borehole completion record/report for each site. The installation shall be carried out in accordance with the standard installation instructions provided by the manufacturer. All components introduced into the borehole shall be disinfected using a chlorine solution. After installation, each pump shall be subjected to a one-hour continuous pumping. A standard spare parts kit shall accompany each pump.

3. Deliverables

The Contract to be established is for the supply and installation of handpumps in **[Insert number of boreholes]** boreholes in **[Insert the Districts]** for the purpose of drinking water supplies. The table below provides details on the location of the Pump Installation Sites **[may include this as an Annex]**.

Table 4.4 Allocation of Pump Installation sites [amend as necessary]

Locations for Pump Installation					
Lot	Province/State	District	County	Community	No.
Lot [#...]					
Lot [#...]					

4. Reporting Requirements

The Supplier shall provide regular reports detailing the progress of the pump installation, costs incurred and estimate of time and costs to completion. Reports shall be submitted on a **[insert frequency]** basis in a format to be mutually agreed upon by the Parties within ten (10) days after signing of this contract.

5. Location and Duration

The Supplier, on acceptance of the contract, shall submit a comprehensive work schedule which should fall within the agreed period of contract execution to the Designated Representative or Supervisor **[delete as appropriate]** for approval before mobilization to site. The work schedule shall include:

- Procurement of pumps by the Supplier
- Installation site by site.

This schedule shall be subject to the approval of the Designated Representative or Supervisor **[delete as appropriate]**.

Prior to mobilization to the site, the Supplier shall, in the company of the Designated Representative or Supervisor **[delete as appropriate]**, visit the beneficiary communities to set the pump installation date.

6. Evaluation Process and Methods

This section of the ToRs should be prepared by programme staff working in collaboration with supply staff. It needs to include the following:

- Solicitation method (i.e. ITB or RFP)
- Description of flow of the evaluation process and sequence of key stages
- Description of the overall evaluation approach
- Technical proposal
- Financial proposal
- (For RFPS) the weighting allocated between the technical and financial proposal
- Detailed evaluation assessment criteria
- Final evaluation

Note that no financial/price information should be contained in the technical proposal. Presentation, details and clarity of the proposals will influence the final assessment.

When evaluating Pump Suppliers, it is extremely important to ensure that they deliver quality products in line with the specifications. Where possible, either accredited Suppliers should be used, or efforts should be undertaken to ensure quality assurance by the national bureau of standards. Roles and responsibilities of UNICEF Programme and Supply Staff are described in the **Toolkit – Module 2 – Section 2.3**.

7. Project Management

Instructions

The contractor shall carry out instructions of the Designated Representative of the client which comply with the applicable law where the project is located.

Designated Representative Decision

Except otherwise specifically stated, the Designated Representative shall decide contractual matters between the client and the contractor in the role of representing the client.

Delegation

The Designated Representative may delegate any of her/his duties and responsibilities to other persons, particularly the Supervisors after notifying the Supplier, and may cancel any delegation after notifying the Supplier.

Communication

Communication between parties in the contract shall be in writing and is only effective when delivered.

Management meetings

Either the Designated Representative or the contractor may require the other to attend a management meeting. The business of the management shall be to review progress of the work and review plans for the remaining work and to deal with matters raised in accordance with early warning.

8. Payment

The price for the works shall become payable to the contractor in accordance with the chosen payment schedule (Table below). On small drilling projects, there are usually 3 milestones associated with payment: mobilization, handing over and end of defects liability period. However, on larger projects with 50 or more boreholes, there could be provision for monthly or quarterly payment for boreholes completed in that timeline. At the issuance of the Final Completion Certificate, the remainder of the retention money shall be paid.

Table 4.5 Example of Milestones for Pump Supply and Installation Contract

Milestone No	Milestone Description
1.	Importation of pumps
2.	Successful installation of XXX pumps
3.	Successful installation of XXX pumps
4.	End of defects liability period and final completion, certificate issued

Annexes – Toolkit Module 4

Annex 4.1 Borehole drilling – different contract modalities explained

The table below provides an overview of the different modalities that can be used to contract borehole siting, drilling works, supervision, pump supply and installation, and the training of handpump caretakers/menders. It describes each method and explains its advantages (+) and disadvantages (–) to the client, the Drilling Contractor, and the end users of the water supply.

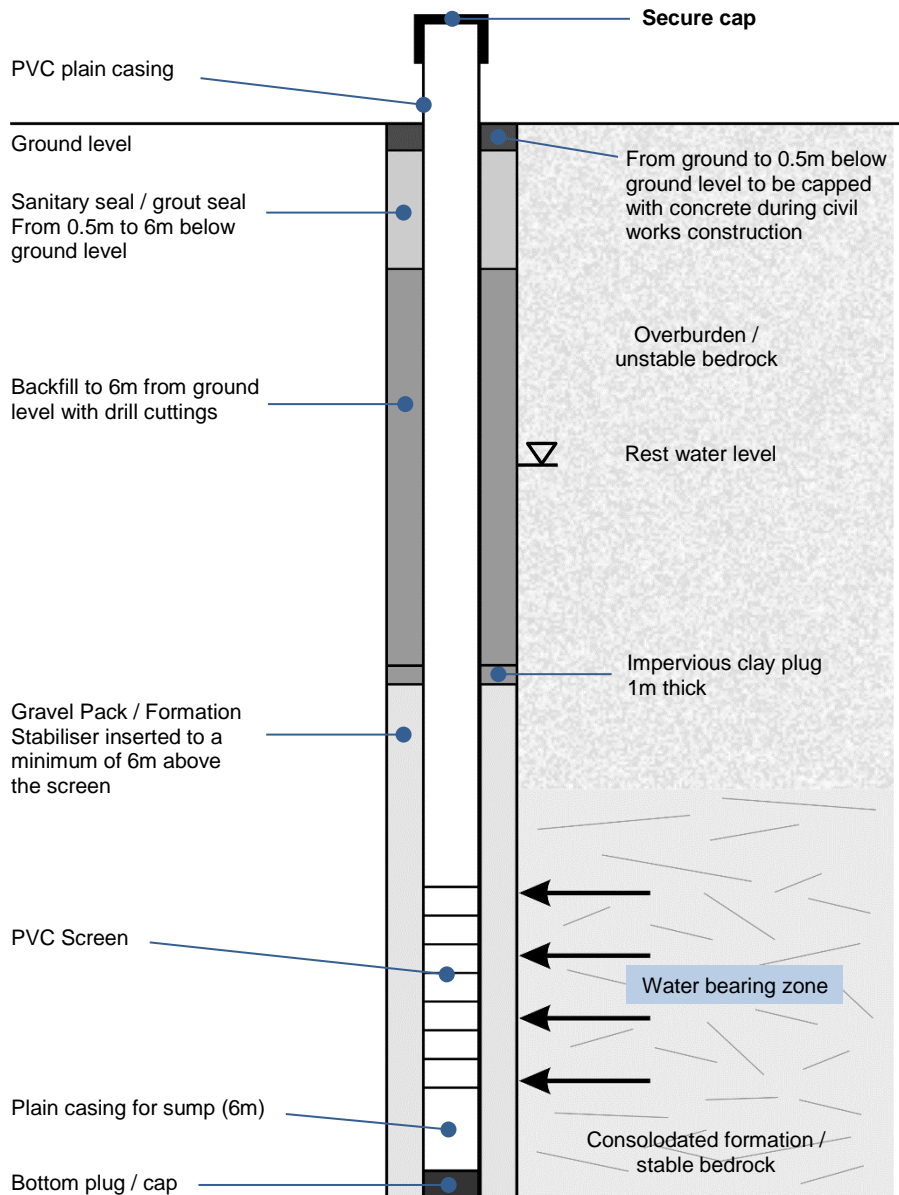
	Method and Description	Implications for the client	Implications for the contractor/supplier	Implications for the end user
Use only on very small contracts.	<p>Turnkey contracts with no payment for “dry holes”, but payment for “wet holes” as set out in tender submitted by the Drilling Contractor. Borehole siting and drilling are one single contract. The Drilling Contractor is responsible for siting.</p> <p>If the borehole does not provide the required yield, then he/she, is not paid anything. If the borehole is successful, the Drilling Contractor is paid a fixed sum.</p>	<p>(+) Client does not have to engage in siting process.</p> <p>(+) Procurement and contract management of siting and drilling can be undertaken jointly.</p> <p>(+) Client can tell donors that they are only paying for successful boreholes.</p> <p>(+) Client does not have to pay for full-time or milestone supervision.</p> <p>(–) Client is not able to assure the quality of the materials used in the borehole.</p> <p>(–) A thorough inspection process (including borehole camera and repeat of pumping test) in order to verify that the borehole is successful.</p> <p>(–) In very risky areas, reputable Drilling Contractors may not tender for work.</p>	<p>(+/-) The Drilling Contractor decides where to locate the borehole.</p> <p>(–) When bidding, the Drilling Contractor has to estimate the risk of drilling dry holes.</p> <p>(+/-) The Drilling Contractor can cut corners with respect to the material quality and well development.</p>	<p>(–) There is a high chance that the Drilling Contractor will select a site with low risk of being dry, such as next to a swamp or open water source which may be flooded and thus contaminated in the rainy season.</p> <p>(–) Water users in areas with a high risk of a dry borehole may be left behind in terms of water supply services.</p> <p>(–) Water source may fail prematurely because corners were cut while drilling to save money.</p>
Never to be used.	<p>Turnkey contracts with no payment for “dry holes”, but payment for “wet holes” for what they actually drill. Borehole siting and drilling are one single contract. The Drilling Contractor is responsible for siting.</p> <p>If the borehole does not provide the required yield, then he/she is not paid anything. If the borehole is successful, the Drilling Contractor is paid only for what is drilled and installed.</p>	<p><i>As above and:</i></p> <p>(+) Client can tell donors that they are paying even less for successful boreholes than above.</p>	<p><i>As above and:</i></p> <p>(–) The Drilling Contractor cannot make up for the cost of dry boreholes with the successful boreholes.</p> <p>(–) Considerable risk of making a loss on the job unless corners can be cut on the successful borehole.</p>	<p><i>As above and:</i></p> <p>(–) Water source may fail prematurely because corners were cut while drilling to save money.</p>

	Method and Description	Implications for the client	Implications for the contractor/supplier	Implications for the end user
Recommended method	<p>Separate contracts for siting and drilling work. Siting contracted first. <u>Drilling works contracted once the siting has been completed and the detailed reports are available.</u></p> <p>Drilling works paid according to a Bill of Quantities.</p> <p>Borehole siting and supervision is undertaken by a consultant, or in-house expertise.</p>	<p>(-) Requires two procurement cycles and two sets of contracts, i.e. siting/supervision and drilling works.</p> <p>(-) Client needs to explain the realities of borehole drilling to the donors and that not every borehole that is drilled can be successful, even with professional siting.</p> <p>(-/+) Cost per borehole drilled may increase in the short to medium term but understanding of the groundwater is likely to increase over the medium term.</p> <p>(-) Requires full-time drilling supervision by skilled personnel.</p> <p>(-) A thorough inspection process (including borehole camera and repeat of pumping test) may be advisable for select boreholes to ensure that there has not been collusion between the Drilling Contractor and Supervisor.</p>	<p>(+) The Drilling Contractor has detailed information for each site upon which his/her proposal can be based.</p> <p>(+) When bidding, the Drilling Contractor does not have to estimate the risk of drilling dry holes</p>	<p>(+) More likely for the end users to be involved in the siting process.</p>
Not recommended.	<p>Separate contracts for siting and drilling work. Siting and drilling works procured and contracted at the same time.</p> <p>Drilling works paid according to a Bill of Quantities.</p> <p>Borehole siting and supervision undertaken by a consultant, or in-house expertise.</p>	<p>(+/-) Requires one procurement cycle and two sets of contracts, i.e. siting/supervision and drilling works.</p> <p>(-) Client needs to explain the realities of borehole drilling to the donors and that not every borehole that is drilled can be successful, even with professional siting.</p> <p>(-) Requires full-time drilling supervision by skilled personnel.</p> <p>(-) A thorough inspection process (including borehole camera, and repeat of pumping test) may be advisable for select boreholes to ensure that there has not been collusion between the Drilling Contractor and the Supervisor.</p>	<p>(-) The Drilling Contractor does not have detailed information upon which the tender can be based.</p> <p>(+) When bidding, the Drilling Contractor does not have to estimate the risk of drilling dry holes.</p>	<p>(+) More likely for the end users to be involved in the siting process.</p>

	Method and Description	Implications for the client	Implications for the contractor/supplier	Implications for the end user
Not recommender.	Pump supply and installation undertaken by Drilling Contractor.	<p>(+) Simplifies procurement for the client.</p> <p>(-) To be sure of quality, client needs to assure that every contractor is supplying and installing pumps that meet national standards and technical specifications.</p> <p>(+) In case there are problems within the defects liability period, the Drilling Contractor carries full responsibility.</p>	<p>(-) Contractor needs pump installation team.</p> <p>(+) Contractor knows where to position the pump as he/she has the final borehole design.</p>	<p>(-) Cannot ensure involvement of the pump caretaker/minder in the installation process.</p> <p>(+) Pump installation more likely to take place immediately after drilling provided that the Drilling Contractor is paid on completion of the installation.</p>
Not recommender.	Pump supply undertaken by Drilling Contractor and installation undertaken by the pump minder/caretaker under the supervision of the Drilling Contractor.	<p>(+) Simplifies procurement for the client.</p> <p>(-) To be sure of quality, client needs to assure that every contractor is supplying and installing pumps that meet national standards and technical specifications.</p>	<p>(+) Contractor does not require pump installation team.</p> <p>(+) Contractor knows where to position the pump as he/she has the final borehole design.</p> <p>(-) Contractor relies on pump caretaker/mechanic who may not have sufficient technical know-how.</p>	<p>(+) Involvement of the pump caretaker/minder in the installation process.</p> <p>(+) Pump installation more likely to take place immediately after drilling provided that the Drilling Contractor is paid on completion of the installation.</p>
Can be used.	Pump supply undertaken through a separate contract with the Supplier. Installation by the staff of the Supplier.	<p>(-) Client needs to procure and contract pump supply separately.</p> <p>(+) Client only needs to assure that the Supplier's pumps meet national standards and technical specifications.</p> <p>(-) In case there are problems within the defects liability period, the client has to diagnosis who is responsible (i.e. Drilling Contractor or Supervisor).</p>	<p>(+) Contractor does not require pump installation team.</p> <p>(-) Supplier needs to be provided with the final borehole design in order to properly position the pump.</p> <p>(-) Contractor relies on pump caretaker/mechanic who may not have sufficient technical know-how.</p>	<p>(-) Cannot ensure involvement of the pump caretaker/minder in the installation process.</p> <p>(+) Pump installation may be subject to delays.</p>
Recommended.	Pump supply and installation undertaken through a separate contract with the Supplier. Installation undertaken by the pump caretaker/minder, under the supervision of the Supplier.	<p>(-) Client needs to procure and contract pump supply separately.</p> <p>(+) Client only needs to assure that the Supplier's pumps meet national standards and technical specifications.</p>	<p>(+) Contractor does not require pump installation team.</p> <p>(-) Supplier needs to be provided with the final borehole design in order to properly position the pump.</p>	<p>(-)(+) Involvement of the pump caretaker/minder in the installation process.</p> <p>(+) Pump installation may be subject to delays.</p>

Annex 4.2 Technical Specifications for the Borehole

Drawing 1 Sample Well Design (consolidated formation – casing and screen in bedrock – to depth of 100-120 m; at greater depths use steel casing)



Drilling diameter to accommodate gravel pack, casing and screen

Casing diameter must accommodate the external diameter of the pump cylinder

Pump should be positioned at the correct level above the screened section, taking into account the drawdown and seasonal variations. This is generally at least 2m below the lowest dynamic water level.

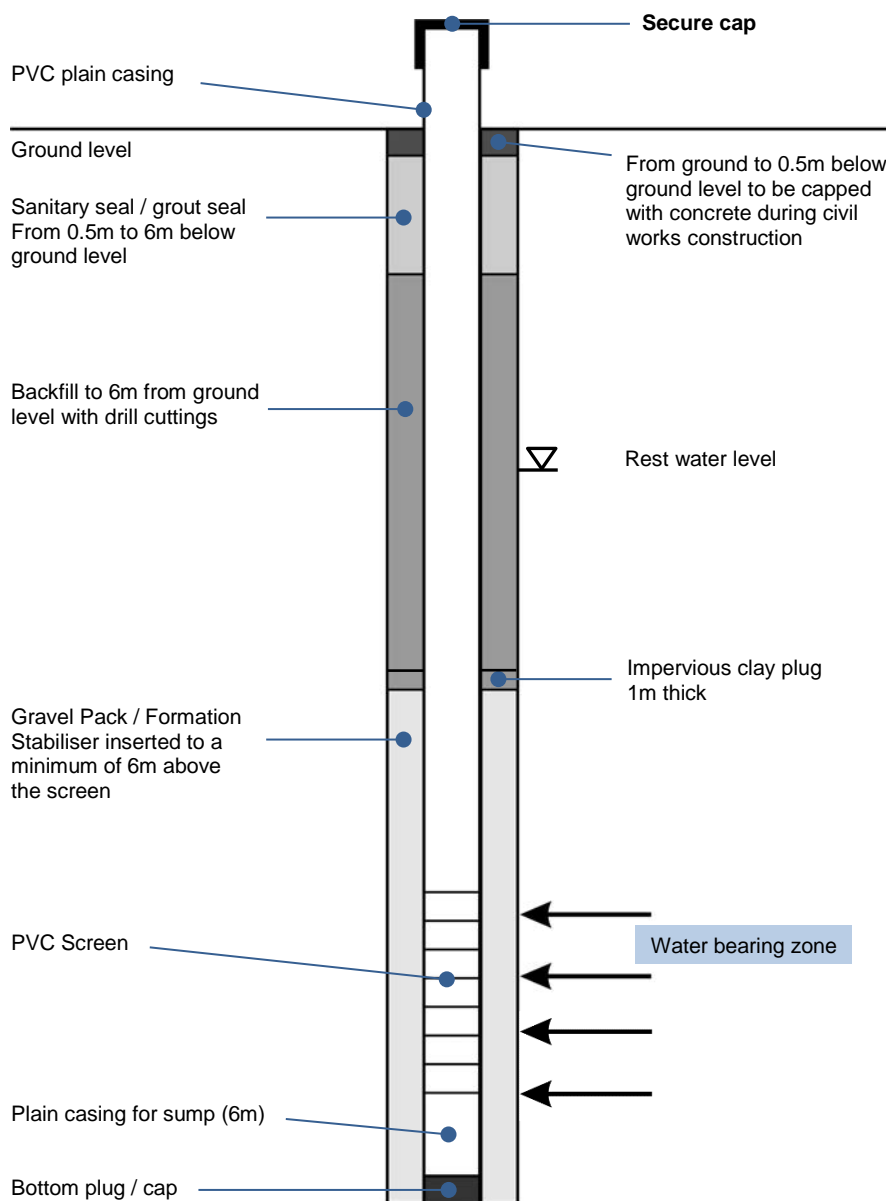
Gravel pack comprising rounded quartz grain from 1mm to 4mm diameter. Drilling diameter needs to accommodate gravel pack. The thickness of the gravel pack depends on the nature of the formation. A thick (75-100mm) annulus will be required in the case of very fine materials such as mica. Alternatively, it may be possible to use a geotextile filter sock depending on the risk of biofouling.

Not to Scale

- Drilling depth depends on the formation. The final drilling depth shall be decided by the supervisor.
- Screen position and length shall be decided by the supervisor

For definitions of gravel pack, filter pack and formation stabilizer see **Definitions** in the Toolkit Introduction.

