U.S. Military Upgrades with HDPE Pipe

By Steve Cooper

Ft. Lewis updates its sanitary sewer system

High-density polyethylene (HDPE) pipe has been known to stand up to some pretty tough environments, including toxic waste sites, but this could be first time the pipe would have to perform under fire—literally. Some HDPE pipe in a new sanitary sewer system is now under a U.S. Army firing range.

A recent expansion of the sanitary sewer system at Ft. Lewis in Washington state was completed in March 2008. It involved installing some 5,000 ft of 36-in. and 400 ft of 30-in.-diameter HDPE pipe from Hancor to replace the base's vitrified clay system.

Design and construction work was done by Bristol Construction Services, LLC, Anchorage, Alaska. Bristol provides heavy construction, construction management, civil engineering and other services with the U.S. Army Corps of Engineers, Naval Facilities Engineering Command and the Federal Aviation Administration in Alaska, Washington state and North Carolina.

Ft. Lewis is home to I Corp and is one of the largest military reservations in the U.S. Named after explorer Meriwether Lewis, it was established just before World War I and now has 30,000 soldiers and 11,000 civilian employees, plus 24,000 retirees and 47,000 family members living both on and off the post.

Recent plans called for the expansion of Ft. Lewis, for which the new sanitary sewer system will provide additional capacity. The new sewer system would be upgraded to include large-diameter pipe. The existing 24-in. clay pipe was half full, leaking and taking on water that infiltrated from the soil, unnecessarily adding a burden to the treatment plant. Originally, the replacement pipe was to be polyvinyl chloride (PVC). But because of its higher cost, Bristol selected the HDPE pipe, and the Army Corps agreed.

"The main problem with the existing sanitary sewer line was that it was already undersized for the needs of Ft. Lewis and would not be capable of meeting the expansion plans," said John Sharp, project manager for Bristol. "Plus the vitrified clay was taking on water, so the sewage treatment plant was having a hard time processing all that extra groundwater when there was a significant storm."

The Job

The new pipeline was installed parallel to the old one, so there was little interruption to base operations. Working six days a week, the Bristol team of around eight members used a CAT 365 excavator that would dig the ditch and drag the trench box along. After the ditch was excavated and the box set in place, bedding was put down to set the grade of less than one half of a percent.

"Production was great. We made very good time on the job. The pipe was fairly light. It was moved into position with the excavator," Sharp said. "A three-man crew was in the trench to connect the pipe sections."

At some locations, such as the firing range, the

write in 619

write in 621

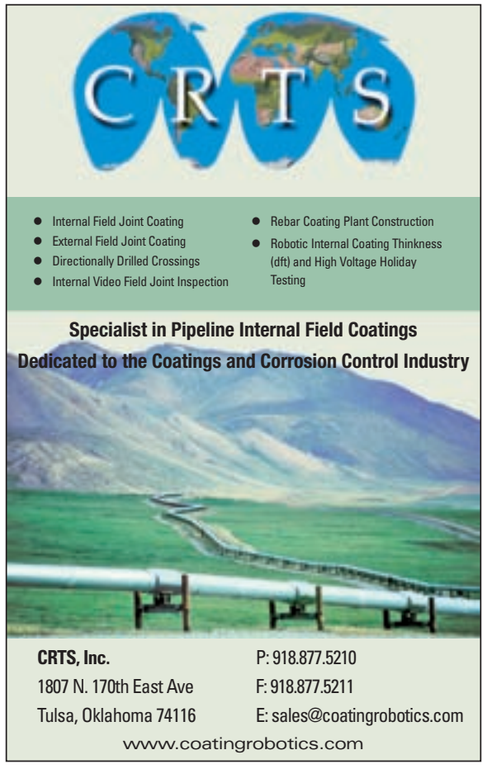
Hancor HDPE pipe is designed for sanitary sewer systems, which are usually buried deeper and subject to greater water pressure than corrugated HDPE pipe used for storm sewer installations.

trench was 25 ft deep. "That was another reason we went with the Hancor pipe—because it would stand up to deflection in this deep burial, even over time," Sharp said. "It could handle the depths we wanted. That particular section of pipe was passing through firing ranges, so you have the normal grade of about 10 ft and then another 15 ft of berm."

Because of the size of the pipe, precast concrete manholes at least 72 in. in diameter at the bottom and tapering to 48 in. at the top were used. Some larger 84-in. manholes were used to accommodate three pipes—two coming in and one out.

After the pipe was put into place, it took about 20 days to do all the tie-ins. We started at the high side and worked down," Sharp said. "We would stop one stick short of the manhole and didn't tie into it. Then, we'd put in the whole line, go to the very bottom and stop one stick short again, excavate for the manhole, expose it and the pipe on both sides. The existing line would then be exposed, and we brought in a system of 8-in. bypass pumps with triple bypass so we would have one workhorse and two back pumps. This was just in case one couldn't keep up or broke down. So we pumped the sewage around the tie-in point, capped it off, cut the pipe open and installed the manhole."

