

To Do It Right, Do It Yourself: Genesee County Road Commission Invests in Catch Basin Repair Technology

by Angus W. Stocking, L.S.

“Genesee County is the 5th largest, of the 83 Michigan Counties,” says Randall Dellaposta, Director of Equipment and Facilities at the Genesee County Road Commission (GCRC). “And of course we have a lot of roadway to take care of—almost 2,000 miles of paved and unpaved primary and local roads, and are under contract with MDOT (Michigan Department of Transportation) to maintain an additional 799 lane miles of state highway. Like other road commissions, we’re pressed to get it all done.”

One particular challenge is catch basin rehabilitation. There are several thousand catch basins in the 17 townships within GCRC’s jurisdiction, and many are made of brick and date back to the 1920s and 1930s. As they age, catch basin failure has caused major problems for Genesee County motorists. “We have certainly experienced failures, including collapse and roadway sinkage,” Dellaposta explains. “When that happens, we have no choice but to put up signs, close the road, and immediately start emergency repairs. And depending on conditions, we may see flooding before repairs can be completed. A failed catch basin really can be a severe roadway hazard.”

To prevent these major failures and keep traffic flowing, GCRC has committed to repairing catch basins proactively, *before* they collapse and sink. They’ve worked with a GIS expert and the Genesee County Drain Commission to identify and prioritize catch basins in need of rehabilitation, and most importantly, GCRC made a major investment in an innovative catch

basin repair solution that enables their own crews to rehabilitate catch basins proactively. And the new solution is fast and high quality, with a very long lifecycle expected. “Using our own crews or

one day. That’s a big difference, and in the first, partial, season—we took delivery of the trailer in June 2016—that we used this system, we were able to rehabilitate 86 catch basins, with



Genesee County repairs catch basins with county crews using the PERMACAST® PC-20HD (Hydraulic) Material Application Platform trailer and Permacast MS-10,000

subcontracting with traditional methods, we were used to a three-man crew taking two to three days to reconstruct a catch basin,” Dellaposta says. “Now, with the AP/M Permaform trailer and spincaster, our own two-man crew is able to complete a basin rehabilitation in just two or three hours, and if conditions are right they can do as many as eight in

just 188 hours of time logged on the trailer. So I’m confident we’re seeing substantial return on our investment.”

Everything Needed, On One Trailer

The PERMACAST® PC-20HD (Hydraulic) Material Application Platform is a dual axle trailer, about seven feet wide and 20 feet

long, that supports a mortar mixer, a hydraulically powered progressive cavity pump, a bi-directional spincaster and spin



Preparing catch basin for rehabilitation

washer, and all the accompanying equipment—such as quick connect hoses, concrete spray gun, and 250-gallon water tank—needed to keep a crew working all day.

GCRC's purchase was coordinated by AP/M Permaform representative Dennis Buckshaw, who says, "It was a rewarding experience working with Anthony Branch, Director of Maintenance and Randall Dellaposta, Director of Equipment and Facilities, two truly professional and dedicated civil servants. Their decision to self-perform storm-water catch basin and manhole restoration provides significant savings (reducing the cost of government) for the Genesee County Road Commission. Anthony Branch reached out again in December 2016, and he is working with us on evaluating the cost savings for the County by self-performing stormwater culvert restoration. Early indications are that this too will provide the County with significant cost savings."

Colin Melton, AP/M's manager of technical services provided the

training for trailer use, which GCRC Equipment Operator Nicholas Nims says was effective and fast. "Really, it only took two days. On the first day Colin came to our facility, gave us a rundown on the function and purpose of the various components, and gave us a very thorough example of how to tear down and clean the unit after use," Nims says. "And also on the first day, we did a demo on a tube we set up in the yard. On the second day we went out in the field and did actual repairs on catch basins—it's a surprisingly easy process.

But, what exactly *is* the process?

What Actually Happens?

