



**Supply and Delivery of Well Pumps and all Pumps'
related material, fittings, and accessories**

PROJECT CODE: AW-24/T /2021

RFP NUMBER: 24/T /2021

VERSION 1.0

July 2021

Aqaba – Jordan

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Introduction

Aqaba Water Company (AWC) invites all eligible local (Jordanian) bidders who has an official registered business in Jordan to prepare and submit their proposals in response to this RFP. Please read the submission instructions and rules listed in section (3) and submit your proposal by the deadline stated below and according to instructions in section (4).

Should you require any additional information or clarification of this RFP, you may seek such information from AWC through the officials named in section (2)

Section 1 - Light RFP Key Information

RFP Number	24/T/2021
RFP Purpose	Supply and Delivery of Well Pumps and all Pumps' related material, fittings, and accessories
Last date to sell tender documents	19/8/2021
Last date to receive inquiries	26/8/2021
Date of releasing Q&As appendix	2/9/2021
Closing Date (Submission Deadline)	19/9/2021
Date of opening the sealed technical offers	10 A.M, 20/9/2021
Project Name / Title	Supply and Delivery of Well Pumps and all Pumps' related material, fittings, and accessories
Bid Language	English
Bid-Bond Value	5200 JD valid for 90 days) Bank guarantee or certified check from an accredited Jordanian bank)
Applicable Code	USAID Code 937 Applies to this Light RFP
Bid Currency	JOD
Penalties	According to Aqaba Water Company (AWC) Laws and Regulations
Project Description & BoQ	Appendix A
Special Conditions	N/A
Award Criteria	Most Responsive (50% Technical and 50% Financial)
Delivery location	All item, equipment, material shall be delivered to AW Disi warehouse
Bidder Eligibility	<ul style="list-style-type: none"> • Have an official established business in Jordan • All licenses and trade certificates are renewed and up to date • Is not banned or black-listed by any government agency or Jordanian Bank • Has official partnership agreement with solution manufacturer • Has well-trained and certified staff • Additional See Section 4
Income/Withholding Tax	Bidder Responsibility (To be paid by the bidder)
Sales Tax	To be clearly included in the commercial proposal
Stamp Fees	All Contracts with foreign and local firms are subject to 0.3% non-refundable Stamp Fee on the Grand Total Amount that is payable by the firm (Seller) upon signing of a contract or purchase order.

Section 2 - Light RFP Contact Person

All inquiries concerning the contents of this RFP document must be addressed in writing via email to:

Bid Evaluation Committee
RFP Title – Bidder Name

Aqaba Water Company
Al-Sharif Al-Hussein Ben Ali Street
Aqaba 77110 Jordan

E-mail: Procurement@AW.COM.JO

Email's Subject Line: RFP - Inquiries

Section 3 – Light RFP Key Terms and Conditions

- All bidders must accept that submission of a Proposal does not place AWC under any obligation to acquire the products, solution, equipment, hardware, software, services or any other item included in the any bidders' Proposal.
- With the submission of a proposal, each Bidder agrees that it will not bring claims or have cause of action against Aqaba Water Company based on any misunderstanding concerning the information provided herein or concerning AW's or AW's failure, negligence, or otherwise, to provide the Bidder with pertinent information as intended by this RFP
- All Bidders must be responsible for any expenses incurred in the preparation of the Proposal and any subsequent presentations or demonstrations.
- AWC reserves the right to amend this RFP prior to final Winning Bidder selection.
- AWC reserves the right, at their sole option, to withdraw its invitation to selected or all bidders to propose to this RFP at any time during the RFP process.
- AWC is not bound to accept the proposal with the lowest quotation. AWC shall have no obligation to disclose the nature of any proposal received.
- All the terms and conditions of this RFP are deemed to be accepted by all bidders and are incorporated in the proposal except for those terms and conditions that are expressly excluded in the proposal.
- Proposals received after the stated Submission Deadline is liable to be rejected.
- The Submission Deadline may be extended at the sole discretion of AWC.
- Proposals not meeting critical requirements are liable to be rejected without further notice.
- All Bidders proposals will become the property of AWC.
- Proposal prices has to be quoted in Jordanian Dinars (JOD) unless otherwise required by AWC
- The Bidders shall provide a fixed total price for all the deliverables. Prices quoted should be valid for a minimum period of Sixty (60) days from the date of Submission Deadline.
- Bidders are to make themselves aware of the applicable government and AWC procurement laws and regulation and such knowledge is assumed by AWC.
- AWC has the right to ask the bidder for any clarification
- Multiple proposals are accepted and will be treated as separate proposals
- AWC reserves the right to accept or reject any part of any proposal, and to accept or reject any or all proposals without penalty or the obligation to give any explanation.
- Prior to AW awarding the contract, AW will inform all unsuccessful bidders that the of its decision and allow unsuccessful bidders to raise their objections within a timeframe not to exceed three (3) working days from the date of AW message. Unsuccessful Bidders have the right to provide their objections using the designed AW form but are not allowed to change their bids or proposals.

- Award of the Contract resulting from This RFP will be based upon the Most Responsive Bidder whose offer will be the most advantageous to AWC in Terms of Cost, responding on AWC requirements and other factors as specified elsewhere in this RFP.

Section 3 – Preparation and Submission of Bids (Proposals)

Bid Submission Format	3 Envelop System (Bid Bond, Technical and Financial)
Number of Copies	<ul style="list-style-type: none"> • Three Hard Copies, signed and stamped with company official stamp • One Soft Copy to be placed in respective envelop, , signed and stamped with company official stamp • All pages shall be signed and stamped by the company authoritative responsible person
Envelop Marking and Labeling	<p style="text-align: center;">Aqaba Water Company Al-Sharif Al-Hussein Ben Ali Street Aqaba 77110 Jordan</p> <p style="text-align: center;">Bid Evaluation Committee RFP Title – Bidder Name</p> <p style="text-align: center;">Envelop Title: Wells Pump</p> <p style="text-align: center;">E-mail: PROCUREMENT@AW.COM.JO Fax: +962 3 201 5982</p>
Technical Proposal Guidelines	<ul style="list-style-type: none"> • Font: Arial 10 • No Pricing in Technical Proposal • Not to exceed: 50 Pages • Marketing Material to be placed in appendices
Financial Proposal Guidelines	<p>Font: Arial 10</p> <p>Has one cost summary table for all items</p> <p>Has detailed pricing for each item proposed</p>
Delivery Address	Aqaba Water Company Headquarters in Aqaba City
Email Delivery	Procurement@aw.com.jo

Section 4 – Eligibility Criteria

Only bidders who fulfill the following criteria are eligible to respond to the RFP. Offers received from the bidders who do not fulfill all or any of the following eligibility criteria are liable to be rejected.

- The bidder should have been providing the services for enterprises for the last two years as on submission date.
- As this procurement is funded by USAID through the FARA agreement signed between AW and USAID, it shall be clear that the bidder comply with USAID Source and Nationality Code – 937.
- Bidder should provide last two years’ financial statement
- The bidder should have qualified and certified personnel for this kind of projects.

Section 5 – Evaluation Criteria

- 5.1. The technical offers will be opened first and evaluated against the technical requirements as outlined in this RFP.
- 5.2. Eligibility of bidders will be assessed as part of the technical evaluation. Bidders who do not meet eligibility criteria will lose points in the technical evaluation and can be automatically disqualified.

- 5.3. AW may use sources of information not supplied by the eligible bidder(s) concerning the abilities to perform this work and any proposed component.
- 5.4. Technical Proposal will be allocated 60% of the total score
- 5.5. AW Bid Evaluation Committee will structure the technical evaluation into:

The evaluation criteria for this RFP will be as follow

Technical Evaluation Criteria

Criterion	Allocated %
Compliance to Technical Specifications	50%

Financial Evaluation Criteria

The financial Criteria will be allocated 50% of the total proposal score. Allocated as follow:

Criterion	Allocated %
Procurement Cost (One-Time Cost to be paid by AWC)	50%
TCO – Running Cost	50%

The final proposal cost will be calculated as follow

$$C1 = (\text{Minimal Procurement Cost} / \text{Evaluated Procurement Cost}) * 50\%$$

$$C2 = (\text{Minimal TCO} / \text{Evaluated TCO}) * 50\%$$

$$\text{Total Financial Proposal Cost} = (C1 + C2) * 50\%$$

Total Cost of Ownership is defined at the operational cost over 10 years including the following assumptions:

- a. Operation time: 24 hour 365 days / year
 - b. Energy K.W.h. cost : 0.11 J.D/K.W.h
 - c. the Pump Expected life cycle over 10 years.
 - d. Pump decrease in efficiency over 10 years according to manufacturer documentations
- 5.6. Eligibility of bidders will be assessed as part of the technical evaluation. Bidders who do not meet eligibility criteria will lose points in the technical evaluation.
 - 5.7. The financial offers will be opened following completion of the technical evaluation. Only financial offers associated with technically qualified proposals will be opened. Financial offers associated with technically unqualified technical proposals will be returned to Bidders unopened.
 - 5.8. financial proposals with a value of more than the ceiling of allocated to this RFP will be eliminated from further consideration, regardless of the technical score.
 - 5.9. A Technically qualified bid/bidder must have scored at least 80% out of 50% in order for the bid to be technically qualified. (i.e. passing grade is 40 out of 50)

Section 6 – Proposal Format

Proposals shall be submitted in three envelopes as follow

6.1 Bid Bond, in a sperate envelope and sealed and stamped

6.2 Technical Proposal Format (in separate enveloped sealed and stamped)

The Submitted **Technical** proposal is suggested to include each of the following sections:

1. Executive Summary.
2. Bidder Company Profile, Strategy and last two years’ financial statements.
3. technical documents and certificates
4. Project Plan
5. Pump & Motor Performance operation & curves
6. Compliance Statement.
7. References.
8. Statement of Conformance
9. Certified personnel
10. Pricing (in Separate Envelop)
11. Materials County of origin

NOTE: All pages of the technical pages shall signed and stamped by the company official stamp and authorized representative.

