

Project: **Drilled Well Water System**
Location: **Lamoine State Park**

Dept. **Conservation-Parks and Lands**
Date: **June 9, 2014**

REQUEST FOR PROPOSAL

The State contact person is: **Matthew Hamilton**

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Please submit a bid with a cost per linear foot plus material, labor, etc.

SCOPE: Drill one (1) potable water well suitable for drinking purposes complete with submersible pump, controls, and water line in accordance with the attached requirements and specifications.

GENERAL: The well shall be drilled at a location designated by the Owner. All materials and methods shall conform to those recommended by the National Water Well Association.

Should the Contractor fail to construct the well to the depth specified or to such depth as ordered by the State or he abandons the well because of poor alignment, he shall, at his own expense, construct another well adjacent thereto at a point satisfactory to the State. The Contractor shall fill such abandoned hole at his own expense and in accordance with the instructions of the Owner.

If insufficient water quantity or quality results are obtained or other undesirable conditions prevail due to conditions not under the Contractor's control, the the required water supply and shall be compensated as indicated under "Payment".

MATERIALS:

1. **Casing:** shall be new standard black U.S. steel six (6) inch pipe weighing approximately 17 lbs./ft., 6.065" I.D., 6.625" O.D. with line or drive pipe couplings. Casing shall terminate in a non-threaded capping device to temporarily secure the top of the well.
2. **Pump:** shall be 1 h.p. or as required, 3 wire, single phase 120V, submersible unit constructed of corrosion free materials as follows:
 - Diffusers and impellers of plastic
 - Bowls, end bells, casing and hex shaft of stainless steel
 - Motor adapters and discharge heads of bronze.
 - Built in check valve shall be cast bronze with bronze poppet, spring and stainless steel self locking nut and retainer.

- Stator shall be hermetically sealed; motor lead assembly shall be factory installed.
- Pump shall have built-in lightning protection.

3. Drop Pipe: shall be black, flexible, polyethylene with a minimum rating of 106 PSI at 73.4 F.; one inch nominal size; NSF approved for drinking purposes. Pump shall be installed at standard depth given the well final depth.
4. Clamps: shall be stainless steel.
5. Anti-Torque Device: shall be similar and equal to the device manufactured by Harvard.
6. Pipe Guides: shall be nylon for 6" I.D. casing and 1" drop pipe.
7. Tape: for securing pump motor cable to pipe shall be 8.5 mil vinyl electrical tape.
8. Pitless Adapter: shall be 1" all bronze with neoprene gasket and "O" ring, similar and equal to Williams. Install G.I.P. handle of proper length for connecting and disconnecting adapter.
9. Pump Motor Cable: shall be #10 three wire neoprene covered.
10. Sanitary Well Seal: shall be NSF approved and shall be fitted with tapping for 3/4" or 1" cable conduit. It shall also have a screened vent and an eye for attaching safety ropes.
11. Safety Rope: shall be 3/8" polypropylene.
12. Power Cable: from control box to well shall be direct burial #12 copper, three wire with ground type UF cable.
13. Conduit: for power cable shall be galvanized steel or PVC.
14. Pipe: from well to building shall be 100 PSI polyethylene, one piece.
18. Reducing Bushing: shall be either brass or PVC.
19. Gate Valves: shall be brass with solid wedge and non-rising stem.
20. Pressure Switch: shall be preset for 30-50 PSI and shall have an automatic low pressure cut out device to trip switch at 10 to 20 PSI. Switch shall be Square D, Form MHP, Type FSG2 or approved equal.