Drawing 2 Sample Well Design (un-consolidated formation to depth of 100-120 m; at greater depths use steel casing)



Drilling diameter to accommodate gravel pack, casing and screen

Casing diameter must accommodate the external diameter of the pump cylinder

Pump should be positioned at the correct level above the screened section, taking into account the drawdown and seasonal variations. This is generally at least 2m below the lowest dynamic water level.

Gravel pack comprising rounded quartz grain from 1mm to 4mm diameter. Drilling diameter needs to accommodate gravel pack. The thickness of the gravel pack depends on the nature of the formation. A thick (75-100mm) annulus will be required in the case of very fine materials such as mica. Alternatively, it may be possible to use a geotextile filter sock depending on the risk of biofouling.

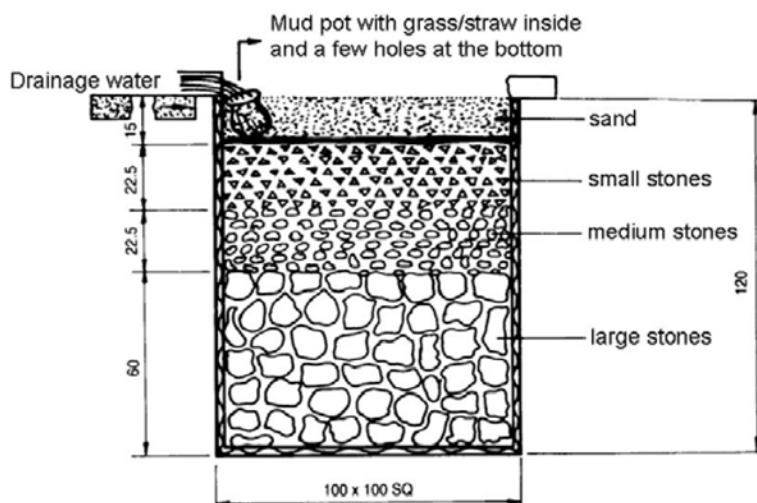
Not to Scale

- Drilling depth depends on the formation. The final drilling depth shall be decided by the supervisor.
- Screen position and length shall be decided by the supervisor

For definitions of gravel pack, filter pack and formation stabilizer see **Definitions** in the Toolkit Introduction.

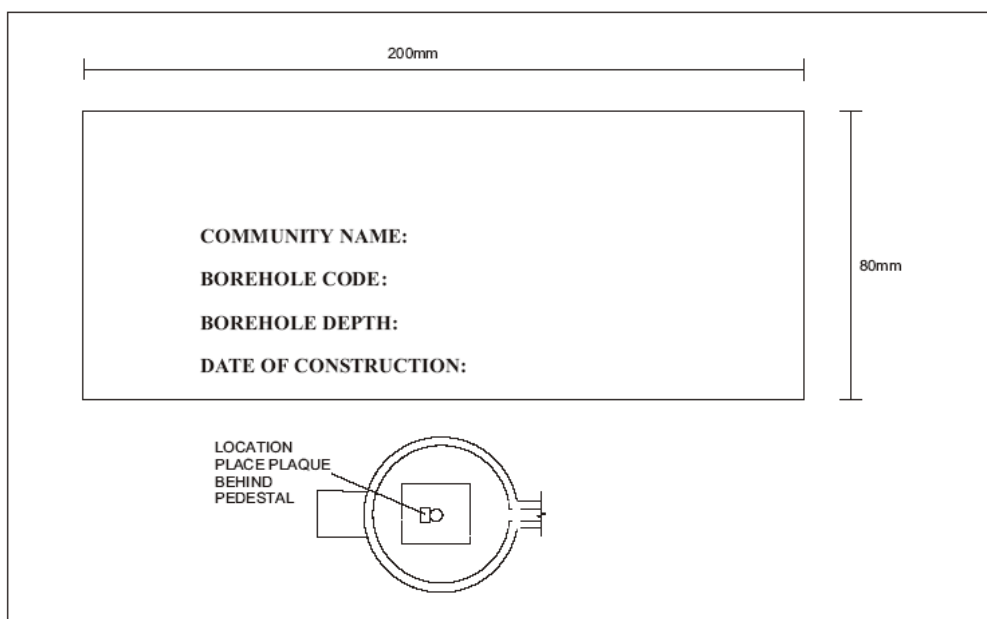


Drawing 4 Soak-Pit



Skat and RWSN (2008) *Platform Design for Boreholes Construction Guidelines* (Revision 1-2008) provides further details.

Drawing 5 Sample Brass Plaque Design



Annex 4.3 Suggested Format for Borehole Completion Record

Contents

1. General
2. Drilling Operation
3. Casing and Well Completion
4. Well Development and Pumping Test Summary
5. Water Quality Summary
6. Lithology
 - 6a. Lithological Logging
 - 6b. Characteristics to be evaluated and assessed during logging of drilling samples
7. Pumping Test Details
 - 7a. Step Drawdown Test
 - 7b. Constant Rate Test
 - 7c. Recovery Test
8. Water Quality Analysis Parameters

1. General**Water Well/Borehole
Reference No:**Use: ☐ Community ☐ Household/Private Compound
☐ Health Facility Education Facility
☐ Company Premises ☐ Test Well ☐ Other

Location:

Owner Name:

Coordinates/
GPS Reference:Grid Ref:
Long. E Lat. N

Owner Address:

Financing Programme/Project/Private:

Well Permit No:

Date Issued:

Issuing Authority:

Name of Drilling Enterprise:

Drilling Contractor's License No:

Address of Drilling Enterprise:

Sketch Map

Approximate Scale:

[illegible]

3. Casing and Well Completion

Casing Material: _____

Screen Open Area (%) _____

Casing Joints: ☐ Threaded ☐ Glue and SocketBottom Plug: ☐ Yes ☐ No**Casing**

From	To	Diameter <input type="checkbox"/> inch <input type="checkbox"/> mm	Type
m	m		
m	m		
m	m		
m	m		
m	m		
m	m		

Screen

From	To	Diameter <input type="checkbox"/> inch <input type="checkbox"/> mm	Type	Slot Size
m	m			
m	m			
m	m			
m	m			
m	m			
m	m			

Gravel ☐ natural ☐ artificial

From	To	Grain Size	Volume used
m	m		
m	m		

Backfill and Sanitary Seal

From	To	Diameter <input type="checkbox"/> inch <input type="checkbox"/> mm	Type and details (Backfill/Sanitary Seal)

Alignment and Verticality Test Remarks:**Well head and Platform**Well Cap: ☐ Yes ☐ No**Apron:**

- ☐ Concrete slab
☐ Drainage
☐ Soak-away pit
☐ Fence

Pump:Pump installed: ☐ Yes ☐ No

- ☐ Stand
☐ Fitted around casing
☐ Welded on casing

Pump Type: _____

Comments:

4. Well Development and Pumping Test Summary**Development:**

- ☐ Air-lift
- ☐ Over-pumping
- ☐ Surging
- ☐ Backwashing
- ☐ Jetting

Duration _____ hr

Comments: _____

Pumping Test:

- ☐ Air-lift capacity evaluation
- ☐ Constant Rate Test (CRT)
- ☐ Step Drawdown Test

Duration _____ hr

Discharge _____ l/s

Dynamic water level: _____ m

Drawdown: _____ m

Comments: _____

5. Water Quality SummarySample taken: ☐ Yes ☐ No

Date _____

Field Parameters:

- ☐ Clear
- ☐ Turbid

Colour _____ Taste _____ Odour _____

Turbidity _____ NTU Temp. _____ °C TDS _____ mg/l

EC _____ μS-cm pH _____

Chemical Quality:

pH: _____

Laboratory: _____

(for more parameters see separate sheet)

Bacteriological Quality:

Faecal coliform: _____ cfu per 100ml

Laboratory: _____

Comments: _____

6a. Lithological Logging													
Water Well/Borehole Reference No:													
Location:									Owner Name:				
									Owner Address:				
Coordinates/ GPS Reference:				Grid Ref: Long. E Lat. N									
Financing Programme/Project/Private:													
Well Permit No.				Date Issued:					Issuing Authority				
Name of Drilling Enterprise:									Drilling Contractor's License No:				
Well Logged by:													
Depth (m)	Description	Colour*	Grain size*	Texture*	Degree of weathering*	Sorting*	Roundness	Stratigraphic unit (if known)*	Remarks (e.g. consolidation, porosity, mineralogy, structures and features, drilling, water)	Penetration rate (min/m)	Discharge	EC ($\mu\text{S}/\text{cm}$)	TDS (mg/l)

Data to be recorded at a minimum of one-metre intervals – add more sheets if required; * See overleaf for description.

6b. Characteristics to be evaluated and assessed during logging of drilling samples

(Source Misstear et al, 2006; MacDonald et al, 2005⁹)

Standard procedures for sample description such as British Standards Institution (1999) or the American Society for Testing and Materials (2000) should be followed.

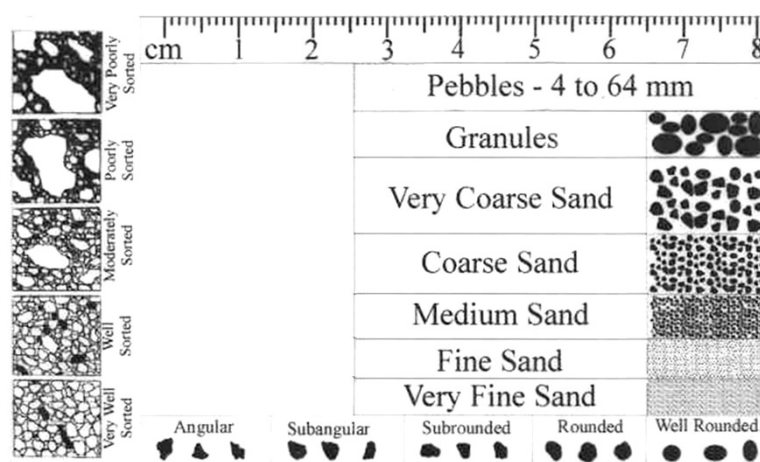
Colour

In order to aid objectivity, a definitive colour chart, e.g. Munsel® Colour Chart, may be used for classification. Munsel® colours are referred to by two or three words such as brownish yellow or light bluish grey and a number.

Grain Size

The visible grains can be compared with a comparator diagram such as the one given below, a grain sample card or the naked eye. A hand lens or microscope may be required to see grains which are not visible to the naked eye.

Figure Grain Size, Sorting and Roundness Chart (Source: University of Wisconsin, 2010)



Texture

Is the sample compact and dense, or light and friable? Is it granular or plastic? Can it be moulded or rolled? Can the fragment be scratched with a steel blade or fingernail? Moh's Scale of Hardness is an indicator.

Degree of weathering

The extent of weathering of rocks affects the availability of groundwater. Essentially, the weathering profile comprises the three basic units of soil, weathered rock and fresh rock. Rock weathering is described in terms of distribution and relative proportions of fresh and discoloured rock, decomposed and disintegrated rock.

Degree of sorting

Sorting describes the variability of attributes such as rounding and grain size. In well-sorted materials, the component grains are mostly of a similar size, shape and roundness. Sorting can be classified as very well sorted, well sorted, moderately sorted, poorly sorted and very poorly sorted as set out in the grain size and sorting chart above.

Roundness

Grains are usually classified as angular, sub-angular, sub-rounded, rounded or well-rounded as shown in the chart above.

Formation / Stratigraphic unit (if known, add codes based on the local stratigraphic nomenclature)

An experienced geologist or driller may be able to identify stratigraphic units. However it is important to distinguish between *interpretation* and *observation*. Thus the basic raw data (above) as well as his or her interpretation should be recorded.

⁹ Misstear, B. Banks, D. and Clark, L. 2006. *Water Wells and Boreholes*. Wiley; MacDonald, A., Davies, J., Calow, R. and Chilton, J. 2005. *Developing Groundwater. A guide for Rural Water Supply*, ITDG Publishing

[illegible]

8. Water Quality Analysis (critical/regular parameters – amend as required)*

Water Well/Borehole Reference No:			Maximum Permitted Level According to National Standards/Guidelines or WHO Guidelines (WHO 2008)
Constituents	Unit	Concentration	
PHYSICAL			
Colour	<i>mg/l Pt (TCU)</i>		
Odour			
Taste			
Temperature	<i>Celcius</i>		
Turbidity	<i>FTU</i>		
Electrical conductivity	<i>μS/cm</i>		
CHEMICAL			
Arsenic (As)	<i>μg/l</i>		
Calcium (Ca ²⁺)	<i>mg/l</i>		
Chloride (Cl ⁻)	<i>mg/l</i>		
Fluoride (F ⁻)	<i>mg/l</i>		
Iron (Fe ²⁺)	<i>mg/l</i>		
Iron (Fe ³⁺)	<i>mg/l</i>		
Magnesium (Mg ²⁺)	<i>mg/l</i>		
Manganese (Mn)	<i>mg/l</i>		
Nitrate (NO ₃ ⁻)	<i>mg/l</i>		
Nitrite (NO ₂ ⁻)	<i>mg/l</i>		
pH			
Potassium (K ⁺)	<i>mg/l</i>		
Sodium (Na ⁺)	<i>mg/l</i>		
Sulphate (SO ₄ ²⁻)	<i>mg/l</i>		
Total Dissolved Solids	<i>mg/l</i>		
Microbiological			
Thermo-tolerant Coliform (E. Coli)	<i>Count/100ml</i>		
Faecal Coliform	<i>Count/100ml</i>		
Total Coliform Count	<i>Count/100ml</i>		

* Refer to National Standards/Guidelines for Drinking Water Quality or WHO Guidelines (WHO 2008) for list of general parameters.

Annex 4.4 Pumping Methods - Handpumps

Pumping principles

Any one of the following mechanical principles can lift water. Pumps may use one or sometimes a combination of these principles:

- **Direct lift:** Water is physically lifted in a container. Typical examples are: Rope and Bucket, Bailer, Persian Wheel.
- **Displacement:** Because water cannot be compressed it can be pushed or displaced. Typical examples are: Piston Pumps, Progressive Cavity Pumps and Diaphragm Pumps.
- **Creating a velocity head:** Water can be propelled to a high speed. The momentum produced can be used either to create a pressure or a flow. Typical examples are: Propeller Pumps, Centrifugal Pumps, Rebound Inertia Pumps, Jet Pumps.
- **Using the buoyancy of a gas:** Air that is blown into water bubbles upward. It will lift a proportion of the water that it flows through. Typical examples are: Air lift.
- **Gravity:** Energy of a media (water) that flows downward under gravity is used to lift water. Typical examples are: Siphons.

Most handpumps use the water displacement principle for pumping.

Reciprocating handpumps

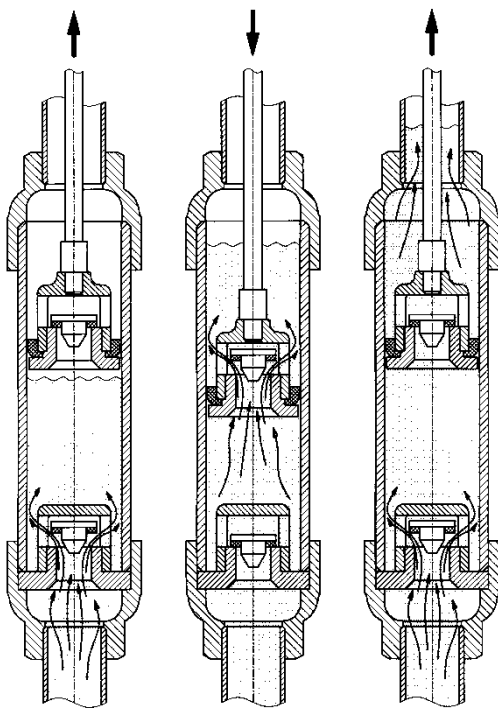


Figure A4.1 Reciprocating Handpump Cylinder

The majority of handpump types used worldwide belong to the group of reciprocating pumps. The water is lifted by a piston that is raised and lowered inside a cylinder that has a foot valve. The piston (or plunger) is moved by a pump rod connected directly to a T-handle or a lever handle at the pump head. In some pump types, a flywheel with crankshaft is used to create the reciprocating movement of the piston.

Included in the group of reciprocating handpumps are:

- a) Suction Pumps
- b) Direct Action Pumps
- c) Lever Action Pumps

The function of the reciprocating pumps is based on the principle that water flows from areas of high pressure to areas of low pressure. The reciprocating pump creates an area of sufficiently low pressure above the body of water, thus causing it to flow upward.

A reciprocating piston pump consists essentially of a long vertical pipe, called a rising main. The rising main extends into the cylinder (the area in which the piston/plunger moves up and

down). Near the bottom of the cylinder, a non-return valve is fitted, called a foot valve. The foot valve allows the water to flow from the lower part of the pump into the cylinder, but prevents it from flowing back into the well. A second non-return valve is situated in the piston/plunger. The piston/plunger and the foot valve alternatively divide the pump into an upper part and a lower part (see Figure 3.1). The lower part of the pump always extends into water body of the well.

When the operator lowers the piston, the atmospheric pressure acts equally on all water surfaces. The foot valve stays closed, preventing water from being pushed back into the well. The piston presses down onto the water until the non-return piston valve opens, allowing water to flow through the piston. At the lowest point of the stroke, the movement of the piston is reversed. The weight of the water column above the piston causes the piston valve to close. This results in two things:

1. The water above the piston starts rising. It cannot flow backwards and will move up in the rising main until it reaches the top of the pump, flowing out by the spout.
2. Because the piston moves up, the pressure in the lower part of the cylinder drops; a vacuum is created. The water in the well is still under atmospheric pressure and will push its way past the foot valve into the cylinder.

This cycle is repeated with every stroke.

Suction pumps

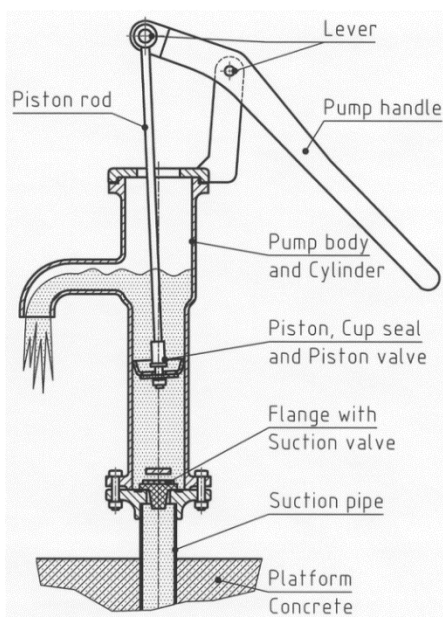


Figure A4.2 Suction pump

In a suction pump, the cylinder is above the water table, usually near the top of the pump head. The rising main extends below the water table. When the pump is operated, during the upwards stroke it appears that water gets 'sucked up' through the rising main into the cylinder.

In fact, the atmospheric pressure forces the water into the area of low pressure underneath the piston. The theoretical limit to which the atmospheric pressure can push up water is 10 metres. In practice, suction pumps can be used to lift water up to about 7 or 8 metres.

A suction pump needs to be full of water before it can be operated. That means the pump needs to be primed: water is poured into the pump head by the operator. This is necessary every time the pump is emptied by a leaking foot valve (in practice all foot valves leak a little, especially in inexpensive suction pumps – so the pump may need to be primed every morning, or even several times a day). Thus, the danger exists that the well can be contaminated through polluted water used for priming.

The advantage of suction pumps is that the cylinder is normally above ground, and thus easily accessible. Maintenance involves replacement of seals and valves, operations that can be easily performed with few tools.

Direct action pumps

In most direct action handpump designs, the up-and-down movement of the piston is made by a T-handle directly connected to the upper end of the pump rod (hence the name).

The pump rod consists of plastic pipes, which are connected by threads, and each pipe length is sealed airtight. With this system, the pump rod pipes are buoyant in the water of the rising main and therefore reduce the force needed on the up-stroke. Because of the relatively large volume of the hollow pump rods and the narrow clearance in the annulus between the pump rod and rising main (6 to 10 mm); the pump rod displaces water during the down-stroke. This results in the delivery of water during both the up-stroke and the down-stroke.

