**ACTIONAID ENGINEERING TEAM**

**STANDARD SPECIFICATION FOR BOREHOLE CONSTRUCTION**

July2024

This Specification relates to the following contract:

**Contract Title:**

**Contract Number:**

**Location:**

**Description:**

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# Abstract

ActionAid Afghanistan is implementing projects known as FCDO-DAWAM projects. One of the primary objectives of these projects is to ensure that planned Health Care Facilities have access to safe water year-round.

The provision and improvement of Water, Sanitation, and Hygiene (WASH) facilities play a crucial role in safeguarding human health and overall well-being. These initiatives serve multifaceted purposes, ranging from preventing waterborne and diarrheal diseases to controlling vector-borne illnesses. Additionally, they contribute to improving health and nutrition outcomes, mitigating the risk of epidemics, and fostering dignity and safety within communities. Economically, investing in WASH facilities yields significant benefits, while also ensuring environmental protection and alignment with international sustainability and health standards.

To strengthen the capacity of healthcare workers to maintain hygiene standards, ActionAid is dedicated to revitalizing and enhancing existing Water, Sanitation, and Hygiene (WASH) facilities in targeted Health Care Facilities (HCFs)

# PREAMBLE TO THE SPECIFICATION

This document outlines a checklist of items that all parties (ActionAid, Borehole Drilling Contractor, and WMC members in each HCFs ) should agree on before starting borehole drilling in any site. Clarifying mutual expectations at the inception of the project is crucial, it reduces disputes that may arise because of false expectations during project implementation.

This Specification covers the minimum standards of workmanship and materials required by the contract. All planned activities shall be done in accordance with (ABS) Afghanistan Building Code, International Building and Construction codes and MRRD norms and Standards

All works shall be carried out with the approval of the Engineer/WASH specialist. Any items which do not meet the requirements of this Specification shall be repaired or demolished and re-instated at the contractor’s expense. The contractor shall be liable for any delays to the project caused because of repairing or demolishing defective work.

Any items of work not described in this Specification but forming part of the works shall meet the minimum standards of workmanship and materials which can normally be expected locally. Where there is a conflict between local standards and this Specification, this Specification shall take priority.

Any items related to sections of work not covered in the Contract shall be deemed not to apply.

**This document forms part of the Contract and should be read in conjunction with the other Contract Documents listed in the annexes table.**

# Involved parties in the agreements

|  |  |
| --- | --- |
| The first party | |
| Name | ActionAid Afghanistan |
| Type of Business | International Non-Governmental Organization (INGO) |
| Department/sector | WASH |
| Project | FCDO-DAWAM |
| Address | City/District:  Street:  House number: |
| Procurement | Mobile: Email: |
| Project Eng. | Mobile: Email: |
| Security focal point | Mobile: Email: |
| Hereinafter referred to as “ActionAid”.  **Note:** Coordination among parties can be communicated by phone, but all technical and financial issues or other critical decision should be kept in written contacts only. | |

|  |  |
| --- | --- |
| The second party | |
| Company Name |  |
| Type of Business |  |
| License number |  |
| T4 Code |  |
| Current address | City/District:  Street  House number: |
| First Contact | Mobile:  Email: |
| Second Contact | Mobile:  Email: |
| Hereinafter referred to as “Contractor” | |

|  |  |
| --- | --- |
| 1.3 The third party | |
| Community Name |  |
| Address | Province: District:  GPS- Latitude: Longitudes: |
| Head of WMC | Mobile: |
| Secretary of WMC | Mobile: |
|  | |

# Roles and Responsibilities

## ActionAid Responsibilities

### 2.1.1. Coordination:

1. 1. In coordination with Local Provincial Rural Rehabilitation and Development, select a site for the intervention.
2. Mobilizing communities and establishing a water management committee WMC in targeted areas.

