**جدول الكميات لمشروع تأهيل بئر جمعية عتيل**

**Electro mechanical works for groundwater well no. 15-19/036 in Attil.**

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| --- | --- | --- | --- | --- | --- | --- |
| **Item** | **Description** | | **Unit** | **Unit Price /$US** | **Qty.** | **Total**  **/$US** |
| **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 equipments 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 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 Attil well committee. The contractor should be responsible technically and financially to supply the suitable materials. All connections including the electrical and mechanical fittings should be according to the general pumping layout view. | | | | | | |
| 1 | | **Electric Motor:**  Disjoin the existing motors and fittings, and then move them outside the operation site to the place within the **Attil** 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 (6-60 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. * 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 24hr continuous service at any and all points within the required range of operation without overheating, cavitations, 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 | Lump sum | 13000 | 1 | 13000 |
| 2. | | **Main Electrical Control Panel Unit**: Price includes all works to carry on the electrical connections and cables to main grid and panels and supply and install suitable new control panel for pumping **100m3 @ 160** meter, and installing in the site for the mode of operation, a control board according to the following specifications and supervisor instructions: control panel box shall be made of **three major compartments** and the price for this item include all equipments and works mentioned below: The first compartment is for main hour meter and fusses- Main Company Breaker. The second compartment is for the **125 hp inverter** as ABB, or equivalent as shown specifications, main breaker as Siemens, contactors, capacitor(s) bank, main cables inlet/outlet.), It shall be **IP56** protected, thermally painted paint as (RAL 7302). All main cables and wiring are inside ducts and must be closed with special plastic cover and protected against human electric shock. The third compartment includes all control circuits, and secondary contactor, breakers for the high voltage cabinet or the low voltage. The control panel must be fixed to the wall by six Jumbo screws and laid on a reinforced concrete foundation 40-50 cm above the ground. The contractor should submit as built drawing including soft and hard copy drawings. In case the contractor will use any digital control equipment including PLC, HMI screen; then he must submit the cable, the software, and new version of computer laptop as hp i7- double core and any other accessories that are necessary to operate and maintain these digital equipment; meanwhile the price for this item includes to train the well’s operator and technical staff on how to use and program the PLC and control panel and all installed equipment in this tender. The training period should not be less than 9-hours training hours over three separate days including safe operation, manual instructions, faults and calibration of equipments (inverter, breakers, timers, etc..).  The labeled nameplates should be mounted at the front of the main board behind the doors and above every switch and group of lamps. Control electric lamps 24v must be fixed to control all operation system, the starter shall be used to start, run, stop , protect and control manually and automatically by using the general required installation of the following equipments completely. The price for this item includes:   * The power circuit must consist of the following: **main circuit breaker** MCCB 3**\*250 A**, 25KA adjustable for the **company** and for **generator** (as MOLLER) **two pieces**. The price includes supplying and installing **manual change over with mechanical and electrical interlocks** switch 4\***250 A**, SOCOMEC type for manual operation. * Bus bar **300A/0.6KV** (3 phases and neutral and earth) * Complete unit 4p \* 20KA **surge arrestors** of replaceable type. With box fuse **3\*63A**. * Digital screen inverter **125 hp** see the annex. Solid state frequency converter as ABB type (with **bypass contactor 125 hp** as MOELLER type equipped with over /under load, over temperature and all control system needed with all protections rated at suitable power that matches the pump motor with (0.8-1.2) over load range). The inverter must be programmed to meet with manufacturers obligations for start-up and shut down of the submersible turbine   **Capacitor Banks**: Standby capacitor banks with discharge resistors compensating reactor dry type 400v 50 Hz to reach power factor not less than 0.97 Ducati. Three phase capacitor with resistors **20 KVAR** Ducati type.   * **Digital multi meter** which is able to read directly from a screen (V, Hz, KW, A, PF). * **Low and high voltage controllers, phase sequence and phase failure controllers and relay(s)** of best quality as MOELLER. * **On-off push** button set and emergency off button. * **Reset** push buttons red color 22 mm. * **Overload** relay unit rated at 1-1.5 of motor full load including digital motor screen protection control board. * **Temperature relay** unit and rated for the submersible motor. It includes thermal protection relay and thermistor sensor, including cable screened twisted pair (screen earthed at one end only) digital motor screen protection control board with all cables and connections. * HRC fuses **3\*63 A** complete Fernaz type. * WHM 50\*50mm. * **24 h clock** with 150 hr mechanical reserve. * Suitable **automatic breaker** **250 A** with adjustable thermal and magnetic protection (ISC>=25KA) NZM. * (0-500V) 96\*96mm **Voltmeter** with selector switch between phases and neutral. * (0-300 A) 96\*96mm ammeter for the three phases. * 3 phase fuse holders set , 10\*38mm , with suitable fuses , * **Suitable earth leakage relay** class **A (AC and Dc trip).** * Contactor with discharge 20 KVAR Moeller type. * **Running hour** timer * **Manual motor speed** controller and mouthed on outside board (range 0.8-1.2 normal speed) * **On-off** lamps for inside doors cabinets * **Breakers** for service as Siemens type. * **Relays** and timers 24 V for no flow switch and high-pressure, low-pressure sensors, temperature. * Three phase 50 Hz 390V (**KWh-meter**), /5A-200/5 CT’s. The KW-h meter as electromechanical meter or solid state and pre-paid card electric type. * 24V/ 50Hz **indication lam**ps installed in front of the control cabinet.. * 3 position selector switch **A-O-M**. * 220-2\* 12V (AC) **transformer 100VA.** * The price includes **all cables** to be used for control purposes shall have the following cross section: * **(3\*95 mm2 +50 mm2**) for the internal connections inside main board and the contractor has to check and order the exact required length (as item 2 properties). * 1.5 mm2 for the coil driving wheel circuits. * 2.5 mm2 for the circuits of tension measurements. * 1.5 mm2 for the sensors. * 4.0 mm2 for the circuits of intensity measurements. * All terminals shall be carefully protected to assure electrical insulation. * Switches, measuring instruments, and warning lights shall be installed in the front side of the panel. * The control panel shall be manufactured with enough space **(minimum 40% free space of the total size)** to insure easy maintenance and no interface between the wiring for all circuits. * **All wires must be coded clearly** and fixed with special wire heads to avoid loose connection. * All timers (PSK), relays and contactors shall be of best quality as Siemens * The contractor shall supply any other materials and devices that might be missed here and considered to be essential to complete the work without claiming any changes in unit prices. * The control panel must be equipped with an alarming bell (100 dB at 50 meters distance) and flashing red alarm (should be visible from 300 meter during day time). **Alarms for all cases of failure as: voltage drop, low or high voltage or phase failure, phase sequence, high or low pressure and no flow, high temperature etc…** * The control panel **must be equipped with** control circuit for either the probe water sensor or to build digital screen for hydrostatic water level sensor. * **Temperature control** as digital screen * The alarm must be muted with/without general reset and there should a special button in the front door to stop/reset it alone. * Circuits must consist of the all necessary materials to operate and protect the system automatically and manually, the wiring color system, numbering all the components. The price includes the design of the whole system of control the contractor is intending to carry. The contractor should also submit at the end of work a s built drawing.   The control panel deign should include:   * Transformer 230/24V 150VA * Water level relay HK type. * 220V AC /120 Watt and **two fans** with filter in each compartment, one for taking in air and the other for taking out the air with grid ( for the panel) complete with thermostat protection. * SIREN (alarm system)   Alarm system 24V are equipped **ON-delay timers** for :   1. High pressure outlet 2. Low pressure outlet 3. No flow 4. Soft start faults 5. High temperature 6. Low, high voltage, phase sequence , failure   The motor must not restart more than the recommended number of starts per hour and day by the manufacturers.   * The price includes **all works, as excavation** works for installing pressure switches, flow switch and level sensor and all the electrical parts with suitable conduits and metal ducts to complete the works. * The price includes installing and testing for the mode of operation all mentioned devices and sensors. The control panel must be equipped with earthling unit so the price includes. * **Earthling**: The price of the control panel includes supplying and installing complete earth unit with earth equalizer compressing C40 box copper B.B. 25 mm2, with minimum two concrete manholes as foundation lines , two earth electrodes, D>19m, L=1.5m and any other missing materials to earth the pumping station . The price includes testing earth unit so as to fulfill the standard requirements (resistance less than 1.5-2 ohm). The across different fittings in the piping system. * The price also include supply all materials (as cables, in-out sockets and install, two outlets as 3-phase complete service unit for the pumping room including Main MCB 5\*20A -10 KA MOLLER type. MCB 2 \*10A – 10KA Moeller type the control * The price include all cable materials and works to conduct the electrical connections of the thermistor sensor inside the motor -(the cable 3x1.5 mm2 , the cable should be of suitable length. Use flexible thermal conduits, cable glands, wire terminals& labeling at both ends and all the accessories needed to complete the work as excavation & backfilling, the cable from the control panel to the head of pump motor. * **Wiring and Lighting the pumping room** Supplying and executing all materials needed for inside and outside lighting of the station (pump and station yard) including all works, trenches, cables, sockets etc. according to the following: * Supply and install 2x36 W flourcent surface mounted (water proof) IP56 for outside the room * Supply and install single split one air conditioner inside the pumping room, size 2-ton (24000 BTU/hr) inverter technology and **EER > 13**. * One phase sockets number four * Lighting the room from inside by four double-glass fluorescent lamps (36 w) in each room (water proof). * 3x30 w emergency 10 hours duration lighting fixture to be fixed in accordance with the supervisor engineer's instructions. * The lighting service should be controlled by a separate DGB. Its power source is directly controlled through a double pole MCB.   Lighting the outside of the rooms by External four projectors each of 60 Watt HyLite **LED** Prizm, as Philips. water proof IP 56 with aluminum body (high quality) (the price includes all materials and works to carry the inside and outside wiring and lighting. The projectors, will be switched on from the service DGB. Distribution box for lighting suitable for 24 v circuit breaker (DBG). Also the price includes conduits, (3x2.5mm) and all size of cables& all accessories needed to complete the work. Supplying materials and executing 5 intake power sockets: one as three-phase and the other four as one-phase. The price includes supplying electric cables, leads, on-off keys, power sockets, trenches…etc. The price includes all any other missed works or materials to execute the lightening item. | L.S | 11000 | 1 | 11000 |
| 3 | | **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 with the control panel, as shown pumping layout view. | Num. | 100 | 1 | 100 |
| 4 | | **Pressure barrel**: Supplying and installing of a pressure barrel. The contractor shall supply and install all the pipes and fittings to connect with outlet main 6” pipes of the pump and should be according to specifications. The price include, complete instrumentation of the pressure barrel including all fittings and steel pipes ½” , and two-1/2 inch ball valves, pressure stabilizer needle valve at the entrance, foot valve-4directions, couples, nibbles, elbows with nuts, bolts, flanges and gaskets as needed to install the pressure barrel. The price includes supplying and installing all necessary materials and works to connect to the pressure switches and casting a suitable reinforced foundation under barrel, and above the pump ground level, as shown pumping layout view. | Lump  sum | 500 | 1 | 500 |
| 5 | | **Pressure Control switch** Supply and install two pressure switches 1-25 bar. Price includes all cables and protection conduits required to connect it with the control panel, as shown pumping layout view. | Num. | 125 | 2 | 250 |
| 6 | | **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. 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 | 130 | 130 | 16900 |
| 7 | | **Shafts:** Supply and install new shafts of carbon steel 1040, 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 | 60 | 130 | 7800 |
