Lake Arlington Lift Station Epoxy Coating Case Study

April 4, 2022

Location: Fort Worth, TX

Client: City of Fort Worth, TX

Carylon Operating Company: Ace Pipe Cleaning

Services Performed: Epoxy Coating

Ensuring long-term protection for a new concrete wet well with 100% solids epoxy

The Lake Arlington Lift Station project in Fort Worth, TX is a successful case study demonstrating the importance of protecting **new concrete assets** with **high quality epoxy coatings**. Within the past few years, the City of Fort Worth, TX (the City) has grown at a steady rate. According to U.S. Census Bureau data, the City is expected to be home to over one million people by 2025, spurring the need for maintenance and updates within their wastewater system including one large wastewater treatment plant (WWTP) and another in the planning stage. The Lake Arlington lift station collects wastewater from a few large transmission lines and pumps the flow downstream towards the existing WWTP.

As part of their series of updates to their wastewater system, the City issued the Lake Arlington Lift Station project. The project consisted of a turn-key lift station including the construction of a trench style wet well with the installation of three submersible pumps with variable frequency drives (VFDs), valves, piping, odor control system, and epoxy application. The owner, a longtime supporter of protective coatings, wanted to ensure **long-term corrosion protection** and **extended service life** for their new structures including the concrete lift station and five 60-inch manholes, the deepest measuring 26-feet in depth.

With a wastewater system subjected to high hydrogen sulfide (H_2S) gas levels and a low pH, the owner specified only **100% solids, high build epoxy** as it had successfully protected their assets from corrosion in the past. Taking this preventative measure early in the project's design and construction would save the owner money in the long run.

Taking the applicators' quotes and past experience into consideration, **ACE Pipe Cleaning** (ACE) was selected for the coatings scope of work.

SCOPE OF WORK

Warren Environmental's **301-14** epoxy is a **solvent-free, high build** epoxy series capable of extending an asset's service life in highly corrosive environments. The coatings scope included coating the new trench style wet well, 19-foot by 61.5-foot by 48-foot deep with 100% solids, high build epoxy specified at **125 mils**.

The concrete wet well was formed in early September 2021. Multi-level scaffolding was installed to facilitate the applicator's coating process. A test patch was applied in the first week of October. The wet well's concrete roof was poured a few weeks later, with all concrete cured 28 days prior to beginning the coating activities in early December. All coating activities, including surface preparation, application, and testing, started on the roof and continued level by level to the bottom of the wet well. Once each 10-foot level was coated with epoxy, it was spark tested and adhesion tested.

ACE first performed surface preparation. The structure's new concrete was abrasive blasted to achieve the desired surface profile for optimal adhesion. The specification required inspection activities by the manufacturer including the observation of surface preparation by Warren's representative, the owner, and the owner's representative. Additionally, the specification required these groups to observe the following: application techniques and equipment, coating thickness and uniformity testing, visual coating uniformity and texture observation, and coating pull-off adhesion testing. After surface preparation, **ACE** lined the structure with **125 mils of Warren's 301-14 high performance epoxy**.

OVERCOMING PROJECT CHALLENGES

Rain events caused high humidity for a few days during the project. At the time, the humidity levels caused the spark testing to give false readings because of some moisture on the cured coating. ACE overcame this challenge by adding warm air blowers to solve the

problem. ACE was conscious of the large temperature fluctuations with the changing of the seasons from September to December. Temperatures ranged from 80° F to 30° F through the course of the coating scope. The surface temperature stayed above 40° F in the underground wet well.

ACE and an AMPP/NACE certified coating inspector witnessed testing conducted on-site. The post-application testing required spark testing and 30 total adhesion (pull) tests per ASTM 7234-21 (Standard Test Method for Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers) across the interior surface of the wet well. In most projects, pull test values that exceed 300 pounds per square inch (psi) are typically required. The average pull test value was greater than **550 psi**, highlighting Warren epoxy's superior **adhesion**.

As one of the top-performing systems on the market, the pull tests demonstrated Warren epoxy's capabilities. This project combined four essential components to deliver a successful coatings project: **a well-written specification, Warren's epoxy solutions, ACE as a highly experienced applicator, and post-application inspection and testing.** Completed in February 2022, the City of Fort Worth, TX can be assured of a well-applied coating to provide long-term protection for their lift station wet well.