Unlike suction pumps, direct action pumps have down-the-hole components that need to be accessed periodically for maintenance and repair. However, these operations are relatively easy for direct action pumps. Once the riser pipes and pump rod pipes are connected, disconnection for maintenance is not required because these pipes are flexible enough to be pulled from the well or borehole in a continuous length without undoing the joints. This operation allows access to the down-the-hole components.

The down-the-hole components are made mainly of plastic (with a few rubber parts). This makes handling and installation of the pump easy (lightweight). It also means the pump is highly corrosion-resistant, even in aggressive waters.

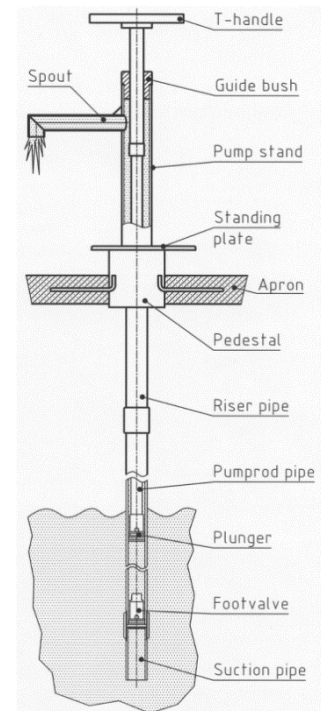


Figure A4.3 Direct action pump

Lever action pumps

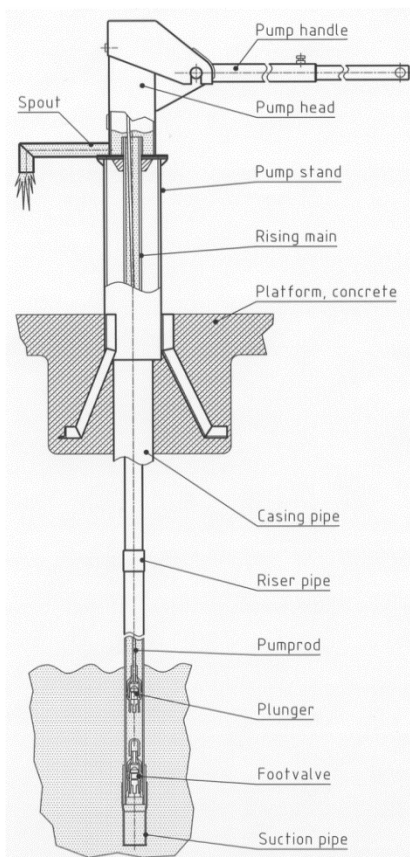


Figure A4.4 Lever action pump

Most deep well handpumps are of the lever action type. The increased length of the water column in deep boreholes requires more effort to draw water and the lever of the handle makes the operation easier. Besides the conventional handle, there are also pump designs, which use a flywheel to operate a crankshaft for transforming the rotation into an up-and-down movement.

Lever action pumps consist of

1. above-ground components like pump head, pump stand and handle, which are usually of welded mild steel components, preferably with a corrosion protection of hot-dip-galvanised zinc layer
2. down-the-hole components like rising main, pump rods with plunger, cylinder and foot valve.

The configuration of the down-the-hole components can include an open-top cylinder. The plunger and the foot valve can be removed from the cylinder without dismantling the rising main. Or they can feature the conventional configuration with a small diameter rising main and a bigger cylinder diameter, which requires dismantling of the rising main for repairs on plunger or foot valve.

Riser pipes are made of galvanised iron (GI) pipes, uPVC (unplasticised polyvinyl chloride) or stainless steel.

Pump rods are made of mild steel, stainless steel or fibre reinforced plastic rods (FRP).

Joining of pump rods is preferably made with threaded connections.

Some pump components such as the plunger and foot valve are made of brass or engineered plastics.

Rotary pumps

The most commonly used rotary handpumps are the rope pump and the progressive cavity pump. Note that although some reciprocating pumps use a circular action mechanism to drive the pistons, they are not categorised as rotary.

Rope pump

The rope pump is based on the principle of the ancient Chinese water-lifting technology, the Chain and Washer Pump. The development of this easy, cost-effective and successful technology for water lifting took place mainly in Nicaragua.

The rope pump is not defined by a specific design but by a concept. Worldwide many different rope pump designs, adapted to their local conditions, are produced locally in small workshops near to the users. The producers need to study the potential market and economic viability carefully. Areas with a high density of dug wells usually have a big potential for rope pumps.

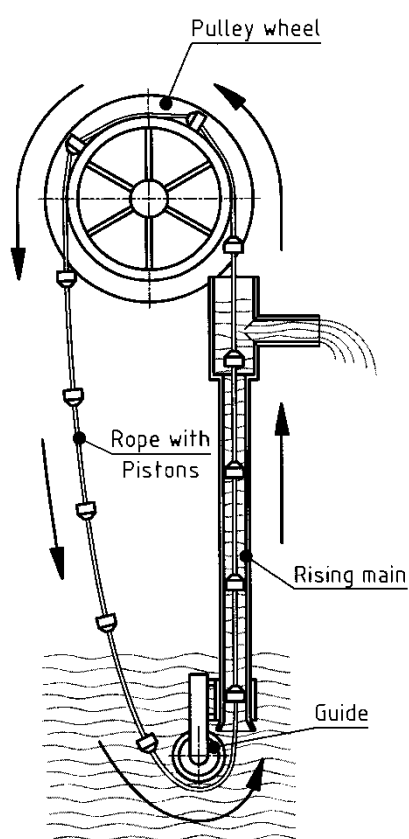


Figure A4.5 The rope pump principle

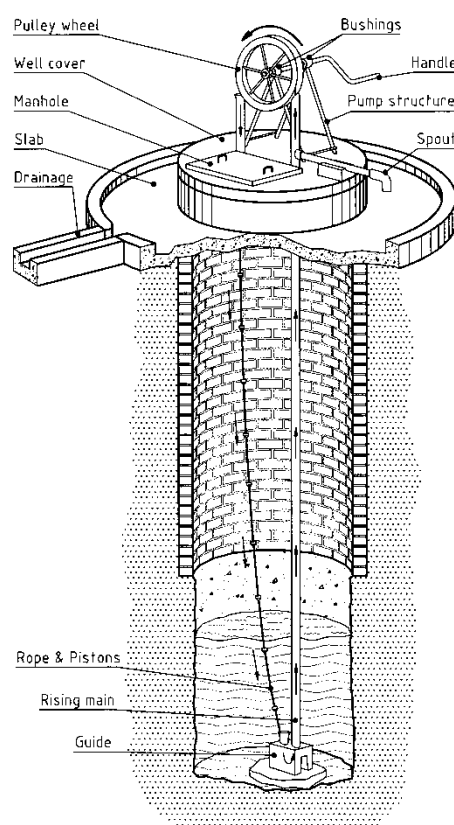


Figure A4.6 Rope pump installation

Rope pumps, being mainly family pumps, require an adapted procurement and supply mechanism. The users themselves should select and purchase their handpumps and take over full ownership. Marketing of the product and its application (they are used for small-scale irrigation as well as for domestic water supply) should be left to the producer and the producer's sales organization. The rope pump should be sold directly to the users.

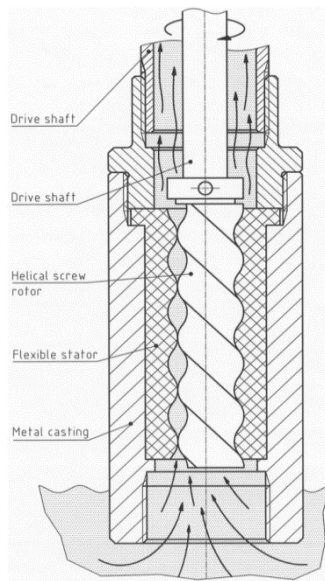
A rope loop with attached pistons, equally spaced, is pulled through a pipe, which is immersed in water at its lower end. The pistons entering the rising main pipe transport the water upwards until it reaches the spout through which it escapes.

A pulley wheel (made of a car tire) pulls the rope with the pistons through the rising main pipe. The pulley wheel is operated by a crank handle, which also acts as the wheel axle. A guide near the bottom of the well leads the rope with the pistons smoothly into the rising main.

Hand-operated rope pumps are mostly used for drawing water from dug wells with depths of 0 to 20 metres. However, this pump can also be installed on boreholes (0 to 40 m depth), provided there is an attachment for leading the rope into the borehole and a smaller guide that fits into the borehole casing.

The simplicity of this low-cost pump makes it easy to understand by everyone. It is also easy to maintain and repair with a few simple tools.

Progressive cavity pumps



Unlike most rotary pumps, progressive cavity pumps can be used in small diameter boreholes.

The progressive cavity pump consists of a single helix rotor. The rotor is made to a high finish, using chromium plated steel or polished stainless steel (SS). It is circular in cross section so that it fits exactly into one of the two helices of the hard rubber stator (the stationary part of a rotor system).

As a result, the empty second helix of the stator is divided into a number of separated voids. When the rotor is turned, these voids are screwed along the axis of rotation. In the well, water will be trapped in the voids and when the rotor is rotated these volumes are pushed upwards and discharged into the rising main.

Progressive cavity pumps need to be driven at a relatively high speed; therefore, handpumps are often fitted with a gearbox. This makes this type of pump relatively complicated and costly.

Figure A4.7 Progressive cavity pump

Diaphragm pumps

Diaphragm pumps are pumps employing a flexible diaphragm that is expanded and contracted to displace water. The advantages of diaphragm pumps are that they are easy to install, because no heavy mechanical parts are used. They can also be made corrosion-resistant through the use of plastic hoses instead of metallic rising mains.

The disadvantages are that diaphragm pumps need high-quality rubber diaphragms, which are costly to buy and replace, and they have a relatively low efficiency because of the energy needed to expand the diaphragm on every stroke. In addition, the working principle is relatively complex so mechanics and caretakers need to complete comprehensive training programmes.

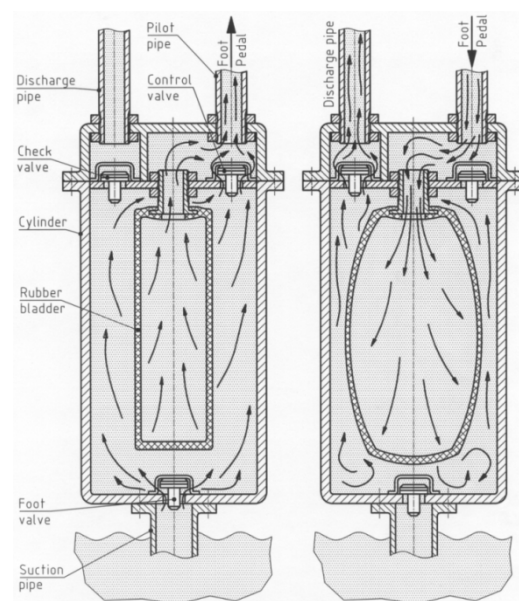


Figure A4.8 Diaphragm pump

Annex 4.5 Guideline for Quality Assurance of Handpumps and Spare Parts

A4.5.1 Introduction

This Annex helps to optimize the process of hand pump inspections and testing to guide country offices in decision making when choosing a type of inspection and/or testing. The main aspects of handpumps and spare parts that this Annex seeks to help evaluate are the quality of the product, quality assurance procedure employed by the company and the performance history of the company or product.

The Annex provides criteria to categorize handpumps into high risk or low risk and evaluate technical performance of handpumps and spare parts performance. Criteria for inspection, product and supplier are defined and specific information about applicability of the criteria provided.

The Annex also provides information related to handpumps, to assess current in country quality assurance (QA) mechanisms to contribute to adequate QA systems and support governments and other development partners to ensure good-quality handpumps. This Annex aims to assist country offices in the preparation, choosing and managing of quality inspections and testing. A description of country office responsibilities and elements that should be reviewed in the evaluation and approval process for quality assurance inspection and/or testing agencies is presented.

It is imperative that this guideline be used together with the latest version of the document: Procurement Strategy: Hand Pumps & Accessories (UNICEF, Water, Sanitation & Education Centre - WSEC).

A4.5.2 Risk-Based Categorization of Hand Pumps and Spare Parts

Country Offices are advised to use risk assessment process to determine and classify the level of risk on handpump spare parts to be procured in order to optimize cost and efforts. Based on the classification, relative to the risk of damage or defects, different actions may be pursued and/or recommended. UNICEF Country Offices should review the risk level assessments on quality and technical analysis and formulate the measures required to mitigate the risks identified.

Country offices should categorise handpumps and spare parts from manufactures/traders/retailers into either high risk or low risk as set out below.

Hand pumps and spare parts are categorized as **high risk** if the following criteria are met:

- Unsatisfactory test and inspection reports
- Lack of availability of spare parts
- Problems with the quality, availability and distribution
- High probability of being operated beyond the design parameters
- The supplier is new and fully matches the criteria for low risk
- Technical/desk evaluation cannot fully determine suitability
- Low performance evaluation score as per rating criteria (see A4.5.3)

A handpump's risk for damages or defects is categorized as **low risk** if the product and/or spare parts does meet, at least one of the following criteria:

- Warranties from a reputable supplier.
- Current/Previous Long Term Agreement (LTA) holders with a good quality track record
- Satisfactory test and inspection reports
- High Performance evaluation score as per rating criteria (see A4.5.3)

Country offices should review information on the criteria listed above for each vendor and/or product periodically evaluated and change/adjust the risk categorisation/classification for the product(s)/supplier(s) if required.

A4.5.3 Handpump Performance Evaluation

Irrespective of whether handpumps and spare parts are classified as high risk or low risk, Country Offices should evaluate handpumps and spare parts performance against the following criteria:

- Data Source: Specialized Technical Laboratory with good performance in field trials, product testing, certification and warranty for hand pumps and spare parts.
- Reliability: Indication of functionality of the hand pumps and spare parts based on a combined judgement of the mean time before failure (MTBF) and the probable down time when the pump is waiting to be repaired.
- Corrosion resistance: Type and corrosive property of materials used for the downhole components.
- Abrasion resistance: Pump's capability to pump water with a lot of sand in relation to the daily output of the pump.
- Manufacturing and maintenance needs: ease of manufacturing of handpumps and spare parts and maintenance of hand-pumps and spare parts in a countries with a low level of industrial development

A4.5.4 Inspection and Testing 1: Pre-qualification inspection and testing

Supplier Quality System

Together with the site inspection and product testing, country offices shall carry out quality audit for manufacturers to get information to evaluate their quality assurance and management system.

The UNICEF Supplier Quality System Questionnaire (See Annex of UNICEF Procurement Strategy: Hand Pumps & Accessories) should be used for getting information from an existing or a potential supplier to evaluate their quality and code of conduct processes to decide if they are capable to be a supplier for UNICEF. The questionnaire does not cover product-specific questions such as design, manufacturing, quality, or performance characteristics. Product/process specific topics must be addressed as needed by technically competent auditors.

Site Inspection

The purpose of site inspection is primarily to assess the capacity of the manufacture, trader and retailer, in terms of capability and available infrastructure to meet UNICEF's quality and technical requirements. The premises of manufactures, traders, agents and importers should be inspected, and the inspection would include, but not be limited to, the following:

- Report any damage(s) and/or non-optimum aspects observed.
- The general information about the manufacturing plant/the trader and retailer shop and its capacity to consistently meet requirement of the specified product in terms of quantity, quality and time.
- Information about workers, including qualifications of key staff.
- Verification of licenses, lay-out, working environment, safety, ventilation and pollution control system and quality control system .
- Manufacturing processes, plant and equipment, machinery and the production infrastructure.
- Laboratory, inspection tools and testing equipment.
- Handling and storage facilities/ warehousing of raw materials and semi-finished products.
- Packing and shipping departments.
- Non-employment of child labour in any area of operation and no connection with production of anti-personnel land mines.

The following is the recommended mode of offer of complete handpumps (in sets) that potential suppliers are supposed to adhere to:

- Head with handle – On racks (preferably bolted on the racks)
- Pedestal – In rows on floor with accessibility between the rows

- Water Tanks – On racks or loosely fitted on Pedestals
- Third Plate – On racks or loosely fitted on water tanks placed on Pedestals
- Cylinder Assembly – On racks in horizontal conditions
- Connecting Rods – In bundles or in loose conditions on racks
- Riser pipes – In bundles or in loose conditions on racks

Unless otherwise specified in the expression of interest, key components such as head with handle assembly, cylinder assembly, water tank with accessories, connecting rods and riser pipes is/should be individually covered with polythene, over-wrapped with tar coated (note that tar coated is not in the guidelines of Indian Standards anymore. It was replaced by straw ropes with hessian cloth/or HDPE bag) and finally packed in wooden boxes.

Product Testing

The purpose of product testing is primarily to carry out sample evaluations and test the range of handpumps and spare parts of products manufactured by suppliers. Handpumps and spare parts from traders/retailers shall only be tested based on one or more of the following:

- The trader/retailer does not provide the requested test certificates for the product.
- The impact on the quality of the product cannot be determined by the lack of certificates.
- There is suspicion on the authenticity of the certificate.
- Any other justified technical reasons.

Among the tests and checks normally to be performed are the following:

- Check items manufactured against specifications/certificates.
- Visual examination of items for quality of workmanship and finish.
- Dimensional checks on randomly selected samples.
- Fitting, alignment and stroke length of pump assemblies.
- Gauge checks on threaded and machined components.
- Proper fitting of bearings in the handle assemblies.
- Concentricity of side axle bushes in the pump assemblies.
- Verticality of water tank coupler.
- Discharge capacity, leakage test and interchangeability of components in cylinders.
- Shore hardness test on rubber components.
- Coating thickness of the galvanized / electro galvanized surfaces.
- Marking and labels / components and packaging.
- Appearance, product instruction and assembly guides.

General Inspection and Testing Requirements

The following are the recommended inspection and testing requirements:

- All the galvanized components should be offered / pre-displayed in a way enabling visual examination of all units.
- Head assemblies should to be bolted at the flanges (preferably at elevated racks) for verification of the alignment & lateral play (if any) in the handle assembly fitment.
- All cylinder assemblies are to be offered in horizontal position, placed in racks, enabling visual examination of inside surface of the brass liner.
- Sufficient accessibility is to be provided to all the offered / displayed sub-assemblies.
- An inspector will draw random samples (as per the specified sampling plan) for conducting visual, dimensional / gauge checks, zinc coating thickness & shore hardness (on rubber parts) checks.

- As per the specified sampling plan (BIS/ ISO 2859-1 or IS-2500 Part 1, General Inspection Level – III), the supplier shall offer the specified number of handpumps in assembled condition for alignment, fitting, interchangeability and stroke length checks.
- Randomly drawn samples by the inspector will be subsequently assembled for interchangeability, fitting and alignment checks.
- The supplier is to have test facilities for conducting discharge test on cylinder assemblies.
- For conducting the leakage test, one length of appropriate size riser pipe is to be made available by the supplier with suitable testing arrangements.
- Random samples of gun-metal components, brass liner, and stainless steel components should be drawn by the inspector and taken along for testing.
- All check gauges and measuring instruments (duly calibrated with date of calibration and next due date of calibration) should be made available during the course of inspection.

Inspection and Testing Expected Outcomes

The following are the expected site inspection and testing outcomes:

Site Inspection expected outcomes

- Depending on the outcome of various checks and tests conducted during the inspection, an inspection note providing “Summary of Inspection and Findings” or an Inspection Non-acceptance Note providing the “Non-conformance Noted” and the supplier’s proposed actions are to be issued to the supplier.
- For non-conformities (if any) observed during the course of inspection, if the supplier is able to take corrective actions and subsequently offer the same to the inspector, the materials would be considered for re-verification in the same visit.
- Completed audit report based on feedback with scoring shared with suppliers. The supplier should be advised of any non-conformance and containment should be addressed if there are issues concerning the production of non-conforming items.
- A summarised audit form comprising supplier strengths, supplier major and minor non-conformances, supplier opportunities for improvement, products rejected, approved or not covered during the audit.

