by Jeff Griffin, Senior Editor

Rapid Cure Lining Offers Advantage Of Same Day Project Completion

A rapid-cure polyurethane lining system with a history of success in Europe has impressed owners of several water system rehabilitation projects in North America where it is being marketed by Alltech Solutions, Moncton, New Brunswick, Canada.

"The process is similar to that of epoxy resin or cement mortar lining," explains Derrick Horsman, P.E., Alltech Solutions president. "It offers the advantages that make these methods popular, but what sets it apart is the added benefit of a very fast curing time."

Horsman says the polyurethane dries to the touch in 60 seconds and final cure is complete in 15 minutes.

"This fast curing time," he emphasizes, "provides the possibility of rehabilitating water mains and returning them to service the same day, thereby eliminating the need and cost of setting up and maintaining a temporary bypass pumping systems."

The fast-cure system makes it possible to shut off a segment of water main soon after residents of a neighborhood leave for work and have service restored by 4 p.m. the same day, Horsman says.

A typical installation begins with excavating an access pit from which cleaning of the pipe to be lined is begun using rack feed boring, drag scraping or high-pressure water jetting. Following completion of cleaning – one to three hours, depending on condition of the pipe – a closed-circuit television (CCTV) inspection is made to verify the pipe is properly prepared for the spray application. The length of a segment of pipe for a polyurethane lining application varies with street and valving layout, but about 575 feet is a reasonable average.

Second pit

A second pit is dug, the umbilical cord of the lining equipment is inserted into the pipe, and the spraying application is begun.

"Application of the spray usually is completed in about one hour," says Horsman. "Within 10 minutes, curing is sufficient to permit a post-lining CCTV inspection to confirm proper application of the coating. After the inspection of the lined section of pipe, it is reconnected at one pit and the other is capped to restore unidirectional flow. By maintaining unidirectional flow, we have introduced an added safety check."

After the main is flushed for approximately one hour, residents then are able to access water. Unlike pipes lined with cured-in-place and folded liners, it is not necessary to restore service connections because the spray application generally does not block openings to services.

As a precaution, customers are advised to boil water until samples are tested by the water system operator. Common practice is to take two samples 24 hours apart. The entire sampling regime produces results within 36 - 48 hours. Horsman says Alltech has yet to have a sample fail from a lining project. Practice in the UK suggests that less than 1/10 of one percent of samples taken fail, and the majority of those are not a water quality issue, rather a sampling problem, says Horsman.

Equipment

Alltech Solutions uses installation equipment made by Pipeway Ltd., West Sussex, UK, an international contractor that played a critical role in the development of rapid-cure polyurethane lining technology and is one of the primary providers of installation services using the method.

Installation equipment includes a trailer-mounted, computer-controlled lining system with heated holding tanks and a nitrogen purge system, metering pumps and flow meters, and heated umbilical hoses.

"The technology is available for use by licensed contractors," Horsman says. "Although there are no formal approvals to use the system in North America, it is highly recommended because of the sensitive nature of the work. Alltech Solutions currently is the only contractor approved by 3M to use the polyurethane fast-cure lining technology in North America."

Horsman believes the technology's slow growth in North America is because engineers and cities are familiar with epoxy resin and cement mortar lining methods, they accept bypass lines as a necessary part of pipe lining procedures, and to date there has been little promotion of the benefits of fast-cure polyurethane pipe lining.

"Education is necessary," he concludes, "but successful projects in the U.S. and Canada now are attracting increasing interest. In fact, most municipalities already are practicing same day return to service. When they have a water main break, they shut the system down, repair the break and return it to service the same day. When you look at it this way, the only thing we are adding is the benefit of a completely restored pipe."

FOR MORE INFORMATION:

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