|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **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. The contractor should verify the design equipments by conducting field visits to the well and must be before ordering any equipment or materials as follows: the contactor must check and verify and match between the reality and the design quantities 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 and total depth, pump suitable 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 with the electric cable. The sizes mentioned in this contract are the best estimate of information we got for this well. The contractor should be responsible technically and financially to supply the suitable materials to match real data. | | | | | | |
|  | | **Supply and install a** multi stage submersible pumping Turbine complete (pump, screen, shaft bowels, stages, check valve, connection head to the **5”** pumping 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 all according to the Annex  Current well casing is **16”** and total well depth is **250** meters. The intended pumping pipes diameter is **5**"; and the total length inside the well is approx. **240** meters, and the well is newly constructed and the well discharge capacity and dynamic drawdown is not known. Static water level is around **40** meters below surface. The contractor offer for the submersible turbine properties has to fit as follows:   * Liquid water is suitable for irrigation and cultivating vegetables; TDS is around 600 mg/l. * Design capacity (m3/h): **60** * Design anticipated total head (TDH) (m): Anticipated turbine discharge at TDH at **270 m** * Maximum pump column and discharge head assembly head losses (m): 3 * Shut-off head limits (m):minimum **330 m** * Turbine overall efficiency at the intended point is not less than 75% * Minimum bowl efficiency at run out capacity (80 %) * NPSHA at maximum run out capacity (m): 8 * NPSHA at maximum anticipated TDH (m): 5 * Motor and pump operating speed (rpm): 2,900 * Non-overloaded motor. * The well casing extends **70** meters below surface; its outside diameter **40** cm * Max. Pump and motor diameter (in): **10”** * Stainless steel column, stainless steel screen filter * Column pipe and discharge head diameter (in): **5”** * Stainless steel built in **Original** (not local) Shroud on the motor to direct the water inlet to the pump as to pass from underneath the motor to the pump. * Closed impellers manufactured from cast bronze and cast iron bowels. * The well pump shall be capable to run on/ off every few minutes with technical warnings. * The electrical motor must be supplied with RTD (PT 100) temperature protection. The type of motor connection must be suitable to present the motor temperature digitally on control panel. The price include all wiring, PT cables and connections and works required to connect the motor inside the well and the main control panel with relay and off-alarm and digital display screen. The pump shutdown when motor temperature exceeds 60 centigrade. * Contractor has to connect the motor cable and up-to the control panel upon his responsibility. The connection using the whole length of flat cables and to carry the cable insulation resistance with megger. * The motor shall be designed and built for 24-hours continuous service at any and all points within the required range of operation without overheating, cavitations excessive vibration and strain. * Motor turbine has to be new and furnished with a stainless steel name plate with data of the serial no., speed, Kw, input voltage, full load, Hz, power etc.) and motor must be 1.25 larger than Pump brake horse power or 1.15 larger than the total Input Horsepower to the Electrical Motor. The motor size should not be less than 100 hp or according to the manufacturer recommendations . * The motor shall be furnished with a removable water block lead assembly to prevent ingress of water and a sand slinger shall be installed where the shaft inters the stator. * The motor shall be filled at the factory with a treated glycol water internal lubricating solution for a maximum reliability and long life. * All works from supplying, installing connecting running and testing are under the contractor's expenses. * All works must be according to the Palestinian standards and engineer’s instructions and the specification 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, catalogues and on site testing report which shows that the motor is matching with the manufacturer specifications. * The well pump shall be capable to run at shutoff head for a few minutes without mechanical problems. * The motor and turbine must fit with each other according to manufacturers’ instructions. * The turbine torque design should be duty inverter at speed range the design torque values between 1:10 * The price includes supplying and installing all required non return valve (**built in**) flanges, coupling, reducers, bolts, spacers, sleeves, nuts, etc. to connect between the turbine outlet, turbine column and the rising pipes and shafts accordingly. If necessary, the price also includes casting concrete foundation and I steel sections to hold the turbine. The price includes all repair works and damages as a result of installing turbine.   The contractor shall do in site testing the turbine in accordance with the performance curve and submitting the test report. Before 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 |  |  |  |
|  | | **Supply and install submersible electric** cable with the following specifications:  The cable is flat with a light blue outer sheath -, drinkable conductors for permanent submersion in potable water, to respective depths and up –to 600 meters. It is water resistance tested to the European standard EN 505825-2-21 (AD8 condition complete submersion in water) and meets the requirements of BS 6920, and IEC 60228 covering the suitability of non-metallic materials and products for use in contact with water. The EPR (Ethylene Propylene Rubber) insulation and Elastomeric Cross-linked outer sheath should provide a robust and water-tight barrier.  The voltage rating is 0.6/1kV and a temperature rating of -25oC to +90oC. It is suitable for use in water of a maximum temperature of 80oC  the conductor main construction properties are as follows:   * Class 5 (Flexible Conductor) fine stranded tinned pure Copper * Voltage rating: (0.6/1kv) 600 V between the conductor and earth, and 1000 V rms between adjacent conductors. * Inner Insulation: EPR (Ethylene Propylene Rubber) * Outer sheath/ Jacket: Elastomeric Cross-linked compound including filler materials * Conductors sizes 3x50 (1FL 3GI3 quality rubber)+1x25 mm2 . The junction box (Water Proof) and main connection as shown in the Annex. The cable is fixed to the pipes by stainless steel clamps each 2 m with soft rubber underneath and pvc ties each meter. The price includes the costs to carry the cable insulation resistance with megger and connect to control panel. | M.L |  |  |  |
