

Novato Face-Lift More than Surface Deep

New water lines installed using PVC pipe, trenchless technology

By Carrie Bishop

Another California face-lift is under way. No, not an extreme makeover in the Hollywood Hills, this reconstructive surgery is taking place underground, 29 miles north of San Francisco in the City of Novato.

Novato is undergoing a \$10.7 million campaign to improve streets and sidewalks in its Old Town shopping and business district. The city's goal is to renew the main street for its citizens and attract business back to the downtown area. This means new curbs and gutters, level sidewalks, new streetlights, new trees and the removal of the "crown" in the road. And, as in any successful improvement project, there's more to it than meets the eye. In this case, the North Marin Water District, purveyor of the city's water supply, is proactively replacing its dated waterlines before a future pipe failure creates the necessity to dig up the new city streets.

A portion of the project entailed the installation of a new 12-in. waterline - 500 ft in length - under an old freeway right of way. The area was composed of layers of asphalt up to 2 ft thick and included an 8-in. thick reinforced concrete base. The Water District turned to the directional drilling method to minimize cost. Open trench projects are estimated to be up to four times more expensive. Plus, trenchless work reduces traffic congestions and pedestrian headaches that come with open trench projects. The Water District hired contractor Redline Directional Inc., of Rancho Cordova, Calif., to perform the new installation.

Another factor critical to the project's long-term success was choosing the right pipe material for the job. Joe Kauwe, project engineer of North Marin Water District, opted for polyvinyl chloride (PVC) pipe over high-density polyethylene (HDPE).

"PVC is a rugged material. We use PVC C900 gasket joints for our everyday open trench installations," Kauwe said. "Our selection of PVC restrained joint was based on availability of common water plumbing components that can connect to PVC. Plus, all the parts we needed for this



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job weren't readily available in HDPE."

PVC is inherently 2.5 times stronger than HDPE, allowing it to be extruded with a thinner wall than HDPE for a comparable pressure rating, according to Steve Gross, director of marketing for CertainTeed's pipe division. It provides a larger inside diameter (ID) on PVC pipe, which maximizes flow performance. He added that HDPE pipe can stretch during installation, further reducing its ID. And, compared to metal pipe, PVC won't rust or corrode and has no detrimental effects on the taste or color of potable water.

Also, compared to other materials, PVC is easier and faster to assemble because it does not require expensive and time-consuming heat fusion, Gross said. It also can be assembled one joint at a time so it won't take up much room and block streets, driveways, etc. The Water District construction crews easily learned how to assemble the restrained joints in less than 15 minutes.

In the end, CertainTeed's Certa-Lok C900/RJ Restrained Joint PVC Pipe was chosen. Beyond its PVC construction, Certa-Lok was the best choice because of its ability to adapt to a congested underground environment such as is the case in Novato.

"Though sketches of the area's existing underground utilities were clear, any driller knows that underground maps can't account for undocumented below-grade structures," says Kauwe. "The maps for this water line replacement project, for instance, failed to note several abandoned storm drains and one very large concrete vault measuring 10 feet by 20 feet."

Fortunately, the directional drilling team was experienced and easily adjusted. "It's critical to get as much information as you can up front about the underground environment where you'll be drilling. You should understand everything from the soil conditions to existing utilities because there's always an element of the unknown when you dig underground," says Kevin Stevens, president of Redline Directional of Rancho Cordova, Calif.

Redline Directional was cognizant to watch for existing utilities and was able to vary elevations of the new 12-in. size Certa-Lok pipe accordingly.

"We were able to stay within the manufacturer's 300-foot minimum bend radii, making it easy to go under, over and around existing and newly found utilities. Besides navigating around the 10-foot by 20-foot vault, Redline was able to adjust the PVC pipe elevation and clear high-pressure gas mains within a 30-foot distance," explained Kauwe.

In total, it took Redline Directional two days to com-



The North Marin Water District is proactively replacing its dated waterlines before a future pipe failure creates the necessity to dig up new city streets and sidewalks that are being planned.

plete the water line installation. Thanks to directional drilling's non-invasive technique, local residents and merchants experienced minimal disruption to their daily lives; however, they looked forward to the end of 2004, when all construction associated with the revitalization of the Old Town Novato would be complete.

Carrie Bishop is a freelance writer for CertainTeed Corp., which is based in Valley Forge, Pa.

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