6.3 Financial Proposal Format (in separate enveloped sealed and stamped)

6.3.1 Proposal Total Cost

Item	Line Total in JOD
Wells Pump One-Time Cost	
Wells Pump TCO	
Gate Valves	
Dismantling Joints	
Riser Pipes	
Air Valves	
Well Head Check Valve	
Power Cable	
Rubber Cable	
Grand Total	
Sales Tax (16%)	
Net Total	

6.3.2 Detailed Costing

6.3.2.1 Wells Pump – As per the technical Specifications in this document

Well #	Well ID	Riser Pipe Size (mm)	Pump Head (M)	Pump Sittng (mm)	Well Dynamic Head (m) @ instantaneous flow	Well Head Pressure (m)	Well Casing Internal Diameter (inch)	QTY	Price (JD)
1	QA 14	150	210	180	133 @ 133m ³ /h	55	18	1	
2	QA3	150	210	168	140 @ 140m ³ /h	55	20	1	
3	QA9	200	210	168	132.2 @ 180m ³ /h	55	18	1	
4	AD3	150	195	150	131 @ 130 m ³ /h	55	24	1	

6.3.2.2 Gate Valves – As per the technical Specifications in this document

Item #	Valve Size (mm)	Pressure Rating	Quantity	Price (JD)
1	150	16	8	
2	200	16	8	

6.3.2.3 Dismantling Joints

Item #	Dismantling Joint Size (mm)	Pressure Rating	Quantity	Price (JD)
1	150	16	8	
2	200	16	8	

6.3.2.4 Riser Pipes

Item #	Pipe Size (mm)	Pipe wall thickness (mm)	Quantity (m)	Price (JD)
1	150	7.1	360	
2	200	8.2	360	

6.3.2.5 Air Valves

Item #	Item description	Size (mm)	Quantity	Price (JD)
1	Combination Air valve	50	20	

6.3.2.6 Well Head Check Valve

Item #	Item description	Size (mm)	Quantity	Price (JD)
1	Swing check valve	150	4	
2	Swing check valve	200	4	

6.3.2.7 Power Cable

Cable size (mm ²)	Cable length (m)	Price (JD)
150	200 m (1 drum)	
120	400 m (1 drum)	
95	200	
70	200	

6.3.2.8 Rubber Cable

Size (mm ²)	QTY (m)	Price (JD)
3*2.5	1000 m (1 drum)	
1*2.5	1000 m (1 drum)	

Section 7 – Compliance Statement

The following are response codes to be used in responding to each requirement. Bidders must describe how the requirement is met in each case, with references to support documents, relevant proposal sections as appropriate.

Response Code	Description
7	Provided Option exceed the required configuration and provides a value-add, adheres to the requirements of the RFP and provides a longer service life and performance enhancements
6	Fully Compliant and exactly meets the indicated requirement
5	The requirement is not part of the provided vehicle Additional products, services and/or tools are provided at <u>no extra cost</u> to AW
4	The requirement is not part of the provided vehicle Additional products, services and/or tools are provided at <u>additional cost</u> to AW
3	The requirement is not part of the provided but will be provided in the near future at maximum 6 months
2	The requirement is not part of the provided but will be provided in the near future at maximum 12 months
1	Future option with a more than 1 year plan.
0	Not Compliant

7.1 Well Pump

No	Specification	Compliance Level	Reference in Proposal	Comments
1	The well pumps shall be designed and constructed to operate continuously on a 24 hour per day, 365 days per year basis at full load service without requiring excessive maintenance, repairs, long work stoppages, or direct operator supervision.			
2	The well pumps shall be of the vertical submersible multistage type conforming to the latest Hydraulic Institute and requirements of ANSI/AWWA Standard E102-06.			
3	The well pumps shall be of heavy-duty design for continuous services. The well Pump shall be able to operate with Variable frequency Drive			
4	The well pump, which shall be suspended from a riser pipe, will be installed in a well casing with minimum internal bore as defined in the data sheets.			
5	The pumps shall be designed to operate with minimum vibration. Critical speeds shall exceed the normal operating speed of the units by at least ten percent.			
6	The net positive suction head (NPSH) requirement shall be stated in consideration of the range of duties throughout the design life.			
7	Well pumps shall be provided with a non-return valve on the discharge flange. Alternatively, an integral non-return valve may be proposed.			
8	Pumps shall be capable of withstanding reverse rotation of 120 percent of the design speed.			
9	Pumps shall be capable of filling the rising main from empty within any extra measures being necessary.			
10	Cable protection shields should be provided for power and instrument cables to give protection to the cables passing over the pump.			
11	Pump bowls shall be of such thickness and quality as to safely withstand a pressure of at least 1.5 times the maximum closed valve design pressure and for the maximum number of impeller stages.			
12	Pumps bowls shall be fitted with renewable wear rings which shall be locked in place but can be easily replaced.			
13	The pump shall be provided with screwed connection (no flange connection) at the delivery housing (thread of riser pipe API-5L),			
14	Pump Construction Bowls shall have integrally cast delivery guide vanes and shall also incorporate the pump bearings. The bearings shall be water lubricated and shall be shielded against the ingress of sand or other abrasive matter. All bowls, bearing housings and motor adapters shall be designed to ensure accurate alignment after dismantling and re-assembly either by means of a spigot joint or dowel pin.			

No	Specification	Compliance Level	Reference in Proposal	Comments
	Pump impellers shall be of the shrouded type and shall have conical locking sleeves. The pumps shall incorporate dynamic wear rings made of POM (Polyacetal Polymer) for reduced internal losses and reduced wear.			
15	Impellers shall be statically and dynamically balanced, the balancing achieved by machining and not addition of weights.			
16	Pump shaft shall be sized to transmit the maximum torque required and to withstand continuously all stresses from supported weights, thrusts and starting.			
17	The pump suction cover shall be provided with a cylindrical screen. The pump suction cover shall have a spigoted flange at its lower end bolted to the driving motor.			
18	The well pump delivery branch or integral non-return valve shall be provided with a flanged delivery branch for connection to the riser pipe.			
19	The pump materials of construction shall be as specified in subsequent clause of this section. The Vendor/Manufacturer shall confirm that the specified materials will meet the design service life specified when operating with well water.			
20	All submersible pump components shall conform to NSF/ANSI 61 or equivalent.			
21	Pump Duties It is accepted that pumps can deliver in excess of their nominal duty, particularly when new. However, this variation shall not exceed 30% of the nominal duty under the minimum head conditions predicted. A steep H-Q curve is therefore desirable. Pump efficiencies at the nominal duty points shall not be less than 75 percent			
Pump Check Valve				
1	The pump shall be provided with a nozzle type check valve on the pump outlet and to avoid water hammer and pipe breakage. The pump check valve shall be suitable for the operational condition plus 25% safety factor.			
2	The check valves shall be capable of being removed.			
3	Nozzle type check valves shall comply with the requirements of this specification and ANSI B16.34.			
4	Nozzle type check valves shall exhibit the following features: 1. A Nozzel type, spring loaded, moving element providing slam free valve closure. 2. Smoothly contoured internal surfaces. 3. Minimum head loss at operating conditions.			
5	Nozzle type check valves shall be made of stainless steel 316 or cast iron as per ASTM A48 class 35, EN 1516 EN-GJL-250,.			
6	All cast iron components shall be inside and outside coated with fusion bonded epoxy. Epoxy shall be applied in accordance with AWWA C550 with minimum			