Product Testing expected outcomes

- In case materials are found to be satisfactory, an Interim Inspection Note shall be issued pending the receipt of satisfactory test results obtained from an independent test laboratory, after which the final inspection report should be issued.
- If however, the laboratory test results are found not to be meeting the requirements, an Inspection Non-acceptance report shall be issued.

For non-conformities which cannot be corrected during site inspection, the materials should be REJECTED, and the supplier would have to re-offer the materials on a later date for inspection and laboratory testing after taking suitable corrective actions. The Inspection Non-acceptance report should be shared with the supplier, indicating the deviations on which the product has not been accepted.

Documentation

It is important that country offices request the following quality documentation from suppliers and/or ensure the supplier furnish the following documents before inspection:

- Test certificates for all raw materials / bought out components detailing the chemical composition & physical / mechanical test
- Test certificates from an independent test laboratory that is nationally or internationally accredited for testing samples for both chemical analysis and physical / mechanical properties as per the specified requirements
- Internal test and inspection records and quality management system documentation

- Calibration certificates / records of all measuring instruments and gauges
- Proposed packing method
- Certificate of conformity
- Other special requirements or documents requested during the pre-qualification

At the completion of inspection and testing for pre-qualification, a comprehensive site inspection and testing report of findings and recommendation, with relevant photographs, will be issued and submitted to UNICEF. The report should cover findings (e.g. reasons, inspections, test, certification, Quality Management System) conclusion and recommendations.

A4.5.5 Inspection and Testing 2: Pre-delivery and post-delivery inspection and sample evaluation

The purpose of pre-delivery inspection (conducted at manufacturer/trader/retailer's premise) and goods receipt inspections (conducted at country office warehouses) is to identify non-conformities or defects, so that preventive and corrective action is taken to eliminate and/or avoid deficient supplies reaching consignees.

Pre-delivery inspections

Pre-delivery and goods receipt inspections will cover checking of products in accordance with purchase order specifications, proper packing, marking and documentation check and fumigation of pallets, and will include all such tests necessary to verify various requirements required. It is recommended that all purchase orders for handpumps and spare parts are subjected to pre-delivery and goods receipt inspections. Pre-Delivery Inspection should include, but is not limited to, the following functions:

- Check quality of the consignment, with samples drawn based on the batch size and sampling plan as per BIS/ ISO 2859-1: latest, or as agreed by country office.
- Check items and equipment against the contract specification, technical drawings and other relevant documents and standards.
- Check the dimension, workmanship and finish of the items/ equipment.
- Verify manufacturers' test reports for raw materials, or if required, witness the testing of the raw materials.
- Check packing, pallet size, and shipping marks against instructions specified in the purchase order, and also verify the quantity of supplies ready in all respects for shipment.
- Collect and forward samples for further laboratory testing if required.
- Report any damage(s) and/or non-optimum aspects observed.
- Any other inspection requirement in the purchase order.

The inspection agency should issue a Certificate of Inspection along with an Inspection Report and provide the country office with relevant photographs for each consignment, within two (2) working days after each inspection, in order to prevent delay in delivery. In the event of an abortive inspection, the inspection agency should submit details of non-conformities in relation to purchase order requirements, with noted deficiencies duly acknowledged (signed and stamped) by the authorised representative of the supplier. The normal, single sampling plan as per BIS/ISO 2859 or IS-2500 Part 1, General Inspection Level – III) should be followed.

For major defects, AQL 1.0 and for Minor defects, AQL 2.5 will be followed unless specified otherwise. Consignments with critical defects should be rejected. However, it is the responsibility of country offices to release consignment for shipment. Inspections against different purchase orders shall be combined, if the supplier and place and date of inspection are the same.

Should the country office consistently receive good quality of items, it may, as an incentive, switch to reduced inspection (as per sampling plan ISO 2859-1). Alternatively, should a deterioration in quality be detected, the country office may request tightened inspection.

Goods Receipt/Post-Delivery Inspection

Post-delivery inspection should include, but is not limited to, the following functions:

- Confirm that the items received by the consignee are those dispatched by the supplier.
- Confirm that the items received by the consignee are in accordance with the client's purchase order.
- Report all damages observed at the consignee's site, including the extent, nature and cause of damage for future preventive measure.
- Conduct a visual inspection and dimensional check to contract specifications.
- Confirm that storage of the items is in accordance with the conditions stipulated by the client or manufacturer.
- Quality Inspection and field observation on the durability of supplies (to be done only upon request by UNICEF).
- Issuance of Inspection Note.

After pre-delivery inspection and/or post-delivery inspection, a detailed report, supported with photo evidence (where possible) of goods in storage, highlighting damage or defects in particular, and duly acknowledged by consignee or authorised representative at site, will be submitted to the country office within 2 working days. The report should cover findings (e.g. supplier, specification compliance, quantity, sampling procedure and size, packing, marking), conclusion and recommendations.

Sample evaluation

This is the actual comparison of the bid sample against the technical specifications mentioned in the Invitation to Bid (ITB), Request for Proposal (RFP) or Request for Quotation (RFQ); stating whether the evaluated samples are compliant or non-compliant with the technical specifications. Country offices should request sample evaluation based on one or more of the following:

- When the technical/desk evaluation is not enough to determine the suitability of the product, and observation and evaluation of the physical sample is needed. In this case, a test to be performed during sample evaluation should be listed with the request.
- If the handpumps and/or spare parts from the supplier are categorized as high-risk
- If the country office has no previous experience with the hand pumps or spare parts
- If the country office has quality issues of the hand pump and/or spare parts reflected in the past performance reports

A4.5.6 Inspection and Testing Services Arrangements

Country offices have two main arrangements to carry out inspection and testing of hand pumps and spare parts:

- **In-sourcing** – Country Offices together with the relevant government counterparts can in-source¹⁰ inspection if they have the resources and critical competencies required for handpumps and spare parts inspection and testing. However, it is important to take into account the best value for money. The country office together with the government counterparts should constitute an in-source inspection and product testing team to carry out activities section A4.5.4 and A4.5.5.
- **Outsourcing** – Country offices and government counterparts with limited technical expertise, facilities and specialized instrumentation, and inability to reach supplier location should outsource¹¹ inspection services/testing services. When their inspection/testing services are outsourced country offices are still accountable to ensure effective and efficient delivery of the outsourced inspection/testing services by the provider(s). Selection

¹⁰ In-sourcing is defined as a business practice in which work that would otherwise have been contracted out is performed in house. In-sourcing is a business decision that is often made to maintain control of critical competencies when meeting certain criteria.

¹¹ Outsourcing is defined as the contracting out of services/functions which have been carried out by direct staff of UNICEF

of an inspection agency/agent should be based on specialization, experience of personnel and methodology and approach of the agency. The following is the recommended way of outsourcing Inspection and testing services in country offices:

- Use Supply Division Long Term Arrangements (LTAs) for Inspection services: Country Offices may forward details of the inspection services required to one or more of these companies, and/or to other local companies, and request a quotation. Since the rate is agreed with these companies and their local agents, they will quote for the number of days the job will take. The Country Office can then decide on the best offer.
- Issue a local Request for Proposal for inspections and testing services if (i) country is not specified in the UNICEF Supply Division LTA, (ii) local market rates are more competitive and (iii) there is no UNICEF Supply Division. LTA can be used for the services requested. Country offices should use sections A4.5.4 and A4.5.5 to define the scope services when using a Request for Proposal applying the UNICEF standard template.

Module 5

UNICEF Request for Proposal for Services for Borehole Drilling Works



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FOR MORE INFORMATION:

For more information, comments and feedback, please contact UNICEF New York headquarters www.unicef.org or Skat Foundation www.skat.ch

AUTHORS:

Dotun Adekile & Kerstin Danert, Skat Foundation, St Gallen, Switzerland; Jose Gesti Canuto, UNICEF, New York, USA; Djani Zadi, Peter Harvey, and Anne Cabrera-Clerget, UNICEF, Copenhagen, Denmark

CONTRIBUTORS:

Fiorella Polo, WASH Specialist, Water and Sanitation Section, UNICEF New York Headquarters, USA
Sue Cavill, Consultant

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Toolkit Orientation Table

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Module 2	Procurement Considerations for Borehole Drilling Works <ul style="list-style-type: none"> ■ Defines procurement process and responsibilities ■ Provides guidance for risk management ■ Compares two solicitation methods: ITB and RFPS ■ Highlights key considerations during the pre-contractual, contracting and contract administration phases including the evaluation of technical and financial proposals and the payment schedule
Module 3	Borehole Siting and Drilling Supervision Consultancy <ul style="list-style-type: none"> ■ Provides template of Terms of Reference which includes: <ul style="list-style-type: none"> ■ Description of the assignment ■ Supervisor's checklist ■ Deliverables and reporting requirements ■ Suggested Bill of Quantities for the consultancy services ■ Completion certificate templates ■ Includes template for UNICEF Agreement for Borehole Siting and Drilling Supervision Consultancy Services
Module 4	Terms of Reference for Borehole Drilling Works and Pump Supply and Installation <ul style="list-style-type: none"> ■ Includes overview of how to select and specify handpumps and assure their quality ■ Provides templates for: <ul style="list-style-type: none"> ■ Terms of Reference for Borehole Drilling Construction and Development of the Borehole ■ Terms of Reference for the Supply and Installation of Pumps ■ Provides Technical Specifications for the borehole and a suggested format for the borehole completion record
Module 5	UNICEF Request for Proposal for Services for Borehole Drilling Works <ul style="list-style-type: none"> ■ Follows the UNICEF frame of Request for Proposal for Services in VISION and advises on options and elements ■ Includes template Bill of Quantities for borehole drilling works

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Abbreviations and Acronyms

No.	Number
Q&A	Questions and answers
RFP	Request for Proposal
RFPS	Request for Proposal for Services
ToR	Terms of Reference

5.1 Introduction

The **UNICEF Toolkit for Planning, Contracting and Management of Borehole Drilling** (subsequently referred to as the **Toolkit**) has been developed to bring uniformity to practices and to guide UNICEF staff involved in borehole procurement and the supply of equipment, as well as contracting consultancy services for borehole siting and supervision. The **Toolkit** comprises five modules (see cover page).

Module 5 – Request for Proposal for Services (RFPS) provides guidance on how to customize the RFPS in VISION for the procurement of borehole drilling works. With Terms of Reference (ToR) developed, the RFPS process needs to define the framework of the solicitation and future collaboration with the supplier(s). The contract(s) that will be granted to the successful supplier(s) is(are) extracted from VISION.

The Request for Proposal for Services (RFPS) refers to the solicitation documents used for contracting of services in UNICEF. The structure of the RFPS is defined and extracted from VISION¹.

The first step in the RFPS process is to develop good Terms of Reference (ToRs). These are a section of the RFPS and detail all technical specifications. Module 4 of the **Toolkit** provides more information regarding TORs.

Module 5 of the **Toolkit** provides guidance on how to customize the RFPS in VISION for borehole procurement and construction:

HEADER TEXT – customized in VISION

COVER PAGE – customized in VISION

IMPORTANT – ESSENTIAL INFORMATION – customized in VISION

PROPOSAL FORM – customized in VISION

UNICEF SPECIAL TERMS AND CONDITIONS – customized to the project

INSTRUCTION TO BIDDERS – Generic information in VISION

GENERAL TERMS AND CONDITIONS (GTC) FOR SERVICES – Generic information in VISION

Note that the General Terms and Conditions (GTC) and Bidder instructions already exist in VISION and therefore do not have to be added. Module 4 and Module 5 of the **Toolkit** provide guidance for Annexes that are part of the RFPS as indicated in Table 5.1.

Advice regarding Prequalification and Shortlisting of Suppliers is given in the Toolkit Module 2, section 2.4.4. Guidance on the RFPS Evaluation Assessment Criteria for borehole drilling works is provided in the **Toolkit** Module 2, section 2.5.5.

¹ VISION refers to UNICEF's Virtual Integrated System of Information

Table 5.1 Where to find guidance on select RPFS sections and annexes

Title	Where to find guidance?
Terms of Reference for Borehole Drilling Works	Toolkit Module 4
Proposal Form	Toolkit Module 5, Proposal Form
Bill of Quantities	Toolkit Module 5, Annex 5.1
Instructions to Bidders	Toolkit Module 5, Annex 5.2
General Terms and Conditions for Services	Toolkit Module 5, Annex 5.3

5.2 Module Formatting

The **Toolkit** provides flexibility so that it can fit the circumstances of a particular project. It should be noted that national laws, standards and codes are to be adhered to, unless otherwise specified. Options for modification to some clauses to suit particular situations are shown with notes in ***[bold italics highlighted in grey]***. Advice and key elements (such as relevant principles) to take into consideration are highlighted in blue text boxes throughout the document (e.g. Box X).

Box X Sample box containing advice and key elements that should be taken into consideration

When commencing with an Invitation to bid, UNICEF procurement.....

5.3 Request for Proposal of Services – Template for Borehole Drilling Works

HEADER TEXT

The drilling, construction and development of ***[Insert number of boreholes]*** boreholes in ***[Insert the Districts]***, to be equipped with hand pumps and fully finished water abstraction points for the purpose of drinking water supplies

COVER PAGE

Interested Borehole Drilling Contractors are invited to submit their offers in a sealed envelope. Sealed Proposals should be sent/placed in the bid box (located in ***[Insert location]***). Proposals forwarded by mail or courier services must contain written instructions on the external envelope that allows the receiving mail agents to place the envelope in the bid box. The mailing address for Proposals is: ***[Insert mailing address]***

IMPORTANT – ESSENTIAL INFORMATION

Example 5.1 Extract of Important – Essential information, as customized in VISION

IMPORTANT - ESSENTIAL INFORMATION

The reference **RFPS-DAN-2017-502433** must be shown on the envelope containing the proposal. Proposals must be sent separately and must not be included in packages containing samples.


The Request for Proposal for Services form must be used when replying to this invitation. You are welcome to enclose your own specifications, if necessary.

Proposals must be received at the above address **by latest 16:00 hours (Copenhagen time) on 01 March 2017**. Request for Proposal for Services received after the stipulated date and time will be invalidated. The proposal will be publicly opened at 10:30 hours (Copenhagen time) on 03 March 2017.

It is important that you read all the provisions of the Request for Proposal for Services to ensure that you understand and comply with the UNICEF's requirements. Note that failure to submit compliant proposals may result in invalidation of your proposal.

PROPOSAL FORM

Example 5.2 Extract of Request for Proposal for Services Form, as customized in VISION



REQUEST FOR PROPOSAL FOR SERVICES FORM

This FORM must be completed, signed and returned to UNICEF.
Proposal must be made in accordance with the instructions contained in this Request for Proposal for Services (RFPS).

TERMS AND CONDITIONS OF CONTRACT
Any Contract resulting from this RFPS shall contain UNICEF General Terms and Conditions for Institutional and Corporate Contracts and any other Specific Terms and Conditions detailed in this RFPS.

INFORMATION
Any request for information regarding this RFPS must be forwarded by email to the person who prepared this document, with specific reference to the RFPS number.

The Undersigned, having read the Terms and Conditions of RFPS No. **RFPS-DAN-2017-502433** set out in the attached document, hereby offers to execute the services specified in this document.

Signature: _____

Date: _____

Name & Title: _____

Company: _____

Postal Address: _____

Tel No: _____

Fax No: _____

E-mail Address: _____

Currency of Proposal: _____

Validity of Proposal: _____

Please indicate which of the following Payment Terms are offered by you:

10 Days 3.0% _____ 15 Days 2.5% _____ 20 Days 2.0% _____ 30 Days Net _____ Other _____

UNICEF SPECIAL TERMS AND CONDITIONS

1. PROCEDURES AND RULES

1.1 Organizational Background

UNICEF is the agency of the United Nations mandated to advocate for the protection of children's rights, to help meet their basic needs and to expand their opportunities to reach their full potential. Guided by the Convention on the Rights of the Child, UNICEF strives to establish children's rights as international standards of behaviour towards children. UNICEF's role is to mobilize political will and material resources to help countries ensure a "first call for children". UNICEF is committed to ensuring special protection for the most disadvantaged children.

UNICEF carries out its work through its headquarters in New York, 8 regional offices and 125 country offices world-wide. UNICEF also has a research centre in Florence, a supply operation based in Copenhagen and offices in Tokyo and Brussels. UNICEF's 37 committees raise funds and spread awareness about the organizations mission and work.

1.2 Purpose of the Request for Proposal for Services

The purpose of this RFPS is to invite proposals for the drilling, construction and development of **[Insert number of boreholes]** boreholes in **[Insert the Districts]**, to be equipped with hand pumps and fully finished water abstraction points for the purpose of drinking water supplies.

The RFPS is open to experienced drilling Contractors who are legally registered in **[insert country]** with relevant licenses/permissions to drill in **[insert country]**.

Box 4.1 Advice with respect to prequalification

It is highly recommended that the country office has a list of prequalified suppliers, which includes verification of legally registered and relevant licenses/permissions (see Module 2, section 2.4.4 for more details on pre-qualification and shortlisting).

1.3 RFPS and Desirable Contract Implementation Schedule

The schedule of the tendering process and **targeted dates for execution** of this RFPS are as follows, subject to revision depending on the programme and partners' priority and availability:

1. Date and time of mandatory site visit(s): **[insert day and time]**
2. Last date to request clarifications/further information on RFPS: **[insert day and time]**
3. Contractor's pre-tender meeting for clarification: **[insert day and time]**
4. Written answers to the questions sent to contractors: **[insert day and time]**
5. Closing date of proposal (RFPS) submission: **[insert day and time]**
6. Contract award notification to selected institution/contractor: **[insert day and time]**
7. Completion of all contracted works as indicated in the Terms of Reference and this RFPS: approximately **[insert a period] after signing of Contract**. The actual work plan and schedule will be established based on the successful Proposal.

Box 4.2 Recommendations with respect to the bid duration, site visits and clarifications

Bid duration from publication to closing/opening should be a minimum of 3 weeks for noncomplex projects plus added time (minimum 1 week) for site visits and (minimum 1 week) for Clarifications. Clarifications should be done after the site visits to allow contractors to "digest" the information.

Different options are possible for site visits (i.e. visits to the locations where the boreholes are to be drilled):

- a. Visits under supervision of UNICEF
- b. Visits by contractors only

It is highly recommended that those visits are mandatory. In case of option b), it is then required to have a prove of visits (e.g. document stamped and signed by defined local authority).

Clarifications (Questions and Answers – Q&A) has to be taken in writing.

1.4 RFPS Clarification Policy

All requests for formal clarification or queries on this RFPS must be submitted in writing to **[insert]** or via e-mail to **[insert]@unicef.org** or via fax to **[insert]**. Please make sure that the e-mail or fax mentions the RFPS reference number.

A copy of the request for information should be emailed to **[insert]@unicef.org**

Please be informed that if the question is of common interest, the answer will be shared with all potential RFPS Institutions/Contractors.

Requests for additional information/clarifications should reach UNICEF **no later than [insert day and time]** and will not be considered if received after this date.

All efforts will be made to provide additional information expeditiously, and answers will be provided **no later than [insert day and time]**.

Bidders are expected to examine all instructions pertaining to the work. Failure to do so will be at the Bidder's own risk and disadvantage.

Box 4.3 Recommendations for publishing responses to clarifications

In the case of an open bidding process, responses to clarifications (i.e. questions and answers – Q&A) will also be published on UNICEF [Country office name] website. This is not necessary where bidding is done through by a shortlist of prequalified suppliers.

1.5 RFPS Response Format

The RFPS response shall be in accordance with the Instruction to Bidders of this RFPS. **Proposals received in any other manner will be invalidated.**

Full Proposals must be received no later than **[Insert time]** on **[Insert date]**.

