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CASE STUDY:

CARLSBAD DESALINATION PROJECT



THE FIRST CHOICE OF ENGINEERS **FLOWTITE** WORLDWIDE

With the aim of alleviating the endemic water shortage, the San Diego County Water Authority initiated the Carlsbad Desalination Project, slated to begin delivering fresh drinking water to businesses and residents by the end of 2015. The plant is designed to convert more than 100 million gallons a day (MGD) of raw seawater into 54 MGD of desalinated, permeate product.¹ This is the first of 12 such plants due to be constructed in California.

For this phase, over 2,000 LF of Flowtite® Fiberglass Reinforced Pipe, with dimensions ranging from 16" to 72", was required.



CHALLENGES TO OVERCOME

Engineers from Thompson Pipe Group – Flowtite worked with the project design team on aspects such as pipe pressure class, proper liner type, etc. With global experience with desalination projects, Flowtite® engineers were able to help overcome a number of design obstacles. A field representative was also onsite during delivery and installation to ensure faultless progress.

Designing and building the pipeline involved a number of unique challenges. Pipe would have to be buried at depths up to 18 feet, sometimes six feet below groundwater level, and withstand both soil pressure and AASHTO H-20 loading. The highly corrosive nature of both the seawater and the chemically treated permeate water, with pH values ranging between 2.5 and 10.5, placed severe demands on pipes, joints and fittings alike. The pipe also had to be in compliance with ASTM D3517, AWWA C950 and NSF 61, and be manufactured with phthalate-free resin.

¹<http://carlsbaddesal.com/desalination-plant>



FLOWTITE® SAVES TIME

The contractor, Kiewit Shea Desalination (KSD), outlined an aggressive construction schedule requiring the fast-paced production of pipe to specification. As the chosen supplier of Flowtite® pipe for the project, Thompson Pipe Group – Flowtite arranged to have the product produced in Louisiana and shipped to California. Field crews with pre-cut fiberglass kits and technical support were able to quickly complete field wraps in place. By taking advantage of

the unique Flowtite® push-on couplings, nearly twenty 72" field wraps could be eliminated entirely, which shaved further valuable time from a tight installation schedule.



PROBLEM-SOLVING AND FLEXIBILITY

Every construction project presents its own challenges, some of which are difficult to anticipate. One such problem arose because of the busy nature of the installation site and the

tight construction schedule. At one point in the project, two forty-foot lengths of 72" Flowtite® had to be joined together and the resulting 80-foot section transported to a site location surrounded by other ongoing activity. The solution was to use a massive tower crane to hoist the 80-foot pipe and carry it over and around the construction site. This was the only installation option available. Because Flowtite® joints are so strong, the operation was completed without risking the integrity of the connection between the two 40-foot component parts.

PIPE SPOOLS AND CUSTOMIZED FITTINGS

Thompson Pipe Group – Flowtite engineers worked with KSD to design a system to fit within the outer casing of the jacking tunnel, and also supplied pipe spools and customized fittings. In addition, the contractor was able to create their own spools by cutting the pipe and joining it to the fittings using the butt-wrap method.

Flowtite® is able to withstand the necessary loading requirements, in addition to meeting all the vacuum and water pressure requirements. Thompson Pipe Group – Flowtite engineers provided the design calculations for each pipe section's unique conditions. The Flowtite® pipes were supplied with two different resins in the liner — polyester (PE) and vinyl ester (VE) — to accommodate the anticipated corrosion levels specified. In each case, the liners were phthalate-free, which was an important project requirement.

Matt Sternisha, P.E., of Kiewit Shea Desalination sums up the collaboration with Thompson Pipe Group – Flowtite engineers:

"We decided on Flowtite® because it was the best value option. They worked with us to solve problems and challenges during both the design and construction stages of this important project. Innovative engineering concepts such as the use of couplings rather than field wraps, together with their fast-paced production capacity, allowed us to meet an aggressive construction schedule and deliver the plant on time."

MATT STERNISHA, P.E., KIEWIT SHEA DESALINATION