|  | | **Main Electrical Control Panel Unit**: Price includes supply and install suitable control panel for pumping **60 m3 @ 270** meters, 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 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 breaker. The second compartment is for the **100 hp inverter** as ABB, or equivalent as shown specifications, main breaker, contactor, capacitor(s) bank, main cables inlet/outlet as Siemens. It shall be IP56 protected thermally painted paint as (RAL 7302). All main cables and wiring 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 completely closed. The contractor should submit as built drawing including soft and hard copy. In case the contractor will use any digital equipment including PLC he must submit the cable, the software, laptop computer and any other accessories that are necessary to operate and maintain these digital equipment; meanwhile the contractor has to train the well’s operator and local committee (at least two sessions) how to operate safely the pumping system.  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\*150A, 25KA. * Bus bar 200A/0.4KV (3 phases and neutral and earth) * Complete 4p \* 20KA surge arrestors of replaceable type. With box fuse 3\*63. * Digital screen inverter 100 Hp see annex Solid state frequency converter as ABB type (see with bypass contactor 100 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.   **Capacitor Banks**: Standby capacitor banks with discharge resistors compensating reactor dry type 400v 50 Hz to reach power factor 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). * No voltage phase sequence and phase failure relays 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 rated at the motor thermal sensor, including digital motor screen protection control board with all cables and connections. * HRC fuses 3\*63A complete Fernaz type. * WHM 50\*50mm. * 24h clock with 150 hr mechanical reserve. * Suitable automatic breaker with adjustable thermal and magnetic protection (ISC>=25KA) NZM. * (0-500V) 96\*96mm Voltmeter with selector switch between phases and neutral. * (0-300A) 96\*96mm ammeter. * 3 phase fuse holders set , 10\*38mm , with 20A fuses , * Suitable earth leakage relay class A (AC and Dc trip). * Contactor with discharge 25KVAR Moeller type. * Breakers for service Siemens type. * Relays and timers 24 V for no flow switch and high-pressure, low-pressure sensors. * Three phase 50 Hz 400V (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 lamps 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: * The price includes supply and install cable that extends from the electric grid network at the site to the control panel. It is of the same specifications in item 2 (3\*50 mm2 + 25 mm2) including for the internal connections inside main board and the contractor has to check and order the exact required length. * \*1.5 mm2 for the 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 8 meters distance) and flashing red alarm (should be visible from 300 meter during day). Alarms for all cases of failure as: voltage drop, no voltage or phase failure high or low pressure and no flow, high temperature etc. * The control panel must be equipped with a complete control circuit for water level sensor; and to install a digital screen for hydrostatic water level sensor. * Temperature control as digital screen * The alarm must be muted without general reset and there should a special button in the front door to stop 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 sensor relay HK type compatible with digital screen display . * 220V AC /80 Watt with 2 fans-filter/ 80 watt 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 for :   1. High pressure outlet 2. Low pressure outlet 3. No flow (non return valve) 4. Soft start fault 5. High temperature 6. Low water level  * 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 thermal sensor inside the motor -(the cable 3x2.5 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(excavation &backfilling),the cable from the MDB to the head of pump motor. | L.S |  |  |  |
|  | | **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 | Num. |  |  |  |
|  | | **Pressure Control switch** Supply and install two pressure switches 1-25 bar (for low and high pressure). Price includes all cables and protection conduits required to connect it with the control panel | Num. |  |  |  |
|  | | 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. The Price also includes supplying and installing 2" coupling, 2”conical record, 2”nipple and 2" gate valve. | piece |  |  |  |
|  | | **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 |  |  |  |
|  | | **Pumping pipes**: Supply and install new seamless iron pumping pipes with the following specifications should be supplied: (SCH 40) Diameter 5", thickness not less than 6.55 mm; and teeth not less than 8 teeth in 1" factor made and painted with fusion –bond epoxy from outside and inside or galvanized and certificate of painting according to standards ISO 21809 Part 2. The number of teeth should be enough to cover the whole length of the intended coupling and not less than **15 cm** length to insure complete coupling to hold the turbine and 240 meters of pipes and accessories. The price includes threading cutting and adding reducers, or flanges, bolts to connect between the rising pipes and the pump. Taking in consideration that the quantity estimated in this tender may increase or decrease. | M.L |  |  |  |