No	Specification	Compliance Level	Reference in Proposal	Comments
	250µm fusion bonded epoxy or epoxy powder coated according to EN 14901 with a minimum thickness of 250 µm and shall be NSF61 and NSF 372, WRAS certified or equivalent recognized standards			
Well Pump Motor				
1	Motors shall comply with all the relevant clauses of the most recent revisions of the International Electromechanical Commission (IEC).			
2	The motor efficiency shall be not less than 90%. The motor shall have a minimum power factor of 80% when operated at 75% of the motor rated power.			
3	Uncorrected motor power factors shall not be less than 0.85 with the pump operating under maximum head conditions with the number of pump stages installed. The service factor shall be 1.15			
4	Motors shall be designed for duty S1, according to IEC 60034-1. Well pump motors shall be submersible electric three phase, squirrel cage induction type or Permanent Magnet Motor, direct coupled to the well pump through a suitable coupling, mounted under the pump whereby the pumped media is used for motor cooling.			
5	A 3 wire Pt 100 RTD temperature sensor or two terminal thermistors shall be fitted to the motor to monitor the motor coolant temperature and to provide a trip facility. The Vendor shall provide full details of the Pt 100 RTD or thermistors and method of sealing for long term use in water.			
6	In the event that a Pt 100 is selected it shall be provided with a triad cable, the cable for a thermistor shall be twisted pair formation. The length of instrument cables shall be the same as that for the power cables.			
7	The motors shall be capable of operating for extended periods at any point within the operating range without overheating or vibrating, Mechanical shroud shall be furnished to cool the motor if required.			
8	The motors shall be sized to prevent overloading at any point on the pump H-Q curve during the life of the motor. The nominal motor power rating shall be at least 10% greater than the power requirement at rated flow or 5% greater than the ultimate maximum power requirement, whichever is greater.			
9	Motor selection shall be non-overloading over the entire range of pump curve for the selected impeller(s).			
10	Motors shall have an enclosure classification of IP68 appropriate to the maximum submergence applicable to the installation.			
11	The number of motor sizes utilized shall be limited to maintain maximum inter-changeability.			
12	The motor shall be suitable for operation with Variable frequency Drive VFD at 400 volts ±10% 3 phase 50HZ ±5%.the VFD available onsite Type and model is AB Power flex 753			
13	Motors Material of Construction			

No	Specification	Compliance Level	Reference in Proposal	Comments														
	<p>The materials of the well pumps motors components shall be as follows or better in order to be suitable for well water quality:</p> <table border="1"> <tr> <td>Component</td> <td>Material of Constructing</td> </tr> <tr> <td>Motor Casing</td> <td>Stainless Steel to 316</td> </tr> <tr> <td>Motor Shaft (internal)</td> <td>Stainless Steel to DIN 431</td> </tr> <tr> <td>Motor Shaft (in contact with well water)</td> <td>Stainless Steel to DIN 431</td> </tr> <tr> <td>Mechanical Seal Faces</td> <td>Carbon/Ceramic/NBR</td> </tr> </table>	Component	Material of Constructing	Motor Casing	Stainless Steel to 316	Motor Shaft (internal)	Stainless Steel to DIN 431	Motor Shaft (in contact with well water)	Stainless Steel to DIN 431	Mechanical Seal Faces	Carbon/Ceramic/NBR							
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Submersible Power Cable																		
1	<table border="1"> <tr> <td>Conductor</td> <td>flexible tinned copper wires</td> </tr> <tr> <td>Number of cores</td> <td>3</td> </tr> <tr> <td>Color of cores</td> <td>R.Y.B</td> </tr> <tr> <td>Cable shape</td> <td>Flat cable</td> </tr> <tr> <td>Double Insulated</td> <td>CU/PVC/PVC/PVC</td> </tr> <tr> <td>Voltage rating</td> <td>600/1000 V</td> </tr> <tr> <td>Ingress protection</td> <td>IP68</td> </tr> </table>	Conductor	flexible tinned copper wires	Number of cores	3	Color of cores	R.Y.B	Cable shape	Flat cable	Double Insulated	CU/PVC/PVC/PVC	Voltage rating	600/1000 V	Ingress protection	IP68			
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Double Insulated	CU/PVC/PVC/PVC																	
Voltage rating	600/1000 V																	
Ingress protection	IP68																	
2	The pump cable shall be furnished and installed in one continuous length from the motor leads to the well head with one splice only allowed at the motor leads. Any cable fillers shall be non-hydroscopic. Paper or jute fillers are not allowed. Length of each cable shall be adequate for the maximum setting depth listed plus 25 meters.																	
3	The downhole cable shall be high potential tested at the factory, and the applied test voltage shall exceed the nameplate voltage rating of the cable to conform with the applicable IEEE and ICEA cable manufacturing standards.																	
4	The cable shall be suitably supported from the column at several points adequate for the type of cable used with corrosion-resistant clamps																	
Rubber Cable																		
1	<table border="1"> <tr> <td>conductor</td> <td>flexible copper conductor</td> </tr> <tr> <td>Insulation</td> <td>EPR,EPDM rubber core</td> </tr> <tr> <td>Sheath</td> <td>PCP (Polychloroprene), Flexible rubber,CPE</td> </tr> <tr> <td>voltage</td> <td>300/500</td> </tr> <tr> <td>Ingress protection</td> <td>IP68</td> </tr> </table>	conductor	flexible copper conductor	Insulation	EPR,EPDM rubber core	Sheath	PCP (Polychloroprene), Flexible rubber,CPE	voltage	300/500	Ingress protection	IP68							
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Documentation and Certification																		

No	Specification	Compliance Level	Reference in Proposal	Comments
2	<p>The Contractor shall provide all the following technical documents and certificates as minimum:</p> <ul style="list-style-type: none"> - Technical catalogues. - Characteristic pump curves showing total dynamic head (TDH), efficiency, NPSH curve and power rating as functions of flow & Variable speed. - Installation manual. - Complete operating and maintenance manuals. - Two years warranty. - - Potable Water Certificate <p style="text-align: center;">PUMP TEST CERTIFICATE</p> <p>Each pump shall be tested at royal scientific society or water authority of Jordan workshop under the witness of Aqaba Water company staff.</p>			

7.2 Valves and Accessories

No	Specification	Compliance Level	Reference in Proposal	Comments
General				
1	All valves shall be designed and constructed for the working pressure and the fluid as specified.			
2	Valve ends shall be flanged ends except where otherwise specified. Where flanged ends are used, mating dimensions and drilling shall be in accordance with the pipe and fitting flange. Thickness of flanges shall be determined based on the working pressure specified and shall conform to internationally accepted standards.			
3	The equipment shall be the product of an established and reputable manufacturer who has had experience in the manufacture of the type of equipment herein specified.			
4	Unless otherwise specified, all valves and gates shall be butterfly valves type for diameters from 250 mm and above and gate valves type for diameters less than 250 mm.			
5	All valves of the same type shall be from one manufacturer.			
6	The Contractor shall make evidence of the hydraulic performance of the valves proposed.			
7	Valves shall be equipped with, hand wheel or electric actuator except where otherwise specified. Actuators shall have arrows cast thereon to indicate the direction of rotation for opening the valve.			
8	All shut-off devices must shut in a clockwise direction. This will be indicated by 'O' (open) and 'C' (closed) with arrows either on the hand wheel or the head of a piece.			

No	Specification	Compliance Level	Reference in Proposal	Comments
	Operation of shut-off devices must be easy both for opening and closing.			
	All valves shall have closing, opening indicators and an arrow cast in the metal to indicate the direction to open.			
Potable Water Certification				
1	The contractor is required to submit certificates from reputable third party that the components of the network must not be of any way toxic to the water being conveyed. And can be fully used for the distribution of potable water to a temperature up to 50°C. The Certificates should be submitted for all the materials in contact with potable water such as paints, gaskets...etc.			
Testing after delivery				
1	All valves supplied to the site in Jordan shall be subjected to acceptance tests carried out by the Royal Scientific Society or an equivalent accredited institution. Final inspection tests must be done in accordance with the test requirements of EN 12266-1/2, ANSI/ASME, or AWWA Standards. If any of the tests mentioned in the standards cannot be performed by the Royal Scientific Society, then the supplier should provide a third-party certificate for those tests taking into considerations the requirements stipulated in Section Third Party Witness. <u>All testing costs should be borne by the Contractor in all cases.</u>			
Potable Water Certification				
1	The contractor is required to submit certificates from reputable third party that the components of the network must not be of any way toxic to the water being conveyed. And can be fully used for the distribution of potable water to a temperature up to 50°C. The Certificates should be submitted for all the materials in contact with potable water such as paints, gaskets...etc			
Valves Packing and Protection				
1	All valves must be packed in such a way to allow instantaneous use on site without additional cleaning. All valves shall be securely packed in crates and boxes to prevent damage during delivery. The cost of packing shall be deemed to be included in the Tender rates, noting that crates will not be returned back to the Contractor.			
Documents to be provided upon delivery				
1	The contractor shall submit at least the following documents: 1. Certificate of origin.			