21. Pressure Relief Valve: shall be 3/4", bronze body with bronze trim, and shall be Swenderman Model SL or approved equal. Valve shall be set to open at 60 PSI.
22. Pressure Gauge: shall be 2" diameter with a range of 0 to 100 PSI with 1/4" IPS stem.
24. Pipe Supports: shall be furnished and installed as required to support pipe in a stable position.
25. Lines: shall be laid in the locations established by the Owner on site.
26. Trenching: for water lines shall be done with an all-purpose excavator with an 18" wide bucket. "Ditch-Witch" or other approved narrow excavator designed and sized for minimal impact on surrounding area.
27. Water Line: shall be installed in a manner to prevent sharp bends in pipe and shall be located approximately 4' below finish grade; line shall be made to pitch from intersection back to well to drain.
28. Lines: located in gravel areas shall be bedded in compacted sand layers, 6" below pipe and 6" above pipe at no additional cost to Owner.
29. Warning Tape: to be installed in electrical trench per codes.
30. Backfill: shall be returned to trenches and firmly compacted in a manner which will not damage pipe but shall leave trench at same finish grade as adjacent ground.
31. Fill Material: around well casing to be placed to raise grade as directed by owner.
32. Correct: any and all deficiencies.

WELL DRILLING

METHODS: A complete drilling log shall be maintained throughout the operation indicating and identifying each change in strata, its depth and any unique characteristics. A copy of this log along with the completed well data, showing depth-casing and total yield and source depth, rate and static water level, shall be submitted to the Owner prior to payment.

During drilling operations and installation of casing, the Contractor shall take

all precautions necessary to prevent contamination of the water. Oil and gasoline tanks and cans shall be stored away and down grade from well location. In the event the well becomes contaminated, due to the Contractor's operation, he shall eliminate the pollution or relocate and drill another well at his own expense.

The well shall be drilled to solid ledge and cased with steel well casing; pipe shall be carried into bedrock a minimum of ten (10) feet and satisfactorily sealed to prevent intrusion of surface water. After casing has been properly sealed drilling may be resumed.

The well shall yield at least 5 gallons of water per minute. The well shall be periodically checked for water inflow as the drilling progresses and the rate of flow and depth at each aquifer reached shall be recorded. This data shall be given to the Owner along with soil and rock conditions encountered.

The Contractor shall have satisfied himself as to the site conditions and shall move his equipment only over routes designated by the Owner.

The Owner may require the well to be bailed at any time during its construction to determine the yield at that point and direct the Contractor to develop the well or to drill to a greater depth within the limits of normal drilling equipment. Upon completion the well shall be sufficiently bailed or pumped, as directed to determine its maximum yield. Drill depth shall ensure the well passes a 48hr pump test.

The Contractor shall extend the casing above existing grade to the elevation horizontal surface free from burrs, before installing the temporary cap. Well shall be chlorinated with bleach under the supervision of the Owner, before well top is sealed.

METHOD OF MEASUREMENT: Well will be measured by the linear foot drilled, determined by the difference in elevation between the bottom of the well and linear foot, determined from the lengths of the total number of pieces of casing installed to the completed and accepted top of casing. Total length paid shall be paid to the nearest foot.

WATER SYSTEM

INSTALLATION METHODS: All portions of the water system to be installed in the well casing shall be kept clean and free from any possible contamination. If necessary before setting assembly into well, all parts shall be washed with soap and warm water and flushed with clear water.

Polyethylene drop pipe shall be installed in one piece. Two stainless steel clamps shall be used on each adapter.

The anti-torque device shall be attached to the drop pipe directly above the submersible pump using stainless steel clamps.

The nylon pipe guides or “torque stops” shall be installed on the drop pipe about twenty feet apart starting twenty feet above the anti-torque device.

The submersible power cable shall be spliced to leads of pump motor using compression sleeves and heat sealing plastic sleeves.

The power cable shall be run along the pipe through the openings provided in the anti-torque device and the nylon guides. At least five complete turns of electrical tape shall be installed to fasten power cable to drop pipe directly above and below each nylon guide and also at not more than five foot intervals along the entire length of drop pipe. The slack pump leads and cable shall be looped and securely taped to the pump.

Perform necessary excavation for installing pitless adapter, pipe and cable.

The safety rope shall be secured to the pump and passed through the openings provided in the anti-torque device and nylon guides and attached securely to the well cap.

Approximately three feet of slack above top of well casing shall be left in both the submersible pump cable and the Type UF cable. Spare cable shall be looped, taped and set into top of well casing before securing well cap to casing.

Install line from well casing to the existing storage tank and float switch system along with all accessories as necessary to complete the water system.

Bare neutral wire of cable shall be connected to well casing and control box ground tap.