

# Updating Sewer System To

By Bruce Ellis, D.P. Nicoli, Inc.

# Green Status



*Tidelands Construction Company was the general contractor installing a new sewer holding tank and pump station on the Campus of California State University in Sacramento. The sewer upgrade is part of a "green building" initiative.*

■ High volume of both vehicle and pedestrian traffic on the adjacent road.

There was little to no room for equipment access except from the ends of the long, deep and narrow excavation, unless the road was closed. Shoring the pit was a major challenge as traditional sheet piling or sloping was not an option.

## Shoring solution

D.P. Nicoli Inc. was contacted to help solve the shoring problem. Ryan Jaffe, vice president of Slide Rail Shoring, worked with Phil Toelkes, owner of Tidelands Construction, and J. M. Turner Engineering to come up with a shoring plan that would work for the unique and challenging situation, yet still be affordable

and relatively easy for the contractor to install.

Nicoli consulted with Mike West, vice president of engineering at Efficiency Production Inc. Nicoli proposed utilizing Efficiency's Slide Rail System in a six-bay, four-sided multi-bay configuration. Nicoli's experience with large pits using Efficiency's slide rail and the patented waler system seemed like a good fit.

## 'Dig and push'

Efficiency's Universal Slide Rail is a component shoring system comprised of steel panels (similar to trench shield sidewalls) and vertical steel posts. The versatile system can be used in a variety of configurations, such as small four-sided pits; large unobstructed working pits as big as 50 by 50 feet; or in a linear multi-bay configuration to install length of pipe over 40 feet.

Slide Rail is installed simultaneously as the trench or pit is excavated by sliding the panels into integrated rails on the posts – either double or triple rails depending on needed depth – then pushing the panels and posts incrementally down to grade as the pit is dug; a process commonly referred to as a "dig and push" system.

The entire excavation needed to be 16-feet wide and 89-feet long. The tank was 64-feet long and needed to be placed in a single pit set at 28-feet deep.

The biggest challenge was engineering a shoring system that would provide an unobstructed open clearance to the pit of at least 60 feet. Efficiency's multi-bay configuration utilizes unique parallel beams that incorporate into the vertical posts and pin-in-place standard trench box spreaders as cross-members. The parallel beams have rollers, and when horizontal walers and sacrificial members are utilized, the entire cross-member apparatus can be easily removed resulting in an unobstructed clearance to the shored excavation!

"The Efficiency slide rail has a little more room to play with because of the integrated rails on the posts and the moveable parallel beams sliding along the face of the posts," said Tony Zottola, project superintendent for Tidelands Construction. "This was very beneficial due to the limited access that we had. We could only install from a couple of spots around the pit, but we had no problem handling the system's components."

Slide Rail is installed and removed incrementally, which allows the trench to be properly shored throughout the entire installation or removal process, maximizing the stability of the surrounding ground. "Clearly, we had no safety issues with the system, it was very safe," said Zottola.

The system was engineered to incorporate a 60-foot long I-beam welded onto a larger I-beam waler, which was then welded to the outside of the vertical posts at the top. Sacrificial beams were placed at the shoes of the linear posts below grade, to eliminate the potential of deflection when the cross-member assembly was removed. Nicoli Inc. supplied all the slide rail components and had their Senior Slide Rail Specialist Bruce Ellis on hand to work with the Tidelands crew.

## Smooth and easy

Tidelands began the excavation by first benching and sloping down about 8 feet. The slide rail system components included four, 32-foot vertical corner posts and five sets of 32-foot linear posts; and 5-inch

California State University - Sacramento (Sacramento State) is "going green." They have several new building projects under way which are incorporating aspects of "green building," a process to create buildings and supporting infrastructure that minimize the use of resources, reduce harmful effects on the environment, and create healthier environments for people.

One of the green building projects at Sacramento State includes upgrading the sewer system on campus. A new 33,000 gallon holding tank and pump station were recently installed to augment the current system. Tidelands Construction Company from Brentwood, CA, was the general contractor installing the tank and pump station.

On a busy campus like Sacramento State, a project such as this was not going to be easy or routine. The excavation site had very limited access and many surrounding obstacles to contend with, including:

- A main road for the university and an adjacent parking structure;
- A drainage ditch and railroad line in close proximity on the opposite side of the excavation from the road;
- An existing pump station and generator near the excavation site; and

thick, 14-foot, 8-foot and 4-foot tall slide rail panels. Tideland's used a Kobelco 400 excavator to install the system.

Water was encountered at 30 feet. A six-inch pump was inserted and the water piped through a small sediment tank. A small Bobcat excavator was lowered into the pit to help finish the final grade.

The base and first section for the pump were set and backfilled at 28-feet deep. After the walers were secured to the posts and the sacrificial beams put in place, three of the five Efficiency parallel beam-spreader assemblies were removed for the tank set. The result was an unobstructed pit that was 60-feet long and was able to accommodate the long tank.

A crane was brought in to set the tank. The tank was also hooked up with a separate strap attached at one end to the excavator, which helped guide the nose of the tank under the last sets of spreaders. The tank was then sand-bagged in place and backfilled. Tideland's also used a Caterpillar 375 excavator when removing the slide rail components.

The entire tank and lift station installation – from first cut to backfill – took about four weeks in October 2006.

D.P. Nicoli is a one-stop resource for the shoring and piling needs of the heavy construction industry, offering a wide variety of materials and equipment for sale or rent. They currently serve the western United

States from three facilities in Oregon and Northern California. Celebrating their 25th Anniversary, Nicoli has developed lasting relationships with both large and small customers.

Efficiency Production provides a wide selection of standard and custom trench shielding and shoring systems. Efficiency's versatile products are designed specifically for safe and cost effective installation of utility systems and infrastructure improvements. All products are P.E. certified to meet OSHA and MIOSHA standards.

**FOR MORE INFORMATION:**

**Slide rail system:**

Efficiency Productions Inc. (800) 552-8800, epi-shields.com

**Excavator:**

Caterpillar, (309) 675-1000, cat.com

Kobelco (866) 726-3396, kobelcoamerica.com

**Mini-excavator:**

Bobcat (866) 823-7898, www.bobcat.com

**Top:** The excavation site had very limited access and surrounding obstacles including a main campus road, a drainage ditch, and a railroad line. **Middle:** Efficiency's Slide Rail in a multi-bay configuration utilizes unique parallel beams that incorporate into the vertical posts and pin-in-place standard trench box spreaders as cross-members. **Bottom:** After the I-Beam walers were secured to the posts and the sacrificial beams put in place, three of the five parallel beam-spreader assemblies were removed for the tank set. The result was an unobstructed pit that was 60-feet long and able to accommodate the 64-foot long tank.