No	Specification	Compliance Level	Reference in Proposal	Comments
	2. Packing list 3. Third Party certificates (if required) 4. Factory inspection certificates. 5. Warranty 6. installation and maintenance manual 7. Any other documents requested by the Engineer and the hand over committee All above documents must be valid and in English.			
	Marking			
1	Markings shall include size, working pressure, body material, name of manufacturer, and year of manufacture cast into the body of the valve.			
	Gate Valves			
1	Gate valves shall conform to the latest version of AWWA Standard C515 covering Resilient Seated gate Valves for Water Supply Service or EN 1171 and EN 1074-2.			
2	The valves shall have short body, hand wheel, body, bonnet cap and bonnet made of ductile iron ASTM A536 70-50-5, A536 65-45-12 or EN-GJS-400-18, EN-GJS-400-15, EN-GJS-500-7/ EN-JS 1030 according to EN 1563. The wedge shall be totally encapsulated with rubber.			
3	Wedge (gate) shall be constructed of ductile iron ASTM A536 70-50-5, A536 65-45-12 or EN-GJS-400-18, EN-GJS-400-15 / EN-JS 1030 according to EN 1563 fully encapsulated in EPDM rubber as per AWWA C-515 with delrin slides affixed to the wedge. The wedge shall be symmetrical and seal equally well with flow in either direction.			
4	The sealing rubber shall be made of EPDM shall be permanently bonded to the wedge to meet ASTM tests for rubber metal bond ATSM D249.			
5	Valves shall be supplied with O-Rings made of EPDM suitable for potable water seals at all joints (no flat gaskets shall be allowed).			
6	The valves shall be non-rising stem, opening by turning counter clockwise and provided with a hand wheel epoxy powder coated and have closing, opening indicators and an arrow cast in the metal to indicate the direction to open.			
7	Flange dimensions and drilling shall conform to ISO 7005-2 or EN 1092-2 PN16 and shall be suitable for a nominal working pressure of 16 bars as specified in the Bill of Quantities.			
8	Stems for non-rising stem assemblies shall be cast bronze ASTM A584 C86700, copper alloy, stainless steel 304 or 316 with integral collars in full compliance with AWWA or (St 1.4021 / X20Cr13) in accordance with EN 10088 - 3.			

No	Specification	Compliance Level	Reference in Proposal	Comments
9	All exterior nuts and bolts shall be Type 18-8 stainless steel.			
10	All stems shall operate with bronze stem nuts, independent of stem. Stems shall have two O-Rings located above thrust collar and O-Ring below. All stem O-Rings shall be replaceable with valve fully opened and subjected to full pressure. The stems shall also have two low torque thrust bearings located above and below stem collar to reduce friction during operation.			
11	Waterway shall be smooth, unobstructed and free of all pockets, cavities and depressions in the seat area. Valves 2" and larger shall accept a full-size tapping cutter.			
12	The body, bonnet and stuffing plate shall be coated with fusion bonded epoxy, both interior and exterior on body and bonnet. Epoxy shall be applied in accordance with AWWA C550 or epoxy powder coated according to EN14901 with minimum 250µm and shall be NSF61 and NSF 372, WRAS certified or equivalent recognized standards.			
13	The valve shall be tested and certified as a complete drinking water valve according to NSF 61 AND 372, WRAS, or equivalent recognized standards			
14	Valve has been cycled tested full opened to close 5,000 times without loss of bubble-tight seal or Minimum life cycle shall be 2500 cycles according to EN 1074-2.			
15	The valve size, pressure rating, year of manufacture and manufacturer's name & model shall be cast onto the valve body or be on a permanently attached nameplate.			
Valve Testing				
1	Prior to shipment from the factory, all valves shall be tested by hydrostatic pressure equal to requirements of AWWA C515, EN 1074 ½ and ISO 5208: or EN 12266-1/2 standards.			
2	Each valve shall be supplied with a factory inspection certificate outlining body pressure test, leakage test, valve size, valve serial number, pressure rating, body heat No., disc heat No., stem heat No. seat material and seat heat No.			
Well Head Check Valve				
1	The Vendor Shall Provide Swing type check valve resilient seated for the well head connection.			
2	The swing check valve shall confirm to AWWA. C508 or equivalent standards			
3	The pump check valve shall be suitable for the operational condition plus 25% safety factor.			
4	Flange dimensions and drilling according to EN 1092, ISO 7005 or equivalent, PN16, and shall be suitable for a nominal working pressure of 16 bars according to the Bill of Quantities.			
5	Swing type check valves shall exhibit the following features:			

No	Specification	Compliance Level	Reference in Proposal	Comments
6	General: Swing check valves for water with full-opening passages, designed for a water-working pressure of 16 bar. They shall have a flanged cover piece to provide access to the disc.			
7	The top access port shall be full size, allowing removal of the disc without removing the valve from the line.			
8	Body and cover: The valve body and cover shall be of cast iron conforming to ASTM A 126 or ductile iron ASTM A536 70-50-5, A536 65-45-12 or EN-GJS-400-18, EN-GJS-400-15, EN-GJS-500-7/ EN-JS 1030 according to EN 1563, They shall be inside and outside coated with fusion bonded epoxy. Epoxy shall be applied in accordance with AWWA C550 with minimum 250µm fusion bonded epoxy or epoxy powder coated according to EN 14901 with a minimum thickness of 250 µm and shall be NSF61 and NSF 372, WRAS certified or equivalent recognized standards.			
9	Disc: The valve disc shall be of one-piece construction, EPDM or NBR Encapsulated and shall be of cast iron, ductile iron conforming to ASTM A536 70-50-5, A536 65-45-12 or EN-GJS-400-18, EN-GJS-400-15, EN-GJS-500-7/ EN-JS 1030 according to EN 1563, or bronze conforming to ASTM B 62 - Composition Bronze Castings.			
10	Hinge Pin and Hinge: The hinge pin and hinge shall be of bronze or stainless steel.			
11	O-Ring and Gasket: shall be made of EPDM OR NBR			
12	Bolts, Nuts and Washers: shall be made of stainless steel.			
13	The valve shall be tested and certified as a complete drinking water valve according to NSF 61, WRAS, or equivalent recognized standards			
14	Each valve shall be supplied with a factory inspection certificate outlining body pressure test, leakage test, valve size, valve serial number, pressure rating, and body heat No.A2.2.3 Air valves			
16	Air valves shall conform to the latest edition of AWWA C512 or BS EN 1074-4.			
17	The air valve shall be tested and certified as a complete drinking water valve according to NSF 61 AND 372, WRAS, or equivalent recognized standards.			
18	Air valves smaller than DN 50 mm shall be female thread inlet connection and larger air valves shall have Flanged inlet, the flange shall comply with EN 1092-2, ISO 7005 or equivalent.			
19	The valve size, pressure rating, year of manufacture and manufacturer's name & model shall be cast onto the valve body or be on a permanently attached nameplate.			
20	Each valve shall be supplied with a factory inspection certificate outlining body pressure test, leakage test, valve size, valve serial number, pressure rating, and body heat No.			

No	Specification	Compliance Level	Reference in Proposal	Comments
	Single Air Valve			
1	The air release valve shall be of the float operated, simple lever or compound lever design, and capable of automatically releasing accumulated air from a fluid system while the system is pressurized and operating.			
2	Air Valves shall be single automatic air valves, PN 16, with body/bonnet in ductile iron ASTM A536 65-45-12 or EN-JS 1030 (GGG 40) according to EN 1563 or cast iron to Cast Iron ASTM A126 Class B or BS EN 1561 EN-GJL-250..			
3	Air Valves shall be inside and outside coated with fusion bonded epoxy. Epoxy shall be applied in accordance with AWWA C550 and shall be NSF61 and NSF 372 certified with minimum 250µm fusion bonded epoxy or epoxy powder coated according to EN 14901 with a minimum thickness of 250 µm.			
4	Orifice and float balls shall be of corrosion free material, the material shall be stainless steel 304 or 316, all seals shall be of EPDM Buna-N rubber or better materials suitable and approved for potable water.			
5	All internal components shall be made of stainless-steel 316 or better.			
6	The valve shall be tested and certified as a complete drinking water valve according to NSF 61 AND 372, WRAS, or equivalent recognized standards.			
	COMBINATION AIR VALVE			
1	Combination Air Valves shall have operating features of both Air/Vacuum Valves and Air Release Valves.			
2	Combination Air Valves shall be in two body or single body style: large orifice air and vacuum valve and small orifice air release valve.			
3	These valves are also called Double Orifice Valves.			
4	Double orifice air valves shall be of the triple function with a flanged inlet ANSI B16.1, ANSI B16.42 pressure Class 150, 250, and 400 psi, EN 1092-2 PN16 and shall be suitable for a nominal working pressure of 16 bars in accordance with the details stated in the Bill of Quantities.			
5	Body and cover shall be of ductile iron ASTM A536 65-45-12 or EN-JS 1030 (GGG 40) according to EN 1563 or cast iron to Cast Iron ASTM A126 Class B or BS EN 1561 EN-GJL-250. They shall be inside and outside coated with fusion bonded epoxy.			
6	Epoxy shall be applied in accordance with AWWA C550 and shall be NSF61 and NSF 372 certified with minimum 250µm fusion bonded epoxy or epoxy powder coated according to EN 14901 with a minimum thickness of 250 µm.			
7	Orifice and float balls shall be of corrosion free material stainless steel grade 304, 316 or better.			
8	All seals shall be of EPDM, Buna-N rubber or better materials suitable and approved for potable water.			

