## The KRED Pipe Jack

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The Kennedy Road Embankment Dam Project (KRED) is one of a suite of stormwater projects which will effectively and sustainably manage stormwater in the catchment of the Nanako Stream, Pyes Pa West – specifically in the area that extends from Kennedy Road to Freeburn Road. The objective of these projects is to limit the potential impacts of flows from existing and future development around the Nanako Stream, and on other land and properties in the catchment.

An overview of the catchment is noted below:



The KRED project included the installation of a 2.5m culvert. Tauranga City Council (TCC) opted to use pipe jack/thrust technology in lieu of open cut. The trenchless option allowed the works to be completed quicker, facilitating faster delivery of much needed housing for the city, as well as enabling TCC to keep Kennedy Road open and operational during the works, and not require reconstruction of the road.

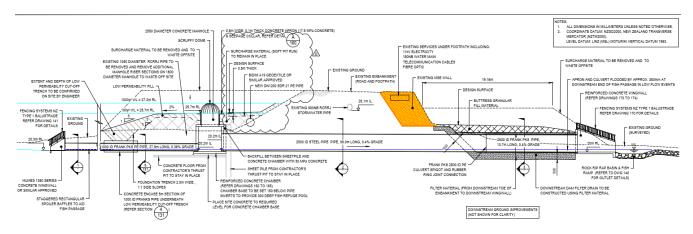
TCC opted for an Early Contractor Involvement (ECI) procurement approach due to the construction complexities and risks. In October 2020, we awarded the contract to MAP Project Ltd (with United Tunneling undertaking the trenchless works). In December 2020 works commenced onsite and in June 2021 the jacking works began. The jacking works were completed in September 2021. It is worth noting that works continued during the August 2021 COVID-19 lockdown due to the risk of the pipe becoming stuck halfway

through the embankment. Practical completion of the dam/overall project was granted in March 2022.

Prior to commencing onsite, we had numerous risk workshops, performed various exploratory geotechnical investigations, and developed various back-up plans (and 'what if' scenarios) in the event the jacking failed.

The material used for the pipe jack was 32mm thick steel. The steel arrived from Australia in May 2021 and came in 11x 32mm sheets that were 3m x 9m). These sheets were rolled in Petone in June 2021 (by Acme Engineering) using submerged arch welding. While the pipe was getting rolled the jacking pits were being setup. The upstream/jacking pit was 12m x 6m and the downstream/receiving pit was 4m x 4m. In July 2021, prior to commencing the jacking we dilled (using micro-tunning equipment) a pilot shot and rod that would steer the larger pipe during the jacking operation. The steel pipe arrived onsite in July and the pipe jacking commenced. We jacked over 36m of pipe. The pipe was 32mm thick and 2.5m in diameter and was jacked in 6m section. After each 6-metre jack, we welded each new section (using confined space procedures) and cleared out and removed the material from inside the pipe. This material was removed via a smaller pipe (600mm) within the larger pipe which draws back the material via a rotary setup and into the skips on the side.

Long-section of pipe through the dam below:



The project was a collaborative and innovative approach to the traditional means of construction. The project was a success and was delivered under budget. It also limited disruption to the residents and allowed for the road to be operational during the works.