

EXCLUSIVE

Top Civil Firms 2010

GEOFOAM LIGHTENS LOADS

2010 Integrated
Project Delivery
eConference

April 22, see page 17

AEC Technologies
Strategies 2010
Conference

May 20, see page 23

Port pipe problems

Plastic water main reduces costs and concerns in a corrosive environment.

By Douglas Glenn Clark

Project

Port of Tampa, Fla., water main

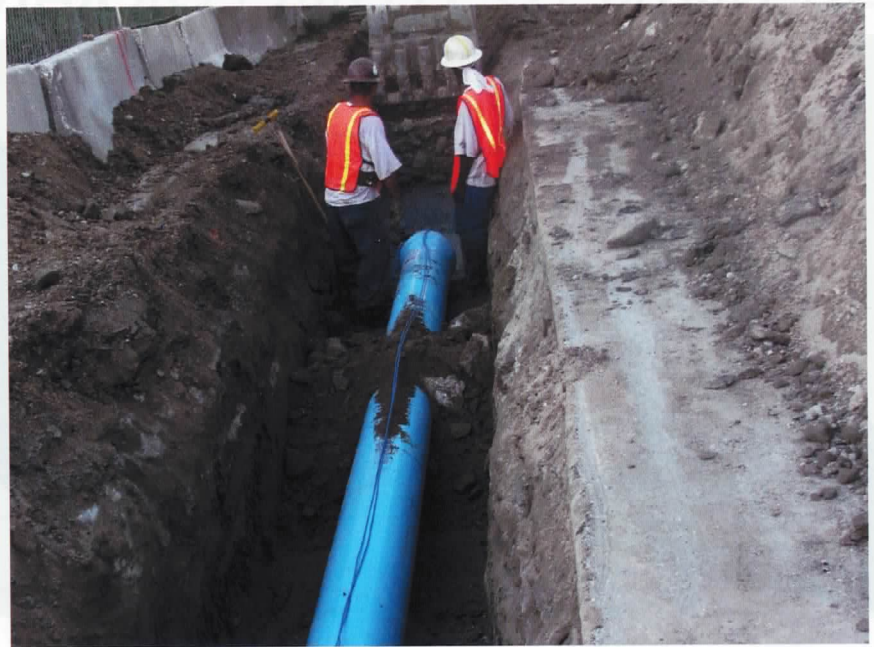
Participants

Tampa Water Department

Dallas 1 Construction & Development,
Thonotosassa, Fla.

Product application

JM Eagle Loc 900 polyvinyl chloride pipe with internal joint restraint provides a corrosion-resistant and time-saving water main replacement solution.



Workers replace a 12-inch-diameter water main near the Port of Tampa with Eagle Loc 900 PVC pipe with an internal joint-restraint system.

Corrosive, aggressive soil conditions near the Port of Tampa, Fla., that destroyed a 35-year-old ductile iron water main — expected to last 100 years — may be typical of conditions near many American ports. In Tampa, contamination came from soils dredged from the bay, which likely contained residual chlorides. It is also possible that the groundwater suffers from salt water intrusion. More than 13 unstoppable leaks were found in a 200-foot-long section of the old iron water main.

As water department engineers carefully researched and deliberated pipe-replacement options, they became aware of JM Eagle's introduction in 2009 of Eagle Loc 900 with a new internal joint-restraint system. Internal joint restraints eliminate the need for external fixtures on polyvinyl chloride (PVC) pipe fittings. Subsequently, the Tampa Water Department approved the purchase of 960 feet of 12-inch-

diameter, DR18 Eagle Loc 900 for the project, which began in November 2009 and concluded in January 2010.

Installation of the PVC pipe was the responsibility of Dallas 1 Construction & Development. The contractor specializes in underground utilities, such as storm drains and sanitary systems, and roadwork. With 28 years of experience working with pipe ranging in size from 2 to 84 inches, the firm was familiar with local city and county needs. Yet, Steve Mitchell, production pipe foreman, said the port project was the first time they had encountered Eagle Loc 900.

JM Eagle's internal joint restraint technology is fitted into the bell portion of PVC pipe when it is manufactured. During onsite installation, each set of connected pipe immediately locks as the joints are put together. Also, to promote corrosion resistance, the internal

joint restraint is encased within the PVC pipe so it is never exposed to soil and flowing fluids (see Figure 1).

"Once I read the instructions, away we went," Mitchell said. "I like the lock system because you don't have to physically install a locking system or put a restraint on the pipe itself. This system saves time because the lock is already installed. I've been doing this for 35 years and I think it would work well in any number of situations."

According to Mitchell, the timesaving aspect of the internal restraint joint was particularly helpful because digging in the port area was challenging. The combination of toxic soil and rotted pipe slowed the process considerably. Yet, the Dallas 1 Construction crew was able to lay more pipe per day than would have been expected with products that require old-style restraints.

PROJECT CASE STUDY

“One particular day we laid 640 feet of pipe,” Mitchell said. “If [we] used [external] restraint joints, we probably would have gotten only 450 to 500 feet installed because it takes about 30 minutes per restraint. Not only do you put them on, you have to get into the hole and put the bolts through. On the 12-inch pipe, which is what we were installing, usually you need two bolts per side of the joint and then you have to snug them up.”