No	Specification	Compliance Level	Reference in Proposal	Comments
9	All internal components shall be made of stainless-steel 316 or better.			
	Dismantling Joints			
	General			
1	Dismantling joints shall be installed where indicated on the drawings for convenient installation or re-installation of valves or similar items.			
2	For prevention of any movement of the pipe joints adjacent to closed valves, meters or flanged equipment dismantling joints shall be provided in general by restrained dismantling pieces (short version).			
3	Dismantling joints shall meet the applicable latest edition of AWWA C219, (short version) according to DIN 2541 or DIN 2547 or equivalent.			
4	Flange dimensions and drilling according to ISO 7005-1 or EN 1092-1 PN16 and shall be suitable for a nominal working pressure of 16 bars.			
5	The Dismantling joints shall be tested and certified as a complete drinking water valve according to NSF 61 AND 372, WRAS, or equivalent recognized standards.			
6	Dismantling joints shall be installed where indicated on the drawings for convenient installation or re-installation of valves or similar items.			
7	Dismantling joint shall Equipped with the following: <ul style="list-style-type: none"> - Flange adaptor. - Flanged spigot piece. - Gasket - Tie-rods and nuts - Studs/Nuts/Washers - Materials specifications and Relevant Standards 			
8	Flange adapter shall be made of ductile iron per ASTM A536 65-45-42 or ductile iron per EN-GJS-450-10, EN-GJS-400-15 or shall be made of carbon steel per ASTM A36 or Steel per BS EN10025 Grade S275.			
9	Flanged spigot piece shall be made of ductile iron per ASTM A536 65-45-42 or ductile iron per EN-GJS-450-10, EN-GJS-400-15 or shall be made of carbon steel per ASTM A36 or steel to BS EN10025 Grade S275..			
10	Gasket shall be made of EPDM, erbutan material, nitrile rubber or equivalent quality shall be used and shall be suitable and approved for the use with potable water.			
11	Tie-rods, nuts, studs and washers shall be made of stainless steel.			
12	Coating: coated (internal & external) with a minimum 250 µm thickness Fusion Bonded Epoxy or epoxy powder. Epoxy shall be applied in accordance with AWWA C550 or according to EN 14901 and shall be NSF61 and NSF 372, WRAS, or equivalent recognized standards certified with minimum 250µm fusion bonded epoxy.			

7.3 Riser Pipe

No	Specification	Compliance Level	Reference in Proposal	Comments
General				
1	The Riser Pipes shall be in accordance with API-5L or ASTM A53 line pipe schedule 40. The pipes shall be seamless and threaded from both sides according to API-5L with 8 threads per inch or ANSI B1.20.1 standard tapered pipe threads.			
2	External coating and internal lining: NSF/ANSI 61 approved fusion bonded epoxy powder coating according to AWWA C213 or equivalent.			
Inspection and Test				
1	Testing shall be performed in accordance with API-5L standards: tensile test, chemical composition test, fattening test, hydrostatic test, dimensions and visual test.			
2	Factory test report certificate shall be in accordance with the API-5L specification.			
Pipe Joint and Jointing				
1	The pipes shall be threaded from both sides at the rate of eight (8) threads per inch according to API-5L or ANSI B1.20.1 standard tapered pipe threads and connected by threaded sleeve type steel coupling. Ends of each pipe shall be provided with protectors to prevent threads damage.			
2	The pipes and couplings when joined together, must be aligned through all the depth of the bore holes which reaches up to 350 meters, and shall not have any deflection through this distance.			
3	The threading for both pipes and couplings shall be done by the pipe manufacturer and shall be free of any failure caused during machine threading or due to transportation or shipment. The pipes and couplings must be suitable for the use with submersible pumps and bore holes in which the depth reaches 350 meters, so the water column to withstand the vibration of the pumping unit.			
Length				
1	Pipes lengths shall be 6 meters in equal lengths.			
Documentation and Certification				
1	The Contractor shall provide all the following technical documents and certificates as minimum:			
2	Technical catalogues.			
3	Factory test report certificates shall be in accordance with the API-5L or ASTM A53 specification.			
4	Potable Water Certificate.			
Marking				
1	The pipes shall be preferably marked with the manufacture's symbol or trade mark, grade, and heat number.			

Section 8 – Statement of Conformance

Bidders need to fill in the Statement of Conformance provided below, sign it by an authorized representative of the company and stamp it with the company official stamp. Enter “Yes” or “No” in the left column to indicate your conformance level (without any additional words or qualifying statements like “Agree in Principle”, “Agree with conservation” ...etc)

Mandatory Requirements Checklist (Statement Of Conformance)	
Agree & Confirm	Requirement
	1. We have read this RFP and we hereby agree and confirm with all the terms, conditions and project scope of the This RFP
	2. We fully understand that the project will be managed and awarded as a turnkey manner as described in the RFP and we take fully responsibility for the successfully delivery and completion of all project and RFP requirements, tasks and as per the directions of AW.
	3. Any malfunction, incomplete delivery, partial delivery or any other reason for any of the solution components that render it as useless or not working up to AWC satisfaction shall be rejected immediately and the winning bidder will be responsible for replacing the component.
	4. The Bidder fully complies with the technical requirements in this RFP and shall not devise from the specification without the written consent of AWC
	5. We confirm that the prices provided in our Financial proposal are comprehensive, conform with the RFP requirement
	6. We have structured our technical and Financial proposals based on the RFP requirements
	7. We have included in our technical and Financial proposals all tools, processes and resources required to successfully complete the project on time, quality and as requested by the RFP.
	8. We conform that any missing item will be assumed at zero cost and AW can't be held liable for any reimbursement or payment to be made.
	9. We have no hidden or un-declared cost items
	10. We confirm that the proposal has been prepared internally without the assistance of any external party or any previously or currently associated vendor(s) with Aqaba Water Company.
	11. We confirm that our company is an independent company that is not or nor has been associated directly or indirectly with any existing or previous vendor(s) who has or in a legal, business, commercial or contractual dispute with Aqaba Water Company
	12. We confirm that we have read and fully understood the USAID Procurement laws and regulations and shall comply with in full.
	13. We confirm that we will submit the proposal according to this RFP format and outline.

Mandatory Requirements Checklist (Statement Of Conformance)	
Agree & Confirm	Requirement
	14. We confirm and agree that our company will sign the contract directly with Aqaba Water Company without any third-party or middleman
	15. We confirm that we have developed, provided information and presented all the information required by the RFP and any additional information that will help Aqaba Water Company to select the winning bidder.
	16. Non-disclosure Agreement. We hereby confirm that our company agrees to the AW NDA agreement and that all employees involved in the preparation of the proposal and proposed for project implementation have signed a similar NDA with our company

Authorized Representative Name & Signature:

Appendix A – Bill of Quantity and Technical Specifications

A.1 – BoQ. Summary

The following is an indicative summary for the BoQ. and bidders should read specifications and pay attention to details.

All item, equipment, material shall be delivered to AW DISI warehouse

Wells Pump – As per the technical Specifications in this document

Well #	Well ID	Riser Pipe Size (mm)	Pump Head (M)	Pump Sitting (mm)	Well Dynamic Head (m) @ instantaneous flow	Well Head Pressure (m)	Well Casing Internal Diameter (inch)	Quantity	Price (JD)
1	QA 14	150	210	180	133 @ 133m ³ /h	55	18	1	
2	QA3	150	210	168	140 @ 140m ³ /h	55	20	1	
3	QA9	200	210	168	132.2 @ 180m ³ /h	55	18	1	
4	AD3	150	195	150	131 @ 130 m ³ /h	55	24	1	

Gate Valves – As per the technical Specifications in this document

Item #	Valve Size (mm)	Pressure Rating	Quantity	Price (JD)
1	150	16	8	
2	200	16	8	

Dismantling Joints

Item #	Dismantling Joint Size (mm)	Pressure Rating	Quantity	Price (JD)
1	150	16	8	
2	200	16	8	

Riser Pipes

Item #	Pipe Size (mm)	Pipe wall thickness (mm)	Quantity (m)	Price (JD)
1	150	7.1	360	
2	200	8.2	360	

Air Valves

Item #	Item description	Size (mm)	Quantity	Price (JD)
1	Combination Air valve	50	20	

Well Head Check Valve

Item #	Item description	Size (mm)	Quantity	Price (JD)
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1	Swing check valve	150	4	
2	Swing check valve	200	4	

Power Cable

Cable size (mm ²)	Cable length (m)	Price (JD)
150	200 m (1 drum)	
120	400 m (1 drum)	
95	200	
70	200	

Rubber Cable

Size (mm ²)	QTY (m)	Price (JD)
3*2.5	1000 m (1 drum)	
1*2.5	1000 m (1 drum)	

A.2 – Technical Specifications

A2.1. Wells Pump Technical Specifications

Scope of Work

This specification covers the work necessary for the supply, technical and performance requirements for the design, fabrication, delivery, testing and commissioning (covering testing at the manufacturer’s factory and site commissioning & testing), supervision and assistance during site assembly and installation of the following:

- A. Submersible multistage well pumps.
- B. Submersible electric motors.
- C. Pump delivery non-return valves.
- D. Submersible power and temperature sensor cables.
- E. All the necessary instrumentation, such as pressure transmitter, thermocouples, temperature transmitters, level sensor etc... needed to monitor and control the pumps and pumps motors.
- F. and any accessories and instruments deemed necessary by the Manufacturer.