### 2.1.2. Technical Assessment:

1. In coordination with WMC members conduct - the preliminary survey/ technical assessment and determine the type of water source (in this case- Borehole) and select the water lifting technology- Handpump).
2. Assess existing non or partially-functional solar-powered networks, then:
   1. Assess and develop the power system - solar size and arrangement.
   2. Assess and upgrade the distribution network.
      1. **Water Quality Test:**
3. ActionAid will run water quality tests at three different stages of the construction process:
   1. When the drilling machinery first approach to the underground aquifer.
   2. After well development- at the end of the pumping test
   3. After the disinfection process – prior to handing over to the community.
   4. Annex6\_Well Tests & Disinfection record and report
      1. **Quality Control and Quality Assurance:**
4. ActionAid reserves the right to control the quality of goods or services provided. ActionAid conducts inspection whenever it wants, but generally, the three-phase control system required by ActionAid of refers to Preparatory, Initial & Follow-Up inspections for each “Definable Feature of Work”. A designated technical person will inspect the quality of construction/installation works. He will order corrections or replacements at no additional expense to the ActionAid, of items determined as not meeting the minimum standards.
   * 1. **Operation and Maintenance:**
5. ActionAid staff will train WMC members at the onset of the project, they will be practically involved in the project implementation. At the end of the project, they will collectively take care of the system. One technician and all members will be trained on the following topics. (Construction, Electrical, Hydraulic, and Administrative parts).
   * 1. **Nature and Taxation of Contract**
6. This contract is solely made construction of (1) number Bore-well in (one HCF (Nowrak, in Pasaband-district) as mentioned in the third part 2.3 of this document. It should not be used in any manner or form construed as anything else. It is the responsibility of the contractor to pay any and all taxes, dues, and levies including income tax required by the government of Afghanistan. ActionAid will not be responsible for the payment of any taxes, dues, or levies on behalf of the contractor, unless otherwise explicitly stipulated in this contract. In line with the new guideline from MoF on tax withholding from contracts, ActionAid will deduct tax according to Afghanistan tax regulations from all transactions of this vendor happening over the course of this contract, which will be subsequently released to the account of MoF respectively.
   * 1. **Non-responsibility**
7. During the course and before or after completion of this contract, ActionAid will not be responsible for any damages and loss to the contractor or its property if caused by attacks, safety issues, natural or manmade disasters.
8. By no means it should be construed that the contractor can waive or ignore construction safety rules and regulations on the project site. This includes:

* OSHA3889 \_ Recommended Practices for Safety and Health Program in Construction. <https://www.osha.gov/sites/default/files/OSHA3886.pdf>, open-source document.

## Contractor’s Responsibilities

The contractor agrees to fulfil the responsibilities listed below in accordance with norms and standards mentioned in and referred to by this document.

### General Requirements

**Water quality:**

Proposed wells are designed to provide potable (drinking) water for CHF in targeted areas. Therefore, the desired quality should meet WHO’s minimum standard for drinking water (standards are mentioned in NSP Engineering Manual 6th Edition p.2) . To ensure the water quality of newly drilled boreholes meets WHO’s standards for drinking water. The Contractor will take two water samples for laboratory analysis, after completion of the long-duration (constant discharge) pumping test. One sample will be used for physical and chemical analysis, and this should be placed in a clean and properly sealed plastic or glass container. Its volume should not be less than five liters. The second sample will be used in a bacteriological analysis. It should be collected in triplicate, in sterilized, properly sealed, and protected containers. The volume of such containers should not be less than 100 milliliters. The samples will be handed to the ActoinAid as soon as they have been collected.

**Water quantity:**

1. The desired yield for boreholes that are planned to be utilized with Handpumps – are greater than (**0.4 litter/sec**), and the acceptable range is not less than (**0.3 liter/sec**).
2. The yield of boreholes that feed a water distribution network, and which will be equipped with motorized pumps, should be set according to the peak daily water use requirements of the targeted CHF. This information can be found in the upgrading plan format and it is contractor’s responsibility to ask for the relevant document from ActionAid (Site Engineer).

