



Suwanee Creek Pump Station

Owner: Gwinnett County Department of Public Utilities
Lawrenceville, GA
Engineer: Brown & Caldwell
Contractor: Ruby Collins, Inc.

Overview

Located in the northeastern suburbs of Atlanta, Gwinnett County, Georgia has been one of America's fastest growing counties for the past 20 years. Faced with increasing population and ever stricter environmental regulations, County officials recognized the need to manage water and wastewater services in an efficient and cost effective manner while maintaining their commitment to environmental protection. In the late 1990s, with input from concerned citizens, County officials developed a Water and Sewer Master Plan, with one of its key objectives being the consolidation of wastewater treatment facilities into regional ones. A primary goal of these efforts is to decrease the risk of hazardous discharge into the County's waterways while taking advantage of modern wastewater treatment and pumping technology.

As part of this effort, applications were made for environmental permits to build a 20 MGD advanced wastewater treatment facility in south Gwinnett County. When this was unsuccessful due to many environmental obstacles, the decision was made and permits were obtained to build the plant in the northern part of the County. The chosen location was at the highest elevation in the area and in close proximity to Lake Lanier, a 38,000 acre lake formed by the Buford Dam in the nearby Chattahoochee River. This state of the art facility, the F. Wayne Hill Water Resource Center, is currently undergoing a 40 MGD expansion.

Suwanee Creek Pumping Station

A key part of Gwinnett County's wastewater treatment infrastructure is the Suwanee Creek Pumping Station. Designed by Brown & Caldwell, the station is designed to pump sewage from the Chattahoochee Basin region to the F. Wayne Hill Water Resource Center. Due to the long force main (42,500 feet) and elevation differential between the pump station and the treatment facilities, the need for high-head pumps and a suitable surge control system were critical parts of the design criteria. Also, land area limitations necessitated a compact building design. To reduce station maintenance and for improved operator safety, the engineers specified a self-cleaning, non-confined ventilated wet-well design.



Morris Pumping Systems

After examination of the small footprint available for the station, a recommendation was made to utilize three (3) sets of vertical dry-pit pumps located on the bottom floor of the building, pumping into second-stage

vertical dry-pit pumps located on the second floor. The motors



were located on the upper floor of the building and connected to the pumps by flexible intermediate line shafts made of composite carbon fiber tubing. The pumping equipment consists of six (6) Morris Series 7100 NC vertical open-shaft pumps driven by 300 HP, 1180 RPM inverter duty mo-

tors with VFD control systems. Each duplex system is designed for a duty point rating of 4,236 USGPM at 345 feet TDH. For surge protection, each drive assembly is equipped with a massive cast iron flywheel (2,920 lbs.) located in the motor support structure. During a power outage,



the flywheel keeps turning to provide gradual deceleration of the rotating assembly. The VFD controls eliminate constant pump cycling and provide additional surge protection. To assure proper system design integration and single-source responsibility, Morris Pumps furnished the VFD control equipment, as well as the motors, flywheel systems and intermediate line shafts. Morris Pumps also furnished a finite element analysis (FEA) for each pump system component from the pump support to the top of the motor.



Equipment Details

S/O: 9805630

Pumps: Morris Series 7100 NC

Model 1012242V-3; 3- Pump Sets, Vertical Two-Stage High-Head Pumping Systems, Rated: 4,236 USGPM at 345 feet TDH; Ductile Cast Iron Construction with Stainless Steel (CA-6NM) Impellers; John Crane 5620 Tandem Mechanical Seals

Motors: Reliance, 300 HP, 1180 RPM, 3/60/460, Inverter Duty, Premium Efficient

Shafting: Johnson Power, Composite Carbon Fiber Tubing

Flywheels: Ductile Cast Iron, 2,920 lb. each

VFDs: Toshiba, PWM, 600 HP (one per duplex pump set)

Complete FE Analysis (FEA) performed by Morris Pumps

Please contact us for more information about this project or for assistance with your pumping needs.