

Penshurst Main Renovation - NSW

Rapid Renovation Keeps Water and Traffic Flowing



Objectives:

Problems with old leaking lead joints prompted the Water Board (Sydney) to look to replacing a section of sixty-year-old lead jointed steel main in the southern suburbs of Sydney.

Challenge:

An additional problem was that a large proportion of the replacement section was under Canterbury Road, one of the busiest roads in the area. Consequently, it was decided to replace the main in-situ, using relining techniques. Tenders were called for the project, which would entail the lining of almost 1.3km of main, to give a minimum effective bore of 640mm. Jasdell Constructions was the successful tenderer and offered 676mm OD x 6mm WT SINTAKOTE MSCL pipe.

Solution:

Thinsulators give room to move

To facilitate the insertion of the new pipe, "Thinsulators" were fixed to each 12m long pipe at 3m intervals. These thermoplastic segments were bolted around the circumference of the pipe to provide an adequate annulus around the pipe for movement and subsequent grouting. They also reduced the frictional drag on the existing pipe during the insertion process.

The job began by constructing a 15m long opening at an air valve in the centre of the first 400m section of main. The original plan was to winch the new pipe through the existing one, but Jasdell Constructions found that the pipeline string could actually be pulled through by an excavator stationed over the trench.

All joints were butt welded with two passes, and the cement lining reinstated at each joint. To further reduce friction between the thinsulators and existing lining, water was fed into the annulus during the pulling operation. Maximum pulls of up to 190m were achieved using this technique.

Around the bend

Throughout the project, excavation was necessary wherever there were bends in the pipeline. These existing bends were removed and replaced by 676mm OD bends after the new pipe was installed. There was no need for thrust blocks in the fully welded pipeline, but concrete was poured between new bends and the existing thrust blocks. In addition to these predicted excavations, another excavation proved necessary where a section of pipeline was subject to a four per cent change in vertical grade. By utilising this innovative technique, traffic disruption was minimised, the cost of conventional replacement reduced, and Jasdell also completed the project ahead of schedule.

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Client	Water Board (Sydney) – Southern Region
Project	In-Situ relining of existing DN750 water main
Pipeline	1,284m of 676 OD × 6mm WT SINTAKOTE MSCL Pipe,
Construction	Jasdell Constructions Pty Ltd
Construction Period	January - May 1992