### Borehole Construction Requirements

The Contractor will use drilling equipment capable of drilling down to the required depths. The use of cable tools, or down-the-hole hammer (air percussion) rigs is acceptable. Any borehole depths indicated to the Contractor prior to drilling should be regarded as tentative and for guidance only. If the actual characteristics of the boreholes to be drilled justify any change in these specifications, the Contractor will request the authorization of the ActionAid for such changes to be made. These communications will be made verbally and shall be correctly recorded by the ActionAid. Once changes in borehole depth have been authorized by the ActionAid, a proper price adjustment will be made in accordance with the final depth of the borehole and the unit price rendered by the Contractor in his original proposal.

1. **Drilling machinery**: Cable – tool (percussion) , Rotary.
2. **Borehole diameter:**

To accommodate both the hand pump and submersible pump, the internal diameter of the borehole should not be less than 12 inches equivalents to 300mm.

The drilling of each hole will be carried out per the requirements of these specifications, using the proper drilling tools, drive pipes, casing pipes, gravel packs, and sanitary protection, based on the real characteristics of the aquifer formation(s). The casing pipe and sanitary protection (seals) should isolate the aquifers from other formations considered unsuitable for the production of potable water. The borehole design is to be authorized by ActionAid (or the ActionAid’s representative on site) before casing pipes and screens are installed in the well.

1. **Maximum and minimum desired depths**:

To ensure the water availability within the borehole throughout the year, and to be safe from the drawdown due to yearly fluctuation in the underground aquifer, the boreholes total depth should not be less than 35 meters. In case the desired yield cannot be secured within the given depth, ActionAid approval for the revised depth is required.

1. **Formation logging records:**

The Contractor will supply a detailed borehole log, in which all relevant information on drilling rate, well casings, and other construction operations will be accurately recorded. The Contractor will also annotate all information pertaining to the appearance of water strikes and aquifers, types of strata found, and formation sampling details. The contractor should report the record using the format Well logging record and report\_Annex.4

1. **Filter Pack:**

The Contractor will supply all pipes, screen filters, and fittings for the proper casing of the wells at the agreed price. An artificial, properly graded gravel pack will be placed in the annular space between the borehole wall and the outer face of the casing/screen. Proper techniques should be used for the accurate placement of this pack on site. The gravel to be used should be clean, and well-rounded. The grains should be hard and of alluvial origin, and in size between 0.5 and 2.5 centimetres dia items meter. This gravel must be approved by the site Engineer.

1. **Well Screen Design:**

The proper selection of slot openings in relation to the size of filter pack materials is important. The selected opening should retain the filter pack and, in turn, selected the filter pack should retain the aquifer materials. Therefore, the perforated section has at least 25 perforations totalling an open area of 1 square inch per ft of section. **Note:** {for further details kindly have a look at \_ filter pack and well screen design \_ an open-source document available at <https://pubs.usgs.gov/of/1963/0060/report.pdf>}.

1. **Casing Seal:**

To prevent the seepage of contaminated surface water from entering the groundwater aquifer through the space (annulus) between the well casing and borehole, a mixture of one part of sand and one part of clay or bentonite, one part cement and 40-48 litters of water for every hundred KG of mixture ought to be filled in the annulus space- it should girdle immediately above the producing zone up to ground surface.

1. **Well development:**

It is the contractor’s responsibility to ensure wells are completed in a manner that ensures no damage will be incurred to the pumping system, plumbing, or fixtures due to sediment in the water. In relation to the type of aquifer materials, the below development techniques could be used; 1- Backwashing 2- Jetting, 3- Surging, 4- Heavy pumping

### Lining Materials

1. **Well’s final platform or cover:**

The contractors should build a concrete apron (according to the Technical drawing of each site). Distance from the top of the casing to ground level should not be less than 300mm.

1. **Permanent casing materials**:

PVC pipe dia 8'' (class C) bar 9, 12.7mm

1. **Internal Liner:**

Rising main UPVC pipe 63mm OD x4.7mm Thickness x2.9 meters long with socket spigot,

1. **Screen:** Plastic schedule 40 PVC, outside diameter 8’’ (inches) or (218 to 219 mm), with weight per meter length 8.5 kg and minimum wall thickness 8.18mm.

