**BoQ for the rehabilitation groundwater well no 14-17/001 in Ras Attiya/ Qalqilya.**

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| **Item** | **Description** | | **Unit** | | **Qty** | | **Unit Price (USD)** | | **Total**  **(USD)** | |
| **Electrical and Mechanical Works:**  The contractor shall submit in his offer and supply maintenance manuals, catalogs, characteristic curves, testing certificates, shipping, lading documents and specifications of pumps, motor, fittings, mechanical and electrical control devices, cables, wiring and all accessories and ancillaries to complete the work. All to be new and not renewed in accordance with the specified specifications. Therefore, the unit price in this tender must fit with the technical specifications; moreover, any material submittal should match with these specifications even if accepted by the open session committee.  The contractor should verify these specifications and carry on the design based on such reference information including all equipment and materials in this tender. The contractor will conduct field visits to the well and must be before ordering any materials or equipment as follows: the contactor must check and verify and match between the reality and the design quantities (well dimensions, pumping pipes, electric and mechanical data) ,as mentioned in this tender. If he notices any difference or no matching, then he must inform the supervisor engineer and find together a suitable solution to such conditions. This include checking and fitting all dimensions mentioned in the tender as the well's hole diameter, well crookedness, pump diameter, electric connections, cables, pipes diameter, discharge head inlet and outlet. The contractor must check in particular that the size of the hole of the well is enough to install the pump, pumping pipes, and the water level pipes together. The sizes mentioned in this contract are the best estimate and information we got for this well from Ras Attiya well committee. The contractor should be responsible technically and financially to supply the suitable materials. Therefore, the winning contractor must verify that the existing control panel at the well site is suitable for the new motor and pump. If not, he should add all missing instrumentation or replaces and install them. All missings or replacements and work including the electrical and mechanical fittings should be according to the pumping standards and included in the tender total offer. | | | | | | | | | | |
| 1 | | **Electric Motor (50 hz continuous):**  Disjoin the existing motor and all fittings, and then move them outside the operation site to the place within the **Ras Attiya** area specified by the project committee. Supply, transport, deliver, install, and operate successfully according to the specifications in the tender on the reinforced concrete foundation a new **vertical hollow shaft Electric Motor** with suitable reinforced foundation. The motor has to be inverter duty as 10:1 (10-70 Hertz) Speed Range Constant Torque voltage 220/380-440. The motor shall be of standard construction and suitable high thrust bearing to carry the loads of the rotating radial thrust, equipped with weather protection as IP56 type-1 standard, insulation **class F** complete thermal protection unit, complete current overload unit. The motor must be not less than **125 horsepower** at 1500 rpm , set at continuous steady state service factor 95%-100%, 1 year warranty starting from the date of the handing over certificate or 7000 working hours and whichever comes first; price involves removing existing concrete casting and casting suitable reinforced concrete base for the new motor which fits the motor dimensions and its height matches level to the last vertical shaft discharge head. The concrete used should be B-300 and the two meshes a steel box and bars diameter 10 mm. The price includes supplying all cables and materials and executing all electrical connections needed between the following elements and despite of the lengths required: A- cable one 95 mm2 in between the main 3-phase power source at the well site (transformer) and the Main Electric Control Board inside the pumping room (XPLE insulation copper) B- a cable between the Main Electric Control Board and the electric motor. The cable size and specifications are as follows: All above cables are to be round, blue or green color, copper conductors are solid and made of pure copper XPLE, insulated, Armored with inner sheath, 600 V, conductors sizes **3x95+1x50** mm2. The price includes all materials and works to install the above cables including whatever of electric, mechanical fittings and accessories as PVC and steel trenches, anchors with clamps, jumpers, stays including base, anchors steel wires, The cables must be lay inside 4"PVC/as rubber pipes of flexible spring type two layers. The price includes excavation inside all types of soil and rock trenches not less than 40\*30 cm and lay the cable inside these trenches and adding pure sand as backfilling to all size of the trenches and casting in the last 10 cm of the trenches with plain concrete over the pipes. The price includes supplying and installing all electric motor control devices (as RTDs thermal, over load) and any other connections including cabling inside or outside the pumping station relevant to this work and according to standard specifications for this work. The opening tender committee will receive an offer about type and motor specifications, catalogues, and an in site testing report which shows that the motor is matching with these specifications.   * The price of this item includes supplying and installing two I steel section (25\*30 cm\*8mm) to hold on the motor and discharge head if necessary. * The electrical motor must be supplied with **RTD (PT100)** temperature protection. The type of motor connection must be suitable to present the motor temperature digitally inside the control panel. The price of this item includes all costs of materials and works to install and test the RTD control device. * The motor shall be designed and built for 24 hr continuous service at any and all points within the required range of operation without overheating, or excessive vibration and strain. * Motor has to be new and furnished with a stainless steel name plate with data of the serial number, speed , KW, input voltage, Full load, Hz, power, etc . * All works necessary for transporting, supplying to the site of work, installing, connecting, running and testing are under the contractor expenses. * All works must be according to the Palestinian standards and engineers instructions and the specifications and drawings. * The price also includes any missing works not mentioned to execute this work.   The contractor must submit the motor specifications, certificate of origin , catalogs and on site testing report which shows that the motor is matching with the manufacturer specifications | | L.S | | 1 | | 13500 | | 13500 |
| 2 | | **Flow Control switch**: Supplying and installing an electrical flow switch suitable for 6" pipes, powered by a 24v-dc power source. Price includes all cables and protection conduits required to connect it and runs with the control panel at the site. | | Num. | | 1 | | 100 | | 100 |
| 3 | | **Vertical Turbine Pump (for drinking and agricultural purposes):** Supply and install a multi stage vertical pumping turbine complete (pump, screen, shaft bowels, stages, connection head to the 6 inch riser pipes, and all related accessories). The price includes any other works to achieve the required head and quantity and efficiency. The main pumping data as follows:  Current well total well depth is 136 meters; and the well hole is 10" and must be checked and verified. The intended pumping pipes diameter is 6"; and the total pumping pipes length inside the well is around 108 meters, and dynamic drawdown is not known. Static water level is expected to be around 103-110 meters below surface. The turbine properties is fit as follows:   * Liquid water is potable for human drinking and suitable for field crops and vegetables irrigation. * Design capacity **120 m3/hr** * Design anticipated total head at the intended turbine discharge **150 m.** * Maximum pump column and discharge head assembly head losses (m): 3 * Shut-off head limits (m) min not less than **200 m.** * Turbine overall efficiency at the working point is not less than 73%. * Min bowel efficiency at run out capacity 80%. * NPSHA at max run out capacity (m) :8 * NPSHA at max anticipated TDH (m): 5. * Pump operating speed (rpm) :1500 * Maximum pump diameter (inch): 9" diameter * Closed impellers free zinc manufactured from bronze and cast iron bowels.   Stainless steel column, stainless steel screen filter  The well pump shall be capable to run at shutoff head for a few minutes without mechanical problems.  The turbine torque design should be duty inverter at speed range the design values between 1:10  The price includes supplying and installing all required flanges, coupling, reducers, bolts, spacers, sleeves, nuts, etc. to connect between the turbine outlet, turbine column and the rising pipes and shafts accordingly. The price also includes casting concrete foundation and I steel sections to should the turbine if necessary. The price includes all repair works as a result of old turbine disjoin or new turbine installation.  The contractor shall do in site testing the turbine in accordance with well hole, static water level, dynamic water level, well over all depth, and submitting the test report. Before ordering or installing any new materials, the contractor must get the initial records for existing conditions of the well including: the well pumping capacity in m3/hr, water level inside the (dynamic and static). Therefore, the contractor must prepare suitable water meter and water level meter to carry on these measures. Therefore, the price of the turbine includes the costs of all these tests. | | Lump sum | | 1 | | 19000 | | 19000 |
| 4 | | **Pressure Control switch** Supply and install pressure switches 1-25 bar. Price includes all cables and protection conduits required to connect it and runs with the control panel at the site. . | | Num. | | 1 | | 100 | | 100 |
| 5 | | **Pumping pipes**: Supply and install new seamless iron pumping pipes with the following specifications should be supplied: (SCH 40) Diameter 6", thickness not less than 7.1 mm; and teeth not less than 8 teeth in 1" and painted with epoxy from outside and inside or galvanized. The number of teeth should be enough to cover the whole length of the intended coupling joint is not less than 13 cm length. The price includes threading cutting and adding reducers, or flanges, bolts to connect between the new rising pipes and the pump and the discharge head. Taking in consideration that the quantity estimated in this tender may increase or decrease. | | M.L | | 15 | | 120 | | 1800 |
| 6 | | **Shafts:** Supply and install new stainless steel 304, of 35 mm diameter and at the joints should be covered by stainless steel sleeves, and ended with a threaded stainless steel couple. The price includes threading, cutting, adding suitable line shaft coupling, stabilizers to connect between the new shafts and the pump. Taking in consideration that the quantity estimated in this tender may increase or decrease. | | M.L | | 15 | | 120 | | 1800 |
| 7 | | **Retainers and bearings:** supply and install new bearing retainers (suitable for 6") pipes made of bronze and taking in consideration that the quantity in this tender is estimated and may increase or decrease. | | Num. | | 5 | | 70 | | 350 |
| 8 | | **Rubber Joints**: supply and install new rubber joints (suitable for 6") and taking in consideration that the quantity in this tender is estimated and may increase or decrease. | | Num. | | 36 | | 30 | | 1080 |
| 9 | | **Provisional:** Supply and install pressure 2" **Relief Valve**, 16 atm, complete, The price includes excavation, cutting, welding, adding screws, 2" pipes, bolts and accessories that are needed to assemble the valve and according to specifications Annex/ S7. The Price also includes supplying and installing 2" coupling, 2" conical record, 2"nipple and 2" gate valve. | | piece | | 1 | | 500 | | 500 |
| 10 | | **Old Pump lifting and installation new pump.** All works related to prepare the site including all mechanical installations that is; disjoin old fittings and install new fittings including: the discharge head, pumping pipes, turbine, shafts, rubber joints, access pipes, retainers and all related accessories. The price involves checking and operating the pump after finishing all project works to insure no vibration or unusual sound. The price includes all machines and labor works related to well's installation. | | L.S | | 1 | | 3000 | | 3000 |
| 11 | | **Pressure gauge**: Supply and assemble pressure gauge, 16 bar with oil liquid Rotal ASME, B40. Price includes excavation, cutting, welding, adding coupling, and accessories that are needed to assemble the gauge. | | Num. | | 1 | | 50 | | 50 |
| 12 | | **Provisional: Accesses Pipes**: **PVC, polyvinyl chloride sch. 80 pipes NP 25 bars of 1.25 Inches Diam.**  Supply, install and test in the well access PVC, pipes sch. 80/1.25 " size threaded and suitable coupling at joints ,These pipes should fixed to the pumping pipes using stainless steel clamps.  The price includes suitable couplings and connections to the riser pipes each two meters maximum. At least 6 meters of pipes inside water must have holes (10 mm) diameter each 20 cm of the pipe. | | M.L | | 110 | | 8 | | 880 |
| 13 | | **Provisional:** Supply, install a screen **digital hydrostatic level** meter (submersible digital level sensor) with the following characteristics:   * Water Level Measurement: 40m (max.) * Excitation: 9 to 30 Vdc, reverse polarity protected * Output: 4 to 20 mA DC, 2 wire, short circuit protected * Input Current: 20 mA max * Accuracy: 0.50% FS BFSL (includes linearity, hysteresis and repeatability) * Response Time: 2 ms * Operating Temperature: -10 to 60°C * Proof Pressure: 150% * Burst Pressure: 200% * Wetted Parts: 316 stainless steel * Electrical Connections: Submersible cable terminating in digital leads   The price includes all works and materials, as cables, connections, sensor, digital screen that shows the remaining water depth above the sensor. The price includes all wiring necessary to connect the sensor inside the well’s hole and wiring, relays and digital display in front of the control panel. In addition to that a process meter/controller, should be digital and programmable one, with flush mounted to be installed in the MCB 's door, step response 2 sec, 6A dual relay. | | L.S | | 1 | | 2000 | | 2000 |
| **Total costs of all materials and works** | | | |  | | | | | |  |

