

Out of Sight

A California contractor completes a major sewer repair on a university campus — under budget and with minimal disruption

By Ted J. Rulseh

Raw sewage running into a wetland at the base of a bluff was the tip-off that a sewer line from the Loyola Marymount University campus had failed.

The campus, in West Los Angeles, rests on a 150-foot bluff with striking views of the Pacific Ocean. An 8-inch sewer line extends down and through the bluff and into a main trunk city sewer.

The sewer leak, which occurred in August, 2000, called for immediate action. Upon its discovery, the university contacted The Lighthart Corporation, a general engineering and mechanical contracting firm with whom it had a 30-year relationship.

The company replaced the sewer pipe using trenchless technology. The replacement cost \$420,000 — about \$80,000 under budget and less than one-third the estimated price of conventional dig-and-replace methods. Furthermore, the work did not disrupt life on campus, where a new term was just beginning.

Troubleshooting specialists

The Lighthart Corporation, based in Los Angeles, is accustomed to difficult projects. "We specialize in jobs that defy normal procedures," says owner Roger Lighthart. "We take on work where conventional methods have failed, or types of work that no one else wants."

The campus of Loyola Marymount, a Jesuit institution, was built in the 1920s. The pipe failure occurred in one of the original sewers, which had been tunneled through the bluff to connect with the city's main line.

The first order of business was to divert the wastewater from the failed line. "It was a very serious situation," recalls Lighthart. "Fortunately, during the late 1970s, an additional 12-inch sewer line had been built through the bluff, so we were able to divert the flow into it."

A video inspection of the sewer



Technicians with The Lighthart Corp. set up at one of the manholes along the route from the Loyola Marymount campus to the main city sewer.



Lighthart Corp. used trenchless technology to pull 800 feet of new 8-inch sewer pipe into place for the Loyola Marymount campus.

revealed an 800-foot section in which the pipe joints had separated. Replacement by trenching was out of the question because the sewer ran at an average depth of 36 feet, and because trenching by its nature would have been impractical.

No disturbance

The sandstone bluff would have been too unstable for excavating. "In the flat areas on campus, trenching would have meant caving of sidewalks, the loss of trees, and possible damage to buildings," says Lighthart. "At the start of the term, with about 4,000 students running around, we would have had to cordon off that whole end of the campus."

Furthermore, the line ran past sensitive areas, such as the chapel, the Jesuits' quarters, the university office, and the Regent's Terrace, a campus gathering place and site of outdoor graduation ceremonies.

Lighthart personnel also ruled out cured-in-place pipe relining on the grounds that further shifting of the earth would likely cause the new linings to fail. The company therefore settled on pipe bursting technology from TRIC Trenchless of Oakland, Calif.

Once the problem was diagnosed and preparatory work done in five manholes along the failed section, the pipe replacement began.

"The university told us that we were to be out of sight and out of mind," says Lighthart. Work was scheduled to avoid conflicts with activities; it included some night and weekend hours.

Pipe bursting technology

The TRIC system uses a hydraulic ram system to pull a polyethylene replacement

pipe through the damaged pipe. A bursting head breaks the old pipe and pushes it aside as the new pipe is drawn through.

The Lighthart crew assembled the new pipe at the base of the bluff by fusing 40-foot lengths, twice as long as traditional pipe sections. "Once those sections are fused together, what you have is one monolithic piece of pipe," says Lighthart.

Cable was fed to the base of the bluff from the first manhole up the line. The cable was attached to the bursting head, the new pipe was affixed to the head, and the entire assembly was pulled through to the manhole. The process was then repeated at each manhole upstream.

During pulling, Lighthart personnel used fire hoses to supply water to soften the soil around the old pipe and lubricate the bursting head. Pulling slowed down at a few points where the old pipe was severely displaced, but work proceeded without incident. On average, once the system was set up and pulling, the new pipe advanced at about 1.5 feet per minute.

All told, including time for wastewater diversion, initial investigation, analysis, project planning and preparation, the entire project required two months. The pipe replacement phase took about two weeks, including pipe construction and manhole preparation. The actual pull took just

TOUGH JOB

PROJECT:

Replace 800 feet of deeply buried 8-inch sewer line through the campus at Loyola Marymount University without disrupting student life

CONTRACTOR:

The Lighthart Corporation, Los Angeles, Calif.

PIPE REPLACEMENT:

TRIC Trenchless pipe bursting system

PIPELINE INSPECTION:

RIDGID/Kollmann SeeSnake video system

two days.

"Safety was paramount on this job, as on all jobs," says Lighthart. "We closely followed all requirements for confined-space safety, with tripods, hoists and pulleys, hoisting cable, gas monitors, and vent fans. Each person working in a manhole wore a harness. Whenever someone was in a manhole, we had someone else right there on standby, observing."

Successful completion

At the conclusion of the project, Lighthart personnel connected the line to the campus system and to the city main. The impact on the campus was minimal — most likely few students even noticed the work or knew the magnitude of the project.

Lighthart estimates that repair by trenching — even if practical — would have cost about \$1.5 million. "That's without considering damage to the landscaping, along with the disruption of campus life, which is hard to translate into dollars. ■"



Students at Loyola Marymount University barely knew the pipe replacement project was under way.