Replacing a 100 year old Earthenware Sewer Main - Minimising Community Impact

Timaru District Council recently replaced 905m of 150mm Sewer Main buried beneath Wai Iti Road. The sewer main is in a critical location and passes by a busy supermarket and small retail complex. Wai Iti Road is one of the busiest roads in Timaru with a traffic count of 25,000 cars per day.

The existing earthenware sewer pipe was installed almost 100 years ago and is in poor condition. The old main has leaky joints, lateral connections and has a high maintenance record. Locals told reporters that the contractor which installed the original sewer main in 1915 is still in business today. Although they no longer complete ‘sewer replacement’ work, the contractor originally employed 200 men to install the trunk sewer using shovels, picks, horse driven carts and general ‘hard manual-labour’, to lay the heavy earthenware pipes at depths of up to 3m.

Construction methods continue to change; almost 100 years later trenchless methods were chosen over open cut to install the new pipeline using a trenchless in-line-replacement method called Pipe Reaming. Reaming uses a horizontal directional drill (HDD) rig that enters the ground at surface level. It bores a pilot borehole through the ground entering the old sewer on grade usually at a manhole and pushes its drill rods through the existing sewer pipe. In this case the drill-rods were bought back to the road surface where a reaming head was introduced to the drill rods, then pulled back under full rotary rotation. The reamer rotates at high speeds reaming/eating or ‘grinding out’ the old pipe disintegrating it. The new pipe is attached behind the reamer (not under rotation) pulling the new pipe into an annulus of drilling mud or drill fluid.

A Timaru contractor provided a competitive tender package offering a new sewer main using this in-line Pipe Reaming technique. They engaged Iplex Pipelines to manufacture Novafuse Fusible PVC Pipe™ and to provide fusion jointing services. They chose PVC pipe because of its higher mechanical tensile strength when compared to other thermoplastic pipe materials which enabled longer pipe-pulls to be completed. Fusion technicians fused the DN150 12m pipe-lengths into 150m pipe-strings at West End Park prior to the pull-backs. In one case, these strings were transported closer to the work site then fused into a single 300m pipe-string.

The contractor lifted the pipe-string onto wheel sets and towed it into the middle of Wai Iti Road, ready for the pull-back to begin. The heavy trafficable roadway was able to continue its normal day-to-day activity round the work-site. The first and longest pipe-pull-back (300m) was pulled into position late on April 16th 2013.

Because PVC pipe had been installed replacing the old main, connecting the existing sewer laterals became much easier as there was no hot fusion jointing required to complete connections. The contractor connected each service lateral (also replaced by trenchless methods) using traditional rubber ring joint PVC Drain Waste & Vent fittings purchased from local merchants. This allowed services to be reconnected easily and quickly.

The contractor said; “I now have another tool for my tool box, the mechanical strength of PVC pipe allows me to complete longer drill shots reducing time on site.”

Author: Todd Randell

**Typical radius of curvature achieved.**

**Intermediate field fusion joint joining 2 pre-fused 150m pipe-strings making the 300m length pipe-string.**