The manufacturer shall be responsible for all engineering, design, finishing, fabrication, materials of construction, inspection, testing and certification of the materials specified; however, this does not relieve the contractor of the responsibility of the comply with the requirements in this section.

The pumps shall be ready to operate after installation, connection and testing. The manufacturer shall include in the scope of work items, accessories and services that are usual or necessary to complete the work, but which may not have been specifically mentioned herein. This includes:

- Touch-up paint.
- All necessary tools and devices to carry out the site tests and specific tools for assembly and erection purposes related to the pumps. The tests shall include temperature test, vibration tests other than performance test.

The contractor shall be responsible for the followings:

- Product shipment, handling, storage and protection of all equipment.
- Supply, start-up and site performance testing.
- Spare parts for commissioning and start-up.

A2.1.1 WELL PUMP

General

The well pumps shall be designed and constructed to operate continuously on a 24 hour per day, 365 days per year basis at full load service without requiring excessive maintenance, repairs, long work stoppages, or direct operator supervision.

The well pumps shall be of the vertical submersible multistage type conforming to the latest Hydraulic Institute and requirements of ANSI/AWWA Standard E102-06.

The well pumps shall be of heavy-duty design for continuous services.

The well Pump shall be able to operate with **Variable frequency Drive**

The well pump, which shall be suspended from a riser pipe, will be installed in a well casing with minimum internal bore as defined in the data sheets.

The pumps shall be designed to operate with minimum vibration. Critical speeds shall exceed the normal operating speed of the units by at least ten percent.

The net positive suction head (NPSH) requirement shall be stated in consideration of the range of duties throughout the design life.

Well pumps shall be provided with a non-return valve on the discharge flange. Alternatively, an integral non-return valve may be proposed.

Pumps shall be capable of withstanding reverse rotation of 120 percent of the design speed.

Pumps shall be capable of filling the rising main from empty within any extra measures being necessary.

Cable protection shields should be provided for power and instrument cables to give protection to the cables passing over the pump.

Pump bowls shall be of such thickness and quality as to safely withstand a pressure of at least 1.5 times the maximum closed valve design pressure and for the maximum number of impeller stages. Pumps bowls shall be fitted with renewable wear rings which shall be locked in place but can be easily replaced.

The pump shall be provided with screwed connection (no flange connection) at the delivery housing (thread of riser pipe API-5L),

Pump Construction

Bowls shall have integrally cast delivery guide vanes and shall also incorporate the pump bearings. The bearings shall be water lubricated and shall be shielded against the ingress of sand or other abrasive matter. All bowls, bearing housings and motor adapters shall be designed to ensure accurate alignment after dismantling and re-assembly either by means of a spigot joint or dowel pin.

Pump impellers shall be of the shrouded type and shall have conical locking sleeves. The pumps shall incorporate dynamic wear rings made of POM (Polyacetal Polymer) for reduced internal losses and reduced wear.

Impellers shall be statically and dynamically balanced, the balancing achieved by machining and not addition of weights.

Pump shaft shall be sized to transmit the maximum torque required and to withstand continuously all stresses from supported weights, thrusts and starting.

The pump suction cover shall be provided with a cylindrical screen. The pump suction cover shall have a spigoted flange at its lower end bolted to the driving motor.

The well pump delivery branch or integral non-return valve shall be provided with a flanged delivery branch for connection to the riser pipe.

The pump materials of construction shall be as specified in subsequent clause of this section. The Vendor/Manufacturer shall confirm that the specified materials will meet the design service life specified when operating with well water.

All submersible pump components shall conform to NSF/ANSI 61 or equivalent.

Pump Duties

It is accepted that pumps can deliver in excess of their nominal duty, particularly when new. However, this variation shall not exceed 30% of the nominal duty under the minimum head conditions predicted. A steep H-Q curve is therefore desirable.

Pump efficiencies at the nominal duty points shall not be less than 75 percent.

MATERIAL OF CONSTRUCTION

The vendor shall advise the proper material considering the water quality, operation condition and performance requirements, keep in mind the material shall be made of the following material or better in order to be suitable for well water quality:

- The Pump Power shall be made of Cast iron as per ASTM A48 class 35, EN 1516 EN-GJL-250, or Cast stainless steel 316.
- The pump impeller shall be bronze or Cast stainless steel 316.
- Pump shaft shall be made of stainless steel 431
- Strainer shall be made of stainless steel 304. Bolts, Nuts and Washers shall be made of stainless steel 316.
- Stainless steel sheet pump will be rejected

Each set of pumps with similar duty conditions shall be identical and all their parts and components must be interchangeable. The material of construction shall be resistant to corrosion and abrasion.

The Vendor/Manufacturer shall confirm the construction material for the pump set components.

The Vendor/Manufacturer shall identify materials of construction by the current ASTM standards specification number(s) or DIN.

All component materials shall be suitable for chemical and physical properties of pumped well water quality of well.

The Manufacturer shall fabricate the equipment using only new materials of the first-grade quality, free from defects impairing strength, durability, and appearance.

Materials of construction and corrosion protection measures shall be selected for galvanic compatibility, corrosion resistance, mechanical and electrical performance and shall be capable of providing the required minimum design lifetime.

All non-metallic materials in contact with or likely to come into contact with conveyed water shall be certified suitable for potable water supplies.

A2.1.2 PUMP CHECK VALVE

The pump shall be provided with a nozzle type check valve on the pump outlet and to avoid water hammer and pipe breakage.

The pump check valve shall be suitable for the operational condition plus 25% safety factor.

The check valves shall be capable of being removed.

Nozzle type check valves shall comply with the requirements of this specification and ANSI B16.34.

Nozzle type check valves shall exhibit the following features:

1. A Nozzel type, spring loaded, moving element providing slam free valve closure.
2. Smoothly contoured internal surfaces.
3. Minimum head loss at operating conditions.

Nozzle type check valves shall be made of stainless steel 316 or cast iron as per ASTM A48 class 35, EN 1516 EN-GJL-250,.

All cast iron components shall be inside and outside coated with fusion bonded epoxy. Epoxy shall be applied in accordance with AWWA C550 with minimum 250µm fusion bonded epoxy or epoxy powder coated according to EN 14901 with a minimum thickness of 250 µm and shall be NSF61 and NSF 372, WRAS certified or equivalent recognized standards.

A2.1.3 WELL PUMPS MOTORS

Motors shall comply with all the relevant clauses of the most recent revisions of the International Electromechanical Commission (IEC).

The motor efficiency shall be not less than 90%. The motor shall have a minimum power factor of 80% when operated at 75% of the motor rated power.

Uncorrected motor power factors shall not be less than 0.85 with the pump operating under maximum head conditions with the number of pump stages installed.

The service factor shall be 1.15

Motors shall be designed for duty S1, according to IEC 60034-1.

Well pump motors shall be submersible electric three phase, squirrel cage induction type or Permanent Magnet Motor, direct coupled to the well pump through a suitable coupling, mounted under the pump whereby the pumped media is used for motor cooling.

A 3 wire Pt 100 RTD temperature sensor or two terminal thermistors shall be fitted to the motor to monitor the motor coolant temperature and to provide a trip facility. The Vendor shall provide full details of the Pt 100 RTD or thermistors and method of sealing for long term use in water.

In the event that a Pt 100 is selected it shall be provided with a triad cable, the cable for a thermistor shall be twisted pair formation. The length of instrument cables shall be the same as that for the power cables.

The motors shall be capable of operating for extended periods at any point within the operating range without overheating or vibrating, Mechanical shroud shall be furnished to cool the motor if required.

