

Sweet Rewards

A new composite cutting blade and a hydraulic ram enable a California contractor to replace corroded pipes without disrupting a factory's production line

By **Scottie Dayton**

A 6-inch sanitary sewer and 4-inch production line drain at the Ghirardelli Chocolate Factory in San Leandro, Calif., were backing up. Plant engineer Paul Gibula called Ben Patterson, a consultant with TRIC Tools Inc. in Alameda, for help.

Patterson found water standing under the cleanout grilles. A thick, opaque soup of cocoa butter mixed with debris from the floors packed the pipes, rendering his camera useless. Patterson taped a Rycom sonde from South Coast Equipment to his 1/4-inch duct rod from Condux International to locate the two lines.

Since repairs had to be done without interrupting production,

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John Rafferty

Patterson recommended pipe bursting to replace the corroded sections of both pipelines. The TRIC team overcame accessibility issues, confined spaces, heat, and humidity to complete the job efficiently as chocolate bars rolled past.

No ordinary sewer

At room temperature, cocoa butter has the consistency of hand soap. Patterson feared that metal jetting nozzles or cutting tools would damage the old, fragile cast-iron pipes, so he invented a cocoa butter cutter. The mirrored, sculpted, solid composite blade tapers to a point on

two sides and fits on the end of a standard sewer snake.

Patterson and crew cleaned the lines using cleanouts spaced 75 feet apart. “The material was dirty, ugly and hard, but the new blade performed as expected and got us down close to bare metal,” he says. “Using that blade was a first for everyone, as was working in a sewer that smelled like vanilla and chocolate.”

The sanitary sewer exited the east side of the factory, and the production line drain exited through the west side, but both converged at different angles into the same manhole behind the building. The outside pipe-bursting job pulled 80 feet of 6-inch SDR-17 polyethylene pipe from a cleanout box beneath the length of a newly installed chilled water facility to the manhole.

The inside job in the bean-roasting room pulled 30 feet of 4-inch SDR-17 beneath a 12-inch thick concrete slab protecting an electrical substation before passing under the building's foundation to the manhole. “The substation and foundation were at the rear of the production area,” says John Rafferty of TRIC. “The real nail-biter was what would we do if pipe bursting didn't work? No way did we want to dig there.”

Food grade

Because Ghirardelli produces food, gasoline-powered equipment was not allowed in the factory, and work areas had to be enclosed to contain dirt and dust. TRIC workers received white smocks, hard hats, complimentary goggles, and earplugs. G.D. Nielson Construction Inc. of Napa arrived the day before the pull to build a 58- by 58-foot Mylar tent around the site of the exit pit. The crew then cut a 3-foot-square hole



TOUGH JOB

John Rafferty of TRIC Tools monitors the pull while a small fan circulates air from overhead. (Photos courtesy of TRIC Tools Inc.)

through the 6- to 12-inch-thick concrete using electric saws.

While excavating down six feet by hand, they encountered abandoned intersecting lines, which they cut and removed. When exposed, the production pipe lay embedded in sand with bay soil above. Spoils were removed with a small skid-steer loader equipped with an air-purifying exhaust scrubber.

“Chocolate factories are hot places to begin with, but the additional heat in the bean-roasting room created sauna-like conditions inside the tent,” says Rafferty, who almost fainted from the stifling environment despite the 10-inch oscillating fan brought into the room for ventilation.

Rafferty found little space in the narrow pit for the 2-foot long, 4- by

PROJECT:

Replace a sanitary sewer and production line drain without disrupting production

CUSTOMER:

Ghirardelli Chocolate Factory, San Leandro, Calif.

CONTRACTOR:

TRIC Tools Inc. in Alameda, Calif.

EQUIPMENT:

Pipe bursting system with 20- and 30-ton rams, TRIC Tools Inc.; prototype cocoa butter cutter from Ben Patterson, Turlock, Calif.

RESULTS:

Pipes replaced without production stoppage

6-inch wood cribbing. He could barely maneuver, and the two halogen lights shining down created more heat than illumination. The 2-foot square by 1-inch thick hard aluminum resistance plate went

against the pulling wall. He cribbed the plate back with wood to position the ram farther into the hole.

Making do

A 1 1/4-hp, 7,500-psi electric hydraulic pump from Power Team replaced TRIC's regular gasoline-powered units. The company's smallest discontinued 20-ton hydraulic ram was chosen for the job because its narrow cylinder bore would respond with reasonable quickness to the lower-volume portable pump.

The 20-foot lengths of SDR-17 pipe were fused in an outdoor lot large enough to allow the pipe to be fed straight into the excavated, enlarged manhole. Both pulls were upstream from this entrance pit.

"We did the indoor pull first because it was the most difficult," says Rafferty. "We had to reset the cribbing several times because it shifted in the soft bay mud and sand bedding, and so I stayed in the exit pit the entire pull to assist the operation." He took one break for air.

The heat and humidity in the pit were so intense that a team member held the oscillating fan directly over Rafferty to provide some relief. "I was near fainting, and that's not typical of me," he says. The pull took two hours. Rafferty spent at

least half that time re-adjusting the downhole unit in the cramped, unstable pit.

The puller's top grippers were worn, too, and no spares were onsite. However, Rafferty knew a simple emergency fix. He grasped the cable with adjustable pliers just above the grippers, then raised the ram. That ran the grips against the pliers, forcibly setting them against the cable. "Since it was a short pull, we lost no time doing it this way," he says.

Light and air

After sawing through the concrete at the culvert behind the building, Nielson had excavated the pulling pit for the 6-inch line. "Nothing was difficult about this portion of the job," says Rafferty. "The only odd thing was Nielson's inside construction traffic running up and down the access ramp beside the culvert."

Rafferty completed the outside pull in 20 minutes using a 30-ton ram with an 18-hp, 3-stage, 7,500-psi, gasoline-powered hydraulic pump from Power Team. "In both cases, the cast-iron pipe was badly corroded and bedded in sand, so it broke apart easily," he says. "We probably used about three to five tons of pull for the inside job, and between five and 10 tons for the outside one."

Michael Lien of TRIC Tools keeps an eye on the puller's pressure gauge.



After the pull, a Nielson Construction crew cuts off excess pipe at entry pit.

MORE INFO:

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TRIC's contract was just to put the pipe in the ground. Nielson used mechanical fittings to connect the lines, then backfilled the holes and replaced the concrete. The combined effort was less expensive than open trench methods, and the aromatic chocolate kept flowing. ■

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