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PipeLine



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HOBAS for DOT Projects

The North Carolina Department of Transportation had a lot of challenges in rehabilitating an aging culvert along its seacoast near Nags Head. The existing culvert was leaking, causing sand to migrate into the pipe, undermining the sand dunes above. The line which outfalls directly into the Atlantic Ocean, was also subject to a severe environment and was therefore corroded. NCDOT wanted a replacement that was both corrosion resistant and leak free. The pipe also had to be abrasion resistant as sand and gravel often work their way into storm sewers. They chose HOBAS for this challenging project.

The existing line was a 36-inch diameter concrete line and ran from NC 12 to the beach. The pipe was sliplined with a 30-inch nominal HOBAS pipe, with an OD of 32 inches. NCDOT crews performed the challenging installation themselves. John Abel, division bridge manager with NCDOT, described the installation, "existing pipe had separated so badly, another challenge was keeping the sand from filtering back into it while the work was underway. We tried to work when the tide was outgoing, so the water would help push the sand from NC 12 to the ocean."

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Years of Construction
2010
Total length of pipe
670 feet
Diameter
30 inch
Stiffness class
143 psi
Installation method
Slipline

Application
Storm sewer
Client
NC DOT
Advantages
Ease of installation, corrosion resistant, leak-free

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Within the narrow easement, adjacent to local businesses, the DOT excavated an installation shaft and removed the top of the existing concrete pipe. The 20-foot segments of HOBAS pipe were then placed one at a time into the sewer and pushed toward the ocean outfall which extends 670 feet.

The DOT is very happy with the end product and its expected performance in the harsh environment of the Outer Banks, and expects a 50-year life from this structure.

HOBAS Pipe USA has supplied pipes to various DOTs across the USA including Texas, Tennessee, New York, New Mexico, Nevada, Hawaii, Connecticut, Illinois, Oregon, Wisconsin and North Dakota. 



DOT crews installed the pipe themselves.



HOBAS Chosen for CMAR Project

Any time you set out to build a large-diameter wastewater pipeline that is nearly 5 miles long and ranges up to 20 feet deep, you are bound to face some challenges. But at the \$41.2-million Plant Interconnect project in Pima County, Arizona, the design and construction team met those challenges and completed the big gravity-flow pipeline with no major problems.

Pima County's Wastewater Reclamation System serves the greater Tucson area, with a population of more than 1 million, and covers approximately 2,000 square miles. A portion of that area, 473 square miles, is served by two wastewater reclamation facilities. One of them, the Ina Road Water Reclamation Facility (WRF), stands 4.6 miles north of the Roger Road WRF.

The Plant Interconnect pipeline connects the two reclamation plants. Construction of the big pipeline is part of Pima County's Regional Optimization Master Plan, which includes an expansion of the Ina Road WRF to 50 mgd, construction of a new 32-mgd reclamation campus at the old Roger Road WRF, odor control facilities, and the decommissioning of the old 41 mgd Roger Road WRF.

The Plant Interconnect pipeline consists of 17,600 feet of 72-inch diameter pipe and 6,600 feet of 60-inch diameter pipe. The pipeline will carry an excess flow averaging 36 mgd (peak 81 mgd) from the new Roger Road facility north to the Ina Road plant. The county's pipe of choice: HOBAS Pipe. The Plant Interconnect project brings to nine the total number of installations in the Tucson area in recent years with this product.

"For long-term reliability we decided to go with HOBAS," says Jaime Rivera, project manager for the Pima County Regional Wastewater Reclamation Department. "We briefly explored PVC pipe, but they don't make it that big. So that narrowed our search to two choices, a T-Lock liner for concrete pipe or HOBAS. We had some issues with constructability of the T-Lock liner, so it was less risky to use HOBAS. It is corrosion resistant with no added-on lining."



The plant interconnect brings to nine the total number of HOBAS installations in the Tucson area.

Saving time

By using the Construction Manager At Risk (CMAR) delivery method, the county was able to slash four to six months from the time it takes to go from design to construction. With the CMAR process, Pima County selected the engineer, Brown and Caldwell, at the same time it chose a construction manager, the Sundt-Kiewit joint venture. Sundt-Kiewit subcontracted the actual pipeline construction to Don Kelly Construction, Bozeman, Montana.

Rivera said the conventional design-bid-build process takes four to six months just to advertise the project for bids, select the low bidder, get the low bidder approved by

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the County Board of Administration, award the contract, and issue a Notice to Proceed. Instead, the county selected the designer and construction manager at the same time and set a maximum amount it could spend to build the Plant Interconnect. The construction manager set \$25.7 million as its guaranteed maximum construction cost – and in fact completed the project for less than that amount. (The \$41.2 million cited above includes non-construction costs such as right-of-way, design costs, and program management.)