Offers delivered in a different form than prescribed in this RFPS, or which do not respect the required confidentiality, or received after the designated time and date, will be rejected. Any delays encountered in the mail delivery will be at the risk of the Bidder.

All references to descriptive materials should be included in the appropriate response paragraph, though the material/documents themselves may be provided as annexes to the RFPS response.

The Bidder must also provide sufficient information in the response to address each area of the Proposal Evaluation Criteria as presented in the RPFS to allow the evaluation team to make a fair assessment of the candidates and their proposal.

Box 4.4 Recommendations for the language of the documents

Documents shall be written in _____ (e.g English/French). For convenience and practical purposes, some of the documents may be translated into _____ (e.g. Bahasa Indonesian). In case of discrepancies, the _____ (e.g English/French) version shall prevail.

1.6 Bidder's Response

1.6.1 Formal submission requirements

The formal submission requirements as outlined in this Request for Proposal for Services must be followed, e.g. regarding form and timing of submission, no price information in the technical proposal, etc.

1.6.2 Response Contents

The scanned copy of the RFPS Form shall be completed, duly signed and dated. The RFPS form must be submitted together with the response in hard copy in order to be accepted. E-mail responses will not be accepted.

Responses must be submitted in (4) four hard copies duly signed and dated, and accompanied by an electronic version of the Technical Proposal on a CD-ROM, flash/pen drive or any suitable electronic device and the Financial Proposal (Excel format) on another electronic device.

The response will be presented in an outer envelope, containing two inner envelopes.

The first inner envelope shall be marked "Technical Proposal", sealed and addressed in the same manner as the outer envelope, and shall contain all documentation and an electronic device with the soft version of the Technical Proposal. The Form "REQUEST FOR PROPOSAL OF SERVICES FORM" must be completed, signed and attached to the Technical Proposal.

The second inner envelope shall be marked "Financial Proposal", sealed and addressed in the same manner as the outer envelope. A separate electronic device with the soft version of the Financial Proposal must be included in the Financial Proposal's envelope.

Sealed Proposals received prior to the stated closing time, and date will be kept unopened in the bid box. The Officer of the bid Opening Committee will open Proposals at the specified time, and no Proposal received thereafter will be considered.

UNICEF will accept no responsibility for a premature opening of a Proposal, or for one which is not properly addressed or identified.

Modification of sealed Proposals already submitted in a sealed envelope will be considered if notice is received by fax, email or mail prior to the stated closing time and date. Neither the revised proposal nor any cost amendment/information shall be shared at this point, and the revised offer shall be placed into the bid box with clear references (Modified Version of RFPS **[insert code]** for Contractor **[insert number]**).

1.6.3 Mandatory Criteria

All mandatory criteria mentioned throughout this Request for Proposal for Services and Terms of Reference have to be addressed and met in the response.

1.6.4 Technical Proposal

The Technical Proposal should address all aspects outlined in this RFPS, paying close attention to the scope of work statement of work, technical specifications and evaluation criteria. The Terms of Reference set out the following:

1. Project Background
2. Description of the Assignment
3. Deliverables
4. Reporting Requirements
5. Location and Duration
6. Evaluation Process and Methods
7. Project Management
8. Payment
9. Annex – Technical Specifications
10. Annex – Format for Borehole Completion Record

The Bidders are free to propose innovative approaches that can meet the deliverables set out in the Terms of Reference as long as the completed works are in line with the technical specifications.

All references to materials should be included in the appropriate response paragraph, though the material/documents themselves may be provided as annexes to the proposal/response.

Technical Proposals must be complete and provide all relevant support documentation to enable the RFPS Evaluation Team to adequately assess and evaluate the proposal.

No financial information should be contained in the technical proposal.

1.6.5 Financial Proposal

The Financial Proposal must include costs for all the services to be provided, taking into consideration the Evaluation Criteria².

The currency of the proposal shall be in **[USD or local currency]**. The price is not subject to any adjustment or revision because of price or currency fluctuations.

The Bill of Quantities (Annex 5.1) forms the basis of the Financial Proposal and shall be priced. Contractors are requested to accept the payment schedule provided the ToR.

² Evaluation Criteria are developed for each RFPS. The Toolkit, Module 2, Table 2.5 provides an example.

Box 4.5 Recommendations for payment for completed boreholes

Payment for completed boreholes will be according to a bill of quantities based on the result of siting of the boreholes and the preliminary borehole design. Please refer to **Principle 6: Payment for boreholes** summarized below and detailed in the **Toolkit – Module 1: Introduction**, and adapt to local context.

Principle 6: Payment for boreholes

Payment for completed boreholes will be according to a bill of quantities based on the recommendations from the siting exercise and the preliminary borehole design, i.e. the probable borehole depth, diameter and lining materials and conditions of geological formations. Payments will be made as per the actual works done and quantities of materials used (rather than as a lump sum).

Where boreholes are declared unacceptable on completion of drilling through inadequate water either in quantity or quality but through no fault of the driller, the driller will be paid according to the measureable quantities of items of work completed up to the point of the borehole being declared unacceptable. This includes boreholes where geophysical surveys have been conducted and where boreholes do not have sufficient yield or safe water quality.

1.6.6 Bill of Quantities

The Bill of Quantities (Annex 5.1) provides a format for the bidders to set out the price for various items. Bidders should review the Technical Specifications and other sections of the bid documents to know the full scope of the requirements included in each item prior to filling in the rates and prices in the Bill of Quantities.

Rates and prices inserted in the Bill of Quantities should cover the Works, finished and complete in all respects. The Bidder should take full account in his/her rates and prices of all the requirements and obligations, expressed or implied in all parts of the Contract, together with all incidental and contingent expenses and risks of every kind involved in the proper construction of the Works. No claim for additional payment will be allowed for any error or misunderstanding in this respect.

The entered rates and prices shall be deemed to cover the full scope of Works, including overheads and profit.

If Bidders are unclear or uncertain as to the scope of any item, they should seek clarification prior to submitting their bid.

All drilling records, maps, drawings, photographs, plans, reports, recommendations and documents and all other data compiled by or received by the Drilling Contractor under this Contract shall be the property of the Client.

1.6.7 Price Proposal

The price proposal should be as per but not limited to the requirements contained in the scope of work and Terms of Reference of this RFPS.

Prices shall be filled in indelible ink, and any alterations necessary due to errors shall be initialled by the Bidder.

Prices shall be fixed and firm for the duration of the Contract. Prices shall be quoted in the manner indicated and in the currencies specified in the RFPS in the bidding documents. For each item, bidders shall complete each appropriate column in the respective Bills, giving the price breakdown as indicated in the Bill of Quantities. Prices given in the Bill of Quantities against each item shall be for the scope covered by that item as detailed in the Technical Specifications, including in drawings or elsewhere in the bidding documents.

Where there are differences between the total of the amounts given under the column for the unit rates and the amount given under the TOTAL, the former shall prevail and the latter will be corrected accordingly.

Where there are discrepancies between amounts stated in figures and amounts stated in words, the amounts stated in words shall prevail.

Items left blank will be deemed to have been included in other items. The TOTAL for each Schedule and the TOTAL of the Grand Summary shall be deemed to be the total price for executing the Works in accordance with the Contract, whether or not each individual item has been priced.

The Bill of Quantities will be checked for arithmetic error. Where an error is found, the bidder shall be informed of the discrepancy. If the bidder is not in agreement, the bid shall be dropped. Where the bidder is in agreement their written acceptance shall be part of the Contract document

No claim will be considered for further payment in respect of any work or method of execution which may be described in the Contract or is inherent in the construction of the Work as detailed in the drawings on account of:

- a) items having been omitted from the Bills of Quantities
- b) any omission from the wording of the items or from clauses
- c) no presentation of Certificate of Substantial Completion or Certificate of Final Completion

Payment shall be on the unit rate as in the bill of quantities. The drilling contractor shall be paid unit prices per metre in accordance with the actual depth drilled on the ratios as set out in the Bill of Quantities. The depths given in the Bill of Quantities are indicative only. The accuracy of the quantities given in the Bill of Quantities is not guaranteed, and quantities given should not be taken as a guide for ordering materials.

Unless expressly stated otherwise, all rates and prices entered in the Bills of Quantities will be deemed to have included the following:

- a) labour and all costs in connection with the execution of the Works and the correction of defects until the expiry of the defects liability period
- b) drilling, borehole development and pumping test equipment and all costs in connection with it
- c) sampling and testing materials and goods, testing workmanship, providing, storing, packing and transporting samples to and from the place of testing in accordance with the Specifications
- d) supplying, erecting, installing or placing of materials and goods in position
- e) safe disposal of surplus and unsuitable materials and goods and excavated materials, including stacking, storing, loading, transporting and unloadings
- f) cleaning and restoration of the site to its original state at the end of the works, including fixing any damage or alterations that may occurred to public or private property
- g) all general obligations, liabilities and risks involved in the execution and maintenance of the works set forth or reasonably implied in the documents on which the bid is based
- h) establishment charges, overheads and profit
- i) complying with all the requirements of the Contract Documents

The rates and prices inserted by the Bidder shall apply throughout the Contract to any location within the Contract and to any additional work ordered by the Client (e.g. additional boreholes or deeper boreholes).

The total quantity included in the final measurement of each item shall be measured to the nearest integer relative to that item, or to one decimal place if so indicated in the Bills of Quantities.

The sums inserted in the Bills of Quantities shall include for levelling, removing surplus material, providing and maintaining fencing and removal on completion, and access and drainage where specified, and for reinstating the Works areas to their original condition upon completion.

The Bidder is deemed to have included a record keeper in the price of personnel.

All prices/rates quoted must be exclusive of all taxes as UNICEF is a tax-exempt organization.

1.6.8 Travel Costs

The Institutions/Contractors will be responsible for their own travel costs to conduct the field visits.

1.6.9 Other considerations

The Bidder shall be deemed to have taken into account all of the following in his/her bid prices and his/her construction programme:

- a) all recognized holidays, festivals, religious and other customs
- b) the weather conditions in the anticipated drilling period

1.7 Confidential Information

Information which the Bidder considers proprietary should be clearly marked "proprietary", if any, next to the relevant part of the text, and UNICEF will treat such information accordingly.

1.8 Rights of UNICEF

UNICEF reserves the right to accept any proposal, in whole or in part; or, to reject any or all proposals. UNICEF reserves the right to invalidate any Proposal received from a Bidder who has previously failed to perform properly or complete contracts on time, or a Proposal received from a Bidder who, in the opinion of UNICEF, is not in a position to perform the contract. UNICEF shall not be held responsible for any cost incurred by the Bidder in preparing the response to this Request for Proposal for Services. The Bidder agrees to be bound by the decision of UNICEF as to whether their proposal meets the requirements stated in this Request for Proposal for Services. Specifically, UNICEF reserves the right to:

- split the award among multiple contractors if benefits to be gained are in the interest of the Project or UNICEF and if the actual completion can be achieved in a shorter time (this will require a process of negotiation with respect to the costs of mobilization to base camp)
- contact any or all references supplied by the Bidder(s)
- request additional supporting or supplementary data (from the Bidder[s])
- arrange interviews with the Bidder(s)
- visit and inspect the contractor's premises
- reject any or all proposals submitted
- accept any proposals in whole or in part
- negotiate with the service provider(s) who has/have attained the best rating/ranking, i.e. the one(s) providing the overall best value proposal(s)
- contract any number of bidders as required to achieve the overall evaluation objectives

1.9 Limitations on Subcontracting and Substitution of CVs

All substitution of CVs (personnel) must be authorized by the Client. Subcontracting is limited to 30% of the contract's total amount and must first be authorized by the Client. The Bidder shall indicate if he/she intends to subcontract any part of the works and, if so, clearly define which items, as detailed in the Bill of Quantities they are referring to. Bidder(s) shall list the names and addresses of his/her proposed subcontractors and the

works to be performed by each, temporary facilities to be provided by each, with full description, availability, location and condition of each major piece of equipment.

The proposed subcontractor's company profile in accordance with the evaluation criteria and previous experiences of similar works shall also be listed in the technical proposal. The Contractor shall obtain the prior written approval and clearance of Clients for all sub-contractors.

The approval of the Client of a sub-contractor shall not relieve the Contractor of any of its obligations under this Contract. The terms of any sub-contract shall be subject to and in conformity with the provisions of this Contract. Where such an Agreement is entered into, the Client shall be charged at the cost rate for the subcontractor services. Were Contractor(s) found to have received any profit from such an Agreement, such action would constitute breach of this Contract.

1.10 Proposal Opening

Due to the nature of this RFPS, there will be no public opening of proposals.

1.11 Property of UNICEF

This RFPS, along with any responses there to, shall be considered the property of UNICEF, and the proposals will not be returned to their originators.

1.12 Validity

The Proposal must be valid for a minimum of **ninety days (90)** days from the date of opening of this RFPS and must be signed by an authorized representative of the legal entity submitting the proposal. Bidders are requested to indicate the validity period of their proposal in the Proposal Form. UNICEF may also request for an extension of the validity of the proposal.

1.13 Full right to use and sell

The Bidder warrants that he/she has not and shall not enter into any agreement or arrangement that restrains or restricts UNICEF rights to use, sell, dispose of or, otherwise, deal with any service or outcome that may be acquired under any resulting Contract.

1.14 Payment Terms

Payment will be made only upon UNICEF's acceptance of the work performed. The terms of payment are net 30 days after receipt of invoice and acceptance of work. Payment will be effected by bank transfer in the currency of billing.

Financial proposals should include any offered discounts based on earlier payment, if available. The Bidder may offer early payment discounts, i.e. payment within a specific period of time faster than UNICEF's standard payment terms of 30 days.

1.15 Payments for Variations

The Drilling Contractor shall provide the Designated Representative with a quotation for carrying out the Variation when requested by the Designated Representative. The Designated Representative shall assess the quotation, which shall be given within seven days of the request.

If the work in the Variation corresponds with an item in the Bill of Quantities, the rate in the Bill of Quantities shall be used.

If the Drilling Contractor's quotation is unreasonable, the Designated Representative may order the Variation and make a change to the contract price which shall be based on the Designated Representative's own forecast of the effects of the Variation on the Contractor's costs.

1.16 Late Delivery

Without limiting any other rights or obligations of the parties hereunder, if the contractor is unable to deliver the services by the delivery date stipulated in the Contract, the contractor shall:

- immediately consult with UNICEF to determine the most expeditious means for delivering the services
- and (ii) use an expedited means of delivery, at the contractor's cost, if reasonably so requested by UNICEF

1.17 Failure to Perform

In case of failure by the contractor to perform under the terms and conditions of the Contract, UNICEF may, after giving the contractor reasonable notice to perform and without prejudice to any other rights or remedies, exercise one or more of the following rights:

- a) procure all or part of the services from other sources, in which event UNICEF may hold the contractor responsible for any excess cost occasioned thereby. In exercising such rights UNICEF shall mitigate its damages in good faith;
- b) refuse to accept delivery of all or part of the services;
- c) terminate the Contract without any liability for termination charges or any other liability of any kind;
- d) for late delivery of services or for services which do not meet UNICEF's Terms of Reference and are therefore rejected by UNICEF, UNICEF will claim liquidated damages from the contractor and deduct 0.5% of the value of the services pursuant to a Contract per additional day of delay, up to a maximum of 10% of the value of the Contract. The payment or deduction of such liquidated damages shall not relieve the contractor from any of its other obligations or liabilities pursuant to this Contract.

1.18 Contractual Terms and Conditions

The UNICEF General Terms and Conditions for Services are attached and will form part of any contract resulting from this RFPS.

1.19 Conflict of Interest

In respect of all aspects of the RFPS, the Bidder must disclose to UNICEF any situation that may constitute an actual or potential conflict of interest or could reasonably be perceived as a conflict of interest. In particular, the Bidder must disclose to UNICEF if:

- a) it or any of its affiliates is, or has been in the past, associated with an organisation that has been engaged by UNICEF to provide services for the preparation of the design, specifications, Terms of Reference, cost analysis/estimation, and other documents to be used for the procurement of the services requested under this RFPS;
- b) it has been involved in the preparation and/or design of the programme/project related to the services requested under this RFPS;
- c) any UNICEF official or professional under contract with UNICEF has an interest of any kind in the Bidder's business or any kind of economic ties with the Bidder (whether directly or indirectly);
- d) any of the Bidders' owners, part-owners, officers, directors, controlling shareholders or other key

- personnel have close family ties with any UNICEF staff or professional under contract with UNICEF; or
- e) there are any other circumstances that could potentially lead to actual or perceived conflict of interest or unfair competition practices.

In order to avoid any actual or perceived conflict of interest and in accordance with best public procurement practice, the vendor awarded the contract for these services (and its affiliates) will not be entitled to bid in response to any request for proposals issued subsequent to and in consequence of the services contemplated by this RFPS. For this purpose, "affiliates" includes any entity that directly or indirectly controls the vendor, is controlled by the vendor or is under common control with the vendor.

If the Bidder is uncertain as to whether a situation constitutes a potential, perceived or actual conflict of interest, he/she must disclose the situation to UNICEF.

All Bidders found to have a conflict of interest may, depending on the nature of the conflict of interest, and at UNICEF's sole discretion, be disqualified from this RFPS process.

1.20 Ethics, Unethical Behaviour, Corrupt and Fraudulent Practices

UNICEF strictly enforces a policy of zero tolerance concerning unethical, unprofessional or fraudulent acts. Accordingly, companies or individuals that are found to have undertaken unethical, unprofessional or fraudulent activities will be suspended or forbidden from business relations with UNICEF.

UNICEF requires that all Institutions/Contractors associated with this Request for Proposal observe the highest standard of ethics during procurement and execution of the work, fully complying with international Codes of Conduct and in particular, but without limiting the foregoing, Institutions/Contractors are expected to conduct themselves in a manner consistent with the Standards of Conduct in the International Civil Service, UNICEF Standards of Electronic Conduct and the requirements set forth in the Secretary General's Bulletin on Special Measures for Protection from Sexual Exploitation and Sexual Abuse, which are incorporated by reference into the contract between the Institution and UNICEF.

1.21 Guidelines on Gifts and Hospitality

Institutions/Contractors shall not offer gifts or hospitality to UNICEF staff members. Recreational trips to sporting or cultural events, theme parks or offers of holidays, transportation, or invitations to lunches or dinners are also prohibited.

In pursuance of these policies UNICEF defines for the purpose of this provision the terms set forth as follows:

1. Corrupt practice means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in the execution of a contract.
2. Fraudulent practice means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the client, and includes collusive practice among Institutions/Contractors (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the client of the benefits of free and open competition.
3. UNICEF will reject a proposal for award if it determines that the selected contractor(s) have engaged in any corrupt or fraudulent practices in competing for the contract in question.
4. UNICEF will declare a contractor ineligible, either indefinitely or for a stated period of time, to be awarded a UNICEF-financed contract if at any time it determines that it has engaged in any corrupt or fraudulent practices in competing for or in executing a UNICEF-financed contract.

1.22 Award Notification (at discretion of Country Office)

[Insert Country Office publishing procedures for award notification].

1.23 Fossils and Cultural Heritage.

Any fossils, coins, articles of value or antiquity and structures or things of geological, archaeological or cultural interest discovered on site shall, for the purpose of this Contract, be deemed to be the property of UNICEF. The Contractor shall take all reasonable precautions to prevent removal or damage to any such article or thing, and shall immediately notify UNICEF of such discovery. UNICEF shall, in each case, decide on course of action for dealing with what has been discovered.