**Costs Summary**

|  |  |
| --- | --- |
| **Ras Attiya Well 14-17/001** | **Total amount /$US** |
| **All Mechanical and Electrical works for the groundwater well. 14-17/001** |  |
| **Total in words (includes) –$US** | |

**Company Name: --------------------------------------------**

**Contractor Name: --------------------------------------------**

**Address: -----------------------------------------------------------------**

**Telephone: -------------------------------------- Fax: ---------------------**

**Signature and Stamp: --------------------------------**

**Date: ----------------------------**

**Description of the Works and Technical Specifications**

The contractor shall submit in his offer and supply maintenance manuals, catalogs, characteristic curves, testing certificates, shipping, lading documents and specifications of pumps, motor, fittings, mechanical and electrical control devices, cables, wiring and all accessories and ancillaries to complete the work. All materials must be new and not renewed in accordance with the specified specifications. The contractor should verify the existing dimensions and sizes before ordering any equipment or materials. This applies to all dimensions and figures mentioned in the BOQ including the hole diameter and depth, pump diameter and length, shafts diameter, discharge head inlet and outlet. The sizes mentioned in this contract are the best estimate of information we got for this well, and the contractor should be responsible technically and financially to supply the suitable materials for installation.

**The price in this tender includes supplying the materials as described in each of the items in the BOQ and all the work to disjoin the existing materials and install and test the supplied materials. The main items in this tender are the turbine, vertical motor and damage pipes or shafts and accessories.**

**Intructions To Bidders**

1. The winning contractor must submit implementation work plan and shows clearly how he will accomplish each activity. He should first get the supervisor engineer approval before going to work.
2. The tenderer is strongly advised to visit and inspect the site of the works and its surroundings for the purpose of assessing, at his own responsibility, expense and risk, factors necessary for the preparation of his tender and the signing of the contract for the works.
3. A clarification meeting on the administrative/technical aspect of the tender dossier together with the site visit will be held by the Contracting Authority, as per communicated in the Tender notice.
4. The Contractor shall take full responsibility for the adequacy, stability and safety of all operations and methods of construction under the contract.
5. The units prices of all items mentioned in the BOQ include all conditions and technical specifications which are shown under the item “Technical Specifications, Bill of Quantity and Pricing”.
6. The contractor should document all works through digital or card pictures. At least these pictures should reflect the initial conditions, during implementation and the final shape of the project.
7. The prices in this tender include the reparation and/or compensation for any damage that may happen to the surrounding environment during the project implementation. This includes damages to the roads, stonewalls, asphalt and concrete structures, cesspits…etc. The contractor should bring back the effected structure to its original conditions and function.
8. The wining contractor should immediately start the implementation after signing the contract; and he must complete all work within maximum of 45 calendar days.
9. The contractor should submit a valid registration to the Union of Palestinian Contractors.
10. The contractor must provide the tender opening committee with all useful documentation (catalogues, price lists etc.) and contact addresses of the manufacturing companies supplying the materials mentioned in the Bill of quantity.
11. The winning contractor must submit implementation work plan and shows clearly how he will accomplish each activity. He should first get the supervisor engineer approval before going to work.
12. Disputes and Arbitration: Any dispute arising out of the interpretation or application of the terms of this contract shall, unless settled by direct negotiations, be referred to an arbitrator who shall be appointed jointly by the parties. The decision of the arbitrators shall be final and binding upon both parties. The costs of arbitrations will be paid by the contractor
13. All conditions of works, specifications in this tender are technically and financially linked to the BOQ.
14. The contractor should prepare materials samples, according to the attached specifications and drawing. Then the supervisor engineer will inspect its details and see if there is any thing missing or requires modification. After making all changes, the contractor will get an approval letter by the supervisor engineer to supply the materials with specified quantities and should be exactly as the final approved sample.
15. This project will be implemented in Ras Attiya, therefore; the contractor is responsible to get all ways of accessand supply the materials and implement the project in these areas. The contracting authority is not responsible for any kind of loss or damages (and with no financial compensation) that may happen to the contractor working staff or equipment and power plant and machines.