Wells completed in unconsolidated aquifers, such as sand or gravel, should be screened. The length of screen required depends on the volume of water to be pumped and the ability of the aquifer to transmit water. Determining the size of opening area and the number of slots are directly relevant to the well screen design, listed under 2.2.2 construction requirements.

### Well pump test:

Once the borehole construction is completed, the well will be developed by treatment with suitable mud dispersant additives (if required) and hydraulic surging (by means of a surging piston/block or compressed air). Immediately after these operations are completed, and the borehole water is certified clean by the ActionAid, the pumping unit can be introduced into the well. The Contractor will provide a test pumping unit capable of discharging 50 percent more water, at the borehole’s pumping water level, than the maximum yield indicated for each borehole.

The test will consist of continuously pumping the borehole at the maximum yield specified (or at any other previously defined rate(s), per the results of the drilling work) between the Contractor and the ActionAid. The duration of this test will be 4 hours. Measurement of dynamic water levels will be performed per the logarithmic time-scale schedule normally used for test pumping water wells.

The borehole will be tested for plumpness and alignment by means of a 12-metre-long, perfectly straight, steel rod or pipe that will be introduced along the whole well. The external diameter of this will, at the most, be 13 millimetres less than the well casing’s inside diameter. This item will be supplied by the Contractor.

The test item described should pass easily through the whole borehole, or through the main section of casing that will contain the production pump and rising main. Loss of plumpness of the well axis should never be more than two-thirds of the inside diameter of the casing. If these minimum requirements are not met in the borehole, the Contractor will, if possible, correct the defects. Otherwise, the ActionAid is at liberty to reject the well and no payments will be made for its drilling and completion. This check should be made before or after the pumping test of the borehole.

1. **The borehole planned to be equipped with a motorized pump:**
   * + To deduce crucial information on sustainable yield (Q) and the expected drawdown(s) within the newly excavated borehole, the test ought to last at least 4 prolonged hours in addition to the designed pumping period of ( 8 hours per day ). Also, the flow rate throughout the pumping period ought to be 1.2 times greater than the design flow rate (see the flow rate of each site) for the targeted project.
     + During the test the discharge of the pump should go sufficiently far away from well point, to prevent recirculation of groundwater.
     + Contractor should record and report the pump test procedure using (well pump test \_Annex.5) format.
2. **The borehole planned to be equipped with a Hand pump**

A bailer test for at least two continuous hours that Ensures greater yield than (0.4litters/sec).

1. **Water quality test:**
2. contractor should collect water samples in three stages. first sample at the outset of the pumping test, the second sample at the middle of the pumping test and the third sample whenever the water level in the well approached to its maximum drawdown.
3. The water drawn out of the borehole will be acceptable if it has a sand particle content of less than three grams per cubic meter. Should this limit be exceeded, the Contractor will make all necessary adjustments to the well structure, at his own expense, to meet this specification.

### Well disinfection

Once the borehole has been completed and tested, the Contractor will disinfect the well with a chlorine solution yielding at least 50 milligrams/litter of active chlorine in all parts of the well. The chlorine solution for this purpose may be prepared by dissolving calcium hypochlorite, sodium hypochlorite, or gaseous chlorine, in water. The chlorine solution should stay in the borehole for at least four hours, at the specified concentration

### Water lifting technology – Type of Pumps

1. The contractor is responsible for supplying and installing the pump(s) according to the specifications and requirements mentioned in the technical drawing and as per manufacturer recommendations. Pumps shall be tested before completing the installation. Defective equipment shall be replaced by the Contractor.
2. Pumps and motors shall be rigidly mounted on new concrete platforms, and securely bolted down. All pipe fittings shall be threaded, or flange bolted to allow for dismounting the pumps. Isolating valves shall be installed on the delivery side of the pump, and the suction side if required.
3. The pipework in the pump house shall minimize the number of bends and junctions. It shall be neat and clean. Badly welded joints shall not be permitted. Old or existing pipework shall be replaced at the direction of the Engineer.
4. The correct type of coupling between the pump and motor shall be installed to allow for any differential alignment or movement. The pump and motor shall be correctly aligned.
5. Electrical equipment for pumps such switches, plugs and fuses shall be installed by a qualified electrician. Installations shall be neat and tidy and shall be carried out such that there is no danger of electric shock. All works shall be carried out to the approval of the Engineer.
6. All hand-pumps that operate manually should be product of reliable companies and meet SKAT standards. In all cases Afridev hand pumps are recommended for the following depth:

* Less than 25 m Afridev Kabul
* 25 – 45 m Afridev Indus
* 45 m – 70m Afridev Pamir

### Well Finishing and Site Clearance

1. Contractor shall construct and develop the borehole construction and take all possible precautions to avoid damage to adjacent land/structure/other assets. Moreover, to restore site conditions back to normal, once the construction work is completed, contractor should properly collect and remove all the debris and leftover hazardous construction materials. should make sure to eliminate all potential risks that which may otherwise harm users or the environment.
2. The Contractor will pay close attention to the due protection of the borehole against entrance of water or other pollutants while drilling or after completion of the borehole. For this purpose, he will provide a temporary cover or cap to be placed atop the borehole casing at any time the drilling rig is not in operation. This cover will also be placed after the borehole has been completed.
3. Sanitary seal: All the boreholes that have been successfully completed and tested should have proper sanitary seal protection built of concrete. This protection will be placed a minimum of two meters below the ground to 0.25 meter above the ground and will occupy all the annular space between the borehole wall and the outside of the casing/screen.

### Service Guarantee

1. The contractor is responsible for building a borehole in a way that ensures that throughout the designed life span of the project, no damage will be incurred to the water lifting technology and its distribution means due to sediment in the water\_ (for pipes and fittings use Annex12\_Pipe Doc\_ Warrantee letters template)
2. Guarantee the functionality of water lifting technology Hand pump or Electronic submersible for at least one year after the Borehole handover date to the WMC. (Use Annex11\_MRRDs Forms -Solar Warrantee letters templet )

### Timeline

|  |  |
| --- | --- |
| **Duration and Remuneration** | |
| Proposed starting date | 20/August/2024 |
| Proposed completion date | 30/September/2024 |
| As mentioned above this contract is in effect for the period of (42 days). The company should immediately notify ActionAid if the delivery delays beyond the timeframe fixed in this contract for any reason. | |

### Costs

should be read and filled in conjunction with a detailed BoQ sheet - Technical drawing, and SOW mentioned in this document.

### Scope of grant:

1. The contract covers the workmanship of planned features of works. It also includes procurement, transportation, installation, repair, replacement, and guarding of all required and estimated components listed in related documents up to 100% completion of the project.
2. The contractor agrees and respects the ActionAid Code of Conduct and will sign it at the beginning of the contract.
3. Selected supplier is not authorized to take the initiative regarding the design of the system before ActionAid WASH specialist confirmation.

### Reminder:

Work continuation depends on the result of water quality and pump tests. If water met WHO’s standard for drinking water and the pump test succeeded to supply the above-mentioned safe yield. Then, the contractor will be permitted to proceed with the rest of the work as per agreed proposal. In case any of the mentioned tests fail to meet the purposed requirements, contractor will be only paid based on the unit cost of completed work. Because this case can affect the entire designed approach and may require adoption or complete change. once ActionAid technical and management team finalize their decision the contractor will be formally informed on next steps.

|  |
| --- |
| 1. **Any changes in construction or installation from this Scope of Work shall be approved in advance in written by ActionAid Program Manager or Grant Officer – the WASH specialist.** |

All work described in this Scope of Work shall be completed by the contractor. The methods that the contractor will use need to provide continuous progress on the job site according to the agreed project timeline.

The contractor shall provide qualified supervisory, technical, and labour personnel capable of meeting the ActionAid requirements. The labour force shall possess the relevant skills such, Electrical, constructional, fabrication and fitting, required for this project. also, sufficient number of staff to accomplish the work in a timely manner.

### Certification of Non-involvement in Unlawful/Criminal Activity

The Contractor hereby acknowledges/commits to fully comply with the following certifications as part of its contractual obligations.