1.24 Checklist for submission of proposals

- ☐ Envelope for **technical proposal**
 - Technical proposal [it does not contain prices]
 - CD, Flash disk or any suitable device with electronic files
 - Request for Proposal for Services (RPFS) PROPOSAL FORM filled in and signed
 - Envelope is sealed
 - Envelope is marked as follows:
 - Name of company, RPFS number and subject, opening date and time, “Technical Proposal”
- ☐ Envelope for **Financial Proposal**
 - Financial proposal
 - CD, Flash disk or any suitable device
 - Envelope is sealed
 - Envelope is marked as follows:
 - Name of company, RPFS number and subject, opening date and time, “Financial Proposal”
- ☐ 1 outer enveloped
 - Containing
 - ☐ Technical Proposal Envelope
 - ☐ Financial Proposal Envelope
 - Envelope is sealed
 - Envelope is marked with details of the RPFS

INSTRUCTIONS TO BIDDERS

The instructions to bidders, which are standard from VISION, are reproduced in Annex 5.2

GENERAL TERMS AND CONDITIONS

The General Terms and Conditions (Version 2017), which are standard from VISION, are reproduced in Annex 5.3

Annexes – Toolkit Module 5

Annex 5.1 Bill of Quantities

See table below for further guidance.

No	Description	Unit	Qty	Unit rate [insert currency]	Amount [insert currency]
1	Mobilisation / Demobilisation				
1.1	Mobilisation from place of origin to the project area	LS			
1.2	Demobilisation from the project area to the place of origin	LS			
1.3	Moving between drill sites	km			
2	Borehole Siting <i>[Delete if not applicable]</i>				
2.1	Hydrogeological investigation in sedimentary terrain	LS			
2.2	Hydrogeological investigation and geophysical survey in basement complex	LS			
3	Borehole Drilling <i>[Delete any of the scenarios below if not applicable]</i>				
3.1	Drilling in overburden and unconsolidated sedimentary formations for the installation of nominal 110mm diameter casing and screen	m			
3.2	Drilling in compacted sediments for the installation of nominal 110mm diameter casing and screen	m			
3.3	Drilling in alluvial deposits for the installation of nominal 110mm diameter casing and screen	m			
3.4	Drilling in hard rock formations for the installation of nominal 110mm diameter casing and screen	m			
4	Borehole lining and installation				
4.1	Supply and installation of nominal 110 mm diameter PVC casings	m			
4.2	Supply and installation of nominal 110 mm diameter PVC screen	m			
4.3	Supply and installation of gravel pack or filter pack	m ³			
4.4	Backfill borehole annulus	no.			
4.5	Supply cement, mix and place grout as specified	No.			
4.6	Backfill and seal abortive borehole as directed by the Supervisor	no			
5	Well development, pumping test, water quality analysis and well cap				

No	Description	Unit	Qty	Unit rate [insert currency]	Amount [insert currency]
5.1	Carry out cleaning, development by jetting and airlifting	hour			
5.2	Carry out pumping test and recovery measurements as specified	no			
5.3	Carry out water quality analysis	no			
5.4	Supply and install well cap as specified	no			
6	Civil Works, installation of handpumps and disinfection				
6.1	Construction of civil works	no			
6.2	Supply and installation of handpumps to maximum depth of [insert] m in communities	m			
6.3	Carry out borehole and handpump disinfection	no			
7	Set of Tools and Manuals				
7.1	Provide training for community members, area pump menders and District Council members (as appropriate)	no			
7.2	Supply set of tools and manuals for area pump menders and caretakers (as appropriate) as per UNICEF specifications	no			
7.3	Training of Pump Caretakers and Water User's Committee members	no			
8	Reporting requirements				
8.1	Prepare and submit final borehole completion reports as specified	copy			
Total USD					

Guidance for Bill of Quantities

The table below provides guidance with respect to each item in the Bill of Quantities. This may be included in the RPFS to provide clarification for bidders.

Item	Description
1 Mobilisation / Demobilisation	
1.1 Mobilisation from place of origin to the project area AND 1.2 Demobilisation from the project area to the place of origin	<p>The lump sum covers the mobilization to the drilling area including transport of the drilling unit and all other equipment, plant and materials from the point of origin to the base camp area and movements between sites within the project area. The necessary insurances of the whole equipment, plant and materials are included in the lump sum.</p> <p>The lump sum covers demobilization, including striking the base camp, cleaning the site of the base camp and transport of the drilling unit and all other equipment, plant and materials from the base camp to the next base camp or to the place of origin. The necessary insurances of the whole equipment, plant and materials are included in the lump sum. The mobilisation cost shall also include the cost of obtaining all the necessary permits.</p>
1.3 Moving between drill sites	The Drilling Contractor shall be paid a unit rate for moving all equipment, vehicles, supplies and plant associated with the drilling unit for a move to the next drill site and for setting up at the next drill site.
2 Borehole Siting	
2.1 Hydrogeological investigation in sedimentary terrain AND 2.2 Hydrogeological investigation and geophysical survey in basement complex	Where siting is the responsibility of the Drilling Contractor, the contractor shall be paid a lump sum for each site completed and the report approved by the Supervisor. The Client shall not pay for unnecessary geophysics.
3 Borehole Drilling	
	The Drilling Contractor shall be paid unit prices per metre in accordance with the depth drilled as set out in the bill of quantities. The unit prices per metre shall include all costs associated with the drilling, drilling water, drilling additives, surface casing, collection of drill cutting samples, gravel packing and development, and preparation of daily drilling reports. The Drilling Contractor shall be paid in accordance with the actual depth drilled on the rates set out in the bill of quantities. The depths given in the bill of quantities are indicative only.
3.1 Drilling in unconsolidated and sedimentary formations	Drilling in unconsolidated and sedimentary formations the drilling will require a mud rotary technique. Temporary casing may be required in the upper horizons.
3.2 Drilling in basement rocks and compacted sediments	Drilling in basement rocks and compacted sediments – in some situations, the upper weathered zone may be unstable and will require temporary casing; the upper section must then be drilled at appropriate diameter for installation of temporary casing which will allow completion of the borehole. Note: the drilling diameter refers to the lower section of the borehole and not the upper section.

4 Borehole lining and installation	
4.1 Supply and installation of nominal 110 mm diameter PVC casings	The price covers supply and installation per metre of nominal 110mm diameter PVC casing with flush threaded joints.
4.2 Supply and installation of nominal 110 mm diameter PVC screen	The price covers supply and installation per metre of 110 mm diameter PVC screens, slots 0.25 mm, 0.5 mm and 1 mm with flush threaded joints.
4.3 Supply and installation of gravel pack or filter pack	The price covers supply and installation of well sorted, well washed rounded silica gravel without micas, clays or other weathering products or contaminants. The price is per borehole.
4.5 Backfill borehole annulus AND 4.6 Supply cement, mix and place grout as specified	Complete the borehole with impervious clay plug and cement grout into the borehole annulus to form the sanitary seal. The price shall be per borehole.
5 Well development , pumping test, water quality analysis and well cap	
5.1 Carry out cleaning, development by jetting and airlifting	The price shall be lump sum and shall be paid when the supervisor certifies adequate development, i.e. when the water is clear and sand-free.
5.2 Carry out pumping test and recovery measurements as specified	The price shall be per borehole.
5.3 Carry out water quality test	Water quality test shall be carried out in laboratories approved by the supervisor
6. Civil works and Installation of handpumps	
6.1 Construction of civil works	The construction of the civil works concrete platform is to be carried out as specified in the technical specifications. The price covers all activities.
6.2 Supply and installation of handpumps to maximum depth of [inset] m in communities	The installation must be carried out as in the technical specifications.

Annex 5.2 Instructions to Bidders (Version: RFPS-DAN -2017-502433)

1. MARKING AND RETURNING OFFERS

- 1.1 Offers shall be submitted in the manner indicated in the cover page of this document.
- 1.2 The Bid Form must be signed, and submitted together with the offer. The Bid Form should be signed by the duly authorized representative of the submitting company.
- 1.3 Proposers should note that offers received in the following manners will be invalidated:
 - a) without the Bid number;
 - b) with incorrect address than prescribed in the Bid documents;
 - c) in a different form than prescribed in the Bid documents;
 - d) do not follow the required confidentiality;
 - e) received after the stipulated closing time and date;
 - f) failure to quote in the currency stated in the Bid documents.

1.4 SEALED OFFERS

- 1.4.1 Sealed Offers must be securely closed in the suitable envelope, clearly MARKED on the outside with the BID NUMBER, and despatched to arrive at the UNICEF office NO LATER THAN the indicated CLOSING TIME AND DATE.
- 1.4.2 Technical Offer and Financial Offer must be sent in separate envelopes clearly indicated with the BID NUMBER, COMPANY NAME and a) Technical offer or b) Financial offer.
- 1.4.3 The Technical and Financial offers in response to the Request for Proposal (for Services)_ must be delivered in three (3) copies each unless otherwise specified in the Specific Terms and Conditions.
- 1.4.4 The Bid Form must be signed, and submitted together with the offer. The Bid Form should be signed by the duly authorized representative of the submitting company.

2. OPENING OF OFFERS

- 2.1 In case when a Public Opening is held, the invited proposers, or their authorized representative, may attend the public bid opening at the time, date and location specified in the -bid documents. Proposers should note that the Bid Opening is the only time and place where information related to pricing from competitors is available.

3. REQUEST FOR INFORMATION

- 3.1 Any request for information regarding the specifications should be sent to the Contracting Officer indicated in this Bid document, and NOT to the Bid Section.
- 3.2 Inquiries received less than seven (7) calendar days prior to the Proposal closing date cannot be guaranteed any response. Only written inquiries will be entertained.

4. ERROR IN OFFERS

- 4.1 Proposers are expected to examine all requirements and instructions pertaining to the work or Bid. Failure to do so will be at Proposers own risk.

5. CORRECTIONS

- 5.1 Erasures or other corrections in the offer must be explained with the signature of the Proposer shown alongside.

6. MODIFICATION AND WITHDRAWAL

- 6.1 All changes to an offer must be received prior to the closing time and date. It must be clearly indicated that it is a modification and supersedes the earlier offer, or state the changes from the original offer.
- 6.2 Offers may be withdrawn on e-mailed, faxed or written request received from Proposers prior to the closing time and date. Negligence on the part of the Proposer confers no right for the withdrawal of the offer after it has been opened.

7. VALIDITY OF OFFERS

- 7.1 Offers should be valid for a period of not less than 90 days after bid opening, unless otherwise specified in the Specific Terms and Conditions. Proposers are requested to indicate the validity period of their offer. UNICEF may request the validity period to be extended.

8. INCOTERMS (if applicable)

- 8.1 Failure to quote in accordance with the requested INCOTERMS may result in invalidation of the Proposal.

9. COUNTRY OF ORIGIN (if applicable)

- 9.1 Items produced in countries other than that of the Bidder must be indicated, stating the country of origin. Bidders may be required to submit a Certificate of Origin of Goods issued by the Chamber of Commerce or other equivalent authority.

10. SUPPLIER REGISTRATION AND EVALUATION

- 10.1 UNICEF is part of the United Nations Global Marketplace (UNGM). Accordingly, all bidders must apply to become a UNICEF supplier and this is done via the UNGM website at <http://www.ungm.org>. The assessment of the application is based on the relevance of the products to UNICEF. Please note that a UNGM registration should be completed as soon as possible, and before an award can be made.

11. ANSWERING SHEETS

Only the forms and sheets provided in the bid documents should be used to present the various aspects of the Proposal. Supplemental information can be provided on each of the answering sheets when requested in the bid documents.

12. Bid document TERMS

The bid documents, along with any Proposal thereto, shall be considered the property of UNICEF and the Offers will not be returned to their originators.

In submitting the offer, the Proposer agrees to acceptance of the decision of UNICEF as to whether the offer meets the minimum requirements stated in the bid documents; and the evaluation.

Information provided in the offer will be treated as confidential unless otherwise noted by the Proposer.

13. RIGHTS OF UNICEF

- 13.1 UNICEF reserves the right to INVALIDATE any offer for reasons mentioned above, and, unless otherwise specified by UNICEF or by the Bidder, to accept any item in the offer.
- 13.2 UNICEF reserves the right to INVALIDATE any offer received from a Bidder who, in the opinion of UNICEF, is not in a position to perform the contract.

Annex 5.3 UNICEF Generic Terms and Conditions for Services May 5th 2017

1. DEFINITIONS AND UNICEF SUPPLY WEBSITE

1.1 In these General Terms and Conditions (Services), the following terms have the following meaning:

- (a) “Affiliates” means, with respect to the Contractor, any of its corporate affiliates or associates, including parent entities, subsidiaries, and other entities in which it owns a substantial interest.
- (b) “Confidential Information” means information or data that is designated as confidential at the time of exchange between the Parties or promptly identified as confidential in writing when furnished in intangible form or disclosed orally, and includes information, the confidential or proprietary nature of which, is or should be reasonably apparent from the inherent nature, quality or characteristics of such information.
- (c) “Contract” means the services contract that incorporates these General Terms and Conditions of Contract (Services). It includes contracts for services issued by UNICEF, whether or not they are issued under a long-term arrangement or similar contract.
- (d) “Contractor” means the contractor named in the Contract.
- (e) “Deliverables” means the work product and other output of the Services required to be delivered by Contractor as part of the Services, as specified in the relevant section of the Contract.
- (f) “Disabling Code” means any virus, back door, timer or other limiting routine, instruction or design, or other malicious, illicit or similar unrequested code that may have the consequence (whether by design or unintentionally) of disrupting, disabling, harming, circumventing security controls or otherwise impeding in any manner the normal operation or performance of (i) any software or service or (ii) any UNICEF information system or network.
- (g) “End User” means, in the event that the Services or Deliverables involve the use of any information systems, any and all UNICEF employees, consultants and other personnel and any other external users collaborating with UNICEF, in each case, authorized by UNICEF to access and use the Services and/or Deliverables.
- (h) “Fee” is defined in Article 3.1.
- (i) “Host Government” means a Government with which UNICEF has a programme of development cooperation, and includes a Government of a country in which UNICEF provides humanitarian assistance.
- (j) Contractor’s “Key Personnel” are: (i) Personnel identified in the proposal as key individuals (as a minimum, partners, managers, senior auditors) to be assigned for participation in the performance of the Contract; (ii) Personnel whose resumes were submitted with the proposal; and (iii) individuals who are designated as key personnel by agreement of the Contractor and UNICEF during negotiations.
- (k) “Parties” means the Contractor and UNICEF together and a “Party” means each of the Contractor and UNICEF.
- (l) Contractor’s “Personnel” means the Contractor’s officials, employees, agents, individual sub-contractors and other representatives.
- (m) “Security Incident” means, with respect to any information system, service or network used in the delivery of the Services or Deliverables, one or more events that (a) indicates that the security of such information system, service, or network may have been breached or compromised and (b) that such breach or compromise could very likely compromise the security of UNICEF’s Confidential Information or weaken or impair UNICEF’s operations. Security Incident includes any actual, threatened or reasonably suspected unauthorized access to, disclosure of, use of or

acquisition of UNICEF Data that compromises the security, confidentiality, or integrity of the UNICEF Data, or the ability of UNICEF or End Users to access the UNICEF Data.

- (n) “Services” means the services specified in the relevant section of the Contract.
 - (o) “UNICEF Data” means any and all information or data in digital form or processed or held in digital form that (a) are provided to the Contractor by, or on behalf of, UNICEF and/or End Users under the Contract or through UNICEF’s and/or End Users’ use of the Services or in connection with the Services, or (b) are collected by the Contractor in the performance of the Contract.
 - (p) “UNICEF Supply Website” means UNICEF’s public access webpage available at http://www.unicef.org/supply/index_procurement_policies.html, as may be updated from time to time.
- 1.2 These General Terms and Conditions of Contract, UNICEF’s Policy Prohibiting and Combatting Fraud and Corruption, the UNICEF’s Policy on Conduct Promoting the Protection and Safeguarding of Children, the UN Supplier Code of Conduct and UNICEF’s Information Disclosure Policy referred to in the Contract, as well as other policies applicable to the Contractor, are publicly available on the UNICEF Supply Website. The Contractor represents that it has reviewed all such policies as of the effective date of the Contract.
- 2. PROVISION OF SERVICES AND DELIVERABLES; CONTRACTOR’S PERSONNEL; SUB-CONTRACTORS**
- Provision of Services and Deliverables**
- 2.1 The Contractor will provide the Services and deliver the Deliverables in accordance with the scope of work set out in the Contract, including, but not limited to, the time for delivery of the Services and Deliverables, and to UNICEF’s satisfaction. Except as expressly provided in the Contract, the Contractor will be responsible at its sole cost for providing all the necessary personnel, equipment, material and supplies and for making all arrangements necessary for the performance and completion of the Services and delivery of the Deliverables under the Contract.
- 2.2 The Contractor acknowledges that, other than as expressly set out in the Contract, UNICEF will have no obligation to provide any assistance to the Contractor and UNICEF makes no representations as to the availability of any facilities, equipment, materials, systems or licenses which may be helpful or useful for the fulfillment by the Contractor of its obligations under the Contract. If UNICEF provides access to and use of UNICEF premises, facilities or systems (whether on site or remotely) to the Contractor for the purposes of the Contract, the Contractor will ensure that its Personnel or sub-contractors will, at all times (a) use such access exclusively for the specific purpose for which the access has been granted and (b) comply with UNICEF’s security and other regulations and instructions for such access and use, including, but not limited to, UNICEF’s information security policies. The Contractor will ensure that only those of its Personnel that have been authorized by the Contractor, and approved by UNICEF, have access to UNICEF’s premises, facilities or systems.
- 2.3 The Contractor will use its best efforts to accommodate reasonable requests for changes (if any) to the scope of work of the Services or time for provision of the Services or delivery of the Deliverables. If UNICEF requests any material change to the scope of work or time for delivery, UNICEF and the Contractor will negotiate any necessary changes to the Contract, including as to the Fee and the time schedule under the Contract. Any such agreed changes will become effective only when they are set out in a written amendment to the Contract signed by both UNICEF and the Contractor. Should the Parties fail to agree on any such changes within thirty (30) days, UNICEF will have the option to terminate the Contract without penalty notwithstanding any other provision of the Contract.
- 2.4 The Contractor will neither seek nor accept instructions from any entity other than UNICEF (or entities authorized by UNICEF to give instructions to the Contractor) in connection with the provision of the Services or development and delivery of the Deliverables.
- 2.5 Title to any equipment and supplies which may be provided to the Contractor by UNICEF, will remain with UNICEF. Such equipment and supplies will be returned to UNICEF at the conclusion of the Contract

or when no longer needed by the Contractor in the same condition as when they were provided to the Contractor, subject to normal wear and tear. The Contractor will pay UNICEF the value of any loss of, damage to, or degradation of, the equipment and supplies beyond normal wear and tear.

Non-conforming Services and Consequences of Delay

- 2.6 If the Contractor determines it will be unable to provide the Services or deliver the Deliverables by the date stipulated in the Contract, the Contractor will (i) immediately consult with UNICEF to determine the most expeditious means for delivery of the Services and/or Deliverables; and (ii) take necessary action to expedite delivery of the Services and/or Deliverables, at the Contractor's cost (unless the delay is due to force majeure as defined in Article 6.8 below), if reasonably so requested by UNICEF.
- 2.7 The Contractor acknowledges that UNICEF may monitor the Contractor's performance under the Contract and may at any time evaluate the quality of the Services provided and the Deliverables to determine whether or not the Services and Deliverables conform to the Contract. The Contractor agrees to provide its full cooperation with such performance monitoring and evaluation, at no additional cost or expense to UNICEF, and will provide relevant information as reasonably requested by UNICEF, including, but not limited to, the date of receipt of the Contract, detailed status updates, costs to be charged and payments made by UNICEF or pending. Neither the evaluation of the Services and Deliverables, nor failure to undertake any such evaluation, will relieve the Contractor of any of its warranty or other obligations under the Contract.
- 2.8 If the Services or Deliverables provided by the Contractor do not conform to the requirements of the Contract or are delivered late or incomplete, without prejudice to any of its other rights and remedies, UNICEF can, at its option:
 - (a) by written notice, require the Contractor, at the Contractor's expense, to remedy its performance, including any deficiencies in the Deliverables, to UNICEF's satisfaction within thirty (30) days after receipt of UNICEF's notice (or within such shorter period as UNICEF may determine, in its sole discretion, is necessary as specified in the notice);
 - (b) require the Contractor to refund all payments (if any) made by UNICEF in respect of such non-conforming or incomplete performance;
 - (c) procure all or part of the Services and/or Deliverables from other sources, and require the Contractor to pay UNICEF for any additional cost beyond the balance of the Fee for such Services and Deliverables;
 - (d) give written notice to terminate the Contract for breach, in accordance with Article 6.1 below, if the Contractor fails to remedy the breach within the cure period specified in Article 6.1 or if the breach is not capable of remedy;
 - (e) require the Contractor to pay liquidated damages as set out in the Contract.
- 2.9 Further to Article 11.5 below, the Contractor expressly acknowledges that if UNICEF takes delivery of Services or Deliverables that have been delivered late or otherwise not in full compliance with the requirements of the Contract, this does not constitute a waiver of UNICEF's rights in respect of such late or non-compliant performance.