During the design stage, HOBAS engineering staff assisted in the preparation of lay drawings to identify the locations for fittings and deflected pipe joints to maintain the designed alignment, said Rene Garcia, EIT, senior engineering associate at HOBAS. “We also

provided input to the proposed installation method, and suggested trench details that would be easily constructible and provide the needed support for the pipe,” said Garcia.

Design was completed in January 2009, and construction Notice to Proceed was given that April. Construction began shortly thereafter, and reached substantial completion by December 2010.

Ease of Installation

Don Kelly Construction began construction at the north end, and used two crews to work southward, digging the trench and burying the pipe. Kelly used 28-foot long trench boxes stacked as necessary for the depth. Production in the sandy silt soil averaged about 250 feet per day per crew over the length of the project.

“There were days when we worked the shallower reaches where a crew would average 400 feet per day,” says Jeff Hagen, Kelly’s general superintendent for the project. “And we laid as much as 500 feet or more on some days. We had 37 manholes to build and that takes some time.”

The HOBAS pipe fit together well, Hagen said. “We generally lowered pipe into the ditch with a strap,” he said. “Depending on the situation, you can pull it home with that strap to make the joint. Or you can push on the end of the pipe with the excavator to join them together. It takes a bit of force because you want to make sure you get a good seal. The 60-inch pipe takes like 6,000 pounds of force to join the two pipes together.” HOBAS uses gasket-sealed FWC couplings to join the pipe.

Rivera notes that for reaches that could have steeper grades, the engineer could specify the smaller 60-inch pipe instead of the 72-inch, because the water is flowing faster on a steeper grade.

Every joint in the Hobas pipe passed an air test of 5 psi as required by the Arizona Department of Environmental Quality, Rivera

Installation crews averaged 400 ft/day of 72-inch diameter pipe.





Year of Construction
2009-2010
Total length of pipe
24,200 feet
Diameter
60 to 72 inch
Stiffness class
46 psi
Installation method
Direct bury
Application
Sanitary sewer
Client
Pima County
CMAR Team
**Brown & Caldwell
and Sundt-Kiewit JV**
Installer
**Don Kelly
Construction**
Advantages
**Reliability, proven
track record**


said. "We tested 100 percent of the joints and all but a couple of them passed the 5 psi test with no trouble. We quickly repaired the ones that did not pass and retested them with a favorable result."

Hagen said the larger HOBAS pipe was tested for deflection by using a wooden cross to measure any deflections (also called a go, no go stick). Smaller pipe could be tested with a mandrel. All pipes were installed below the 5 percent deflection limit. And finally, due to the tight grade requirements, the county ran a closed circuit television camera down the pipe, following some water poured into it, to measure dips and peaks. "We have to make sure there are no excessive dips in the line," says Rivera. "Our standard is 1.75 inches and all pipe passed that test as well."

The pipe was bedded in 6 inches of imported sand, and backfilled with sand up to 1 foot over the crown. Kelly compacted the sand backfill alongside the pipe with a tamping compactor, to provide side support. "The sand works well to get compaction so that

those pipes will not deflect when you finish backfilling over the top of them," Hagen said. "As long as you have side support, the HOBAS pipe will not over-deflect on you."

Hobas' Garcia says, "Flexible pipes by nature require support from their surroundings. Our high stiffness products, properly installed, have very predictable and reliable performance."

Like Hagen, Rivera had compliments for the HOBAS pipe. Whereas the siphons were a challenge to build, the Hobas pipe was easy to install, Rivera said. "It was uneventful," he concludes. 

Sanitary Sewer Rehabilitation in the Lone Star State

HOBAS was directly installed under an interstate highway and active rail line.

Conroe is a growing suburban city 40 miles north of Houston, TX with a population approaching 60,000 residents. Like most municipalities, the City of Conroe has maintenance tasks within their sewer and wastewater system that need to be addressed. One such project, the Interstate 45 Sanitary Sewer Rehabilitation, was recently completed.

As a budget conscious city, Conroe designs and manages most of their infrastructure improvement projects. They believe this method increases their control while saving the City consulting expenses. The funds are then diverted directly toward ongoing maintenance projects as well as increasing the capacity within their water and sewer systems. The Interstate 45 Sanitary Sewer Rehabilitation project rehabilitated the existing 54-inch trunk line. The solution consisted of sliplining with 535 feet of 48-inch diameter HOBAS Centrifugally Cast Fiberglass Reinforced Polymer Mortar (CCFRPM) pipe. As the main trunk line flowing into the only wastewater treatment plant for Conroe, this line is critical.

