Contractors Solves Storm Drain Problem in Georgia

by Maretta Tubb a Managing Editor

When Robins Air Force Base in Warner Robins, GA, set out to build an 80,000 square-foot depot plant services facility they knew they faced a number of challenges. Not only is land at a premium on the busy military base, the building site selected was situated directly over an aging large diameter storm sewer.

Julian Fant, a project engineer with the U.S. Army Corps of Engineers, charged with both project management during the design stage and construction after the contract award, said the initial bid for construction of the $10 million design-build project also included rehabilitating the 500-foot section of storm sewer. “It was decided that by doing the rehab in the initial phase it would expedite construction and the owners would not have to deal with the storm sewer at a later date.”

Since cost was also a factor, planners sought a cost-effective but viable solution that would eliminate having to remove and replace the storm sewer that was located 25 feet below grade. Prior to the project being bid, Fant said a decision was made to rely on sliplining or an approved method of equal satisfaction to rehabilitate the large diameter storm sewer.

When the project was put out for bid, Capital Construction Inc., an experienced general contracting firm based in Smyrna, GA, was awarded the $10 million design building contract. Under a separate subcontract from Capital, Southeast Pipe Survey, Patterson, GA, was charged with rehabilitating the storm water line.

David Herrin, president of Southeast Pipe Survey, said the 60-inch O.D. line to be rehabilitated was constructed of corrugated metal pipe and had a 15, 18, and 54-inch line dumping into it on the upstream end.

Noting that the 60-inch storm sewer served a large area of Robins Air Force base and handled significant flows during periods of heavy rains, Herrin said it was crucial to either increase or maintain the diameter of the line. “This basically precluded the use of sliplining,” he pointed out.

With this in mind, an alternative solution was sought. Ultimately, it was determined that the cured-in-place pipe (CIPP) method offered the optimum solution. The structural strength of the CIPP was also a factor in the selection because it enhances the structural strength of the host pipe. Moreover, since the CIPP was much smoother than the corrugated metal storm host pipe, it would slightly increase overall flow capacity.

At the same time that Southeast Pipe Survey was seeking approval of a CIPP design it had submitted to the Corps, Herrin said he was also negotiating with Coker Pipeline Rehab (CPR) Ltd., Spring, TX, that was later awarded the job.

CPR’s owner and president, Kerry Coker, said his company primarily uses the CIPP method (MasterLiner) to rehabilitate sanitary and storm sewer pipelines throughout the United States.

As noted by Coker, CIPP is the least problematic pipeline rehabilitation method used today.

In describing the benefits of CIPP technology, Coker said CIPP requires no extensive excavation, basically involves inserting a resin-saturated fabric into the existing pipe by pulling, or inverting by hydrostatic pressure. On such a large diameter installation, the fabric is impregnated on site with a heat-sensitive resin that cures in place. Once in place and cured, it is considered a permanent solution that has a design service life of 50 years.

Coker Pipeline Rehab’s CIPP equipment spread set up to rehabilitate a 500-foot section of storm sewer at Robins Air Force Base in Warner Robins, GA.

A trackhoe was used to lift the heavy liner to relieve stress during the inversion process.

Kerry Coker examines ropes inside the liner to assist with installation.

Resin is shown being introduced into the liner.

The CPR officials also noted that while this trenchless method was once proprietary and only available under special licensing agreements in the U.S., materials and resins to carry out CIPP work can now be purchased directly from domestic suppliers.

$1 -million equipment spread

Even though Coker indicated that product availability in the U.S. could fuel CIPP popularity, he stressed that well trained and experienced crews are essential. The equipment spread used on the project was valued in excess of $1 million, while material cost exceeded $100,000. “You can’t afford mistakes when costs of this magnitude are involved,” he warned.

The CPR official said he selected a felt fabric covered with an impermeable polyurethane film for the project that was supplied by Applied Felts Inc., Martinsville, VA. The resin, also designed to Coker’s specifications, was manufactured by Alpha/ Owens Coming L.L.C., Collierville, TN, and supplied by Cippcon Incorporated, Ponte Vedra Beach, FL.

Continuing, he also pointed out that while his company averages installing more than 100,000 linear feet of CIPP annually, they did not have a conveyor or static mixer capable of handling the 60-inch liner required on this project.

The conveyor, leased from NJR Industries, Mobile, AL, and capable of handling 48- to 120-inch liner products, is among the largest available in the U.S. Other major equipment items included two boiler trucks manufactured and purchased from Rush Sales of Odessa, TX.

During early evaluations, Coked had determined that the CIPP installation could be accomplished by working from just two manholes. At the location where the liner installation was to take place, crews remove the chimney portion of the manhole and installed a trench box to provide sufficient space for the conveyor to be set up and lower the liner into host pipe. At the second location, crews were able to gain access without removing the inside of the manhole or carrying out any excavation.

Coker pointed out that before beginning the installation, the existing line was inspected for obstructions using closed circuit TV (CCTV). Nothing unusual was found, however, the CCTV survey did locate several areas where the corrugated metal storm drain had corroded and some deterioration was visible. Metal strips were also found at several locations covering corroded areas at the bottom of the pipe.

CIPP installation

CPR’s crews, under the direction of David Leckie, director of operations, arrived in Warner Robins in December to perform the CIPP rehab job.

Leckie said the installation process starts with the felt fabric being impregnated with a heat sensitive resin. Next, the inversion tube is filled with water. The pressure of the water pushes the liner into the host pipe and turns it inside out, forcing the heat sensitive fabric against the walls of the host pipe.

After the fabric is inserted to the specified length, water is circulated through a boiler. The hot water activates the heat sensitive resin causing it to cure within a matter of hours. Once completed, the pipe is inspected and tested.

Completion of the project culminated a week of intense preparation and equipment set up, two days of CIPP installation activity and another week of equipment tear down. Coker noted that once the installation process begins it is continuous. “Once it gets started, there’s no stopping,” he said.

For both Fant and Terry Stab, a Corps of Engineers mechanical engineer on the job, seeing the CIPP installation was a new experience.

“I’ve been aware of the liner process and read about it in magazines,” Stab said. “After seeing an actual installation I would definitely recommend it if a situation dictated its use.”

Fant and Stab also indicated they were surprised at the speed of the actually lining process, which required only two days. “While it requires an extensive amount of setup and tear down time, the actual lining process goes very fast,” Fant said.

Resin is visible as the felt becomes saturated.