

# Pipeline Project

Even the most straightforward of projects present unexpected challenges and opportunity for innovation as Higgins Contractors found when building the Havelock North Relief Sewer.

**Mary Searle Bell** explains.

**H**avelock North in Hawke's Bay is a growing community, and the town's sewer line has had to be upgraded to ensure it is able to cope.

Nick Cottier of Hastings District Council is the senior project manager on the Havelock North Relief Sewer project and says the work is to cope with expected continued growth in the region. He says the existing pipe out of the town is nearing capacity and the new, second pipe is a vital piece of infrastructure.

"This project has been in the wings for a long time," he says. "It will future proof Havelock North for the next 50 years."

The pipeline stretches just over seven kilometres and has a couple of major chambers along its length. Higgins Contractors won the tender for this work back in April last year and has almost completed the project – it finished laying the pipe five weeks ahead of schedule but things are on hold for a period while the council undertakes some other, complementary work. When that is done, Higgins will complete the downstream chamber.

The pipe is a 700mm diameter structural wall PE pipe. In places where there is shallow cover, a heavy wall structural PE was used, but the rest is standard pipe.

In many respects it has been a straightforward project. The pipeline was constructed offline – by building a complete new line there was no disruption of service. Also, as the line is mainly rural, there were not many properties to deal with, says Nick.

However, he also describes it as a difficult site and there were a few quirks that added challenges, the biggest being the plethora of existing underground services in the berm.

"There were a lot of cables and not a lot of room for the pipe," he explains.

Graeme Clarke of Higgins cites the excess of cables as the obvious difficulty with the project too.

A two-metre wide trench was required to lay the pipe so Higgins had to change the alignment in places – sometimes moving into the road – to sidestep the other services.



Foxbox from Real Steel is a new trenching product made from high tensile steel imported from Sweden.

Another difficulty was the very flat grade. Clarke describes this challenge as unique.

"The grade was 1:1078, which works out at 0.93mm of fall per metre."

Stretch that out over 7.3 kilometres and you can comprehend how vital it was to get it right and just how tight the tolerances were. Higgins had a survey control point set up and did two survey checks a day. The tolerance was just half a millimetre for every six-metre length of pipe.

"It was critical to get it right," says Clarke.

The weather also caused a couple of headaches.

"We had a lot of rain last year which meant working in wet conditions and we had a couple of collapses," says Clarke. "In one particular instance we had the road collapse along the centreline – we had dug out some old stumps which must have been acting as a plug. When the trapped water was released it left a very deep 3.2-metre-long crack in the road, and put a big dent in our trenching cage."

Then there were the usual traffic issues to deal with too – particularly on the two kilometres which ran alongside the state highway.

Unbeknown to Higgins, the stretch of state highway between Clive and Hastings was originally a concrete road built after the World War Two. At one point, the pipe had to cross the highway, which meant digging through 250mm thick concrete, and then reinstating it in sections to ensure the road could remain open to two lanes of traffic.



Challenges surmounted, Higgins also employed innovation in the form of a bespoke trenching cage from Real Steel after its existing one was damaged when the road collapsed.

“The opportunity arose to buy a stronger trenching cage – one built from hardened Hardox steel,” says Clarke. “We had hired an aluminium one and while it was strong, it was super heavy. We wanted the strength without the weight.”

The standard length for cages used when laying six-metre lengths of pipe is 6.8 metres but Higgins asked Real Steel to build a 7.2 metre long cage (which, incidentally, was still lighter than the 6.8 metre aluminium one).

“We wanted it slightly longer – 6.8 metres is not quite enough room for the boys to be safe when working around the end of the pipe,” explains Clarke. “It proved its worth when the trench collapsed while the boys were in there.”

The new cage had a number of other innovations, including armoured struts which prevent the cage getting damaged when the digger moves it. Also, the pins on the struts were recessed, as was the ladder, to prevent accidental damage by the digger.

Carl Leenders, production and design manager at Real Steel, says the Foxbox, as the new product has been named, is made from high tensile steel imported from Sweden.

“The Hardox wear plate is specifically designed to be

hard – it’s used to build digger buckets and the like,” he says. “Along with being extremely strong the properties of the steel allow us to do fancy things with the engineering.”

Most significantly, the Foxbox is much lighter than comparable products and Carl says this makes it more manoeuvrable on site. He says Higgins was able to swap out its 25 tonne digger for a 12 tonner to move the new cage.

Another helpful tool is that each Foxbox has its own webpage. Clients can enter the serial number of their Foxbox and see all the relevant documents specific to their cage, including the user manual and guide on ground pressure ratings, on their phone.

Real Steel is in the process of bringing out the next generation of Foxbox, which incorporates further innovations based on feedback from Clarke and other customers and promises even more safety features built in. But the original Foxbox has done the job nicely for Higgins.

“It works really well,” says Clarke. “We got the cage early this year and it has been great.”

Although the project is not completely finished yet, what has been done has gone well. Higgins laid an average of 36 metres of pipe a day, which, according to Clarke, and considering all the obstacles in the way, is pretty good going at up to 3.5 metres deep. [WNZ](#)