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Moa Point – a lesson in digital learnings

Some infrastructure projects are so critical to the health and well-being of the local community, that they cannot wait including one of the largest diameter wastewater rehabilitation projects ever seen here. Story written and supplied by Interflow.

Located under the coastal streets of Moa Point is one of Wellington's most critical sewer pipelines that manages wastewater for over 200,000 residents.

It was discovered that the pipeline had been compromised by severe corrosion and was at risk of collapsing. The corrosion had reached, and in places penetrated, the steel reinforcement of the pipeline, posing a health threat.

Wellington Water publicly tendered the works seeking an innovative yet cost-effective solution that would minimise disruption to local residents.

The project was awarded to water infrastructure specialist, Interflow and the Moa Point wastewater rehabilitation project would become the largest diameter sewer pipeline renewal project to take place in this country.

Compromised by pandemic

The contract was awarded in late February to reline 260 metres of Wellington's main sewer and work started in April when work crews had to adapt to the L4 lockdown.

With New Zealand's lockdown regulations among some of the strictest in the world, Interflow's project engineer, Saadia Ali, describes some of the challenges the crews had to overcome to keep the project on schedule.

"The expectation that colleagues from Australia would fly out and provide support was no longer a reality and required us to employ some unconventional approaches," she says.

Interflow's New Zealand crew had been expecting assistance from their Australian counterparts through training from experienced Rotaloc staff. Once travel restrictions were put in place by both the Australian and New Zealand governments, in a business first, Interflow's crews turned to virtual channels to bridge the training gap.

Tenacity and determination shine

"The solution was a remote Rotaloc training session held via video link to bring our team up to speed on the patented technology's application and operations."

The Rotaloc installation of a new liner into the pipe provides a durable, long-term solution that will protect Wellington's wastewater Interceptor from corrosion and support the needs of the community for at least another 50 years.

"Our team worked extremely hard to overcome the challenges faced due to the pandemic. We were working away from our families in an 'Interflow bubble' and had to rethink the way we collaborated with our customers, contractors, and the broader community," says Saadia.

The works have now been completed thanks to virtual training and collaboration that took place during this project, a method that is now incorporated into the company's New Zealand team.

Pandemic sludge pipeline rescue

Stantec was involved in the story of the Mt Albert sludge pipeline repair in Wellington during the pandemic. Article supplied by the Stantec Wellington team.

Back in mid-January two pipelines that take wastewater treatment sludge from Moa Point Treatment Plant to the Wellington City Council's Southern Landfill burst.

Wellington Water put CCTV through the pipes located in the base of the Mt Albert wastewater tunnel on 28 January to understand the extent of the fault and find solutions for a long-term repair. The faults were located at approximately 170 and 230 metres from the Adelaide Road chamber, one of two entries to the tunnel.

The bursts happened only a matter of weeks after a wastewater tunnel collapsed underneath Willis and Dixon streets in central Wellington on 20 December 2019. As in that case, the first priority was to minimise the risk of public and environmental harm.

An urgent fix was required to prevent sludge outflow entering the Cook Strait. A trucking operation was used to convey sludge from the plant to the landfill and, at 120 trips daily, the 'turd taxis' as local residents came to call them were the most significant cost at close to \$100,000 a day which included personnel, pump hire and varied other costs.

Plus, carrying over a million litres of sludge a day and working on a 24-hour rotation, the trucks' constant noise and smell was a real disruption for residents on Wellington's South Coast, along with the ongoing safety and environmental risks of trucking waste.

Fortunately, quick work from the team made up of Wellington Water, consulting engineer Stantec, and contractors Brian Perry Civil and Hadlee & Brunton meant no wastewater or sludge was discharged to the environment as a result of the pipe failure, and the risks associated with the trucking operation.

As time ticked on and the trucking costs increased day by day the team worked around the clock to get the pipelines operational again.

The repair posed a major technical challenge because the bursts occurred deep beneath Mt Albert in a live wastewater tunnel, therefore it wasn't practical to excavate the pipes. The safest option, and most likely to be successful to reinstate the pipework, was to use specialised liners – a circular polyester weave extruded with thermoplastic polyethylene which didn't require curing in place.

Manufactured by German company AMEX Sanivar, the liners and their installation team had to fly to Wellington at a most inconvenient time: during the global pandemic and our Level Four Lockdown.

"Wellington Water pulled out all the stops to get AMEX down to New Zealand," explains Project Manager Josh Wright from Stantec.

"They worked closely with the Council and Government to secure special permission for the group of five German experts to

come and help us fix this network.

"We had the liners delivered separately. Waiting for both to turn up at the same time would have resulted in a three-week delay for sludge pipeline operation, created construction sequencing challenges, and increased sludge trucking costs."

The first liner arrived in Wellington on 3 May and was joined by the German installers who had been in a two-week quarantine in Auckland.

The Wellington team together with the lining experts completed a patch repair and installation of approximately 1.8 kilometres of liner between 6 and 9 May in the first of the two sludge pipeline repairs.

The patch was remotely installed 170 metres into the pipeline to stop infiltration and to cover any sharp edges, protecting the liner during installation and operation. The liner was then folded, taped and pulled through the existing pipeline with a winch and inflated to break the tape.

By 23 May, the first pipeline was handed over to the operator and the sludge trucks could be taken off the road.

In case of a delay on both liners Stantec had a 'Plan B'. This involved patching the bursts, which had to be done anyway, then pumping the sludge from Moa Point to Berhampore through the existing 5.5 kilometre section of pipeline to a set of temporary pumps that would be installed at Berhampore Golf Course.

From there the sludge would be pumped to the dewatering plant at the Southern Landfill until the arrival and installation of the liners.

Although this would have been an additional cost, Plan B endeavoured to reduce the trucking costs by getting them off the road at the same time as the original plan. If Plan B had been operational for three weeks before lining it was expected to cost around \$1.1 million (setup and operation), however, that would have saved \$2.1 million in trucking costs and thereby a net saving of \$1 million over a three-week period.

Should the delays have extended beyond those hypothetical three weeks, the operational costs for the pump were 30 percent of the trucking costs, so further savings would have been realised.

The second liner arrived on 20 May into Wellington and the second pipeline is expected to be operational in July following the construction of additional chambers outside the tunnel.

Further project requirements include repairs to the base of the tunnel. This will involve person entry and requires a significant amount of planning and risk mitigation before the repairs can be carried out.

A video about the pipeline repair can be found on the Wellington Water website.