ms consultants, inc.
engineers, architects, planners

LOWER ALUM CREEK RELIEF PUMP STATION/FORCE MAIN

CHALLENGE

THE DELAWARE COUNTY REGIONAL SEWER DISTRICT PROACTIVELY IDENTIFIED FUTURE FLOWS EXCEEDING EXISTING CAPACITY DUE TO PROJECTED EXTENSIVE GROWTH IN THE AREA THAT WILL NEED ADDITIONAL SYSTEMS.

SERVICES

- Architecture
- Electrical Engineering
- Environmental Planning
- Mechanical Engineering
- Structural Engineering
- Wastewater Systems Engineering
- 3D Scanning + BIM

LOWER ALUM CREEK RELIEF PUMP STATION/FORCE MAIN

The Delaware Country Regional Sewer District Sanitary Sewer Master Plan identified wet-weather flows exceeding existing capacity in the Alum Creek Interceptor sewer and at the Alum Creek Pump Station. Due to extensive growth in the Delaware County area, sanitary and stormwater flows have increased causing the Alum Creek Interceptor sewer to be undersized. The Lower Alum Creek Relief Pump Station will provide additional system capacity by reducing flow through the Alum Creek Interceptor sewer.

INCREASING CAPACITY WITH A NEW PUMP STATION

The Lower Alum Creek Pump Station diverts up to 14 MGD off of the existing Alum Creek Interceptor Sewer through a diversion structure and 36-inch gravity sewer. Flows enter the station by passing through influent channel grinders to reduce the influent solids. From the wet well, flow is conveyed using up to 4 dry-pit submersible pumps through an 8,200 foot force main. The force main required a new connection to the pretreatment building. Along with the new connection structure, additional upgrades to the pretreatment building were constructed. These improvements included new influent sampling, a new odor control system, and new HVAC improvements to meet NFPA standards.

The dry-pit submersible pump station configuration with brick façade and electrical control room features:

- Four, vertical, dry-pit, submersible 250-horsepower pumps with variable frequency drives
- Influent grinders and an odor control system
- On-site backup generator
- Overhead door and hoist for pump removal
- Instrumentation and controls
- Photoionisation odor control system for the wet well

The discharge force main design includes:

- 8,200 feet of 24-inch force main of horizontal directional drill installation.
- A 14-foot-by-7-foot diversion structure to divert flow from the existing Alum Creek Interceptor to the new pump station.
- Replacement of an existing culvert with 80 feet of an 8-foot-by-6-foot box culvert, which runs along a hiking path in Preservation Parks.
- Modifications to the influent chamber at the headworks of the Alum Creek Water Reclamation Facility.

UTILIZING BIM

The Lower Alum Creek Pump Station was designed using Revit, a BIM technology, to model the proposed structure. Utilizing BIM technology, changes within the model are visible to all disciplines in real time, making conflict identification a seamless and instantaneous process. Using our Virtual Reality technology, the client was able to take a guided tour through the structure to provide live feedback throughout the design process.