CASE STUDY

VOID FILLING OF ANNULUS FOR NEWLY RELINED STORMWATER PIPE CULVERT

Site Profile

Wilmot Pipelining ("Wilmot") transforms ageing pipelines and infrastructure using experience and expertise transforming failing pipelines and assets using NO-DIG Trenchless Pipe Relining Technology. As part of this service, Wilmot conducts rehabilitation of pipelines of all sizes and, with most liners able to be installed within a single day, enables the assets to be back up and running quickly with minimal disturbance to the public.

Recently, Wilmot were engaged to reline a 250m long, 1.8m diameter culvert near Maitland NSW as part of the Hunter Valley Flood Mitigation Scheme maintenance program. Excitingly, this project would include the largest UV cured-in-place pipe liner ever installed in Australia.

Figure 1. One of the Access Points for the Relined Pipe

The Situation

Due to some heavy floods experienced in the area recently, the existing corrugated iron culvert had been damaged and collapsed, leaving a dangerous sinkhole which threatened the stability of the overlying sealed road (which was now closed off for safety of the public). Subsequently, the commencement of this project was fast-tracked, and Wilmot investigated opportunities to reduce their overall project duration through innovations and other technology.

Figure 2. Internal Resin Injection Through New Pipe Lining

One of the potential time-saving opportunities identified by Wilmot was to use expanding Polyurethane Resin instead of traditional cementitious grout to fill the annulus between the new fibreglass liner and the existing 'host' pipe.

Having had previous experience with Resinject, Wilmot contacted our Business Development team who, understanding the urgency and time-critical nature of the project, were able to inspect the site and promptly determine a suitable Resin Injection void-filling solution for Wilmot.

Our Solution

Resinject proposed injecting Resin from inside the stormwater pipe via a pattern of small, upward

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direction drill holes through the new liner, which would be backfilled and sealed post-injection.

Due to the length of the pipe, Resinject proposed accessing the stormwater pipe via three points: one at each end of the culvert and one near the middle of the culvert. This positioning would be the most optimum for Resinject to achieve the nominated productivity and ensure the entire length of the pipe annulus void was sufficiently filled with Resin.

The Resin used for this void filling would not only provide a watertight and flexible membrane around the new fibreglass liner but would also save considerable time in the construction program since it was estimated to only require a total of five days to complete.

Figure 3. Working in Confined Spaces

Wilmot accepted Resinject's proposal, and the treatment was scheduled in for immediately after the liner was installed.

The Results

Resinject's treatment included a pattern of over 600 injection holes drilled at 1.2m spacings throughout the top half of the pipe liner. The injected Resin migrated around the full circle of the annulus and the remnant drill holes were backfilled with flexible sealant. The void filling works were successfully completed within four days which also enabled Wilmot to save another day in their construction program.

Figure 4. Annulus Filling Completed

Wilmot were delighted with the results and the efficiency of the service delivery. Furthermore, avoiding the use of cementitious grout in this instance saved on labour time and environmental impact with the considerable clean-up usually required after void filling works.

Acknowledgements

Resinject would like to thank the Wilmot team for the opportunity to demonstrate our time and cost-effective, sustainable solutions and for their permission to publish this case study.