

## Rehabilitating New Zealand's largest sewer pipe

*Interflow NZ Ltd has renewed in-situ the largest diameter sewer pipe ever attempted in New Zealand, and in doing so has won New Zealand's prestigious 2009 Ingenium Excellence Award.*

*The project involved rehabilitating 628 metres of 1575mm and 1800mm diameter trunk sewer in Hastings as part of a sewer upgrade project undertaken by the client, Hastings District Council.*

The sewer main had suffered varying degrees of hydrogen sulphide attack to the extent that the steel reinforcement was either exposed and corroded or missing altogether over large sections of the pipe crown.

Sections of the pipe which required renewal were located under residential properties, by the side of footpaths and busy roads, and below commercial orchards and shelterbelts. The major challenges for Interflow were firstly, to provide a structural pipe liner at such a large diameter (up to 1800mm), and secondly, to install the liner from existing access chambers so as to avoid the need for open excavations and thereby minimise the disruption to the local community.

For this project Interflow's used Rotaloc®, a structural close-fit, spirally wound PVC liner developed by Sekisui Rib Loc Australia. Although Rotaloc technology had been used extensively in Australia, this was the first time that Rotaloc was used in New Zealand.

The Rotaloc liner is essentially a new pipe that is produced inside the existing pipe by machine. For this project the Rotaloc machine was lowered and assembled inside existing access chambers thereby avoiding the need for any open excavations.

The PVC profile was then fed from spools above ground into the machine below. The machine produced the new pipe by rotating and continuously wrapping and locking adjacent profile strips together. At the same time as it rotated the machine progressively advanced through the existing pipe until it reached the next access chamber. Sections of the trunk sewer between successive access chambers were renewed this way.



*The PVC profile was delivered to site on spools and fed into the Rotaloc winding machine in the sewer below.*

An advantage of the Rotaloc system is that the machine is fitted with hydraulic arm-sets which hold the profile in close contact with the existing internal pipe wall during installation. This ensures that the new pipe is produced tight against the host pipe and so the loss in cross-sectional area is only minimal.

Another benefit of Rotaloc is that the liner can be installed without the need for personnel to enter and work inside the deteriorated pipe. In the case of this project this was of significant benefit because working inside the deteriorated pipe was unsafe and not permitted. After the pipe had been lined with Rotaloc, the structural capacity of the pipe was restored.

This made it safe for Interflow personnel to enter the relined sections of the pipeline.



*Rotaloc restored the structural capacity of the original pipe making it safe to enter the relined sections of pipe.*

The sewer was renewed without the need for any open excavations, this was a major benefit given that the alternative of open trenching and relaying new pipes would have required excavating the front yards of residents, removing fence lines, digging up footpaths, and uprooting established trees in resident properties, along road ways and in orchard farms.

To complete the rehabilitation work Interflow grouted the void between the outside of the Rotaloc liner and the existing pipe wall.

The benefits of Rotaloc, combined with diligent project planning and a thorough consultation process with the client prior to, and throughout, the duration of the project made it possible for Interflow to complete the project 3 weeks ahead of schedule, within budget, without any safety incidents, and without any environmental or community issues.

The success of this project was recognised on a national level with Interflow winning New Zealand's Ingenium Excellence Award in 2009.