Mitchell calculated that the use of Eagle Loc 900 on the Port of Tampa job probably saved him “a couple of days of labor.”

Additionally, there is no need to make a separate run to pick up restraint and joint fixtures, which then are often stored in the open air for long durations, perhaps rusting before installation. Compare that scenario, said Mitchell, to the use of internal joint-restraint technology. When the PVC is delivered, it is ready to go.

Saving time was not the only virtue of using PVC. The lightweight Eagle Loc 900 meant Mitchell’s crew did not have to expend as much physical energy to get the job done. Therefore, they were more productive each day. “It saves energy and physical abuse to the body,” said Mitchell.

Proving new materials

Previous to the port project, the largest PVC pipe installed by the Tampa Water Department was 8 inches in diameter. Why was the department so slow to adapt to other PVC products? According to Roy Thames, president and CEO of Thames and Associates, a Tampa-based supplier of PVC products to the water and wastewater industries, Tampa is “similar to many municipalities, where engineers embrace new standards and products only after the technology has been thoroughly tested and proven. In this case, ductile iron had been the reigning standard material for many years.”

Mitchell concurred: “It’s not that Tampa officials don’t like PVC. But

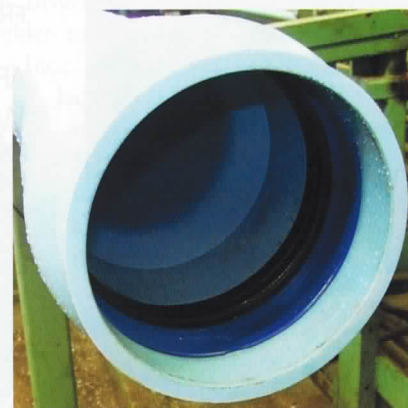
like many municipalities, the city is picky about trying new products. The corrosive soil gave them no choice. This port island was pumped in 50 years ago. They didn’t have a lot of regulations, so everything you can imagine probably got put in there. Every iron pipe we’ve dug up has been totally eaten up.”

Soil corrosion wasn’t the only problem engineers needed PVC products to overcome. Another issue for Tampa officials was the live loads that the water pipe would endure daily. The intersection of Gatx Drive and Guy N Verger Boulevard, where the PVC pipe was installed, leads to one of many docks in the Tampa Port Authority district. Large trailer trucks traverse the area at all hours of the day. Understandably, city engineers initially expressed concern about PVC’s ability to handle the pressure and weight. Conclusive evidence of PVC’s suitability for the project came from a U.S. Army Corps of Engineers study.

The internal joint-restraint system also resolved another dilemma that allowed the city of Tampa to avoid a costly renovation: The port water main crosses underneath railroad tracks in three locations. Replacement pipes — plastic or iron — would need to

fit through existing protective underground sleeves. Engineers knew that external restraints typically would make the replacement pipe too large to fit through the existing sleeves. Eagle Loc 900 pipe saved the time and labor that would have been required to expand the underground sleeves. ■

Douglas Glenn Clark is a writer based in the Los Angeles area. This article was contributed by JM Eagle.



Internal joint-restraint technology is fitted into the bell portion of PVC pipe when it is manufactured.

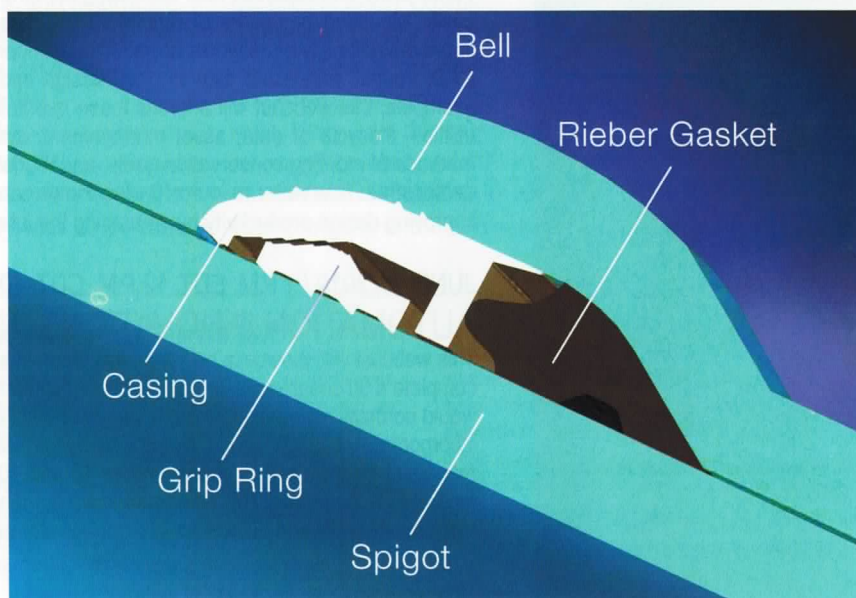


Figure 1: JM Eagle’s internal joint restraint is encased within the PVC pipe.