The heart of the PERMACAST® system is the bi-directional spincaster, a technology pioneered by AP/M Permaform and used in several applications, including manhole rehabilitation and trenchless centrifugally cast

concrete pipe (CCCP) storm sewer rehabilitation. The spincaster sprays on thin, smooth layers of high strength cementitious mortars. In Genesee County, GCRC uses a winch to lower the spincaster into 36" x 48" (typical, some are deeper) brick catch basins, using multiple passes to spray on concrete layers about an inch and a half thick. For this application, AP/M Permaform's MS-10,000 is used, a fine aggregate, waterproof, corrosion resistant cementitious liner that adheres tightly to the brick substrate, forming a monolithic new 'pipe' that is sealed and structurally sound, independent of the original catch basin. "The seamless and structural aspects of the rehabilitation are excellent for our brick catch basins," says Dellaposta. "Really, the end result is a much stronger and better catch basin than the brick basins were even when they were new."



Lowering the bi-directional spincaster into the catch basin

“This is the first alternative that we’ve come across that is both better and faster than the method we’d been using,” says Nims. “The old way worked, but it was very time consuming—we’d have to cut the road and remove surface material around the basin, then patch or rebuild by hand. And then of course we’d have to patch and repave the road around the basin. Using the trailer and spincaster, most of that work is now unnecessary.”

Nims says that the PERMACAST process is much more efficient. “Now we’re catching the basins before total failure. We inspect and clean them as needed, with the spinwasher on the trailer, then do minor repairs like filling voids and replacing loose block. If there are any inlet or outlet tubes we cover them with disposable bowl covers before spraying,” he says. “When all that’s done, we hook up the machines and mix the cement. Most basins take about five bags of MS-10,000, and that usually takes about five passes with the spincaster to get even coverage between an inch and an inch and a half thickness. Then we remove the bowl covers, replace grates, and we’re done.” Quality control is straightforward; by counting the bags of mortar used, Nims has a good idea of the total volume of material used, and a simple gauge can be used before the material cures to spot check layer thickness as needed.

Depending on conditions, up to eight basins can be rehabilitated in a day. The biggest factor,

according to Dellaposta, is weather. “The mortar has a 24-hour cure time, so we don’t do rehabilitations when rain is expected,” he says. “On the other hand, when conditions are warm and humid, that’s good for the machines, because we can run the equipment longer without breaking down to clean. If we’ve prepped several catch basins that are close together, so we can keep the pump and spincaster working without a long break, we really can do eight catch basins in a day. But you have to be careful not to let a batch set up—20 minutes is too long to sit.”

Cleaning is of course the primary



Fully relined and rehabilitated catch basin

maintenance required. A total cleanout is required at the end of any day of trailer use, and depending on the work scheduled one or more cleanouts may be needed during the day. AP/M Permaform also helps with equipment maintenance. “Under our government agency contract agreement, we provide one annual complete rebuild on our robotic spincaster—no charge,” Buckshaw explains. “And of course I visit with GCRC occasionally, routine sales calls, and am always available for technical support as needed.”

Possibilities

In the first season of use, GCRC concentrated on the backlog of catch basin repair needed. But going forward, Dellaposta is excited about the possibilities for different types of rehabilitation work. “The trailer is set up to support rehabilitation of storm water culverts up to 60 feet long, and we expect to be doing some of that work,” he says. “And the hand sprayer on the unit is also very handy, and is often all we need for spot repairs on all our storm and drainage infrastructure.”

GCRC has already demonstrated, in its first season of use, that the

PERMACAST®
PC-20HD
(Hydraulic)
Material
Application
Platform does
quality work in
short time frames,
demonstrating a
major return on
investment
compared to
conventional
methods and
subcontracting.
Perhaps more
importantly, by
proactively
rehabilitating catch
basins *before*
failure, GCRC is

avoiding the expenses and hazards of emergency repairs.

When investing in maintenance systems, and devoting government crew time to rehabilitation work, analyzing return on investment compared to subcontracting can be a tricky chore. But for Genesee County, this particular investment appears to be a slam-dunk.

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