

THE LONG PULL

An innovative pipe bursting approach successfully upsizes an old trunk sewer line to serve a new subdivision in Southern California

By **Scottie Dayton**

Young Homes, a Southern California developer, was building 95 homes on the outskirts of Perris, Calif., southeast of Riverside. The Eastern Municipal Water District (EMWD) had video-inspected the site's 10-inch ID clay trunk sewer line and determined that it had insufficient fall between the last two manholes.

EMWD told Steve Gabrielson, Young Homes' project superintendent, to upsize the line to 12-inch ID pipe using pipe bursting. The agency also restricted the company from closing escrow on the homes until the job was completed.

In October 2005, the agent Gabrielson's office hired to assemble the required contractors called TRIC Tools Inc. in Alameda, Calif., to evaluate the job. Site drawings showed that one-quarter of the 350-foot line was under a busy street parallel to a railroad track. The remainder followed a dirt service road bordering a small airport.

"Digging up the sewer was the logical solution, but EMWD had specified bench construction for the excavation," explains John Rafferty of TRIC. "Requiring

bursting a flat line was its way of avoiding an 18-foot-wide swath across the main road. The job met EMWD requirements, and the trunk line was successfully upsized.

Resurrection

The only tool powerful enough for the job was a 100-ton ram from TRIC Tools, a high-pressure model that had not seen action in more than six years. Company founder Ward Carter manufactured a new pulley base for the machine, then shipped it from his R&D facility in Louisiana. The firm's Bay Area shop fabricated a new, steel front end, but had no time to replace the hydraulic seals.

In early January, Rafferty drove to Perris to supervise the pipe fusion. Kelly Pipe of Bakersfield delivered and fused 360 feet of 14-inch SDR-17 polyethylene pipe in two days, laying it in the entry position along the railroad right of way. Zednem Construction of Chino, Calif., handled all excavation, manhole connections and roadwork.

Preparations for the pull took the first week in May. The sewer's flow — 10,000 to 15,000 gallons an hour — kept the clay line two-thirds full. To ensure that the downstream and upstream manholes were dry to fuse the couplings, Zednem's crew installed a 6-inch bypass from the next upstream manhole 700 feet away. They cut a 12-inch-deep bypass trench across the busy road to meet the downstream manhole. Traffic was not rerouted.

Zednem completed the excavations in two days using a large Cat excavator and Cat loader. The 10- by 15- by 8-foot-deep pulling hole was in the service road. A 10- by 8-foot fixed box, open in the front for the equipment, was lowered into the pit. Two, 1-inch-thick steel road plates provided resistance against the open pulling wall, and more plates covered the shoring. The pit was much larger than necessary, since the original plan was to pull from behind a narrower shoring box.

The entry point ramped down 25 feet beside the downstream manhole, then entered a 10-foot box at pipe level, passing over the top of the mainline where it met the trunk line. Once the pull started, the box was covered with plates.



The bursting head is cut free

an open trench nine-feet wide on either side of the pipeline made no sense, because it was only eight feet deep and not that big."

However, the water district has a perfect safety record with OSHA and was adamant about maintaining it. Pipe



A 360-foot length of polyethylene pipe is attached to the bursting head and ready to pull.

"We had to monitor each stroke to ensure that enough pulling force remained to release the cable from the ram."

John Rafferty

One, two, three — heave

The pull began on Monday of week two with Bob Zamaroni from TRIC assisting Rafferty. Within eight feet, the grippers lost traction, and the ram

TOUGH JOB

PROJECT:

Pipe burst a 350-foot-long trunk line and replace the 10-inch clay pipe with 14-inch SDR-17 polyethylene pipe

CONTRACTORS:

TRIC Tools Inc., Alameda, Calif.; Zednem Construction, Chino, Calif.

CUSTOMER:

Young Homes, Rancho Cucamonga, Calif.

EQUIPMENT:

100-ton ram, TRIC Tools; three-phase, high-pressure 7,500 psi hydraulic pump, Power Team, Rockford, Ill.

RESULT:

Line replaced and Young Homes able to close escrow on the new homes

recoiled suddenly. The company van contained another pair of grippers whose inside configuration matched the lay of the 1 1/2-inch wire rope, but the grips were much shorter.

Within 100 feet, these chucks stripped. The ram rocketed back, slammed into an adjacent side plate, and broke its hydraulic fitting. Zamaroni and Rafferty found a replacement at an automotive supply store. Searching the Yellow Pages, they located a tool and die company that TIG-welded treads matching the lay of the rope to the inside of the grippers, giving them traction.

The pull resumed at noon the next



day and averaged one 40-foot section per hour. Nine hours later, high pressures and hot hydraulic oil were taxing the ram's original seals as it pulled close to

At left, attaching the bursting head. Below left, positioning the 100-ton TRIC puller. (The pit is larger than necessary because the pull was originally planned from behind a narrower shoring box.) Below, working with grippers and cable, TRIC technicians John Rafferty (in pit) and Bob Zamaroni make necessary adjustments.



its 100-ton capacity.

"We had to monitor each stroke to ensure that enough pulling force remained to release the cable from the ram," says Rafferty. Disassembly and cleanup took another hour, but by 10:30 p.m., the equipment was loaded in its trailer.

The cooking box

The next day, Zednem core-drilled 16-inch ports in each manhole to accommodate the 14-inch pipe. Rafferty used electrofusion couplings to connect the pipe to the manholes.

The central electrofusion box and coupling worked as expected at the downstream manhole, but the unit refused to recognize the Freitech coupling upstream. "It's 5:30 Friday afternoon and everybody is closed," Rafferty says. "I finally connected with P&F Distributors Saturday morning and rented a Freitech box and a generator to power it."

With the second coupling fused, Zednem mortared the manholes with waterstops. An hour later, the new sewer line passed its air pressure test and was ready for backfilling and service. "The EMWD was happy to see everyone leaving, and Young Homes had no further restrictions on the sale of its homes," says Rafferty. ■

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