|  | | **Discharge head:** Supply and assemble a new steel plate as discharge head complete: the intake and outlet dimensions are 5"\*6" with a steel plate 80\*80 cm with a minimum 5. cm thickness. It includes 3 openings welded to steel pipe 15 cm height and 2 inches diameter and 4 mm thickness. The price include all works and materials necessary to fix the pumping pipes to the discharge head including excavations, casting reinforced concrete and in installing two I beams to support the discharge head and the pumping pipes. The price includes casting reinforced concrete B300 floor around the discharge head 20 cm thickness 2.5\*2.5m (using double mesh steel bars diameter 10 mm each 20 cm in both directions/top and down) The contractor should calculate the onsite dimensions to decide the exact elevation of the discharge to avoid in water leakage from the surrounding to inside the well hole. | Lump sum |  |  |  |
|  | | **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 plastic ties to fix it to the pumping pipes. Meanwhile, making 1 cm holes every 20 cm and the last 6 meter pipes inside the well . | M.L |  |  |  |
|  | | **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 should be according to specifications mentioned in Annex. | Num. |  |  |  |
|  | | **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. |  |  |  |
|  | | **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 should be according to specifications mentioned in Annex. | Num. |  |  |  |
|  | | **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 should be according to specifications mentioned in Annex. | Num. |  |  |  |
|  | | **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 should be according to specifications mentioned in Annex. The Price also include supplying and installing 2" coupling, nipple and 2" gate valve. | Num. |  |  |  |
|  | | **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. | Num. |  |  |  |
|  | | **Dresser:** 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. | Num. |  |  |  |
|  | | **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. | Num. |  |  |  |
|  | | **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. | Num. |  |  |  |
|  | | **Steel pipes:** Supply and install by welding in the site of the well new steel pipes 150 mm nominal diameter. The steel pipes, wall thickness are 3.96 mm, with the (Techen Stamp or equivalent) on each pipe. The pipes must be newly manufactured chamfered at both ends; and supported with manufacturing and transport documents; meanwhile, including physical and chemical test documents. The pipes must be smoothly rounded on the edges and no signs of corrosion or welding along the pipe. The pipes should be manufactured according to specification in the annex or equivalent. The price includes all necessary works to supply the pipes to the site of work including transport costs, loading and unloading. The price also includes excavation of trench depth 70 cm and 60 cm wide laying the pipe inside and including soft backfilling. The price include painting two faces one as red oxide primer as lead-free, oil-based, high-quality, rust-resistant as shown in Annex. The price include all elbows, tees, reducers, and connection to discharge head and to the main distribution pipes in the well site. | M.L |  |  |  |
|  | | **Galvanized 3**" **pipes**  Supply and install 3” diameter galvanized steel pipes thickness 3.96 mm, and according to specifications Annex. | M.L |  |  |  |
|  | | **Galvanized 2**" **pipes**  Supply and install 2” diameter galvanized steel pipes thickness 3.96 mm, and according to specifications Annex. |  |  |  |  |
|  | | **Elbows, T or Saddle:** Supply and install 6"/90 or 45 degree black steel elbows or T and Saddle for welding SCH 40. |  |  |  |  |
|  | | **Electric Motor:**  Disjoin the existing motors and fittings, and then move them outside the operation site to the place within the 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  **110 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 in between the main 3-phase power source at the well site and the Main Electric Control Board inside the pumping room 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, PVC insulated, Armored with inner sheath, 600 V, conductors sizes 3x70+1x35 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 |  |  |  |  |
|  | | **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. |  |  |  |  |
|  | | **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. |  |  |  |  |
|  | | **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. |  |  |  |  |
|  | | **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. |  |  |  |  |
|  | | **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 **125** 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 **115** meters, and dynamic drawdown is not known. Static water level is around **85-90** 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 **90** m3/hr * Design anticipated total head at the intended turbine discharge **165** 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. |  |  |  |  |
|  | | Supplying and installing of **6" Strainer** of cast iron body for 16 bar working pressure complete with companion flanges, gaskets, bolts and nuts. The general specifications are according to Annex S6. The installation works includes all costs of excavations, cutting, shaping, welding, paintings, either on new or old pipe lines. |  |  |  |  |
|  | | Supply and install a complete 6" **cast iron water mete**r according to ISO 4064 (class B) or equivalent. Capacity 150 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. |  |  |  |  |
|  | | Supply, install a screen digital hydrostatic level meter (submersible digital level sensor) with the following characteristics:   * Water Level Measurement: 210m (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. |  |  |  |  |
| **Total costs of all materials and works** | | |  | | |  |

**Costs Summary**

|  |  |
| --- | --- |
| **Description** | **Total amount /$US** |
| **All Mechanical and Electrical works for the groundwater well.** |  |
| **Total in words (includes) –$US:** | |

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

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

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

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

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