

**Performance Specification**  
**Farlow Park Pond Irrigation and Pond Water Supply Project**

General: The purpose of the project is to install a new submersible well pump maximum 5 horsepower, capable for pumping 25 gallons per minute at 50 psi to the irrigation system. The new well pump will be set approximately 350 feet deep in the existing Farlow Pond Well.

The following items will be provided:

**One well pump:**

- 5 Horsepower, 208 volt 3 phase motor sized for VFD Service
- 304 stainless steel well pump
- 25 gpm at 415 feet TDH

**Well level sensor**

Shall de-energize pump motor if water inside well casing drops to 10 feet above well pump assembly. Provide 1 inch conduit to Well Controller with instrumentation wiring.

**Drop Pipe and Pitless Adapter**

Provide 2 inch Drop Pipe and 2 inch pitless adaptor. Provide two ¾ inch pipes, two ¾ inch valves and valve boxes and 2 inch isolation gate and valve box with t wrench extension to ground surface to allow use of air to winterize well drop pipe and 2 inch pipe to irrigation system.

**Pipe to Irrigation System**

Install 2 inch pipe from Well to Irrigation system (located adjacent to Pump Control Cabinets). Materials and methods to comply with Specification 02810.

**Variable Speed Control**

Provide variable speed pump controller to convert single phase supply power to 3 phase power supply for new well pump. Provide lightning protection for VFD. VFD Fail status shall energize external alarm light.

**PLC Controller**

Provide PLC based controller to:

- Energize de energize well pump
- Shut down well pump based on well drawdown
- Shut down pump based on loss of water pressure (20 psi initial set point)
- Provide control signal to well VFD to supply constant pressure to Irrigation system (initial set point 50 psi).

To energize irrigation system when called for by time clock (provide filed adjustable setting for irrigation time clock) and allowed by time clock, temperature sensor (initial well pump lock out setting of 40 F) and rain sensor gauge.

Control solenoid valve to irrigation system

Energize well pump to fill Farlow Pond when called for by low pond level sensor and to de energize the well pump when high level sensor is energized.

Irrigation setting shall take precedence over pond filling function.

Control solenoid valve for well water flow to Farlow Pond. Provide backpressure valve if required for proper well pump VFD operation.

Pump or system fail shall energize external alarm light.

PLC supplier shall coordinate with well pump start signals from the irrigation system controller.

### **Pond Level Sensors**

Provide two water level sensors for high and low level water sensing in pond. Provide low voltage wiring to PLC Controller. General Contractor to provide stainless steel pipe anchored to pond bottom and bridge to attach the pond level sensors.

### **VFD and PLC Cabinets**

Provide separate 304 stainless steel cabinets for VFD and PLC controller. Provide external heat sink and fan for cooling VFD and PLC. Provide lockable cabinets with yellow alarm light on top of each cabinet. Provide custom engraved sign with instructions for department to call in event of alarm. Provide special isolated ground grid for VFD and PLC. Provide lightning protection for VFD/PLC Cabinets. Provide shop drawings for internal wiring of VFD/PLC Cabinet.

### **Irrigation System Control and Cabinet**

The irrigation control system provided by Specification Section 02810 will require a 20 amp single phase power connection. All other wiring, zone valves and controls associated with the irrigation will be provided by Section 02810. The Irrigation Contractor shall be responsible for integrating well pump start signals with the Well Pump VFD PLC.

Irrigation Cabinet shall be located adjacent to Well Pump VFD and PLC Cabinets.

### **Commissioning, Training and Operation and Maintenance Manuals**

After irrigation and pond filing system has been started up and operating without failure for 5 days, provide 4 hours on site training for OWNER's staff. Provide three (3) copies of O&M Manuals for all components including wiring drawings.

<b>COST ESTIMATE FOR FARLOW PARK POND</b>					
<b>100% Bid Set</b>					
12.20.11					
	<b>units</b>	<b>quant</b>	<b>unit price</b>	<b>total</b>	<b>subtotals</b>
<b>general conditions</b>					
general conditions		0.08	\$255,935	\$20,475	
tree protection	ea	17	\$200.00	\$3,400	
					<b>\$23,875</b>
<b>demolition / site preparation</b>					
earth fill removal in concrete pool liner	CY	780	\$45	\$35,100	
<i>hand work / extreme care</i>					
					<b>\$35,100</b>
<b>drainage structures / infrastructure</b>					
new catch basin	ea	1	\$4,500	\$4,500	
overflow inlet at pond edge	ea	1	\$2,500	\$2,500	
new manhole	ea	1	\$4,500	\$4,500	
Frame and Cover	ea	1	\$560	\$560	
Frame and Grate	ea	1	\$600	\$600	
drainage gate valve	ea	1	\$1,500	\$1,500	
drainage pipe	lf	125	\$50	\$6,250	
					<b>\$20,410</b>
<b>utility services /mechanical equip</b>					
electrical service connection / cabinet	ls	1	\$9,000	\$9,000	
(1) well pump / (1) aerator / (1) water level	ls	1	\$25,000	\$25,000	
new irrigation system	ls	1	\$35,000	\$35,000	
30' of pipe from pump to pond	lf	30	\$50.00	\$1,500	
					<b>\$70,500</b>
<b>general site improvements</b>					
loam & seed of disturbed areas	LS	1	\$15,000	\$15,000	
36" HT Black steel picket fence	LF	215	\$165	\$35,475	
4' W black steel picket gate	ea	1	\$1,900	\$1,900	
					<b>\$52,375</b>
<b>Yearly Maintenance Costs</b>					
electrical service for pump for irrigation syste	annual	1	\$300	\$300	
electrical services for pump for pond filling	annual	1	\$100	\$100	
seasonal litter cleanout/ mucking out pond - volunteer effort				\$0	
weekly maintenance ie:trash etc - volunteer effort				\$0	
spring start up/winter shut down - with existing irrigation contract				\$250	
					<b>\$650</b>
<b>Concrete Restoration - Pond</b>					
Concrete Partial Depth Repair	SF	450	20	9000	
Concrete Full Depth Repair	SF	250	30	7500	
Crack Repair - Routing and Sealing	LF	280	20	5600	
Crack Repair - Gravity Filling	SF	280	35	9800	
Crack Repair - Polyurethane Injection Groutir	LF	200	150	30000	
Epoxy Pond Liner System	LS	1	15000	15000	
					<b>\$76,900</b>
<b>subtotal</b>				<b>\$279,810</b>	<b>\$279,810</b>
<b>contingency</b>				10%	<b>\$27,980.98</b>
<b>grand total</b>					<b>\$307,790.78</b>