| 8 | | **Retainers and bearings:** supply and install new bearing retainers made of bronze and taking in consideration that the quantity in this tender is estimated and may increase or decrease. | Num. | 100 | 43 | 4300 |
| 9 | | **Rubber Joints**: supply and install new rubber joints and taking in consideration that the quantity in this tender is estimated and may increase or decrease. | Num. | 10 | 43 | 430 |
| 10 | | **Discharge head:** Supply and assemble a new steel discharge head complete type F. The intake and outlet dimensions are 6”\*6" the price includes supplying and installing wick and box, and suitable stainless steel column for the last riser pipe and connect with and up to motor shaft. The basic dimensions for the discharge head are 45\*65 cm. The price includes supplying and installing a suitable stainless steel column for the last riser pipe. This column will connect with motor shaft. And it includes also supplying 2 suitable I steel section and casting new reinforced concrete foundation underneath the discharge head, as shown pumping layout view. | Lump sum | 1200 | 1 | 1200 |
| 11 | | Supply and install pressure 2” **Relief Valve**, 16 atm, complete, The price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve and according to specifications Annex 1/ S7. The Price also includes supplying and installing 2" coupling, 2”conical record, 2”nipple and 2" gate valve, as shown pumping layout view. | piece | 700 | 1 | 700 |
| 12 | | **Old Pump lifting and installation new pump.** All works related to prepare the site including all mechanical installations, 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, as shown pumping layout view. The price includes all machines and labor works related to well's installation. | Lump sum | 2500 | 1 | 2500 |
| 13 | | **Vertical Turbine Pump;** Supply and install a multi stage vertical pumping turbine complete (pump, screen, shaft bowels, stages, connection head to the 5 inch riser pipes, and all related accessories) all as specified in the technical specifications attached with the tender. 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 **>200** 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 **130** meters, and dynamic drawdown is around 95 meter below surface. Static and dynamic water level are around **55, 95** meters below surface respectively. The turbine properties is fit as follows:   * Liquid water is potable for human drinking and suitable for field crops and vegetables irrigation. * Design capacity **100 m3/hr** * Design anticipated total head at the intended turbine discharge **160** m. * Maximum pump column and discharge head assembly head losses (m): 3 * Shut-off head limits (m) min not less than **220 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) :8” diameter: * Closed impellers 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. 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. In case the contractor failed to get these measurements, the turbine price will be less by 30% than the price proposed in his tender. | Lump sum | 17000 | 1 | 17000 |
| 14 | | **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 | 10 | 260 | 2600 |
| 15 | | **Gate valve**: Supply and assemble gate valve, 6"complete, 16 bar. Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed anywhere within the project area and according to specifications mentioned in Annex1, S2 , as shown pumping layout view. | Num. | 500 | 6 | 3000 |
| 16 | | **Gate valve**: Supply and assemble gate valve, 3"complete, 16 bar. Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed anywhere within the project area and according to specifications mentioned in Annex1, S2 , as shown pumping layout view. | Num. | 300 | 1 | 300 |
| 17 | | **Gate valve**: Supply and assemble gate valve, 2"complete, 16 bar. Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed anywhere within the project area and according to specifications mentioned in Annex1, S2 , as shown pumping layout view. | Num. | 50 | 1 | 50 |
| 18 | | **Non return valve**: Supply and assemble a non return valve, 6" complete, 16 bar of the swing type .Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed anywhere within the project area according to specifications mentioned in Annex 1/ S1, as shown pumping layout view. | Num. | 900 | 1 | 900 |
| 19 | | **Compound air valve**: Supply and assemble 2" compound air valve complete, 16 bar. The price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed according to specifications mentioned in Annex 1, S3. The Price also include supplying and installing 2" coupling, nipple and 2" gate valve. , as shown pumping layout view. | Num. | 500 | 1 | 500 |