Contractor's Personnel and Sub-Contractors

- 2.10 The following provisions apply with regard to the Contractor's Personnel:
 - (a) The provisions of Article 7 (Ethical Standards) will apply to the Contractor's Personnel as expressly stated in Article 7.
 - (b) The Contractor will be responsible for the professional and technical competence of the Personnel it assigns to perform work under the Contract and will select professionally qualified, reliable and competent individuals who will be able to effectively perform the obligations under the Contract

- and who, while doing so, will respect the local laws and customs and conform to a high standard of moral and ethical conduct.
- (c) The qualifications of any Personnel whom the Contractor may assign or may propose to assign to perform any obligations under the Contract will be substantially the same as, or better than, the qualifications of any personnel originally proposed by the Contractor.
 - (d) At any time during the term of the Contract, UNICEF can make a written request that the Contractor replace one or more of the assigned Personnel. UNICEF will not be required to give an explanation or justification for this request. Within seven (7) working days of receiving UNICEF's request for replacement the Contractor must replace the Personnel in question with Personnel acceptable to UNICEF. This provision also extends to Personnel of the Contractor who have "account manager" or "relationship manager" type functions.
 - (e) If one or more of Contractor's Key Personnel become unavailable, for any reason, for work under the Contract, the Contractor will (i) notify the UNICEF contracting authority at least fourteen (14) days in advance; and (ii) obtain the UNICEF contracting authority's approval prior to making any substitution of Key Personnel. In notifying the UNICEF contracting authority, the Contractor will provide an explanation of the circumstances necessitating the proposed replacement(s) and submit justification and qualification of replacement Personnel in sufficient detail to permit evaluation of the impact on the engagement.
 - (f) The approval of UNICEF of any Personnel assigned by the Contractor (including any replacement Personnel) will not relieve the Contractor of any of its obligations under the Contract. The Contractor's Personnel, including individual sub-contractors, will not be considered in any respect as being the employees or agents of UNICEF.
 - (g) All expenses of the withdrawal or replacement of the Contractor's Personnel will, in all cases, be borne exclusively by the Contractor.
- 2.11 The Contractor will obtain the prior written approval and clearance of UNICEF for all institutional sub-contractors it proposes to use in connection with the Contract. The approval of UNICEF of a sub-contractor will not relieve the Contractor of any of its obligations under the Contract. The terms of any sub-contract will be subject to, and will be construed in a manner that is fully in accordance with, all of the terms and conditions of the Contract.
- 2.12 The Contractor confirms that it has read UNICEF's Policy on Conduct Promoting the Protection and Safeguarding of Children. The Contractor will ensure that its Personnel understand the notification requirements expected of them and will establish and maintain appropriate measures to promote compliance with such requirements. The Contractor will further cooperate with UNICEF's implementation of this policy.
- 2.13 The Contractor will supervise its Personnel and sub-contractors and will be fully responsible and liable for all Services performed by its Personnel and sub-contractors and for their compliance with the terms and conditions of the Contract.
- 2.14 The Contractor will comply with all applicable international standards and national labor laws, rules and regulations relating to the employment of national and international staff in connection with the Services, including, but not limited to, laws, rules and regulations associated with the payment of the employer's portions of income tax, insurance, social security, health insurance, worker's compensation, retirement funds, severance or other similar payments. Without limiting the provisions of this Article 2 or Article 4 below, the Contractor will be fully responsible and liable for, and UNICEF will not be liable for (a) all payments due to its Personnel and sub-contractors for their services in relation to the performance of the Contract; (b) any action, omission, negligence or misconduct of the Contractor, its Personnel and sub-contractors; (c) any insurance coverage which may be necessary or desirable for the purpose of the Contract; (d) the safety and security of the Contractor's Personnel and sub-contractors' personnel; or (e) any costs, expenses, or claims associated with any illness, injury, death or disability of

the Contractor's Personnel and sub-contractors' personnel, it being understood that UNICEF will have no liability or responsibility with regard to any of the events referred to in this Article 2.14.

3. FEE; INVOICING; TAX EXEMPTION; PAYMENT TERMS

- 3.1 The fee for the Services is the amount in the currency specified in the fee section of the Contract (the "Fee"), it being understood that such amount is specified in United States dollars unless otherwise expressly provided for in the fee section of the Contract. Unless expressly stated otherwise in the Contract, the Fee is inclusive of all costs, expenses, charges or fees that the Contractor may incur in connection with the performance of its obligations under the Contract; provided that, without prejudice to or limiting the provisions of Article 3.3 below, all duties and other taxes imposed by any authority or entity must be separately identified. It is understood and agreed that the Contractor will not request any change to the Fee after the Services or Deliverables have been provided and that the Fee cannot be changed except by written agreement between the Parties before the relevant Service or Deliverable is provided. UNICEF will not agree to changes to the Fee for modifications or interpretations of the scope of work if those modifications or interpretations of the scope of work have already been initiated by the Contractor. UNICEF will not be liable to pay for any work conducted or materials provided by the Contractor that are outside the scope of work or were not authorized in advance by UNICEF.
- 3.2 The Contractor will issue invoices to UNICEF only after the Contractor has provided the Services (or components of the Services) and delivered the Deliverables (or installments of the Deliverables) in accordance with the Contract and to UNICEF's satisfaction. The Contractor will issue (a) one (1) invoice in respect of the payment being sought, in the currency specified in the Contract and in English, indicating the Contract identification number listed on the front page of the Contract; and (b) provide a clear and specific description of the Services provided and Deliverables delivered, as well as supporting documentation for reimbursable expenses if any, in sufficient detail to permit UNICEF to verify the amounts stated in the invoice.
- 3.3 The Contractor authorizes UNICEF to deduct from the Contractor's invoices any amount representing direct taxes (except charges for utilities services) and customs restrictions, duties and charges of a similar nature in respect of articles imported or exported for UNICEF's official use in accordance with the exemption from tax in Article II, Section 7 of the Convention of the Privileges and Immunities of the United Nations, 1946. In the event any governmental authority refuses to recognize this exemption from taxes, restrictions, duties or charges, the Contractor will immediately consult with UNICEF to determine a mutually acceptable procedure. The Contractor will provide full cooperation to UNICEF with regard to securing UNICEF's exemption from, or refund of amounts paid as, value-added taxes or taxes of a similar nature.
- 3.4 UNICEF will notify the Contractor of any dispute or discrepancy in the content or form of any invoice. With respect to disputes regarding only a portion of such invoice, UNICEF will pay the Contractor the amount of the undisputed portion in accordance with Article 3.5 below. UNICEF and the Contractor will consult in good faith to promptly resolve any dispute with respect to any invoice. Upon resolution of such dispute, any amounts that have not been charged in accordance with the Contract will be deducted from the invoice(s) in which they appear and UNICEF will pay any agreed remaining items in the invoice(s) in accordance with Article 3.5 within thirty (30) days after the final resolution of such dispute.
- 3.5 UNICEF will pay the uncontested amount of the Contractor's invoice within thirty (30) days of receiving both the invoice and the required supporting documents, as referred to in Article 3.2 above. The amount paid will reflect any discount(s) shown under the payment terms of the Contract. The Contractor will not be entitled to interest on any late payment or any sums payable under the Contract nor any accrued interest on payments withheld by UNICEF in connection with a dispute. Payment will not relieve the Contractor of its obligations under the Contract and will not be deemed to be acceptance by UNICEF of, or waiver of any of UNICEF's rights with regard to, the Contractor's performance.

- 3.6 Each invoice will confirm the Contractor's bank account details provided to UNICEF as part of the Contractor's registration process with UNICEF. All payments due to the Contractor under the Contract will be made by electronic funds transfer to that bank account. It is the Contractor's responsibility to ensure that the bank details supplied by it to UNICEF are up-to-date and accurate and notify UNICEF in writing by an authorized representative of the Contractor of any changes in bank details together with supporting documentation satisfactory to UNICEF.
- 3.7 The Contractor acknowledges and agrees that UNICEF may withhold payment in respect of any invoice if, in UNICEF's opinion, the Contractor has not performed in accordance with the terms and conditions of the Contract, or if the Contractor has not provided sufficient documentation in support of the invoice.
- 3.8 UNICEF will have the right to set off, against any amount or amounts due and payable by UNICEF to the Contractor under the Contract, any payment, indebtedness or other claim (including, without limitation, any overpayment made by UNICEF to the Contractor) owing by the Contractor to UNICEF under the Contract or under any other contract or agreement between the Parties. UNICEF will not be required to give the Contractor prior notice before exercising this right of set-off (such notice being waived by the Contractor). UNICEF will promptly notify the Contractor after it has exercised such right of set-off, explaining the reasons for such set-off, provided, however, that the failure to give such notification will not affect the validity of such set-off.
- 3.9 Each of the invoices paid by UNICEF may be subject to a post-payment audit by UNICEF's external and internal auditors or by other authorised agents of UNICEF, at any time during the term of the Contract and for three (3) years after the Contract terminates. UNICEF will be entitled to a refund from the Contractor of amounts such audit or audits determine were not in accordance with the Contract regardless of the reasons for such payments (including but not limited to the actions or inactions of UNICEF staff and other personnel).

4. REPRESENTATIONS AND WARRANTIES; INDEMNIFICATION; INSURANCE

Representations and Warranties

- 4.1 The Contractor represents and warrants that as of the effective date and throughout the term of the Contract: (a) the Contractor has the full authority and power to enter into the Contract and to perform its obligations under the Contract and the Contract is a legal, valid and binding obligation, enforceable against it in accordance with its terms; (b) all of the information it has previously provided to UNICEF, or that it provides to UNICEF during the term of the Contract, concerning the Contractor and the provision of the Services and the delivering of the Deliverables is true, correct, accurate and not misleading; (c) it is financially solvent and is able to provide the Services to UNICEF in accordance with the terms and conditions of the Contract; (d) it has, and will maintain throughout the term of the Contract, all rights, licenses, authority and resources necessary, as applicable, to provide the Services and deliver the Deliverables to UNICEF's satisfaction and to perform its obligations under the Contract; (e) the work product is and will be original to the Contractor and does not and will not infringe any copyright, trademark, patent or other proprietary right of any third party; and (f) except as otherwise expressly stated in the Contract, it has not and will not enter into any agreement or arrangement that restrains or restricts any person's rights to use, sell, dispose of or otherwise deal with any Deliverable or other work resulting from the Services. The Contractor will fulfill its commitments with the fullest regard to the interests of UNICEF and will refrain from any action which may adversely affect UNICEF or the United Nations.
- 4.2 The Contractor further represents and warrants, as of the effective date and throughout the term of the Contract, that it and its Personnel and sub-contractors will perform the Contract and provide the Services and Deliverables (a) in a professional and workmanlike manner; (b) with reasonable care and skill and in accordance with the highest professional standards accorded to professionals providing the same or substantially similar services in a same industry; (c) with priority equal to that given to the

same or similar services for the Contractor's other clients; and (d) in accordance with all laws, ordinances, rules, and regulations bearing upon the performance of its obligations under the Contract and the provision of the Services and Deliverables.

- 4.3 The representations and warranties made by the Contractor in Articles 4.1 and 4.2 above are made to and are for the benefit of (a) each entity (if any) that makes a direct financial contribution to UNICEF to procure the Services and Deliverables; and (b) each Government or other entity (if any) that receives the direct benefit of the Services and Deliverables.

Indemnification

- 4.4 The Contractor will indemnify, hold and save harmless and defend, at its own expense, UNICEF, its officials, employees, consultants and agents, each entity that makes a direct financial contribution to UNICEF to procure the Services and Deliverables and each Government or other entity that receives the direct benefit of the Services and Deliverables, from and against all suits, claims, demands, losses and liability of any nature or kind, including their costs and expenses, by any third party and arising out of the acts or omissions of the Contractor or its Personnel or sub-contractors in the performance of the Contract. This provision will extend to but not be limited to (a) claims and liability in the nature of workers' compensation, (b) product liability, and (c) any actions or claims pertaining to the alleged infringement of a copyright or other intellectual property rights or licenses, patent, design, trade-name or trade-mark arising in connection with the Deliverables or other liability arising out of the use of patented inventions or devices, copyrighted material or other intellectual property provided or licensed to UNICEF under the terms of the Contract or used by the Contractor, its Personnel or sub-contractors in the performance of the Contract.
- 4.5 UNICEF will report any such suits, proceedings, claims, demands, losses or liability to the Contractor within a reasonable period of time after having received actual notice. The Contractor will have sole control of the defence, settlement and compromise of any such suit, proceeding, claim or demand, except with respect to the assertion or defence of the privileges and immunities of UNICEF or any matter relating to UNICEF's privileges and immunities (including matters relating to UNICEF's relations with Host Governments), which as between the Contractor and UNICEF only UNICEF itself (or relevant Governmental entities) will assert and maintain. UNICEF will have the right, at its own expense, to be represented in any such suit, proceeding, claim or demand by independent counsel of its own choosing.

Insurance

- 4.6 The Contractor will comply with the following insurance requirements:
- (a) The Contractor will have and maintain in effect with reputable insurers and in sufficient amounts, insurance against all of the Contractor's risks under the Contract (including, but not limited to, the risk of claims arising out of or related to the Contractor's performance of the Contract), including the following:
 - (i) Insurance against all risks in respect of its property and any equipment used for the performance of the Contract;
 - (ii) General liability insurance against all risks in respect of the Contract and claims arising out of the Contract in an adequate amount to cover all claims arising from or in connection with the Contractor's performance under the Contract;
 - (iii) All appropriate workers' compensation and employer's liability insurance, or its equivalent, with respect to its Personnel and sub-contractors to cover claims for death, bodily injury or damage to property arising from the performance of the Contract; and
 - (iv) Such other insurance as may be agreed upon in writing between UNICEF and the Contractor.

- (b) The Contractor will maintain the insurance coverage referred to in Article 4.6(a) above during the term of the Contract and for a period after the Contract terminates extending to the end of any applicable limitations period with regard to claims against which the insurance is obtained.
- (c) The Contractor will be responsible to fund all amounts within any policy deductible or retention.
- (d) Except with regard to the insurance referred to in paragraph (a)(iii) above, the insurance policies for the Contractor's insurance required under this Article 4.6 will (i) name UNICEF as an additional insured; (ii) include a waiver by the insurer of any subrogation rights against UNICEF; and (iii) provide that UNICEF will receive thirty (30) days' written notice from the insurer prior to any cancellation or change of coverage.
- (e) The Contractor will, upon request, provide UNICEF with satisfactory evidence of the insurance required under this Article 4.6.
- (f) Compliance with the insurance requirements of the Contract will not limit the Contractor's liability either under the Contract or otherwise.

Liability

- 4.7 The Contractor will pay UNICEF promptly for all loss, destruction or damage to UNICEF's property caused by the Contractor's Personnel or sub-contractors in the performance of the Contract.

5. INTELLECTUAL PROPERTY AND OTHER PROPRIETARY RIGHTS; DATA PROTECTION; CONFIDENTIALITY

Intellectual Property and Other Proprietary Rights

- 5.1 Unless otherwise expressly provided for in the Contract:

- (a) Subject to paragraph (b) of this Article 5.1, UNICEF will be entitled to all intellectual property and other proprietary rights including but not limited to patents, copyrights and trademarks, with regard to products, processes, inventions, ideas, know-how, documents, data and other materials ("Contract Materials") that (i) the Contractor develops for UNICEF under the Contract and which bear a direct relation to the Contract or (ii) are produced, prepared or collected in consequence of, or during the course of, the performance of the Contract. The term "Contract Materials" includes, but is not limited to, all maps, drawings, photographs, plans, reports, recommendations, estimates, documents developed or received by, and all other data compiled by or received by, the Contractor under the Contract. The Contractor acknowledges and agrees that Contract Materials constitute works made for hire for UNICEF. Contract Materials will be treated as UNICEF's Confidential Information and will be delivered only to authorized UNICEF officials on expiry or termination of the Contract.
- (b) UNICEF will not be entitled to, and will not claim any ownership interest in, any intellectual property or other proprietary rights of the Contractor that pre-existed the performance by the Contractor of its obligations under the Contract, or that the Contractor may develop or acquire, or may have developed or acquired, independently of the performance of its obligations under the Contract. The Contractor grants to UNICEF a perpetual, non-exclusive, royalty-free license to use such intellectual property or other proprietary rights solely for the purposes of and in accordance with the requirements of the Contract.
- (c) At UNICEF's request, the Contractor will take all necessary steps, execute all necessary documents and generally assist in securing such proprietary rights and transferring them (or, in the case, intellectual property referred to in paragraph (b) above, licensing) them to UNICEF in compliance with the requirements of the applicable law and of the Contract.

Confidentiality

- 5.2 Confidential Information that is considered proprietary by either Party or that is delivered or disclosed by one Party ("Discloser") to the other Party ("Recipient") during the course of performance of the

Contract or in connection with the subject matter of the Contract will be held in confidence by the Recipient. The Recipient will use the same care and discretion to avoid disclosure of the Discloser's Confidential Information as the Recipient uses for its own Confidential Information and will use the Discloser's Confidential Information solely for the purpose for which it was disclosed to the Recipient. The Recipient will not disclose the Discloser's Confidential Information to any other party:

- (a) except to those of its Affiliates, employees, officials, representatives, agents and sub-contractors who have a need to know such Confidential Information for purposes of performing obligations under the Contract; or
 - (b) unless the Confidential Information (i) is obtained by the Recipient from a third party without restriction; (ii) is disclosed by the Discloser to a third party without any obligation of confidentiality; (iii) is known by the Recipient prior to disclosure by the Discloser; or (iv) at any time is developed by the Recipient completely independently of any disclosures under the Contract.
- 5.3 If the Contractor receives a request for disclosure of UNICEF's Confidential Information pursuant to any judicial or law enforcement process, before any such disclosure is made, the Contractor (a) will give UNICEF sufficient notice of such request in order to allow UNICEF to have a reasonable opportunity to secure the intervention of the relevant national government to establish protective measures or take such other action as may be appropriate and (b) will so advise the relevant authority that requested disclosure. UNICEF may disclose the Contractor's Confidential Information to the extent required pursuant to resolutions or regulations of its governing bodies.
- 5.4 The Contractor may not communicate at any time to any other person, Government or authority external to UNICEF, any information known to it by reason of its association with UNICEF that has not been made public, except with the prior written authorization of UNICEF; nor will the Contractor at any time use such information to private advantage.