"We used a channel manhole for that because it's open at the bottom and could be slipped over the top of the pipe," Sharp continued. "The crew did the grouting, got it all buttoned up, brought the new line into the manhole,



write in 614

write in 615

took the plug out and connected to the pumps. We then did likewise to the opposite side and wanted to make sure everything was tested before we did that."

HDPE Pipe

The Hancor HDPE pipe is designed specifically for sanitary sewer systems, which are usually buried deeper and subject to greater water pressure than corrugated HDPE pipe used for storm sewer installations. While PVC pipe is generally considered for a job such as this, rising product cost and long-distance delivery required that a more cost-effective solution be found.

The HDPE pipe for this project was made in the manufacturer's Olympia, Wash., plant, which provided favorable transportation costs and just-in-time delivery for the Ft. Lewis project.

"Generally, PVC pipe for this area would have to come from out of state or from Canada," said Hancor Sales Representative Joe Sheehy. "Currently, the cost for PVC pipe in those large diameters is around $25 a foot more than HDPE pipe."

According to Sheehy, two types of Hancor HDPE pipe were used: SantiTite Sanitary Sewer pipe and Low Head pipe. "Both provided the necessary water-tight seal between pipe sections," he said.

Since 1917, Ft. Lewis has been serving the country. With the projected life expectancy of HDPE pipe listed at 100 years, the property will be at least 200 years old when it next might need a new sewer system. WWD

Steve Cooper is a writer for SCA Communications. Cooper can be reached at 516.623.7615 or by e-mail at steve@scacommunications.com.

For more information, write in 1111 on this issue's Reader Service Card.

WEBresources>>>

Related search terms from www.waterinfolink.com: HDPE, pipe, sanitary sewer system

For more information related to this article, visit www.wwdmag.com/lm.cfm/wd070911

AdvantEdge Series™

NEW!

LOOKING FOR A QUALITY ALTERNATIVE?

NOW you have a CHOICE!

HF scientific
Water Quality Measurement Solutions
Phone: (239) 337-2116
Fax: (239) 332-7643 e-mail: HFinfo@Watts.com

OPTICAL DISSOLVED OXYGEN
ONLINE MEASUREMENT ELECTRODE

The AdvantEDGE Optical Dissolved Oxygen RDO® sensor uses the latest luminescence-based sensor technology to measure dissolved oxygen (DO) in demanding environments.

- ROBUST INERT CONSTRUCTION
- COST EFFECTIVE
- SIMPLE TO USE
- ACCURATE REPRODUCIBLE RESULTS
- REPLACEABLE CAP LASTS A FULL YEAR

For more information visit our web site:
www.hfscientific.com

Visit us at AWWA Booth 729

RDO is a registered trademark of In-Situ, Inc., Fort Collins, CO USA

write in 620

Setting the Industry Standard Since 1939...

Ask for the Original

Smith-Blair

BLUE!

Joint Restraints | Repair Clamps | Service Saddles | Steel Couplings | Restraint Couplings | Tapping Sleeves | Expansion Joints | ...and more!

30 Globe Ave-Texarkana, AR 71854 Ph: 870-773-5127 - 800-643-9705 Fx: 870-773-5212 - 800-648-6792 www.smith-blair.com

write in 623

freeflo™
Quality Base Elbow Rail Systems.

- 1.25", 1.50", 2.00", 3.00", 4.00" and 6.00"
- Vertical and Horizontal Discharges
- Stocked for 24 Hour Shipment

CONERY MFG INC
T: 419.289.1444
F: 419.281.0366
1380 Enterprise Parkway
Ashland, OH 44805

www.conerymfg.com

Please see us at WEFTEC Booth 23095, Hall B1 0807C

write in 641

ASSURED FLOW'S
HYDRA-TAG
TAGGING SYSTEMS FOR FIRE HYDRANTS & GATE VALVES

Identification systems are important for emergency locations, maintenance and repairs, security, mapping and performance evaluations.

ASSURED FLOW'S HYDRA-TAG is a custom tagging system for fire hydrants & gate valves.

About ASSURED FLOW'S economical HYDRA-TAG system:
- Made from rust and corrosion-resistant brass for a durable identification system
- Custom stamping available
- Attaches securely to bonnet bolts for a virtually tamper-proof installation
- A simple, quick and tamper-proof way to identify Fire Hydrants
- Also can be used on Check Valves, Backflow Preventers and Pumps
- Now available with barcodes

www.gradelock.com
e-mail: sales@gradelock.com
(800) 388-0678 • Fax: (941) 953-9695
P.O. Box 49633 • Sarasota, FL 34230-6633

ASSURED FLOW SALES, INC.

write in 622