**General Information:**

**Well #: 14-17/001**

Location: Ras Attiya- Qalqilya

Coordinantes: X= 148970 Y= 174213, Z= 123 a.m.s.l

ID Number: 14-17/001

Method of Drilling: Tool Percussion

Total Depth: 136 meters

Static Water Level: expected 105 meters below surface

Dynamic water level not known

Pump Setting: 108 below surface

Diameter of Drilling: 10"

Existing Pumping pipes diameter: 6"

Existing Pumping Capacity: 90 m3/hr

**Annex 1: Fittings Materials Specifications**

**A-S1: Check valves**

1. Body: Cast Iron
2. Disc: Cast Iron
3. Cover: Cast Iron
4. Seat Holder Cast: Iron
5. Body Seat Ring: Bronze ASTM B62
6. Disc Seat Ring: Rubber (BUNA-N) ASTM D 2000 AA 7008
7. Hinge Pin: Stainless Steel
8. Plug: Malleable Iron
9. Cover: Bolt & Nut: Steel
10. Seat Holder Bolt: Stainless Steel
11. Cover Gasket: Rubber (BUNA-N)
12. Coating: fusion bonded epoxy inside and outside

**A-S2: Gate valves none rising stem:**

1. Body: Cast Iron
2. Bonnet: Cast Iron
3. Packing Box: Cast Iron
4. Disc Cast: Iron
5. Hand Wheel: Cast Iron
6. Body Seat Ring: Bronze
7. Disc Seat Ring: Bronze
8. Gland Cast: Iron
9. Stem Nut: Bronze
10. Stem Bronze
11. Bonnet Gasket: steel
12. Packing Box Gasket: steel
13. Bonnet Bolt & Nut: Steel
14. Gland Stud & Nut: Steel
15. Packing Box Stud & Nut: Steel
16. Top Nut: Steel
17. Washer: Steel
18. Packing: Graphite Fiber Commercial
19. Operating Nut: Cast Iron A 126 Class B
20. Coating: Electro statically applied epoxy inside and outside,

**A-S3: Combination Air Valve**

1. Body: PN21 Sphere Nodular ASTM-536 60-40-18
2. Rolling Seal: Rubber E.P.D.M
3. Clamping Stem: Reinforced Nylon
4. Float: Foamed Polypropylene
5. Base: Brass ASTM B-124
6. O-Ring: Buna-N
7. Cover : PN21 Cast iron ASTM A-48 CL-35B
8. Nozzle Seat: Bronze ASTM B-62 B-271 C83600
9. Nozzle Seal: Rubber E.P.D.M
10. O-Ring: Buna-N
11. Bolt and Nut: Galvanized Steel, Chromate Plated
12. Float: Stainless Steel 304L
13. Body: PN21 Cast iron ASTM A-48 CL-35B
14. Sleeve: Reinforced Nylon
15. Threaded Outlet: Brass
16. 16: Coating: fusion bonded epoxy inside and outside

**A-S4: Butterfly Valves: (GEAR)**

1. Stem: Stainless steel
2. Body: Cast iron
3. Bushing: Brass
4. O ring: EPDM
5. Bushing (spacer): Polymeric
6. Disc: Stainless steel
7. Liner: EPDM
8. Washer: Bronze
9. Retaining ring: Spring steel
10. Plug: Plastic
11. Coating: Fusion bonded epoxy inside and outside

**A-S5: Water meter specification and materials.**

1. Working pressure 16 or 25 bars as required.
2. Max. temperature 60 C
3. Body: cast iron
4. Coating: epoxy
5. Connection: Flanged ends

