PROJECT SHEET

Quarles Water Treatment Plant

2021

ABOUT THIS PROJECT:

Market Segment:
Wastewater Collection & Treatment

Owners:
Cobb County-Marietta Water Authority

Products Used:
Xypex Admix C-500

Location:
Marietta, Georgia

General Contractor:
Archer Western

Engineers:
Hazen and Sawyer

PROBLEM

Completed in 1954, the James W. Quarles Water Treatment Plant was the first facility commissioned by the newly formed Cobb-County-Marietta Water Authority (CCMWA) in the greater Atlanta area. Known as Plant No. 1, the site consisted of numerous concrete tanks for flocculation and sedimentation trains for the treatment of up to 42 million gallons per day (mgd) of potable water.

Xypex Admix C-500 waterproofs and protects the water containment structures in Marietta, Georgia's new James E. Quarles water treatment plant.

This plant draws water from the Chattahoochee River for treatment, which includes oxidation and flocculation processes. The constant movement of water and chemical treatment processes has an abrasive effect on the concrete containment and conveyance structures.

THE XYPEX SOLUTION

In 2012, after 58 years of service, Plant No. 1 showed the effects of age from decades of service. The concrete in Plant No. 1 suffered deterioration, including exposed rebar, exposed aggregate, loss of surface paste and spalling. CCMWA called on water engineering experts Hazen and Sawyer to study its operation and make a recommendation for Plant No. 1. The team recommended replacing the original plant with a new plant with a capacity of 33 mgd that could be expanded to 66 mgd in the future.

Construction began with demolishing half of the original Plant No. 1. The remaining half (foreground) was maintained in working order while the new plant (top) was constructed.

The new plant was designed to meet current water quality goals and future regulatory requirements. A key component of the concrete specification included Xypex C-500 for all water containment structures, including the three concrete tanks for flocculation and sediment, the filtration building, and two splitter boxes. Hazen and Sawyer selected Xypex C-500 for this project due to its certification for contact with potable water to NSF 61 and its effect on waterproofing the concrete while increasing its durability.

Multiple trucks from Ernst Concrete line up to unload concrete treated with Xypex Admix C-500. By using Xypex Admix to waterproof and protect concrete offsite rather than applying waterproofing at the site, fewer trades were needed at an already crowded worksite.

Archer Western Contractors served as general contractors for the $80 million construction project. John Wilson, project manager, was familiar with the benefits of Xypex waterproofing protection. Incorporating Xypex into the concrete mix saves time and project costs compared to applying a membrane or other surface protection to the concrete at the jobsite. For Wilson, the benefit of Xypex is that the concrete arrives onsite with built-in waterproofing.

"Xypex lets us build the protection into the structure itself," Wilson said.

"Xypex takes time to heal any cracks in the concrete and we allow for that when we hydro-test each section.

The engineers for this project were adamant about avoiding crack injection, and we could do that by using Xypex. We can't put crack injection into our budgets, so that's an expense we want to avoid, and we were able to do that on this project."

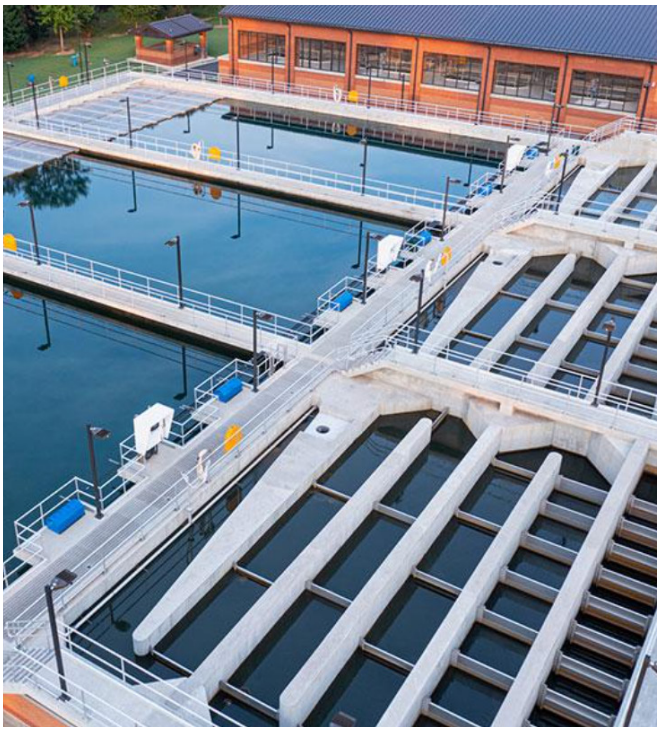
Xypex Admix becomes an integral part of the concrete mix and protects the concrete for the life of the structure. Xypex Admix C-500 was incorporated into about 9,500 yd3 of concrete for the project.

Hydro-testing the central flocculation/sedimentation basin treated with Xypex Admix C-500 crystalline waterproofing.

The ready-mix supplier for the project was Ernst Concrete, a fourth-generation family-owned business that services Ohio, Indiana, Kentucky and Georgia.

"We have used Xypex in our mixes for many years," said Charles Lambert, technical services director for Ernst Concrete. "When a specification requires a crystalline waterproofing admixture, Xypex is what we use."

Ernst Concrete supplying concrete with Xypex Admix C-500 to the project.



All water-holding structures in the new plant are waterproofed using Xypex Admix C-500.

Lambert, who has been in the concrete industry for over 30 years, added, "commercial water treatment and wastewater treatment facilities always specify a crystalline waterproofing admix, and usually Xypex by name. Some other products are just a moisture barrier and cannot withstand hydrostatic pressure like Xypex can."

For over a year, the new Quarles Plant No. 1 has provided clean drinking water for CCMWA customers. With the inclusion of Xypex in the concrete, Hazen and Sawyer designed this project to last over 100 years and provide flexibility to accommodate future population growth.

"This was a big project by any measure and one that was critically important for this region," added Archer Western's John Wilson. "We're proud to have been involved. Xypex Admix is a smart way to meet a critical design goal for projects like this – that of concrete waterproofing and protection."

The completed Quarles WTP includes 9,500 yd3 of concrete treated with Xypex Admix C-500 crystalline waterproofing technology.