* Contractor certifies that in connection with this contract it has not directly or indirectly made, offered, or promised, and will not make, offer, or promise, any illegal or otherwise improper payment or transfer of anything of value to any government official, third-party, or ActionAid employees; and that it will comply with all applicable laws in the performance of this contract
* Contractor certifies that neither it nor any of its principals or owners, nor any of its subcontractors and their principals or owners, nor any other person who will provide services under this contract, do not and will not provide financial or material support to any individual or organization that is known to have advocated, sponsored or engaged in violence or unlawful/criminal activity.

Failure to comply with the above certifications or submission of false supporting documentation shall lead to termination of this contract.

## Water Management Committee (WMC)Responsibilities

## 2.2.1. Disclaimer: The water management committee members are working voluntary. Not ActionAid nor contractor hold liabilities to pay for effort mentioned hereunder in this section of the SoW document.

### Borehole site selection

It is the Water Management Committee’s responsibility to mobilize community members and together with **ActionAid** technical team and the borehole contractor select the most appropriate well location within HCFs. These discussions should concentrate on below major points:

1. Groundwater availability- evaluating the potential and reliability of water sources. It could be based on indigenous knowledge, performance of existing wells and some hydrogeological assessment.
2. Groundwater access – ensuring the source is accessible to the community, and the different households within it.
3. Determining the demand- providing the list for user for each borehole.
4. Borehole site safety - ensuring that borehole site safe against flood, avalanche, sliding etc.
5. Distance from pollutants- ensuring that borehole is distant from latrines, wates dumping sites, cemetery, and areas with fertilizer or chemicals use- Based on MRRD standard maintaining a minimum of 20m distance is compulsory.

### Land Acquisition and donation documents

* Provision of land for borehole construction is solely WMC responsibility. Selected property shall be public premises, if not it needs to be transformed into public property. The process should be recorded in a formal document and formally attested by WMC and PRRD representative at district level (land acquisition document\_annex.1).
* **Reminder**: Not **ActionAid** nor the contractor hold any liability for the compensation of mention land.

### Regular Supervision

* WMC members are responsible to oversees water system upgrades and monitors the work of contractor.
* WMC members should assure that assigned local mechanic and caretakers are trained by ACTIONAID team and Contractor on post completion operation and maintenance (for further information have look to ACTIONAID\_WMC guidance).

# Attachments

I hereby acknowledge that I have read and understand the terms and conditions for this Scope of Work SOW, and all related technical documents listed in below table.

|  |  |  |
| --- | --- | --- |
| **#** | **Document** | **Number of Pages** |
| 1 | The SoW documents it self | 14 |
| 2 | Annex1\_land acquisition document | 1 |
| 3 | Annex2\_Technical Drawing\_ | Norak (Solar Sys Design=10pages, drawing=8pages) |
| 4 | Annex3\_Detailed BoQ | 5 |
| 5 | Annex-4\_Well logging record and report | 1 |
| 6 | Annex5\_Pumping test and recovery records and report | 4 |
| 7 | Annex6\_Well Tests & Disinfection record and report | 1 |
| 8 | Annex7\_Operation and Maintenance timetable | 1 |
| 9 | Annex8\_Well completion report | 2 |
| 10 | Annex11\_MRRDs Forms –Solar-Warrantee letters template | 3 |
| 11 | Annex12\_Pipe Doc-Warrantee letters template | 9 |

Note: Annex No( 1,4,5,6,7,11,12)(Annex1\_land acquisition document, Annex-4\_Well logging record and report, Annex5\_Pumping test and recovery records and report, Annex6\_Well Tests & Disinfection record and report, Annex7\_Operation and Maintenance timetable, Annex8\_Well completion report, Annex11\_MRRDs Forms –Solar-Warrantee letters template, Annex12\_Pipe Doc-Warrantee letters template) will be submitted to the contractor (company) after the contract has been signed.

Company’s/supplier’s signature & stamp: \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_مهر و امضاء شرکت/فروشنده:

Address: \_\_\_\_\_\_\_\_\_\_\_\_\_­­­­­\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ آدرس:

Contact number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ شمارهء تماس: