

PIPE DREAM

Illinois airbase's storm sewers get a facelift

By Hugh B. Mickel



Use of conventional round liner pipe would have required considerable downsizing in order to provide adequate clearance during the installation process.

Scott Air Force Base (AFB), located in St. Clair County, Ill., is home to several command and control elements that represent logistics for the U.S. Army, Navy, Air Force, Marines and Coast Guard. The base was one of 32 Air Service training camps established after the U.S. entered World War I in April 1917 and was named after Cpl. Frank S. Scott, the first enlisted person to be killed in an aviation crash. One of the main goals at Scott AFB is to provide mission-ready airmen with capabilities to enable rapid mobility.

During a routine base infrastructure inspection to ensure that everything was functioning and operating at peak condition, it was determined that a section of the runway was in need of improvement. There were multiple older storm sewers at the airfield either under or in close proximity to the runways and taxiway. The base decided to rehabilitate the storm sewers and make

other new drainage improvements at the airfield. The largest pipe slated for rehabilitation was a 78-in. diameter, 10% vertical ellipse storm sewer installed underneath the base's primary runway and taxiway.

The Solution

The facilities engineers at Scott AFB did not want to excavate the storm sewer, which would require cutting through the runway pavement. While air traffic was able to be diverted to an adjoining airport, keeping the runway intact and functional during installation was preferred. Rather than close the runway down and redirect daily air traffic, it was decided that a slipline rehabilitation of the existing storm line would be the best method.

Due to the irregular shape of the existing storm sewer, the use of conventional round liner pipe would have required considerable downsizing in order to

provide adequate clearance during the installation process. This approach would have had a substantial negative impact on the hydraulic capacity.

Contech Engineered Solutions proposed the use of a larger, elliptical liner pipe that would result in greater cross-sectional area of the liner pipe and improved hydraulic capacity, utilizing DuroMaxx steel reinforced polyethylene liner pipe, a high-performance pipe system available in 30- to 120-in.-diameter sizes and offering a Mannings 'n' value of 0.012. The relatively thin wall profile, light weight and strength make it an ideal sliplining solution. It also is a stand-alone, direct-bury pipe product that is included in the AASHTO material and design standard specifications.

The Installation

The contractor, Davinroy Mechanical, had never done a large-diameter reline of any kind before this

project. The contractor determined that, because of the straight alignment and the vertical ellipse shape of the existing pipe and liner pipe, the most appropriate installation procedure was to segmentally slipline through a limited number of insertion pits that allowed for pulling in individual liner pipe sections, which then could be joined inside the existing pipe. This technique allowed for easy placement of timber blocking and grouting tubes between the liner pipe and existing pipe ahead of the sliplining operations. The almost continuous blocking provided flotation restraint and position control.

Three insertion pits were used to provide access to the existing storm sewer. Davinroy constructed a specialized pulling head and other devices, then used a conventional winch and cable system to pull the individual liner pipe sections into place and push home the joints. Although only one pipe was pulled at a time, Davinroy was able to streamline the process. Learning from pulling only one pipe in the first day, the contractor quickly developed an efficient system and was able to pull more pipe into place by the end of the second day.

The joints required a small amount of gasket lube, which was applied above ground but checked just ahead of joint insertion. The longest pulling distance was directly under the runway and taxiway and totaled nearly 1,100 ln ft. The pipe featured gasketed bell and spigot joints that were manufactured at Contech's Montgomery, Ala., plant. The ellipsing process took place at the company's Sikeston, Mo., plant. Staged grouting featured the use of lightweight cellular grout after bulkheads were placed at each insertion location and at the original access structures. Air vents were used in the bulkheads to allow the escape of air as grout filled the void between the original and new pipe. Buoyant forces were evaluated and managed prior to grout placement to ensure the desired end result. The grouting was conducted by subcontractor MixOnSite USA Inc. of Buffalo Grove, Ill., a nationwide contractor specializing in low-density cellular

concrete. Wood struts were installed at Contech's manufacturing facility to hold the oval shape during the installation of the pipe.

"This was a once-in-a-lifetime project," said Mark Davinroy, owner of Davinroy Mechanical Contractors. "Although the ellipsing of the pipe created some challenges, I would gladly pull round pipe any day and would definitely

do this kind of job again given the opportunity. I was very happy with the outcome."

The installation was completed in July 2014 and totaled 2,208 ln ft of pipe. **SWS**

Hugh B. Mickel, P.E., is vice president of Contech Engineered Solutions LLC – Reline Technologies. Mickel can be reached at hmickel@conteches.com.

Let There Be Light. UV Light.

We didn't invent light, but we are mastering innovative ways to use it.

Inliner Technologies is now uniquely positioned to offer a proven ultraviolet light-cured option in addition to our experienced line of water- and steam-cured CIPP products.

inliner
REINFORCED UV-CURED LINER **STX**

Introducing **Inliner STX**
Reinforced UV-cured Liner.

www.inliner.com

© 2015 Inliner Technologies


inliner
technologies