



Aerial view of the wastewater treatment plant looking south.

26th Ward Wastewater Treatment Plant

Brooklyn, NY

26th Ward WPCP Upgrade

Mueser Rutledge Consulting Engineers (MRCE) performed a geotechnical investigation and evaluated foundation requirements for a planned major upgrade and expansion of the 26th Ward Wastewater Treatment Plant in Brooklyn, New York. Proposed structures included a new 65 foot deep raw sewage pump station, 30 foot deep return sludge pump station, blower building, preliminary settling tanks, centrate aeration tanks, sludge storage tanks, chemical building and reconstruction of 1800 lineal feet of sheet pile bulkhead along the Hendrix Street Canal.

BULKHEAD For the replacement of approximately 1900 LF of an existing steel sheet pile bulkhead along the west side of Hendrix Creek with a new steel sheet pile bulkhead installed 18" in front of the existing bulkhead, MRCE prepared design drawings and contract documents including details for extending new sheet pile bulkhead. MRCE prepared all waterfront permit applications to the U. S. Army Corps of Engineers, New York State DEC, and New York State DOS for bulkhead replacement. Drilled tiebacks were used to anchor the new bulkhead in order to maintain active plant access roads directly behind the bulkhead. Construction of the new bulkhead began in May, 2003 and was completed in March, 2004.

GEOTECHNICAL INVESTIGATION The geotechnical investigation included conventional borings, test pits and a pumping test. Test pits and a diver investigation was performed to examine the condition of the existing bulkhead and develop design alternatives for a new sheet pile bulkhead. The pumping test was performed with a partially penetrating well and analyzed using both conventional analytical methods and three dimensional groundwater modeling to evaluate aquifer anisotropy and the benefit of partial penetration in reducing pumping quantities and groundwater drawdown at distance. The results of the pump test were used to evaluate dewatering inflows to excavations and facilitate determination of appropriate construction methods and their costs.

FOUNDATION DESIGN MRCE also selected appropriate foundation types and developed design criteria for the proposed new Plant structures. Alternative foundation types included mat foundations and driven and drilled piles. Drilled piles were recommended due to concerns of vibrations induced by pile driving causing densification of the natural sands and consequent settlement of adjacent structures. As part of these services, MRCE prepared design drawings and contract documents for a soldier pile tremie concrete (SPTC) cutoff wall to facilitate construction of the raw sewage pump station to alleviate concerns of excessive pumping quantities required in lowering groundwater levels and its consequent side effects (possible ground subsidence and deterioration of untreated timber piles) on surrounding structures and properties. The cutoff wall was designed to penetrate to a depth of 175 feet to key into the underlying low permeability aquitard (the Gardiners formation) and form a barrier to horizontal and vertical groundwater flow. Due to budget constraints, additional design work for foundations and excavation support for other proposed structures was interrupted and construction postponed. Work has begun on an interim rehabilitation plan to maintain Plant operation for the next ten years until funds are secured to again move forward with the original planned construction.