

**Flygt Dry Pit Submersibles Replace Outdated Raw Influent Pumps**

**Problem:** The City of Kalamazoo Water Reclamation Plant undertook a project to replace two of their Raw Influent Pumps. The existing pumps were Worthington shaft-driven pumps coupled to 200HP motors two stories above the pumps. The Worthington pumps were producing approximately 12,000 GPM at full speed. The shafts that connect the pump to the motor required frequent maintenance and repair. They also posed a potential safety concern, as a slight imbalance would cause vibration and premature failure of the U-joints holding the shaft sections together. In addition, the pump seals leaked constantly and required frequent maintenance or replacement. The leaking seals also exposed the operators to the raw sewage and allowed sewer gases into the building, creating an additional safety hazard. The pump and motor bearings also required maintenance, as they had to be greased regularly. These pumps were consuming valuable resources (labor and money) that the plant management felt could be better utilized elsewhere. Safety concerns for the operations and maintenance personnel were also high on the priority list and needed to improve.

Existing Non-Flood Proof Pumps with Shafting and Motors Located on the Second Floor



Upgraded Flygt Dry Pit Submersible Pumps are Flood Proof, Efficient & Dramatically Improve Safety



**Solution:** After considering all the options for replacing the Worthington pumps, plant personnel decided a dry pit submersible was the best option. The city, through a mechanical contractor, purchased 2) Flygt 3602, 215 hp dry pit submersible pumps. These pumps eliminated the maintenance and safety concerns associated with the existing pumps. Flygt Dry pit submersible pumps are a single, integrated, low-maintenance pump/motor. The pumps include permanently greased, 100,000 hour life bearings and maintenance-free, double mechanical seals. Plant management personnel also wanted to increase the capacity of each pump to 16,500 GPM. This was easily accomplished with the Flygt 3602, while only increasing the motor size by 15HP. Kennedy industries personnel

performed an energy audit on the existing Worthington pumps and found that they were consuming over 183 kWh per million gallons pumped. The same tests were performed on the Flygt pumps after installation, and they were consuming 161 kWh per million gallons. Based on an annual flow of 9.4 billion gallons, the plant qualified for a rebate from Consumers Energy of \$35,000.00 for installing the Flygt 3602 pumps and VFDs. In addition to the rebate, the plant will save over \$20,000.00 every year in reduced energy consumption, not to mention the reduction in labor and maintenance costs associated with the old pump. The project was considered by all to be a complete success. The replacement of the older, less efficient, labor intensive pumps with Flygt 3602 dry pit submersible pumps reduced their operating costs, eliminated many safety hazards and freed up valuable human resources for other important tasks at the plant.