

How to Repair 91 Manholes in 24 Days

By Andrew Farr



The Mr. Manhole chimney replacement system uses a cutter-extractor to cut and remove the manhole frame from the road. The cutting system has an adjustable cutting diameter of 28 in. up to 86 in. and can cut through asphalt and concrete.

The City of Winterset, Iowa, recently completed the reconstruction of 97 manholes using the Mr. Manhole rehabilitation system. Save Our Sewers Inc., a manhole rehabilitation contractor and certified Mr. Manhole system installer based in Iowa, completed the repairs of 91 of those manholes in just 24 days last fall.

The City of Winterset along with engineers from Visu-Sewer, the prime contractor, was originally interested in repairing the manholes using a conventional precast method. Save Our Sewers Inc., which was sub-

contracted by Visu-Sewer to do the rehab work, proposed the idea of implementing the Mr. Manhole system because of the cost-saving benefits, mainly due to the large quantity of manholes that needed repair.

Mr. Manhole's Six Shooter system is a high-volume chimney repair method that enables crews to perform a comprehensive repair of manhole chimneys in a timely manner. According to Trip Davis, marketing and sales manager for Mr. Manhole, one of the main benefits of the system is that it is less costly and less

labor intensive than traditional methods. The Six Shooter removes a manhole frame and lid down to the cone level and rebuilds it level to the exact slope and height of the road.

How the Mr. Manhole System Works

The Mr. Manhole chimney replacement system uses a cutter-extractor to cut and remove the manhole frame from the road. First, a speed plate locks in to the frame of the manhole and allows the machine — typically a skid loader or a

backhoe — that controls the cutter to be positioned at the appropriate points around the manhole frame. Attaching the cutter to a machine such as a skid loader generally uses a standard auger drive and requires no modification to the hydraulic system of the machine.

The cutting system has an adjustable cutting diameter of 28 in. up to 86 in. and can cut through asphalt and concrete. Cutting into asphalt on average takes less than five minutes, but in concrete, cutting can take anywhere from 20 to 35 minutes. Once the manhole frame and surrounding road material is cut down to the cone level, it is removed from the road. The manhole frame is then measured to fit a new liner that is cut to fit the proper height and slope of the road. Sealant is then applied to the new liner, which is covered with a bentonite strip before it is placed on the manhole cone to prevent any water from entering the manhole. More sealant is then applied to the top of the liner to glue the frame in place, creating an air-tight chimney system.

After replacing the lid, the entire rebuilt structure is encased in concrete along with epoxy-coated steel rebar rings to provide additional reinforcement. The concrete is poured to the exact grade of the manhole lid and the road. Another sealant is applied to seal the interface between the outer edges of the concrete finish and the road to prevent water from penetrating the structure.

Davis said there are several advantages to the Mr. Manhole Six Shooter system, most notably the benefits compared to old methods of repair which involved air hammers, concrete adjusting rings, ready mix concrete and asphalt.

“The process was costly and labor intensive,” he said. “Frequently, the manhole lid would not be level with the road after a repair because the concrete adjusting rings were not the right size. With the Mr. Manhole method, the lid is always set to the exact height and slope of the road.”

One Crew, 91 Manholes, 24 Days

The job for the City of Winterset involved the repair of 97 manholes using the Mr. Manhole system, 91 of which were

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initially repaired due to six needing to be replaced completely. The job was bid in August 2011 and Save Our Sewers Inc. completed the chimney repairs in 24 working days from late October to early December 2011.

According to Brad Steenhoek, general manager of Save Our Sewers, the repairs were performed using a four-person crew that was able to complete about four manholes a day. Steenhoek, who



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is the only contractor that uses the Mr. Manhole system in the state of Iowa, said one of the main reasons the City of Winterset eventually decided to use the Six Shooter was because of the overall cost savings for the amount of manholes that were being repaired.

“We proposed to the city engineer to get away from the conventional repair methods using pre-cast grade beam frames,” he said. “We went with the Mr. Manhole system because of the cost-savings and the quantity. If we only had a half a dozen, the cost-savings would be pretty small, but when you multiple that by nearly a 100, the cost-savings gets real large, real quick. At the end of the day, we saved the city a lot of money.”

Steenhoek said one of the biggest challenges of this job in particular was doing the work in the fall. Due to the shorter days and less daylight to work in, his crew was actually limited to the amount of manholes they could repair each day. But Steenhoek said the Mr. Manhole system is a process that is

quicker, more efficient and in the end, benefits everyone.

“In my opinion, the Mr. Manhole system makes a lot more sense compared to conventional methods,” he said. “Having a round hole with an overcut vs. a square hole provides a smoother cut and many other engineering benefits. The design benefits make more sense from a structural standpoint. Until about 2004, there wasn’t a tool out there in the marketplace that allowed contractors to be able to put round holes around round manholes.”

Steenhoek also said from his perspective, in terms of gaining attention, new reconstruction methods such as this one have really suffered from economic shortfalls stemming back to 2008. He said there really haven’t been a lot of contractors willing to invest in new methods or practices for their businesses.

Andrew Farr is an assistant editor of *Trenchless Technology*.

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