

LIFT STATION PERFORMANCE ANALYZER

PART 1 -- GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall furnish, test, install and place in satisfactory operation the MerMaid Lift Station Performance Analyzer, with all spare parts, software, accessories, and appurtenances as herein specified and as shown on the Drawings.
- B. Lift station performance analyzer shall be the MerMaid as manufactured by MAID Labs Inc., or equal.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Control and Information System Scope and General Requirements
- B. Powered Instruments, General

PART 2 -- PRODUCTS

2.01 LIFT STATION PERFORMANCE ANALYZER

- C. Lift Station performance analyzer shall be based on Volumetric Measurement and Motor Efficiency Analysis.
- D. Current inputs shall be record each phase of the motors. Current clamps shall be rated for 5-15-75 Amp, 150 Amp, 300 Amp or 1500 Amp.
- E. Inputs shall include up to 3 motors/pumps or 2 motors/pumps and 1 three phase voltage input.
- F. Voltage inputs shall use a step-down transformer to monitor delta or wye voltage connection. The step-down transformers shall be connected to PUMP 3/Volts input.
- G. The lift station performance analyzer shall have 4 digital inputs. One digital input shall be used for monitoring rain fall from a standard 8 inch tipping bucket rain gauge.
- H. The lift station performance analyzer shall include one digital output preconfigured by MAID Labs software for alarms.
- I. The lift station performance analyzer shall have one analog input to measure 4/20mAdc, 0-5Vdc. The analog input shall be preconfigured for range of operation and engineering units by MAID Labs software.
- J. The lift station performance analyzer shall record data at 1/10th second intervals and store 500K of data points. When the MerMaid logger memory is full, the logger shall record over the oldest events and continue to record the most recent into memory.
- K. New station file setups in the MAID Labs software shall provide the ability to erase logger memory and set time to host computer.
- L. MAID Labs software shall be utilized to create station files for simplex, duplex and triplex lift stations.
- M. Maid Labs software shall be used to download data from the MerMaid data logger and update station files.
- N. The MerMaid power supply input shall be used to record AC power failures. Power failures shall be displayed in station files as time-stamped events in the Flow Report. Power supply shall be 120 Vac 60 Hz to 3.3Vdc.

- O. The MerMaid shall include status LEDs to indicate active inputs.
- P. MerMaid data logger shall use internal “C” cell batteries for backup to AC power supply. New ‘C’ cell batteries shall provide backup power for a min of two weeks of operation without an analog input transmitter attached.
- Q. An internal thermistor shall be used to monitor the logger’s internal temperature.
- R. The MerMaid shall have a standard RS-232 DB-9 connector for communications and downloads.
- S. Flow accuracy shall be plus or minus 2% for monitoring inflow draw down and pump down cycles and shall be based on the volumetric measurements of the lift station.
- T. Pumping capacity accuracy shall be plus or minus 2% and calculated within the MAID Labs software.
- U. All flow, pumping capacity, digital and analog data shall be accessible in MAID Labs software in the form of reports, graphs and tabular data.

2.02 SOFTWARE

- A. Lift station performance analyzer shall include MAID Labs software.
 - B. MAID Labs software shall be used to display data, setup stations files and download event data from the MerMaid logger.
 - C. The MAID Labs software report data shall be used to assist with inflow and infiltrations studies, wet/dry weather flow modeling, lift station maintenance, pumping efficiency reporting, hydraulic and pump capacity analysis and engineering studies.
 - D. The station files shall include general station information, station layout, dimensions of wet well, quantity of pumps, size of current clamps and line voltage configurations.
 - E. Station files shall include analog input, digital input and output settings.
 - F. MAID Labs software shall display and graphically present data to 0.1 second resolution.
 - G. MAID Labs Software shall provide two primary reports types, electrical analysis and lift station analysis.
 - 1. Electrical analysis shall include a motor’s summary report, analog chart graph and digital events graph.
 - 2. Lift station analysis shall include a flow and rain report, inflow and infiltration graph/report and an evaluation report.
 - 3. The evaluation report shall include dimensions of the lift station’s wet well, pump level control points, motor/pump electrical performance, motor phase balance, efficiency of each pump and average pump cycle run times, pump capacities, pumped volumes, events, power consumption in kWh/pump (unit of volume) and annual cost analysis data.
 - 4. The flow and rain report shall include time-stamp data for each pump cycle and power loss events. The flow and rain report shall include the monthly flow totals, average inflow and peak inflow rates.
 - 5. The inflow and infiltration report shall include graphical flow and rain data.
 - H. All reports shall be adjustable with start date/time and end date/time.
 - I. All data shall be exportable in excel, tab delimited, word and pdf formats.
 - J. The MAID Labs software shall be compatible with Microsoft Windows XP, Windows Vista, Windows 7, Windows 8 and Windows 8.1.
- A. MAID Labs software shall be manufactured by MAID Labs Technologies, Inc.