

# Restrained Joint PVC

## Offers Corrosion Solution For Navy Air Station

In 2006, U.S. Naval Air Station (NAS) Point Mugu in Ventura County, CA, was stuck with a potable water distribution system that was falling apart. Corrosive soils on the Pacific Coast had damaged the system's steel piping, warranting a vast mainline replacement.

The issue at hand was installing a quality corrosion-resistant pipe material that would not require supplemental corrosion protection like iron pipe often does. For this project, the U.S. Navy specified polyvinyl chloride (PVC), the most common product used nationwide in underground water systems.

The Navy hired Reyes Construction Inc., of Pomona, CA, to design and build the new pipe system, and Reyes hired Willdan, an Anaheim, CA-based engineering/planning firm, to serve as engineering consultant on the job. Considering the Navy's material requirements, Willdan included 8-inch through 16-inch CertainTeed Certa-Lok C900/RJ restrained-joint PVC pipe on the 40,000-foot pipeline.

"We've had tremendous success with the CertainTeed PVC pipe, especially in corrosive soil conditions like at Point Mugu," says Steve Leathers, vice president of Infrastructure Engineering at Willdan.

The design process began in January 2006, and by August, Reyes Construction's 20-worker crew was ready to break ground on the open-trench project. After excavating the trench and disconnecting and removing the corroded steel pipe, they began assembling and laying a new pipeline. The fact that the pipe joints assembled one piece at a time in 20-foot lengths helped simplify installation considerably, and it also took up less space than welded steel pipes.

"If you lay all steel pipe, you have to do it all in one shot," says Joe Flores, project manager for Reyes Construction. "Since we were jumping around, putting PVC and ductile iron fittings in, there's no way you could do a continuous run like that."

### Ductile fittings

Ductile iron fittings had to be used to handle the many changes in direction, creating the need for cathodic protection via an Impressed Current Cathodic Protection (ICCP) system, commonly used at large facilities with corrosion problems. The systems typically consist of a network of DC-powered cathodic protection rectifier stations, where the above-ground rectifier module is connected to the pipeline

through electrodes welded to ductile iron fittings. Also connected to the pipeline are bags with metal rod anodes to complete the cathodic protection system. Half of the anodes installed at Point Mugu were magnesium and half were zinc, depending on the soil conditions. These systems slow the rate of corrosion and keep track of when fittings have corroded to the point of needing replacement.

The most challenging part of the project for Reyes Construction was setting up these individual cathodic test stations, a very time-consuming part of the project. With a station needed at each ductile iron fitting, the total exceeded 300. Ductile iron fittings had to be used at valves and for T-shaped directional changes, but the crew was able to save time and money by using CertainTeed C900/RJ Sweeps at all angled directional changes. C900/RJ Sweeps can be used in place of ductile iron fittings in municipal pipe installations that require no cathodic protection.

"With the ductile iron fittings, we'd have to go back to each one, weld electrodes to the fitting, draw lines up, put in anode bags, set up the cathodic protection station and set up a box for the station," Flores says. "It's pretty tedious work. The PVC sweeps allow you to keep the job moving. You don't have to go back and put in another cathodic protection station. It saves you a lot of time and man hours."

Though the cathodic protection portion of the project proved time-consuming, the job moved along steadily without any major hitches. The Reyes Construction crew finished up and tied in the new water distribution system in August. Reyes Construction and Willdan were both pleased with the outcome and see the many advantages of using the corrosion-resistant restrained-joint PVC pipe and sweeps in corrosive soil conditions, such as those on the Pacific Coast.



"I think the use of PVC pipe and fittings is becoming more common in our region these days because of its performance and corrosion resistance," Leathers says. "There was some reluctance at first to move toward PVC because some people didn't think it would be strong enough in comparison to steel pipe, but the material has proven itself. I think a lot of municipalities and agencies are starting to change their way of thinking about PVC."

### FOR MORE INFORMATION

#### Contractor:

Reyes Construction Inc., (909) 622-2259, reyesconstruction.com

#### PVC restrained joint pipe:

CertainTeed, (866) CT4-PIPE, certainteed.com

#### Ductile iron fittings:

American Ductile Iron Pipe, (205) 325-1965, acipco.com