



# South Dakota Town Replaces Severely Corroded Manholes

The manholes located in a small community just north of Sioux Falls called Renner, South Dakota, were badly deteriorated from high levels of acid produced from *Microbiologically Induced Corrosion (MIC)*. Unprotected concrete can be damaged in just a few short years in these conditions. The deterioration of these manholes was very severe, allowing ground water to infiltrate.

Renner chose to fix these manholes, using a process called PERMAFORM® with T-Lock Plastic Liner. This was the easiest and most economical way because of the high groundwater and many utilities that surrounded the five manholes. PERMAFORM® is a unique, patented process for reconstruction of manholes quickly and cost-effectively, involving neither excavation nor stoppage of the flow. Lightweight steel panels are assembled inside the manhole and concrete is poured between the form and existing wall. After the concrete has hardened, the formwork is removed leaving a completely sealed, structurally sound, 'manhole within a manhole'. Ameron T-Lock is PVC sheeting that is smooth on one side and ribbed on the other so it locks mechanically into the interior wall of concrete during rehabilitation. It provides a flexible corrosion barrier that will withstand decades of severe service.

The five manholes were completed in November 2006 by Recon Inc. of Watertown, South Dakota, President Darrin LaQua and SprayCom Inc. of Sedalia, Missouri, President Gary Bartley.

### Engineer Testimony

"I would like to take this opportunity to express our extreme satisfaction with the PERMAFORM® repair that was performed on five manholes in the Renner Sewer District. The final product was a PVC lined manhole that looked like it was manufactured at a pre-cast concrete manufacturer. We were particularly impressed with the newly finished invert bench and the short time it took the field crew to construct the PERMAFORM® manhole and place backfill around the manhole. We will recommend this type of repair again when considering this type of manhole rehabilitation."

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Steel forms are erected starting from the flow line in the bottom chamber and are worked upwards. During assembly of forms, prefabricated tubular sections of the T-Lock are fitted around the formwork exterior like skin.



Once in place, the entire void between the old deteriorated wall and the plastic covered forms are filled with high-strength ready-mix concrete.



After the concrete has set, the formwork is disassembled. The joints then receive a heat-fused welding strip to completely seal the new concrete from future corrosion. Then the liner is spark tested to ensure there are no defects or pinholes.



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