



IN THE TRENCHLESS

CASE STUDY

400 feet beneath the Houston Zoo Bluelight LED CIPP tames beastly I&I

The Houston Zoo in Texas houses over 6,000 animals from more than 900 species in a 55-acre zoological park. More than 2 million patrons visit the zoo in a year. Open-cut replacement was not feasible here for the 400 feet of failing 8-inch, vitrified clay sewer pipe running from the hippo tanks beneath other exhibits.

The zoo called in a Houston-based specialist in trenchless pipe solutions, and they recognized this job as an ideal candidate for the Bluelight® LED cured-in-place-pipe (CIPP) system.

Cracks in the clay pipe with root penetration had caused extensive infiltration and intrusion (I&I). Debris and sediment that had built up over time decreased the pipe's capacity and flow.

At first the team hoped to clear the pipe and then seal its interior with epoxy. Uncontrollable inflow made it impossible to dry the pipe sufficiently for that method. For laterals and drainpipes in such wet conditions, CIPP was a much more viable trenchless pipe rehabilitation solution.

The crew said the time they would save using the Bluelight LED light-cure would allow the team to complete the job quickly, performing the installation in two separate manhole-to-manhole, 200-foot inversions. Cleaning the pipes of epoxy and debris took longer than anticipated, even using a Picote Miller.

Work cleaning the pipes began around 9 p.m. on Friday evening and lasted until 3 a.m. on Saturday morning. That left only enough time to perform one installation. They needed to return Saturday night to do the other.

The light cured CIPP system allowed the team to prep for the installations offsite before zoo activities resumed each day. Since light-cured resin can only be activated by the light head, liners were measured, cut, wet out and stored until needed at the jobsite.

The team also saved time otherwise required for inspection. The LED head's integrated camera documented each installation while it was taking place. Once the LED head had been retrieved from the full length of the application, the pipe was ready for immediate reconnection and use.

The crew said they inverted a resin-impregnated 8-inch liner from a Super HydraDrum into the first 200-foot run. Then they inverted a calibration tube. The calibration tube optimized adhesion, helping the liner mate uniformly to the pipe and coaxing resin into cracks and voids.

In this case the calibration tube also carried the LED head and its pullback cable into position at the far end of the run. The calibration tube is transparent, allowing the blue light to cure the resin unimpeded. Automated pullback of the head was calculated precisely for the liner used, the resin and diameter of the pipe to ensure consistently correct exposure of the resin-impregnated liner to the blue light, ensuring a confident, uniform cure. Rate of pullback was 96 feet per hour.

The crew was off the site by 7:00 a.m., having one liner inversion completed, and was back on site at 7:30 p.m. Saturday night to perform the next inversion. The crew left the zoo by midnight, having successfully completed the entire project.

The crew said zoo officials were very pleased with the result. The job had been done with no impact on zoo activities. One tiger, though, seemed quite interested in the process, curiously studying the installation through its exhibit glass. The crew said he pretty much roared the whole time we were there.



A tiger supervises the inversion process with characteristic feline curiosity.



Each 200-foot manhole-to-manhole liner inversion is followed by a transparent calibration tube, which carries the LED head to the other end.



The LED CIPP pipe rehab operations take place at night and require no construction work. The trenchless technique has zero impact on the zoo's routine activities or its daily patronage.