The project specifications allowed several different methods and products to rehabilitate the line, including a cured-in-place option and a segmental sliplining option. Trenchless methods were preferred for this project due to the cover depth, which ranged from 20-22 feet, and the amount of surface traffic. The existing line ran underneath a heavily traveled interstate and popular rail line. Although both CIPP and CCFRPM were specified, Lewis Contractors of Bertram, TX was the low bidder on the project and chose to rehabilitate the pipe by sliplining with CCFRPM.

Assessing Infrastructure

The existing 54-inch reinforced concrete pipe was installed in the late 1970s. Experience with other concrete pipes of this age in the



city led the public works employees to suspect the condition of this main trunk line. An inspection of the line was performed to determine the condition.

“They televised using ultrasonic technology,” explained Erwin Burden, Assistant Public Works Director, City of Conroe. Evaluation of the existing line by this technology can be used to verify defects in the existing line and provide information useful in determining the extent of corrosion on the line.

The survey revealed the existing pipe was showing signs of deterioration. The steel reinforcement was visible in the crown of some of the existing concrete pipes. “In addition to the decay, there was joint separation under the railroad crossing” added Burden. Acting proactively, the City opted to rehabilitate the line.

Quick and Easy Installation

The entire project took approximately three weeks to complete with the majority of the time spent preparing the job site for the



installation and post installation site cleanup. HOBAS PIPE USA supplied 20-foot sections of 48-inch diameter 36-psi stiffness pipe. The pipe designed for this installation utilized a low profile bell and spigot joint. This joint facilitates an easy, quick installation and requires less joining force. The entire 535 feet of pipe was installed in a 14 hour period.

The installation pit was installed on the east side of Interstate 45 and the pipe string was pushed west under the main lanes and feeder road of the interstate highway just south of Conroe's Loop 336. The I-45 is the main interstate highway and a major traffic corridor that travels in a north-south direction across the eastern portion of Texas. Conroe is located on I-45 along the main traffic route between Houston and Dallas.


In addition to traveling under roadways, the existing trunk sewer travels within the Union Pacific Railway easement and, in one location, directly under the Railroad crossing. "The pipe was sliplined through an existing line that was in place and there was no disturbance to the railroad right-of-way," explained Matt Lewis, Project Manager with Lewis Contractors. The installation pit and work efforts were located adjacent to the rail line but did not affect the operation of the line. Trains passed through daily, even during the installation of the slipline pipe; there was no interruption to rail service.

The City obtained a permit from the Texas Department of Transportation (TxDOT) to slipline the pipe under Interstate 45. In addition to the sliplining directly under the TxDOT road, "We were abandoning manholes along the frontage road so that we could move them out of the

pavement, allowing us future access without having to shut down a lane and create traffic," explained Burden. The high strength fiberglass composite used for sliplining pipes is designed to withstand the E-80 and HS-20 live loads.

Bypass pumping was necessary during the installation due to the necessary manhole rehabilitation and relocation. "The flow was too great so we had to by-pass pump, but still had a live flow within the line. It was just decreased, running about half," stated Lewis. The pipe was installed from the upstream location downstream, with the flow.

"The new manholes that were installed were also manufactured of fiberglass material and were located at the launch pit and one receiving pit locations. An additional manhole was installed on an existing 18-inch line, which redirected flow into one of the new manholes. There were two existing manholes that were plugged and filled with flowable fill and abandoned," explained Lewis.

The completion of this project will ensure that the line remains operational for the City of Conroe. "The City has been proactive in upgrading our sewer system to corrosion resistant materials," Burden. 

Year of Construction
2011
Total length of pipe
535 feet
Diameter
48 inch
Stiffness class
46 psi

Installation method
Slipline
Application
Sanitary sewer
Client
City of Conroe, TX
Contractor
Lewis Contractors
Advantages
Chemical resistance, leak free





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HOBAS Goes Green

We are pleased to announce that HOBAS Pipe USA has obtained ISO 14001 certification, the international standard for environmental management.

The certification was granted following in-depth audits by TUV SUD Management Service GmbH and is in addition to the ISO 9001 certification which HOBAS Pipe USA has in-place. The certificates verify the establishment and application of a Quality (9001) and Environmental (14001) Management Systems for development, production, sales and customer service of Centrifugally Cast Fiber-Reinforced Polymer Mortar (CCFRPM) Pipes.

Award of the ISO 14001 certification reaffirms HOBAS's commitment to the environment. This internationally recognized management standard is

the gold standard in environmental performance. The system provides an effective framework for establishing and continually improving management system processes. We are an environmentally responsible company and this certification will serve as a tool to continually improve our environmental performance. 



HOBAS Trivia is back!

Test your knowledge of HOBAS, and you may be the winner of a new iPad 2

<http://hobaspipe.com/quiz.asp>