**A-S6:Strainers Specifications:**

1. Body: cast iron ASTM 126 class B
2. Cover: cast iron ASTM 126 class B
3. Screen: stainless steel
4. Gasket: Buna -N
5. Plug: steel
6. Bolts: steel
7. Coating: fusion bonded epoxy inside and outside

**A-S7: Control Valves specifications (float valves and pressure reducing valves)**

1. Connection: flanged
2. Water temperature up to 60 C
3. Working pressure 25 bars
4. Valve body and cover ductile iron (ASTM A-536)
5. Valve internals: stainless steel and bronze
6. Control trim: brass
7. Elastomers: Buna-N
8. Coating: fusion bonded epoxy

**A S-8: Painting works include** adding two faces (red oxide as priming paint and zinc oxide base oil paint for finish). The pipe surface must be painted with two coats from all sides, particularly lower part to the ground. Therefore, the pipe must hold on supports above the ground minimum 30 cms, and then released to ground down after the paint was dry. Prepare the surface and stir the paint before use or mix using a power agitator. Before applying paint, a thinner liquid has to be added to the pipes surface to clean away oil and grease, use a detergent to remove excess dirt and contaminants. Remove the metallic debris such as mill scale and rust using disc sanders, sandpaper or wire brushes which ensures an adhesive surface.

**A-S-9: Carbon steel line shafts: According to ASTM A576**

**A-S-10: Irrigation Steel Pipes Welded Black Steel Pipes, ASTM A53 or as API5L:**

**A53 Type F**, which is longitudinally furnace butt welded or continuous welded (Grade A only),

**A53 Type E**, which is longitudinally [electric resistance welded](http://en.wikipedia.org/wiki/Seam_welding) (Grades A)

**B- The Vertical Hollow Shaft Electric Motor Set** shall be complete with the accessories and ancillaries needed in accordance with the following specifications:

* An efficient approved engine speed 1500/1800 rpm (works at 50/60Hz) inverter duty VFD and fitted to maintain engine speed at all condition of load.
* The cooling system shall be a closed type with, class F insulation, temperature rise class B, and internally built thermal senor to be connected to the MCB.
* The Electric Engine set shall be mounted on a suitable reinforced concrete foundation with common steel frame and no vibration and high thrust capacity
* Other standard parts and instruments needed for good operation. As power factor at full load not less than 90% and efficiency at full load not less than 94%
* Winding design as standard 3-phase motor 415 V, 50/60 Hz and permissible and preferences for variable speed motor or duty frequency motor (in the range between 10-70 Hertz), tolerance of 10% in voltage in the range 380-480 volt.
* Rated and output power apply for standard ambient conditions of 40°C
* Motor frame, end shields, terminal box are made of cast iron, fan made of sheet stainless steel.
* High capacity bearing, single output shaft of stainless steel
* Degree of protection as standard IP 56
* The offer must be supplied with catalogue (M&O) for the motor set, curves power, efficiency, engine specification and test certificate, etc…
* The contractor is responsible to issue a 1 year warranty starting from the date of the taking over certificate.

**C- Solid state frequency inverter**

* Wide Voltage Range: 320 ~ 480V
* Input Frequency Range: 40 ~ 65Hz
* Output Voltage Range: 0 ~ rated input voltage
* Output Frequency Range: 0 ~ 500Hz
* Overload Capacity: 60s with 150% of rated current, 2s with 180% of rated current
* From 0.75 ~ 7.5KW Plastic house; 11 ~ 630KW is metal house
* Control Mode: High Quality V/F Control
* Speed Accuracy: V/F + 0.5% of maximum speed
* 20 channels for frequency setting
* Analogsignal: 0 ~ 10V,-10V ~ 10V,0 ~ 20mA.
* Pulse setting input: 0~50 KHz.
* Built-in RS485 communication port
* Solid state programmable screen and PLC configurations
* All model are integrated IGBT
* The malfunction ratio is 0.8% within 24 months warranty