

Specialty Coatings Refurbish Drinking Water Reservoir in Far North Queensland

PROJECT PROFILE

Q15W053

mainmark



INDUSTRY

Infrastructure - Water utility

STRUCTURE

Above ground reservoir

PROBLEM

Degradation of concrete

LOCATION

Far North Queensland

DURATION / YEAR

Stage 1: June - Sept 2016

Stage 2: June - Sept 2017

TECHNOLOGY

Polyurea

BUSINESS UNIT

Mainmark Australia

Summary

An inspection of the external and internal surfaces of an above ground drinking water reservoir in Far North Queensland, identified efflorescence on the grout around the tension anchors, at roof and wall joints, along several minor cracks, and on mortar joints.

It was determined that not all of these elements indicated active leaks in the reservoir, and no significant carbonation was found. However, it was established that replacement of the interior and exterior coatings was needed to prevent further degradation of the concrete and ensure the asset was preserved for the longer term.

The reservoir, commissioned in 1991, features concrete walls, a concrete base and flat concrete roof, and is approximately 34m in diameter and 6m high, with a storage capacity of 4.55 megalitres. The original construction details, relating to the application of internal coatings and the placement of the joint sealing systems, were not available.

Mainmark selected a specialty coating, a potable water approved pure polyurea system, as the superior solution for the interior of the reservoir, featuring strength and high elasticity to allow for movement at the joints of the tank.

Additionally, the external surfaces were to be recoated with a high grade graffiti proof epoxy coating system suitable for the surrounding environment.

The scale of the project, remote location and environmental conditions presented a number of challenges. However, Mainmark was able to successfully deliver an innovative refurbishment solution, completed in two stages, to significantly extend the service life of the critical asset.

Specialty Coatings Refurbish Drinking Water Reservoir in Far North Queensland continued

Objectives

The objectives were to remove and replace the existing internal and external tank coatings with products suitable for use in a drinking water facility, to deliver a long-term remediation solution for the reservoir.

The solution had to be delivered with minimal disruption to the operation of the water tank, which was in active use supplying the local community. Both the project length and expected reservoir out-of-service time had to be considered during the tender evaluation process.

Solution

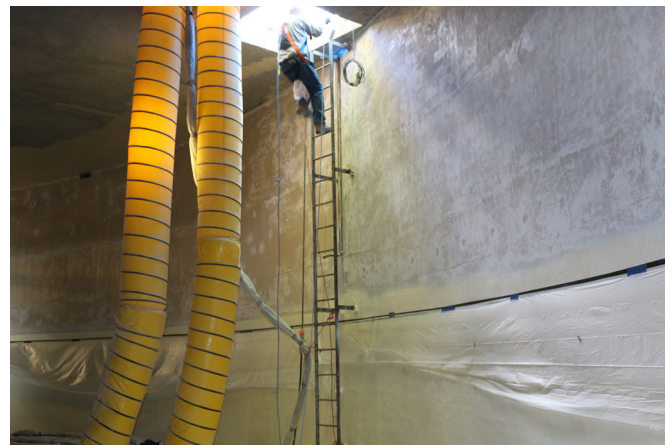
The original tender called for an epoxy coating system for the internal surfaces of the reservoir. Mainmark proposed the alternate pure polyurea product, which was better suited for this specific application. The selected coating features more than 400% elongation to allow for structural movement and cracks in the substrate, and offers high abrasion and corrosion resistance as well as exceptional adhesion, providing long-term protection of the asset.



Mainmark technician applying polyurea product on the wall of the water tank

Importantly, the chosen polyurea has a long and successful history of safely protecting the inside of many concrete and steel drinking water municipal reservoirs throughout Australia. When used in conjunction with an epoxy primer, the Australian made coating is certified safe for contact with drinking water to AS4020-2005.

As a first step, all previous coatings were removed and the concrete and steel surfaces cleaned and prepared for application. This process included the replacement of sealant within the floor joint, rebuilding of defective joint edges and removal of the access ladder, which was later replaced.



Mainmark technician climbing down the reservoir through restricted access

Mainmark sprayed a 3mm layer of the protective coating system onto the internal surfaces of the reservoir. The external surfaces were then finished with a high performance anti-graffiti epoxy coating system suitable for the conditions around the location.

Overall, the two specialty coatings have provided the asset with an extended 20+ years of service life, protecting against leaks, corrosion and wear.