Data Protection and Security

- 5.5 The Parties agree that, as between them, all UNICEF Data, together with all rights (including intellectual property and proprietary rights), title and interest to such UNICEF Data, will be the exclusive property of UNICEF, and the Contractor has a limited, nonexclusive license to access and use the UNICEF Data as provided in the Contract solely for the purpose of performing its obligations under the Contract. Except for the foregoing license, the Contractor will have no other rights, whether express or implied, in or to any UNICEF Data or its content.
- 5.6 The Contractor confirms that it has a data protection policy in place that meets all applicable data protection standards and legal requirements and that it will apply such policy in the collection, storage, use, processing, retention and destruction of UNICEF Data. The Contractor will comply with any guidance or conditions on access and disclosure notified by UNICEF to Contractor in respect of UNICEF Data.
- 5.7 The Contractor will use its reasonable efforts to ensure the logical segregation of UNICEF Data from other information to the fullest extent possible. The Contractor will use safeguards and controls (such as administrative, technical, physical, procedural and security infrastructures, facilities, tools, technologies, practices and other protective measures) that are necessary and sufficient to meet the Contractor's confidentiality obligations in this Article 5 as they apply to UNICEF Data. At UNICEF's request, the Contractor will provide UNICEF with copies of the applicable policies and a description of the safeguards and controls that the Contractor uses to fulfil its obligations under this Article 5.7; provided that any such policies and description provided by the Contractor will be treated as the Contractor's Confidential Information under the Contract. UNICEF may assess the effectiveness of these safeguards, controls and protective measures and, at UNICEF's request, the Contractor will provide its full cooperation with any such assessment at no additional cost or expense to UNICEF. The Contractor will not, and will ensure that its Personnel will not, transfer, copy, remove or store UNICEF Data from a

UNICEF location, network or system without the prior written approval of an authorized official of UNICEF.

- 5.8 Except as otherwise expressly stated in the Contract or with UNICEF's express prior written consent, the Contractor will not install any application or other software on any UNICEF device, network or system. The Contractor represents and warrants to UNICEF that the Services and Deliverables provided under the Contract will not contain any Disabling Code, and that UNICEF will not otherwise receive from the Contractor any Disabling Code in the performance of the Contract. Without prejudice to UNICEF's other rights and remedies, if a Disabling Code is identified, the Contractor, at its sole cost and expense, will take all steps necessary to: (a) restore and/or reconstruct any and all UNICEF Data lost by UNICEF and/or End Users as a result of Disabling Code; (b) furnish to UNICEF a corrected version of the Services without the presence of Disabling Codes; and (c) as needed, re-implement the Services.
- 5.9 In the event of any Security Incident, the Contractor will, as soon as possible following the Contractor's discovery of such Security Incident and at its sole cost and expense: (a) notify UNICEF of such Security Incident and of the Contractor's proposed remedial actions; (b) implement any and all necessary damage mitigation and remedial actions; and (c) as relevant, restore UNICEF's and, as directed by UNICEF, End Users' access to the Services. The Contractor will keep UNICEF reasonably informed of the progress of the Contractor's implementation of such damage mitigation and remedial actions. The Contractor, at its sole cost and expense, will cooperate fully with UNICEF's investigation of, remediation of, and/or response to any Security Incident. If the Contractor fails to resolve, to UNICEF's reasonable satisfaction, any such Security Incident, UNICEF can terminate the Contract with immediate effect.

Service Providers and Sub-Contractors

- 5.10 The Contractor will impose the same requirements relating to data protection and non-disclosure of Confidential Information, as are imposed upon the Contractor itself by this Article 5 of the Contract, on its service providers, subcontractors and other third parties and will remain responsible for compliance with such requirements by its service providers, subcontractors and other third parties.

End of Contract

- 5.11 Upon the expiry or earlier termination of the Contract, the Contractor will:
- (a) return to UNICEF all of UNICEF's Confidential Information, including, but not limited to, UNICEF Data, or, at UNICEF's option, destroy all copies of such information held by the Contractor or its sub-contractors and confirm such destruction to UNICEF in writing; and
 - (b) will transfer to UNICEF all intellectual and other proprietary information in accordance with Article 5.1(a).

6. TERMINATION; FORCE MAJEURE

Termination by Either Party for Material Breach

- 6.1 If one Party is in material breach of any of its obligations under the Contract, the other Party can give it written notice that within thirty (30) days of receiving such notice the breach must be remedied (if such breach is capable of remedy). If the breaching Party does not remedy the breach within the thirty (30) days' period or if the breach is not capable of remedy, the non-breaching Party can terminate the Contract. The termination will be effective thirty (30) days after the non-breaching Party gives the breaching Party written notice of termination. The initiation of conciliation or arbitral proceedings in accordance with Article 9 (Privileges and Immunities; Settlement of Disputes) below will not be grounds for termination of the Contract.

Additional Termination Rights of UNICEF

- 6.2 In addition to the termination rights under Article 6.1 above, UNICEF can terminate the Contract with immediate effect upon delivery of a written notice of termination, without any liability for termination charges or any other liability of any kind:

- (a) in the circumstances described in, and in accordance with, Article 7 (Ethical Standards); or
 - (b) if the Contractor breaches any of the provisions of Articles 5.2-5.11 (Confidentiality; Data Protection and Security); or
 - (c) if the Contractor (i) is adjudged bankrupt, or is liquidated, or becomes insolvent, or applies for a moratorium or stay on any payment or repayment obligations, or applies to be declared insolvent, (ii) is granted a moratorium or a stay, or is declared insolvent, (iii) makes an assignment for the benefit of one or more of its creditors, (iv) has a receiver appointed on account of the insolvency of the Contractor, (v) offers a settlement in lieu of bankruptcy or receivership or (vi) has become, in UNICEF's reasonable judgment, subject to a materially adverse change in its financial condition that threatens to substantially affect the ability of the Contractor to perform any of its obligations under the Contract.
- 6.3 In addition to the termination rights under Article 6.1 and Article 6.2 above, UNICEF can terminate the Contract at any time by providing written notice to the Contractor in any case in which UNICEF's mandate applicable to the performance of the Contract or UNICEF's funding applicable to the Contract is curtailed or terminated, whether in whole or in part. UNICEF can also terminate the Contract on sixty (60) day's written notice to the Contractor without having to provide any justification.
- 6.4 As soon as it receives a notice of termination from UNICEF, the Contractor will take immediate steps to bring the performance of any obligations under the Contract to a close in a prompt and orderly manner, and in doing so, reduce expenses to a minimum, and will not undertake any further or additional commitments as of and following the date it receives the termination notice. In addition, the Contractor will take any other action that may be necessary, or that UNICEF may direct in writing, in order to minimise losses or protect and preserve any property, whether tangible or intangible, related to the Contract that is in the possession of the Contractor and in which UNICEF has or may be reasonably expected to acquire an interest.
- 6.5 If the Contract is terminated by either Party, the Contractor will immediately deliver to UNICEF any finished work which has not been delivered and accepted prior to the receipt of a notice of termination, together with any data, materials or work-in-process related specifically to the Contract. If UNICEF obtains the assistance of another party to continue the Services or complete any unfinished work, the Contractor will provide its reasonable cooperation to UNICEF and such party in the orderly migration of Services and transfer of any Contract-related data, materials and work-in-process. The Contractor will at the same time return to UNICEF all of UNICEF's Confidential Information and will transfer to UNICEF all intellectual and other proprietary information in accordance with Article 5.
- 6.6 If the Contract is terminated by either Party no payment will be due from UNICEF to the Contractor except for Services and Deliverables provided to UNICEF's satisfaction in accordance with the Contract, but only if such Services and Deliverables were required or requested before the Contractor's receipt of the notice of termination or, in the case of termination by the Contractor, the effective date of such termination. The Contractor will have no claim for any further payment beyond payments in accordance with this Article 6.6, but will remain liable to UNICEF for all loss or damages which may be suffered by UNICEF by reason of the Contractor's default (including but not limited to cost of the purchase and delivery of replacement or substitute Services or Deliverables).
- 6.7 The termination rights in this Article 6 are in addition to all other rights and remedies of UNICEF under the Contract.

Force Majeure

- 6.8 If one Party is rendered permanently unable, wholly, or in part, by reason of force majeure to perform its obligations under the Contract, the other Party may terminate the Contract on the same terms and conditions as are provided for in Article 6.1 above, except that the period of notice will be seven (7) days instead of thirty (30) days. "Force majeure" means any unforeseeable and irresistible events arising from causes beyond the control of the Parties, including acts of nature, any act of war (whether declared or not), invasion, revolution, insurrection, terrorism or other acts of a similar nature or force.

“Force majeure” does not include (a) any event which is caused by the negligence or intentional action of a Party; (b) any event which a diligent party could reasonably have been expected to take into account and plan for at the time the Contract was entered into; (c) the insufficiency of funds, inability to make any payment required under the Contract, or any economic conditions, including but not limited to inflation, price escalations, or labour availability; or (d) any event resulting from harsh conditions or logistical challenges for the Contractor (including civil unrest) associated with locations at which UNICEF is operating or is about to operate or is withdrawing from, or any event resulting from UNICEF’s humanitarian, emergency, or similar response operations.

7. ETHICAL STANDARDS

- 7.1 Without limiting the generality of Article 2 above, the Contractor will be responsible for the professional and technical competence of its Personnel including its employees and will select, for work under the Contract, reliable individuals who will perform effectively in the implementation of the Contract, respect the local laws and customs, and conform to a high standard of moral and ethical conduct.
- 7.2 (a) The Contractor represents and warrants that no official of UNICEF or of any United Nations System organisation has received from or on behalf of the Contractor, or will be offered by or on behalf of the Contractor, any direct or indirect benefit in connection with the Contract, including the award of the Contract to the Contractor. Such direct or indirect benefit includes, but is not limited to, any gifts, favours or hospitality.
- (b) The Contractor represents and warrants that the following requirements with regard to former UNICEF officials have been complied with and will be complied with:
- (i) During the one (1) year period after an official has separated from UNICEF, the Contractor may not make a direct or indirect offer of employment to that former UNICEF official if that former UNICEF official was, during the three years prior to separating from UNICEF, involved in any aspect of a UNICEF procurement process in which the Contractor has participated.
 - (ii) During the two (2) year period after an official has separated from UNICEF, that former official may not, directly or indirectly on behalf of the Contractor, communicate with UNICEF, or present to UNICEF, about any matters that were within such former official's responsibilities while at UNICEF.
- (c) The Contractor further represents that, in respect of all aspects of the Contract (including the award of the Contract by UNICEF to the Contractor and the selection and awarding of sub-contracts by the Contractor), it has disclosed to UNICEF any situation that may constitute an actual or potential conflict of interest or could reasonably be perceived as a conflict of interest.
- 7.3 The Contractor further represents and warrants that neither it nor any of its Affiliates, or Personnel or directors, is subject to any sanction or temporary suspension imposed by any United Nations System organisation or other international inter-governmental organisation. The Contractor will immediately disclose to UNICEF if it or any of its Affiliates or Personnel or directors, becomes subject to any such sanction or temporary suspension during the term of the Contract.
- 7.4 The Contractor will (a) observe the highest standard of ethics; (b) use its best efforts to protect UNICEF against fraud, in the performance of the Contract; and (c) comply with the applicable provisions of UNICEF’s Policy Prohibiting and Combatting Fraud and Corruption. In particular, the Contractor will not engage, and will ensure that its Personnel, agents and sub-contractors do not engage, in any corrupt, fraudulent, coercive, collusive or obstructive conduct as such terms are defined in UNICEF’s Policy Prohibiting and Combatting Fraud and Corruption.
- 7.5 The Contractor will, during the term of the Contract, comply with (a) all laws, ordinances, rules and regulations bearing upon the performance of its obligations under the Contract and (b) the standards of

conduct required under the UN Supplier Code of Conduct (available at the United Nations Global Marketplace website - www.ungm.org).

- 7.6 The Contractor further represents and warrants that neither it nor any of its Affiliates is engaged, directly or indirectly, (a) in any practice inconsistent with the rights set out in the Convention on the Rights of the Child, including Article 32, or the International Labour Organisation's Convention Concerning the Prohibition and Immediate Action for the Elimination of the Worst Forms of Child Labour, No. 182 (1999); or (b) in the manufacture, sale, distribution, or use of anti-personnel mines or components utilised in the manufacture of anti-personnel mines.
- 7.7 The Contractor represents and warrants that it has taken and will take all appropriate measures to prevent sexual exploitation or abuse of anyone by its Personnel including its employees or any persons engaged by the Contractor to perform any services under the Contract. For these purposes, sexual activity with any person less than eighteen years of age, regardless of any laws relating to consent, will constitute the sexual exploitation and abuse of such person. In addition, the Contractor represents and warrants that it has taken and will take all appropriate measures to prohibit its Personnel including its employees or other persons engaged by the Contractor, from exchanging any money, goods, services, or other things of value, for sexual favours or activities or from engaging in any sexual activities that are exploitive or degrading to any person. This provision constitutes an essential term of the Contract and any breach of this representation and warranty will entitle UNICEF to terminate the Contract immediately upon notice to the Contractor, without any liability for termination charges or any other liability of any kind.
- 7.8 The Contractor will inform UNICEF as soon as it becomes aware of any incident or report that is inconsistent with the undertakings and confirmations provided in this Article 7.
- 7.9 The Contractor acknowledges and agrees that each of the provisions in this Article 7 constitutes an essential term of the Contract.
- (a) UNICEF will be entitled, in its sole discretion and at its sole choice, to suspend or terminate the Contract and any other contract between UNICEF and the Contractor with immediate effect upon written notice to the Contractor if: (i) UNICEF becomes aware of any incident or report that is inconsistent with, or the Contractor breaches any of, the undertakings and confirmations provided in this Article 7 or the equivalent provisions of any contract between UNICEF and the Contractor or any of the Contractor's Affiliates, or (ii) the Contractor or any of its Affiliates, or Personnel or directors becomes subject to any sanction or temporary suspension described in Article 7.3 during the term of the Contract.
- (b) In the case of suspension, if the Contractor takes appropriate action to address the relevant incident or breach to UNICEF's satisfaction within the period stipulated in the notice of suspension, UNICEF may lift the suspension by written notice to the Contractor and the Contract and all other affected contracts will resume in accordance with their terms. If, however, UNICEF is not satisfied that the matters are being adequately addressed by the Contractor, UNICEF may at any time, exercise its right to terminate the Contract and any other contract between UNICEF and the Contractor.
- (c) Any suspension or termination under this Article 7 will be without any liability for termination or other charges or any other liability of any kind.

8. FULL COOPERATION WITH AUDITS AND INVESTIGATIONS

- 8.1 From time to time, UNICEF may conduct inspections, post-payment audits or investigations relating to any aspect of the Contract including but not limited to the award of the Contract, the way in which the Contract operates or operated, and the Parties' performance of the Contract generally and including but not limited to the Contractor's compliance with the provisions of Article 7 above. The Contractor will provide its full and timely cooperation with any such inspections, post-payment audits or investigations, including (but not limited to) making its Personnel and any relevant data and

documentation available for the purposes of such inspections, post-payment audits or investigations, at reasonable times and on reasonable conditions, and granting UNICEF and those undertaking such inspections, post-payment audits or investigations access to the Contractor's premises at reasonable times and on reasonable conditions in connection with making its Personnel and any relevant data and documentation available. The Contractor will require its sub-contractors and its agents, including, but not limited to, the Contractor's attorneys, accountants or other advisers, to provide reasonable cooperation with any inspections, post-payment audits or investigations carried out by UNICEF.

9. PRIVILEGES AND IMMUNITIES; SETTLEMENT OF DISPUTES

- 9.1 Nothing in or related to the Contract will be deemed a waiver, express or implied, deliberate or inadvertent, of any of the privileges and immunities of the United Nations, including UNICEF and its subsidiary organs, under the Convention on the Privileges and Immunities of the United Nations, 1946, or otherwise.
- 9.2 The terms of the Contract will be interpreted and applied without application of any system of national or sub-national law.
- 9.3 The Parties will use their best efforts to settle amicably any dispute, controversy or claim arising out of, or relating to the Contract. Where the Parties wish to seek such an amicable settlement through conciliation, the conciliation will take place in accordance with the UNCITRAL Conciliation Rules then in force, or according to such other procedure as may be agreed between the Parties. Any dispute, controversy or claim between the Parties arising out of the Contract which is not resolved within ninety (90) days after one Party receives a request from the other Party for amicable settlement can be referred by either Party to arbitration. The arbitration will take place in accordance with the UNCITRAL Arbitration Rules then in force. The venue of the arbitration will be New York, NY, USA. The decisions of the arbitral tribunal will be based on general principles of international commercial law. The arbitral tribunal will have no authority to award punitive damages. In addition, the arbitral tribunal will have no authority to award interest in excess of the London Inter-Bank Offered Rate (LIBOR) then prevailing and any such interest will be simple interest only. The Parties will be bound by any arbitration award rendered as a result of such arbitration as the final adjudication of any such controversy, claim or dispute.

10. NOTICES

- 10.1 Any notice, request or consent required or permitted to be given or made pursuant to the Contract will be in writing, and addressed to the persons listed in the Contract for the delivery of notices, requests or consents. Notices, requests or consents will be delivered in person, by registered mail, or by confirmed email transmission. Notices, requests or consents will be deemed received upon delivery (if delivered in person), upon signature of receipt (if delivered by registered mail) or twenty-four (24) hours after confirmation of receipt is sent from the addressee's email address (if delivered by confirmed email transmission).
- 10.2 Any notice, document or receipt issued in connection with the Contract must be consistent with the terms and conditions of the Contract and, in case of any ambiguity, discrepancy or inconsistency, the terms and conditions of the Contract will prevail.
- 10.3 All documents that comprise the Contract, and all documents, notices and receipts issued or provided pursuant to or in connection with the Contract, will be deemed to include, and will be interpreted and applied consistently with, the provisions of Article 9 (Privileges and Immunities; Settlement of Disputes).

11. OTHER PROVISIONS

- 11.1 The Contractor acknowledges UNICEF's commitment to transparency as outlined in UNICEF's Information Disclosure Policy and confirms that it consents to UNICEF's public disclosure of the terms of the Contract should UNICEF so determine and by whatever means UNICEF determines.

- 11.2 The failure of one Party to object to or take affirmative action with respect to any conduct of the other Party which is in violation of the terms of the Contract will not constitute and will not be construed to be a waiver of the violation or breach, or of any future violation, breach or wrongful conduct.
- 11.3 The Contractor will be considered as having the legal status of an independent contractor as regards UNICEF. Nothing contained in the Contract will be construed as making the Parties principal and agent or joint venturers.
- 11.4 The Contractor will not, without the prior written consent of UNICEF, assign, transfer, pledge or make other disposition of the Contract, or of any part of the Contract, or of any of the Contractor's rights or obligations under the Contract.
- 11.5 No grant of time to the Contractor to cure a default under the Contract, nor any delay or failure by UNICEF to exercise any other right or remedy available to UNICEF under the Contract, will be deemed to prejudice any rights or remedies available to UNICEF under the Contract or constitute a waiver of any rights or remedies available to UNICEF under the Contract.
- 11.6 The Contractor will not seek or file any lien, attachment or other encumbrance against any monies due or to become due under the Contract, and will not permit any other person to do so. It will immediately remove or obtain the removal of any lien, attachment or other encumbrance that is secured against any monies due or to become due under the Contract.
- 11.7 The Contractor will not advertise or otherwise make public for purposes of commercial advantage or goodwill that it has a contractual relationship with UNICEF or the United Nations. Except as regards references to the name of UNICEF for the purposes of annual reports or communication between the Parties and between the Contractor and its Personnel and sub-contractors, the Contractor will not, in any manner whatsoever use the name, emblem or official seal of UNICEF or the United Nations, or any abbreviation of the name of the United Nations, in connection with its business or otherwise without the prior written permission of UNICEF.
- 11.8 The Contract may be translated into languages other than English. The translated version of the Contract is for convenience only, and the English language version will govern in all circumstances.
- 11.9 No modification or change in the Contract, and no waiver of any of its provisions, nor any additional contractual relationship of any kind with the Contractor will be valid and enforceable against UNICEF unless set out in a written amendment to the Contract signed by an authorised official of UNICEF.
- 11.10 The provisions of Articles 2.14, 3.8, 3.9, 4, 5, 7, 8, 9, 11.1, 11.2 and 11.7 will survive provision of the Services and delivery of the Deliverables and the expiry or earlier termination of the Contract.