

Akron Retention Tank



Utilities

Case Study



CLIENT

City of Akron CSO Retention Tank No. 2

CHALLENGE

Identify a lighting source that would survive a toxic sewer environment

RESULTS

Effective, low-maintenance daylighting

PRODUCT

24 Solatube SolaMaster® 330 DS-0 units

SOLATUBE INSTALLER

Wilson-Shaw

DESIGN ENGINEER

GPD Group

FACILITY SIZE

972,000-cubic-foot storage tank 8 feet below ground

BACKGROUND: The City of Akron CSO Retention Tank No. 2 is an underground storage tank serving a Combined Sewer Overflow (CSO) system within an industrialized area on the south side of Akron in Ohio.

The project included rehabilitating a large concrete storage tank (180 feet wide, 180 feet long and 30 feet deep or 972,000 cubic feet), buried approximately 8 feet below ground with new maintenance-friendly applications, including lighting. Past efforts to illuminate the underground storage tank failed within months of their initial installation.

CHALLENGE: “During our design process, it is standard practice for the City of Akron to look for innovative products and ideas for our projects that provide a long-term solution, with minimal maintenance. When designing a lighting system for our underground tank, typical lighting systems installed in sewage tanks corrode and quickly fail,” said Michael J. Teodecki, design division manager, City of Akron.

They needed a system that would live for the next 30 to 50 years or longer inside what was essentially a sewer. Electrical lighting systems in this particular environment weren't feasible. A natural lighting system was thought to be a better approach.

According to R. Tony Burgoyne, project manager, GPD Group, “Past efforts to artificially light the space used for temporary storage of sanitary waste were unsuccessful. During frequent rain events, the tank fills with combined sanitary sewage and storm water which led to lighting shortages



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and ultimate failure of the system. Without lighting, the City's maintenance forces cannot affectively clean the tank after its use."

SOLUTION: Solatube Daylighting Systems were selected because of their unique ability to transmit daylight eight feet underground. Photometric plans were developed to identify light output based on a series of conditions including clear and overcast skies, to account for variable weather in Northeast Ohio.

The design team was mainly concerned with the survivability of a lighting system in a harsh and toxic sewer environment so they selected 24 Solatube 330 DS-0 units.

"When asked by the City of Akron to develop a solution to provide lighting in an underground storage tank, GPD Group turned to Wilson-Shaw and Solatube International," Burgoyne said. "GPD's engineers worked with them to develop a design that not only applies but protects the Solatube systems in this particular setting."

RESULTS: Solatube daylighting devices provided the means to light the tank naturally so that no additional lighting sources were needed.

Teodecki added, "In this case, we found Solatube products and engineered a new installation method that has very little contact with sewer gases and uses no energy to operate in this underground tank. Upon completion, we are very impressed with the light levels achieved during the daytime."

"The results are simply remarkable. Equally important, the City now has a natural lighting system that not only meets its needs, but reduces the industrialized footprint on the environment and is free of any long-term power consumption costs," Burgoyne said.

Manholes were designed into this custom installation. Periodically workers extend a ladder into the tank through the manhole to clean the protective diffusers.

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