The motors shall be sized to prevent overloading at any point on the pump H-Q curve during the life of the motor. The nominal motor power rating shall be at least 10% greater than the power requirement at rated flow or 5% greater than the ultimate maximum power requirement, whichever is greater.

Motor selection shall be non-overloading over the entire range of pump curve for the selected impeller(s).

Motors shall have an enclosure classification of IP68 appropriate to the maximum submergence applicable to the installation.

The number of motor sizes utilized shall be limited to maintain maximum inter-changeability.

The motor shall be suitable for operation with Variable frequency Drive VFD at 400 volts $\pm 10\%$ 3 phase 50HZ $\pm 5\%$. the VFD available onsite Type and model is AB Power flex 753

Motors Material of Construction

The materials of the well pumps motors components shall be as follows or better in order to be suitable for well water quality:

Component	Material of Constructing
Motor Casing	Stainless Steel to 316
Motor Shaft (internal)	Stainless Steel to DIN 431
Motor Shaft (in contact with well water)	Stainless Steel to DIN 431
Mechanical Seal Faces	Carbon/Ceramic/NBR

A2.1.4 SUBMERSIBLE CABLE

Power Cables

Conductor	flexible tinned copper wires
Number of cores	3
Color of cores	R.Y.B
Cable shape	Flat cable
Double Insulated	CU/PVC/PVC/PVC
Voltage rating	600/1000 V
Ingress protection	IP68

b. The pump cable shall be furnished and installed in one continuous length from the motor leads to the well head with one splice only allowed at the motor leads. Any cable fillers shall be non-hydroscopic. Paper or jute fillers are not allowed. Length of each cable shall be adequate for the maximum setting depth listed plus 25 meters.

c. The downhole cable shall be high potential tested at the factory, and the applied test voltage shall exceed the nameplate voltage rating of the cable to conform with the applicable IEEE and ICEA cable manufacturing standards.

The cable shall be suitably supported from the column at several points adequate for the type of cable used with corrosion-resistant clamps.

Rubber Cable

Rubber Cable Specifications

conductor	flexible copper conductor
Insulation	EPR,EPDM rubber core
Sheath	PCP (Polychloroprene), Flexible rubber,CPE
voltage	300/500
Ingress protection	IP68

DOCUMENTATION AND CERTIFICATES

The Contractor shall provide all the following technical documents and certificates as minimum:

- Technical catalogues.
- Characteristic pump curves showing total dynamic head (TDH), efficiency, NPSH curve and power rating as functions of flow & Variable speed.
- Installation manual.
- Complete operating and maintenance manuals.
- Two years warranty.
-
- Potable Water Certificate

PUMP TEST CERTIFICATE

Each pump shall be tested at royal scientific society or water authority of Jordan workshop under the witness of Aqaba Water company staff.

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A2.2 VALVES AND ACCESSORISE

General

All valves shall be designed and constructed for the working pressure and the fluid as specified.

Valve ends shall be flanged ends except where otherwise specified. Where flanged ends are used, mating dimensions and drilling shall be in accordance with the pipe and fitting flange. Thickness of flanges shall be determined based on the working pressure specified and shall conform to internationally accepted standards.

The equipment shall be the product of an established and reputable manufacturer who has had experience in the manufacture of the type of equipment herein specified.

Unless otherwise specified, all valves and gates shall be butterfly valves type for diameters from 250 mm and above and gate valves type for diameters less than 250 mm.

All valves of the same type shall be from one manufacturer.

The Contractor shall make evidence of the hydraulic performance of the valves proposed.

Valves shall be equipped with, hand wheel or electric actuator except where otherwise specified. Actuators shall have arrows cast thereon to indicate the direction of rotation for opening the valve.

All shut-off devices must shut in a clockwise direction. This will be indicated by 'O' (open) and 'C' (closed) with arrows either on the hand wheel or the head of a piece. Operation of shut-off devices must be easy both for opening and closing.

All valves shall have closing, opening indicators and an arrow cast in the metal to indicate the direction to open.

Potable Water Certification

The contractor is required to submit certificates from reputable third party that the components of the network must not be of any way toxic to the water being conveyed. And can be fully used for the distribution of potable water to a temperature up to 50°C. The Certificates should be submitted for all the materials in contact with potable water such as paints, gaskets...etc.

Testing after delivery

All valves supplied to the site in Jordan shall be subjected to acceptance tests carried out by the Royal Scientific Society or an equivalent accredited institution. Final inspection tests must be done in accordance with the test requirements of EN 12266-1/2, ANSI/ASME, or AWWA Standards. If any of the tests mentioned in the standards cannot be performed by the Royal Scientific Society, then the supplier should provide a third-party certificate for those tests taking into considerations the requirements stipulated in Section Third Party Witness.

All testing costs should be borne by the Contractor in all cases.

Valves Packing and Protection

All valves must be packed in such a way to allow instantaneous use on site without additional cleaning.

All valves shall be securely packed in crates and boxes to prevent damage during delivery. The cost of packing shall be deemed to be included in the Tender rates, noting that crates will not be returned back to the Contractor.

Documents to be provided upon delivery

The contractor shall submit at least the following documents:

8. Certificate of origin.
9. Packing list
10. Third Party certificates (if required)
11. Factory inspection certificates.
12. Warranty
13. installation and maintenance manual
14. Any other documents requested by the Engineer and the hand over committee

All above documents must be valid and in English.

Marking

Markings shall include size, working pressure, body material, name of manufacturer, and year of manufacture cast into the body of the valve.

A2.2.1 Gate Valves

Gate valves shall conform to the latest version of AWWA Standard C515 covering Resilient Seated gate Valves for Water Supply Service or EN 1171 and EN 1074-2.

The valves shall have short body, hand wheel, body, bonnet cap and bonnet made of ductile iron ASTM A536 70-50-5, A536 65-45-12 or EN-GJS-400-18, EN-GJS-400-15, EN-GJS-500-7/ EN-JS 1030 according to EN 1563. The wedge shall be totally encapsulated with rubber.

Wedge (gate) shall be constructed of ductile iron ASTM A536 70-50-5, A536 65-45-12 or EN-GJS-400-18, EN-GJS-400-15 / EN-JS 1030 according to EN 1563 fully encapsulated in EPDM rubber as per AWWA C-515 with delrin slides affixed to the wedge. The wedge shall be symmetrical and seal equally well with flow in either direction.

The sealing rubber shall be made of EPDM shall be permanently bonded to the wedge to meet ASTM tests for rubber metal bond ATSM D249.

Valves shall be supplied with O-Rings made of EPDM suitable for potable water seals at all joints (no flat gaskets shall be allowed).

The valves shall be non-rising stem, opening by turning counter clockwise and provided with a hand wheel epoxy powder coated and have closing, opening indicators and an arrow cast in the metal to indicate the direction to open.

Flange dimensions and drilling shall conform to ISO 7005-2 or EN 1092-2 PN16 and shall be suitable for a nominal working pressure of 16 bars as specified in the Bill of Quantities.

Stems for non-rising stem assemblies shall be cast bronze ASTM A584 C86700, copper alloy, stainless steel 304 or 316 with integral collars in full compliance with AWWA or (St 1.4021 / X20Cr13) in accordance with EN 10088 - 3.

All exterior nuts and bolts shall be Type 18-8 stainless steel.

All stems shall operate with bronze stem nuts, independent of stem. Stems shall have two O-Rings located above thrust collar and O-Ring below. All stem O-Rings shall be replaceable with valve fully opened and subjected to full pressure. The stems shall also have two low torque thrust bearings located above and below stem collar to reduce friction during operation.

Waterway shall be smooth, unobstructed and free of all pockets, cavities and depressions in the seat area. Valves 2" and larger shall accept a full-size tapping cutter.

The body, bonnet and stuffing plate shall be coated with fusion bonded epoxy, both interior and exterior on body and bonnet. Epoxy shall be applied in accordance with AWWA C550 or epoxy powder coated according to EN14901 with minimum 250µm and shall be NSF61 and NSF 372, WRAS certified or equivalent recognized standards.

The valve shall be tested and certified as a complete drinking water valve according to NSF 61 AND 372, WRAS, or equivalent recognized standards

Valve has been cycled tested full opened to close 5,000 times without loss of bubble-tight seal or Minimum life cycle shall be 2500 cycles according to EN 1074-2.

The valve size, pressure rating, year of manufacture and manufacturer's name & model shall be cast onto the valve body or be on a permanently attached nameplate.

Valve Testing

Prior to shipment from the factory, all valves shall be tested by hydrostatic pressure equal to requirements of AWWA C515, EN 1074 ½ and ISO 5208: or EN 12266-1/2 standards.

Each valve shall be supplied with a factory inspection certificate outlining body pressure test, leakage test, valve size, valve serial number, pressure rating, body heat No., disc heat No., stem heat No. seat material and seat heat No.

A2.2.2 Well Head Check Valve:

The Vendor Shall Provide Swing type check valve resilient seated for the well head connection.

