Sewage backing into the emergency room complex of the Villages Regional Hospital brought employees from the maintenance arm of CH2M Hill on the double.

They pumped what they could, then tried to televise the 260-foot, 8-inch SDR-35 PVC gravity sewer. The upper portion of the line ran 150 feet under the circular ambulance driveway to the center manhole in a median strip.

The camera head went two feet from the upstream and center manholes before hitting a collapsed section. The 110-foot lower sewer portion, running south from the center manhole under a parking lot to a manhole in the street, had two partially collapsed but passable sections.

Open cutting to replace the sewer would destroy the driveway and entrance to the emergency room. Instead, the CH2M Hill personnel contacted Jim Theriault of Omni Eye Inc. in Sarasota, Fla., to pipe-burst the line. After Theriault reviewed the inspection video, he called Ward Carter of TRIC Tools to help plan and execute the burst.

Because of the pipe’s condition and extenuating circumstances, Theriault expected the job to last longer than a week. The collaborative effort restored the sewer to full capacity in five days without disrupting access to the emergency room.

Meltdown

The problem began when a boiler room valve stuck open, releasing scalding water that poured down the floor drains and through the bell-and-spigot sewer pipe, softening and collapsing it.

The CH2M Hill team pumped the sewer until Theriault arrived to insert a tag line using a 1/2-inch jet nozzle. The jetter, launched from the center manhole in the parking area just south of the emergency room entrance, traveled 100 feet before the hose became stuck. Two sewer lines entered that manhole.

CH2M Hill resumed pumping, while some of Theriault’s crew set up the bypass system. They intercepted the two lines at the cleanouts and installed two flow-through plugs before the north manhole.

After inserting 4-inch suction lines, they attached each to a Thompson pump (with a redundant unit in reserve) that pumped the sewage to a tanker. A Vactor sewer cleaner emptied one-fourth of the tanker’s capacity at a time. The center manhole had a second inlet to one side, which the men diverted by pumping the flow to the south manhole.
Meanwhile, other workers excavated an entrance pit next to the center manhole in the 10-foot-wide median between the parking lot and circular driveway. They hammered out the north and south manhole inverts, then excavated to a depth that positioned the 60-ton TRIC X60 HDPE pipe in line with the sewer pipe. The 12-foot-deep south pulling manhole required shoring, but the 5-foot-deep north manhole did not.

At the same time, Carter fused 20-foot-long sections of 8-inch HDPE pipe. The staging area was along a row of bushes in front of the parking lot and next to a drive leading to the ambulance circle. During the pull, the pipe had to bend around the end of bushes, then cross a sidewalk before entering the hole.

“We parked a pickup truck over the curb to pin the pipe against the shrubs and force it around the corner,” says Carter. “We couldn’t risk the pipe sliding into the street and impeding the ambulances.”

North and south

Once workers installed the 6-by-6-inch wood cribbing in the north manhole, they used a confined-space tripod to lower the steel resistance plate with an aluminum pulling wheel. “We had to punch an opening through the collapsed PVC to the entrance pit to pull back the 1-inch swaged cable that attaches to the bursting head,” says Carter.

“I did that using a 3/8-inch duct rodder and Wedge service line replacement tool from Footage Tools Inc. However, the pipe was still so badly buckled that I needed 3/8-inch post-tensioning wire and a TRIC C20 20-ton ram powered by a 12 hp hydraulic pump to bring back the cable.”

Once the cable was in the pulling pit, workers replaced the 20-ton ram with the 60-ton unit. “We roll pin and pinch the new pipe,” he says. “Then the host pipe collapses on the new one, causing parasitic drag of 10 to 20 tons.”

A 14 gpm/10,000 psi TRIC/Enerpac prototype pump powered the X60 puller with 12 square inches of piston area. “We had so much sand, mud and plastic pipe coming into the hole that we couldn’t tell if the bursting head was in there or not,” says Carter. Workers introduced water from a hose and finally spotted the head sticking through a square hole in old pipe.

**Fully rejuvenated**

“The PVC pipe came in 13-foot sections, and the head smashed every one of them, one inside the other,” says Carter. “The shards formed telescoping rings and were jammed so tightly together that it took all day to pull them out using a reciprocating saw and locking pliers.” Carter finally cut off the head at 9 p.m.

At 7 a.m. the following day, Therault televised the line, searching for dips or depressions. Finding none, he restored the manhole invert, then bedded and covered the pipe with pea gravel.

Meanwhile, Carter burst the south half of the sewer in 20 minutes using just the 8-inch head. “We couldn’t trench back far enough without interfering with the ambulance approach, so we had to use the backhoe bucket to guide the HDPE pipe into the host pipe,” he says. “Other than that, things went smoothly.”

A final inspection confirmed that the rejuvenated sewer was perfectly on grade. Once the remaining manholes were restored and the median strip sodded, no one could tell anything had happened.

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Ward Carter