

Clogs Draw a “Get Out of Jail Free” Card

Flygt’s breakthrough Concertor™ technology eliminates clogging in even the toughest applications in Chester County Prison.

Although by no means overwhelming, clogging problems in a county prison wastewater treatment system had simply become a nuisance, and it was time to take action with new technology to solve the problem.

Chester County Prison is located about ten miles south of Chester County’s seat, West Chester, Pennsylvania. The current prison was opened in 1959, and operated under the original construction until 1983 when parts of the prison underwent renovations and expansion.

Scope

The facility is subject to modern trash, consisting of products that manufacturers label as “flushable,” and includes baby wipes, baby diapers, paper towels, disinfectant wipes, and feminine use products. Non-dispersible, they wreak havoc in collection systems, but particularly in a prison where it is also not uncommon for clothing, towels, rags, and trash to join the flow, creating a clog potential for the pumps. It is also common for the effluent to contain a high amount of candy and snack wrappers along with plastic eating utensils. The prison also experiences periods of high flow with extended periods of low flow due to the nature of the complex—a blend of the prison, youth center, pre-release/work release center, and the convalescent home.

While many items of modern trash claim to be flushable or safe for sewer and septic, they will not break down like toilet paper when flushed down a toilet.

Chester County Prison has existing duplex submersibles that handle the waste generated from the prison. The pumps have performed very well, but occasionally have been subjected to clogging due to the harsh conditions in which they operate. Xylem’s Philadelphia Branch had previously provided repair services to Chester County Prison and knew the challenges of the installation.



Chester County Prison pump station

Customer: Chester County Prison

Challenge: Clogging Problems

Products: Flygt Concertor™ System

Solution

Due to the uniqueness of the system requirements, Philadelphia Branch engineers felt that this application would be an excellent choice to test out Flygt's new innovative Concertor technology, while simultaneously addressing the prison's occasional clogging issues. The manufacturer's engineers discussed with the customer how the Concertor system integrated the pump, control system, and software package into one pumping solution. The Concertor includes an algorithm that maximizes efficiency and has the ability to detect and clear potential clogs. The system combines this integrated control system with IE4 motor efficiency, patented Adapted N-hydraulics, and clog detection, making it easier to start up and operate, as well as allowing better regulation of the process itself and considerable cost savings due to fewer maintenance call-outs.

Using a combination of advanced software functions and state-of-the-art hardware, the system senses the operating conditions of its environment and adapts the pumping performance in real time. With the new Concertor system, the Adaptive N-technology and algorithms that detect and handle clogs, initiate pump cleaning, and minimize energy use, were the most desirable features to county officials.

The Philadelphia Branch installed a prototype four-inch Concertor pump and control module into the existing lift station in August 2015. On average, the pumps run between two and three hours per day. The prototype pump was installed as the lead pump with no alternation with the lag pump only being used for high level conditions. During the one-year testing period, the lag pump ran a total of 27 hours.

Results

Over the course of the testing period the prototype pump exceeded the performance of the previously installed pump, which was a duplicate of the lag pump. Due to the flexibility in performance and energy minimizer functionality of the integrated pump control, the results showed an 11 percent savings in energy costs compared to the previous pump. Additionally, there were no instances of ragging during the test period. These benefits were possible utilizing the simple Concertor integrated pump package.

It was found that the Concertor pump not only reduced the electrical usage, but also eliminated clogging. Operating for a period of one year without clogging or call outs showed that increased reliability is possible from a pump with integrated software and performance algorithms.



Existing control panel can be reduced in size with Concertor solution.

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