| 20 | | **Pressure gauge**: Supply and assemble pressure gauge, 25 bar with oil liquid Rotal ASME, B40. Price includes excavation, cutting, welding, adding coupling, and accessories that are needed to assemble the gauge, as shown pumping layout view. | Num. | 50 | 1 | 50 |
| 21 | | **Dresser-Universal Coupling:** Supply and assemble 6" dresser complete. Price includes ears 60 cm rods and screws, bolts, excavation, cutting, welding, and adding accessories that are needed to assemble the dresser with NP 16 bar, as shown pumping layout view | Num. | 125 | 6 | 750 |
| 22 | | **Dresser:** Supply and assemble 3" dresser complete. Price includes ears 60 cm rods and screws, bolts, excavation, cutting, welding, and adding accessories that are needed to assemble the dresser with NP 16 bar, as shown pumping layout view. | Num. | 100 | 1 | 100 |
| 23 | | **Dresser conical record:** Supply and assemble 2" dresser complete. Price includes rods and screws, bolts, excavation, cutting, welding, and adding accessories that are needed to assemble the dresser with NP 16 bar, as shown pumping layout view. | Num. | 70 | 1 | 70 |
| 24 | | **Steel pipes**: Supply and install 6" steel pipes for irrigation network. The minimum thickness of pipes is 4 mm as shown in Annex 1 /S9. The price includes, all costs of transportation, pipes distribution, excavation, cutting, shaping, welding, painting two faces (red oxide priming paint and zinc oxide base oil paint). The price includes reconnecting the new installed pipes with old network pipes and adding new connections (2", 3" or 4") of similar sizes for all farms which exist on the old pipe line. | M.L | 30 | 12 | 360 |
| 25 | | **Galvanized 3" pipes**  Supply and install 3” diameter galvanized steel pipes thickness 3.96 mm, and according to specifications Annex 1/ S1-9, as shown pumping layout view. | M.L | 15 | 12 | 180 |
| 26 | | **Galvanized 2” pipes**  Supply and install 2” diameter galvanized steel pipes thickness 3.96 mm, and according to specifications Annex 1/ S1-9, as shown pumping layout view. | M.L | 15 | 6 | 90 |
| 27 | | **Elbows, T or Saddle OR Elbows:** Supply and install 6"/90 or 45 degree black steel elbows or T and Saddle for welding SCH 40 anywhere within the project area | Num. | 40 | 5 | 200 |
| 28 | | Supply and install a complete 6" **cast iron water mete**r according to ISO 4064 (class B) or equivalent annex 1/ S5. Capacity 200 m³/hr, 16 bar painted with epoxy coated from both inside and outside, the measuring unit should be removable type without removing the body Price includes excavation, cutting, welding, adding dresser, flanges, screws, bolts, gaskets and adding accessories that are needed to assemble the valve with the dresser, as shown pumping layout view. | Num. | 1000 | 1 | 1000 |
| 29 | | 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 to the MCB. 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 2sec,6A dual relay. | L.S | 2500 | 1 | 2500 |
| 30 | | **Water Cooling Tank:** Supply and install plastic polyethylene water tank capacity 1 m3 for cooling and lubrication of the shafts and rubber joints before the start according to PSI 99-1 to 6-1999. The price includes supplying and installing all necessary connections as 1-inch galvanized steel pipes, 1-inch ball valve, 1-inch dresser, 1-inch elbows etc. to connect between the water tank and the opening of the outlet at the discharge head, as shown pumping layout view. | Num. | 400 | 1 | 400 |
| **Total costs of all materials and works** | | |  | | | **88730** |

**Costs Summary**

|  |  |
| --- | --- |
| **Attil Well 15-19036** | **Total amount /$US** |
| **All Mechanical and Electrical works for the groundwater well. 15-19/036** |  |
| **Total in words (includes) –$US** | |

**Company / Contractor Name: --------------------------------------------**

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

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

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

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

**General Information well 15-19/36**

Location: Attil-Qalqilya, Attil Area

Coordinantes: X= 155350 Y= 179965, Z= 70 a.m.s.l

ID Number: 15-19/036

Method of Drilling: Tool Percussion

Total Depth: > 200 meters

Static Water Level: 55 meters below surface

Pump Setting: 130 below surface

Diameter of Drilling: 10”

Existing Pumping pipes diameter: 6”

Existing Pumping Capacity: 100 m3/hr

Irrigated Area: 800 Dunums

Number of farmers: 87

Average working hours in summer: 450 per month

Average working hours in winter: 350 per month

**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 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 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
* Analog signal: 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