borrowed TIME MANAGEMENT

Trenchless storm sewer rehabilitation on Hilton Head Island

By Cary Gaffney

Hilton Head Island is a resort town off the coast of South Carolina. At 55.5 sq miles, it is a big island—second only to Long Island, N.Y., as the largest island on the East Coast.

It also is big economically. Tourism brings in about $1.5 billion annually, and much of the island is covered in gated communities and golf courses. Infrastructure is a little haphazard because of rapid growth. The town was not incorporated until 1983, but has been developed since the late 1950s, mostly in the form of private resorts that did not apply common standards or coordinate large projects. As a result, the town faces some chronic infrastructure maintenance issues.

Storm sewers, for example, are mostly corrugated metal pipe (CMP). They worked fine when first installed, but tidal conditions, golf course lawn chemicals and age have led to widespread deterioration. The island now has more than 12 miles of aging CMP in the ground.

To stay ahead of the repair/replacement schedule and to keep streets, golf courses and other amenities running with minimal disruption, Hilton Head Island has established an on-call contract authorizing several different repair technologies for sewer rehabilitation, including cured-in-place pipe (CIPP), spiral-wound pipe lining and centrifugally cast concrete pipe (CCCP).

For CCCP, the town's contract specifies the CentriPipe system and materials from AP/M Permaform—a spin-casted concrete lining that creates a new, watertight, structurally sound pipe inside a failing pipe, without trenching and the accompanying social disruption. At larger pipe diameters—about 30 in. and up—it is highly cost effective compared with CIPP and requires far less staging area. Minimizing interference with island traffic is an important consideration when a priority is keeping roads and golf courses open. It also works well in conditions that are less than perfectly dry, making it ideal when storm sewers are affected by high groundwater tables and tides because of the difficulty of achieving perfect dewatering.

The following are a few CentriPipe projects performed on Hilton Head Island, all by certified applicator Utility Asset Management Inc. (UAM).

Multiple Projects

Hilton Head Island's first CentriPipe project took place in 2011, on a project that was intended to be CIPP—a 30-in. CMP storm sewer that was 50 ft long.

"It seemed like the Atlantic Ocean wanted to come up right through the pipe," said Anita Clyne, UAM's president. "We fought water like crazy."

Water was not the only problem; this was a shoulderless road in a wet area and there was not much staging area. Even without trenching, setting up for CIPP would have closed down a bike

CCCP was ideal on Hilton Head Island, where minimizing interference with island traffic and keeping roads and golf courses open are priorities.

lane and a nearby golf cart tunnel—and on Hilton Head Island, every effort is made to keep the golf carts rolling. The CIPP contractor looked for alternatives and suggested CentriPipe, and the decision was made to give it a try.

"One nice thing about CentriPipe is that the staging area footprint doesn't change, regardless of the sewer's size or length," Clyne said. That meant there was enough room for UAM to work, with no closures, provided the company agreed to work mostly at night.

After factors such as depth of cover and soil types are recorded and transmitted to AP/M Permaform, a third-party engineer designs and signs off on a plan that includes new concrete thickness, plus material and application notes. The pipe then is dewatered as thoroughly as possible, and UAM usually has to repair the invert with a void-filling, self-leveling cementitious product like AP/M Permaform's PL-12000 to provide a smooth "runway" for the spincaster. Depending on the condition of the sewer, contractors

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will pressure wash and stabilize loose sections of the pipe. And if pipe corrugations are very deep, some troweling may be needed. The spincaster then is inserted into the pipe to apply thin, centrifugally-compacted layers of AP/M Permaform's PL-8000, which adheres well to metal surfaces, even in moist conditions. Depending mainly on temperature, two to four layers may be needed to achieve design thickness typically ranging from 1 to 4 in. Layers usually cure in less than a day.

Quality control is straightforward. Thickness gauges are used before the new concrete sets, and the quantity of material is carefully tracked to the applied volume and thickness. After final curing, a visual or video inspection is made of the pipe interior. In the year since this particular project, the site has been visited several times and the newly lined sewer is holding up quite well, without any visible cracking or settling.

From a storm water administrator's viewpoint, the results are excellent—the method is completely structural and independent of the original pipe, smooth, watertight and with minimal flow reduction—and it is a cost-effective technique that will last as long as new concrete pipe.

As of November 2012, two more projects have been completed under the new contract:

- A 72-in., 50-ft-long CMP was failing and causing settling underneath one of Hilton Head's multi-use pathways and a golf cart path. UAM again worked at night to minimize impact on the pathway and the golf course, pumping water around the sewer as needed.
- Three 54-in. CMP lines ran parallel under a very busy road and directly into a tidal marsh. A small dam was built on the marsh side to assist with dewatering, and incoming storm water was diverted away from working pipes. On this project, UAM crews worked whenever tides were low, day or night, and they also overcame one of Hilton Head Island's unique challenges—most days, an alligator had to be evicted from the site before work could begin.

It is true that Hilton Head Island has more golf carts than some towns, and more tourists, but in the end, the town faces the same difficulties as any municipality: infrastructure that needs constant maintenance, shrinking budgets, and roads and other facilities that have to stay open to serve the public. CentriPipe proved to be a useful and progressive new technology for the island's storm sewer maintenance to extend the life of its buried pipe. SWS

Cary Gaffney is storm water administrator for Hilton Head Island, S.C. Gaffney can be reached at caryg@hiltonheadislandsc.gov or 843.341.4773.

For more information, write in 805 on this issue's reader service form on page 40.

PROJECT PROFILE:

Stormwater Filtration

PROJECT NAME:	Orange United Methodist Church
PRODUCT USED:	8'-0" DoubleTrap®
TOTAL WATER STORED:	42,869 cubic feet
LOCATION:	Chapel Hill, NC

PROJECT DESCRIPTION:

StormTrap® was chosen to design a stormwater management system for the Orange United Methodist Church expansion project. StormTrap manufactured a stormwater system that met the water quality and attenuation requirements of the entire site. The stormwater runoff enters into the sediment chamber and flows over the weir wall into the sand filter chamber. The runoff infiltrates through the sand and then exits through the underdrain pipes. The treated runoff is then conveyed to the outlet control unit and sent downstream.

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