

# REPLACEMENT OF POND 1 WELL PUMP AND DROP PIPING

MAY 7, 2021

During the 2020 irrigation season it became evident that the discharge pressure of the Pond 1 well pump was steadily deteriorating. This pump provides make-up water to the pond to maintain proper level as well as water for the Sloan Clubhouse's 24 irrigation zones. As the pressure deteriorated from 60 psi down to about 40 psi many of the zones became ineffective or inoperable. Our irrigation contractor and several well company technicians surmised that the problem was either the pump, leaks in the galvanized drop piping or a combination of both. A request for proposal was developed and bids were received for installation of a new (identical model) pump and corrosion resistant PVC drop pipe. The successful bidder was Edward Powell Pump & Well Drilling of Aston, PA with a price of \$6,495, which included a new solenoid valve to control the flow of water to the irrigation system.

The well is 305 feet deep and was drilled in 2005 by Thomas G. Keyes, Inc. of Frazer, PA; the yield of the well was tested at 60 gpm. The pump was a Goulds 25 gpm, 2 HP, 230 volt, single phase unit. It was connected to the surface by 240 feet of 1¼ inch galvanized steel drop pipe. To save the high cost of domestic water, the original well pump installation was converted by Hydroscaapes in 2016 to provide irrigation water to the clubhouse system. This involved piping the discharge to an above-ground header with shutoff valves, a grit filter, a pressure sensor, a surge tank and more than 300 feet of HDPE pipe to connect to the clubhouse system; a variable speed controller was also added that serves to regulate the discharge pressure of the pump.



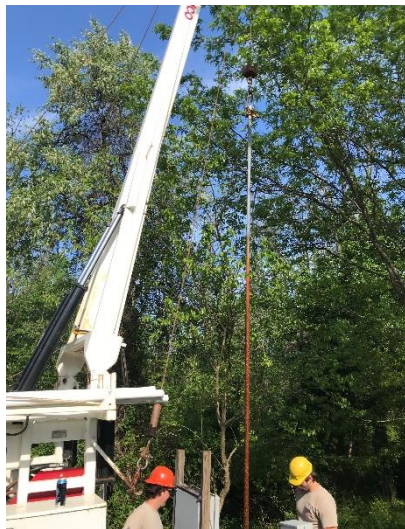
Access to the well was along the path on the western shore of the pond.



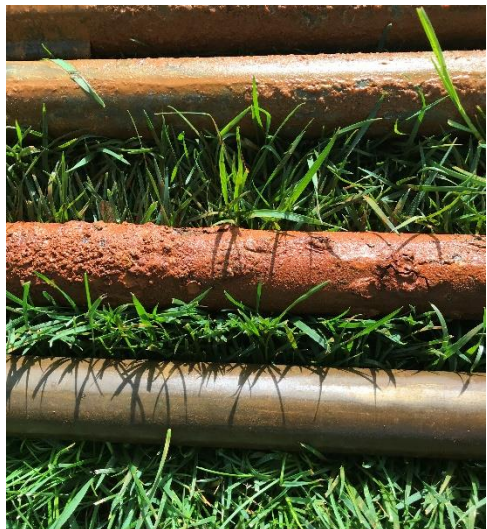
The Powell hoist truck remained on common property throughout the work day.



Disassembling the piping header. Co-owner Dave Powell supervised on site for about 2 hours.



Hoist lifting pipe string, enabling each 21' section of pipe to be uncoupled and moved to the scrap laydown area.

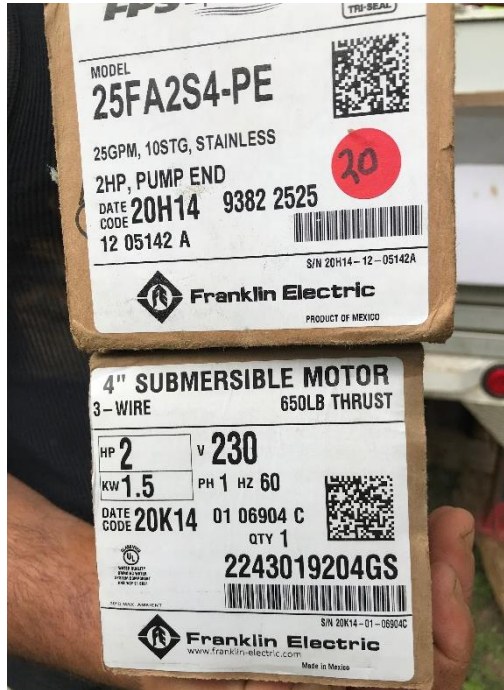


The galvanized pipe sections exhibited vastly different patterns of corrosion.





One of roughly half dozen corrosion leaks. These clearly contributed to the 2020 irrigation pressure deterioration.



The pump, despite the label on the shipping box, was manufactured by Goulds and is the identical model to the original.



New assembly: 2 HP motor on the bottom, then the 25 gpm pump, topped by a stainless steel check valve.



Motor leads were connected to the 4-conductor #10 wire using heat-shrunk waterproof splices.



The pump/motor assembly was then lowered into the well casing supported by the first length of PVC pipe (which is rated for an internal pressure of 600 psi).



A torque arrester was installed above the pump to prevent twisting of the pipe string when the motor starts.





A well pipe clamp secured the first length of 1 1/4" PVC pipe while the next length was threaded into it.



A plastic spacer was snapped onto every length of pipe to keep the pipe string centered in the well casing.



The power cable was taped to the pipe every 8 to 10 feet to prevent chafing against the well casing.



A drain-back valve was discovered in the drop pipe and was reused. This allows water to be drained out of the upper portion of the pipe to prevent freezing.



The piping header was reassembled after all in-well work was completed. The pump was then started and an extended flush performed. Pressure is now restored to 60 psi.



A DC latching solenoid valve was installed in the line to the Sloan irrigation system. It is closed during the day to prevent feeding the leak(s) in the irrigation network. It opens after midnight to provide pressure to the irrigation zones.