The swing check valve shall confirm to AWWA. C508 or equivalent standards

The pump check valve shall be suitable for the operational condition plus 25% safety factor.

Flange dimensions and drilling according to EN 1092, ISO 7005 or equivalent, PN16, and shall be suitable for a nominal working pressure of 16 bars according to the Bill of Quantities.

Swing type check valves shall exhibit the following features:

General: Swing check valves for water with full-opening passages, designed for a water-working pressure of 16 bar. They shall have a flanged cover piece to provide access to the disc.

The top access port shall be full size, allowing removal of the disc without removing the valve from the line.

Body and cover: The valve body and cover shall be of cast iron conforming to ASTM A 126 or ductile iron ASTM A536 70-50-5, A536 65-45-12 or EN-GJS-400-18, EN-GJS-400-15, EN-GJS-500-7/ EN-JS 1030 according to EN 1563, They shall be inside and outside coated with fusion bonded epoxy. Epoxy shall be applied in accordance with AWWA C550 with minimum 250µm fusion bonded epoxy or epoxy powder coated according to EN 14901 with a minimum thickness of 250 µm and shall be NSF61 and NSF 372, WRAS certified or equivalent recognized standards.

Disc: The valve disc shall be of one-piece construction, EPDM or NBR Encapsulated and shall be of cast iron, ductile iron conforming to ASTM A536 70-50-5, A536 65-45-12 or EN-GJS-400-18, EN-GJS-400-15, EN-GJS-500-7/ EN-JS 1030 according to EN 1563, or bronze conforming to ASTM B 62 - Composition Bronze Castings.

Hinge Pin and Hinge: The hinge pin and hinge shall be of bronze or stainless steel.

O-Ring and Gasket: shall be made of EPDM OR NBR

Bolts, Nuts and Washers: shall be made of stainless steel.

The valve shall be tested and certified as a complete drinking water valve according to NSF 61, WRAS, or equivalent recognized standards

Each valve shall be supplied with a factory inspection certificate outlining body pressure test, leakage test, valve size, valve serial number, pressure rating, and body heat No.A2.2.3 Air valves

Air valves shall conform to the latest edition of AWWA C512 or BS EN 1074-4.

The air valve shall be tested and certified as a complete drinking water valve according to NSF 61 AND 372, WRAS, or equivalent recognized standards.

Air valves smaller than DN 50 mm shall be female thread inlet connection and larger air valves shall have Flanged inlet, the flange shall comply with EN 1092-2, ISO 7005 or equivalent.

The valve size, pressure rating, year of manufacture and manufacturer's name & model shall be cast onto the valve body or be on a permanently attached nameplate.

Each valve shall be supplied with a factory inspection certificate outlining body pressure test, leakage test, valve size, valve serial number, pressure rating, and body heat No.

Single Air Valve

The air release valve shall be of the float operated, simple lever or compound lever design, and capable of automatically releasing accumulated air from a fluid system while the system is pressurized and operating.

Air Valves shall be single automatic air valves, PN 16, with body/bonnet in ductile iron ASTM A536 65-45-12 or EN-JS 1030 (GGG 40) according to EN 1563 or cast iron to Cast Iron ASTM A126 Class B or BS EN 1561 EN-GJL-250..

Air Valves shall be inside and outside coated with fusion bonded epoxy. Epoxy shall be applied in accordance with AWWA C550 and shall be NSF61 and NSF 372 certified with minimum 250µm fusion bonded epoxy or epoxy powder coated according to EN 14901 with a minimum thickness of 250 µm.

Orifice and float balls shall be of corrosion free material, the material shall be stainless steel 304 or 316, all seals shall be of EPDM Buna-N rubber or better materials suitable and approved for potable water.

All internal components shall be made of stainless-steel 316 or better.

The valve shall be tested and certified as a complete drinking water valve according to NSF 61 AND 372, WRAS, or equivalent recognized standards.

COMBINATION AIR VALVE

Combination Air Valves shall have operating features of both Air/Vacuum Valves and Air Release Valves.

Combination Air Valves shall be in two body or single body style: large orifice air and vacuum valve and small orifice air release valve.

These valves are also called Double Orifice Valves.

Double orifice air valves shall be of the triple function with a flanged inlet ANSI B16.1, ANSI B16.42 pressure Class 150, 250, and 400 psi, EN 1092-2 PN16 and shall be suitable for a nominal working pressure of 16 bars in accordance with the details stated in the Bill of Quantities.

Body and cover shall be of ductile iron ASTM A536 65-45-12 or EN-JS 1030 (GGG 40) according to EN 1563 or cast iron to Cast Iron ASTM A126 Class B or BS EN 1561 EN-GJL-250. They shall be inside and outside coated with fusion bonded epoxy.

Epoxy shall be applied in accordance with AWWA C550 and shall be NSF61 and NSF 372 certified with minimum 250µm fusion bonded epoxy or epoxy powder coated according to EN 14901 with a minimum thickness of 250 µm.

Orifice and float balls shall be of corrosion free material stainless steel grade 304, 316 or better.

All seals shall be of EPDM, Buna-N rubber or better materials suitable and approved for potable water.

All internal components shall be made of stainless-steel 316 or better.

A2.2.4 Dismantling Joints

General

Dismantling joints shall be installed where indicated on the drawings for convenient installation or re-installation of valves or similar items.

For prevention of any movement of the pipe joints adjacent to closed valves, meters or flanged equipment dismantling joints shall be provided in general by restrained dismantling pieces (short version).

Dismantling joints shall meet the applicable latest edition of AWWA C219, (short version) according to DIN 2541 or DIN 2547 or equivalent.

Flange dimensions and drilling according to ISO 7005-1 or EN 1092-1 PN16 and shall be suitable for a nominal working pressure of 16 bars.

The Dismantling joints shall be tested and certified as a complete drinking water valve according to NSF 61 AND 372, WRAS, or equivalent recognized standards.

Dismantling joint shall Equipped with the following:

- Flange adaptor.
- Flanged spigot piece.
- Gasket
- Tie-rods and nuts
- Studs/Nuts/Washers
- Materials specifications and Relevant Standards

Flange adapter shall be made of ductile iron per ASTM A536 65-45-42 or ductile iron per EN-GJS-450-10, EN-GJS-400-15 or shall be made of carbon steel per ASTM A36 or Steel per BS EN10025 Grade S275.

Flanged spigot piece shall be made of ductile iron per ASTM A536 65-45-42 or ductile iron per EN-GJS-450-10, EN-GJS-400-15 or shall be made of carbon steel per ASTM A36 or steel to BS EN10025 Grade S275..

Gasket shall be made of EPDM, erbanan material, nitrile rubber or equivalent quality shall be used and shall be suitable and approved for the use with potable water.

Tie-rods, nuts, studs and washers shall be made of stainless steel.

Coating: coated (internal & external) with a minimum 250 µm thickness Fusion Bonded Epoxy or epoxy powder. Epoxy shall be applied in accordance with AWWA C550 or according to EN 14901 and shall be NSF61 and NSF 372, WRAS, or equivalent recognized standards certified with minimum 250µm fusion bonded epoxy.

A2.3 Riser Pipes

General

The Riser Pipes shall be in accordance with API-5L or ASTM A53 line pipe schedule 40. The pipes shall be seamless and threaded from both sides according to API-5L with 8 threads per inch or ANSI B1.20.1 standard tapered pipe threads.

External coating and internal lining: NSF/ANSI 61 approved fusion bonded epoxy powder coating according to AWWA C213 or equivalent.

Inspection and Test

Testing shall be performed in accordance with API-5L standards: tensile test, chemical composition test, fattening test, hydrostatic test, dimensions and visual test.

Factory test report certificate shall be in accordance with the API-5L specification.

Pipe Joint and Jointing

The pipes shall be threaded from both sides at the rate of eight (8) threads per inch according to API-5L or ANSI B1.20.1 standard tapered pipe threads and connected by threaded sleeve type steel coupling. Ends of each pipe shall be provided with protectors to prevent threads damage.

The pipes and couplings when joined together, must be aligned through all the depth of the bore holes which reaches up to 350 meters, and shall not have any deflection through this distance.

The threading for both pipes and couplings shall be done by the pipe manufacturer and shall be free of any failure caused during machine threading or due to transportation or shipment. The pipes and couplings must be suitable for the use with submersible pumps and bore holes in which the depth reaches 350 meters, so the water column to withstand the vibration of the pumping unit.

Length

Pipes lengths shall be 6 meters in equal lengths.

Documentation and Certification

The Contractor shall provide all the following technical documents and certificates as minimum:

Technical catalogues.

Factory test report certificates shall be in accordance with the API-5L or ASTM A53 specification.

Potable Water Certificate.

Marking

The pipes shall be preferably marked with the manufacture's symbol or trade mark, grade, and heat number.