Speedy slipline saves money

Ted Joynt, Franco Bonanno and Gerald Bauer report on a town in Ontario, Canada, which saved time and money by using sliplining for water main rehabilitation

THE town of Smiths Falls, a community in eastern Ontario, has been incorporated since 1854. For over 150 years, the town used one building as its water-treatment facility, repairing and retrofitting as needed over the years. But, the cost of maintaining the former grist mill rose steadily, and in 2002 an environmental assessment called for a new facility.

RV Anderson Associates (RVA) undertook the project of how to tie in the old distribution system to the new water-treatment plant. With sliplining, RVA was able to save Smiths Falls time and money, and enhance the community.

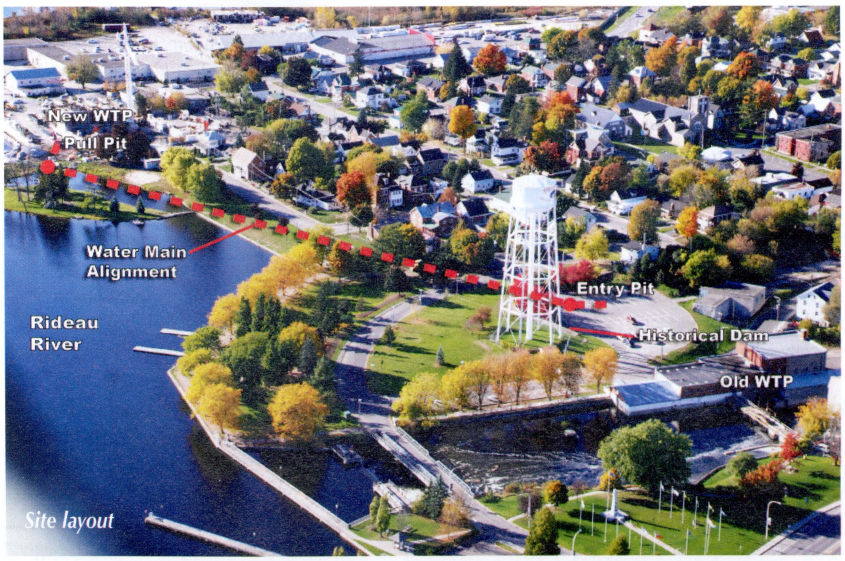
The new, 14 million litres/day, state-of-the-art water-treatment plant is located 450m upstream of the old plant. RVA determined that the new plant's discharge line would tie in to the existing system just outside the original treatment facility, requiring 350m of piping.

There were three options to feed the existing distribution system:

- follow the existing alignment with a new pipe;
- create a new alignment with a new pipe; or
- use the existing raw-water intake line.

The first two options would significantly affect the social, historic and environmental make-up of the Rideau River area. Therefore, the third, trenchless solution was determined the best.

This trenchless solution required rehabilitating the 750mm-diameter, concrete pressure pipe, which had been serving as a raw-water gravity-feed line to the original plant. The pipe was in good structural condition, but it could not hold pressure beyond 50psi. Options for rehabilitation included pipe bursting, cured-in-place liners, spray-on liners and sliplining. Sliplining provided the best overall life-cycle cost benefits, could be completed quickly and had minimal environmental effects.



Site layout

Before beginning work, RVA tackled several challenges, such as changing the existing gravity pipe to a pressure line, allowing for a vertical, 22° bend, and accounting for various historical, archaeological and environmentally sensitive areas along the route, while also limiting the effect on the area's tourism industry.

> **"RVA saved three to six months on the schedule"**

Working alongside Pipeflo Contracting, its subcontractor, DeRose Brothers General Contracting, and the general contractor, Thomas Fuller Construction, the team started work in September 2009, sliplining 264m of the existing 750mm concrete pressure pipe with a 500mm-diameter HDPE DR17 PC100 pipe, using the open-cut method for 10m at the pull pit and for 63m at the entry pit to allow for the tie-ins.

The existing pipes were opened by removing one pipe section upstream and three downstream, allowing the 40t horizontal directional-drilling machine to pull the new pipe into the host pipe. The HDPE pipes were fused on-site. Dewatering was only required to control the inflow of groundwater. There were two 100mm-diameter pumps at the entry pit and one 150mm pump in the upstream pit. During pulling, water was allowed through to lubricate the pull. Once the pipe was in place, it was filled and tested.

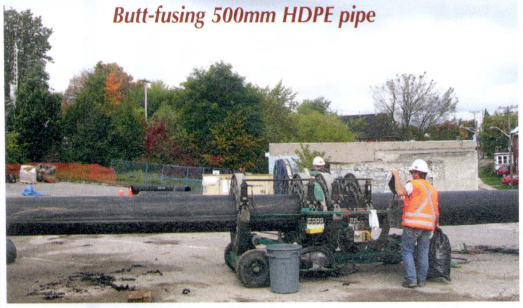
The whole process took only six days and the pipe was in place on October 5, 2009. Grouting was completed in three days the following month, after the water level had dropped.

RVA's rehabilitation of the old pipes saved the Town of Smiths Falls money, time and environmental repercussions. Using the open-cut method instead of sliplining would have cost three to four times more. The life-cycle costs were reduced, as were energy costs from the low C-factor of the pipes. In addition, RVA saved three to six months on the schedule. Finally, sliplining preserved the beautiful environmental and historic features of the area, with little disruption to the public areas of enjoyment.

Project team

Owner: Town of Smiths Falls
Engineer: RV Anderson Associates
General contractor: Thomas Fuller Construction
Trenchless contractor specialists: Pipeflo Construction Corporation (from Hamilton, Ontario) in association with DeRose Brothers General Contracting

Butt-fusing 500mm HDPE pipe



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