

MNDOT District 6 Tests Centrifugally Cast Pipe in Problem Area Tuesday November 16, 2010

“Our district is faced with thousands of deteriorated centerline roadway pipes,” says Ruth Betcher, P.E., hydraulics engineer for the Minnesota Department of Transportation’s (MNDOT) District 6, “and replacing all that pipe is cost prohibitive—and also, citizens don’t welcome detours!”

Currently, MNDOT uses cured in place pipe (CIPP) and HDPE pipe relining extensively, but both have disadvantages: CIPP is expensive and HDPE decreases hydraulic capacity due to reduced inner pipe diameter—HDPE also requires at least 25 feet of clear area for staging.

So Betcher recently tested a new method of pipe rehabilitation called centrifugally cast concrete pipe, known as CCCP or **CentriPipe**. Using equipment and engineered PL 8,000 mortar provided by AP/M Permaform, District 6 relined 80 feet of badly deteriorated 36-inch CMP. “This pipe was rusted, with holes in the floor and an interior section of 33-inch pipe that had separated.”

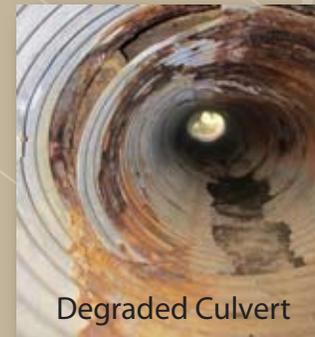
Casting is done by a skid-mounted spinning nozzle that is pulled through the pipe. Fiber-reinforced mortar is mixed on site and pumped to the nozzle. The spin casting method has been perfected on vertical manholes, and is now proving successful in horizontal pipe applications.

In this case, after cleaning, the CMP floor was so uneven that a self leveling PL 12,000 mortar had to be laid to provide a smooth skidding surface. Then, on successive days, two passes were made laying down a 3/4-inch layer of mortar, plus a final pass with a curing compound. Each pass took less than two hours, and after the first pass some spot repairs were made to fill voids caused by deteriorated pipe invert. The final result was, essentially, a new, smooth, structurally sound, 1-1/2-inch thick concrete pipe, bonded with the original CMP.

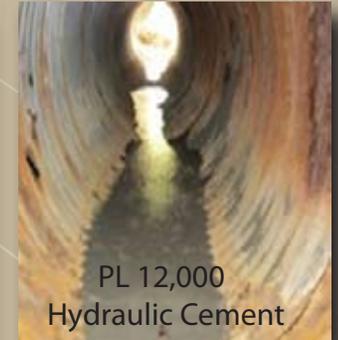
“This was a challenging test project,” Betcher says, due to badly deteriorated pipe, shallow depth that exposes the pipe to freeze/thaw cycles, and heavy loading from farm equipment. Initial results are good, and Betcher says that CentriPipe’s combination of cost effectiveness and minimal pipe diameter reduction is very promising. This is one new idea that may well find a place in MNDOT’s suite of pipe rehabilitation solutions.

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