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PROJECT SHEET

BILOELA RESERVOIR REMEDIATION

PROJECT SUMMARY

Client: Banana Shire Council

Location: Biloela

Duration: 4 Months (2017)

Project Value: $ 1 M

Major Challenges Overcome:

- Unforeseen defects
- Floor membrane and varying conditions
- Poor quality of the substrate

The Project

Banana Shire Council (BSC) engaged Epoxy Solutions to carry out the structural remediation and waterproofing of a 9Ml reservoir. The Biloela Reservoir has an aluminium roof that is supported by 69 reinforced concrete columns. The reservoir was constructed in 1967 and required rehabilitation work to maintain its structural integrity and durability.

An independent structural condition assessment completed in early 2017 identified defects that required remediation for long and short-term operation. The defects ranged from minor surface repairs to large grout pours and reinforcing replacement.

The initial scope proposed application of polyurea membrane to the columns and floor joints only. However, Epoxy Solutions was able to offer a value proposition of applying the membrane throughout the

BILOELA 9ML RESERVOIR

reservoir, which included the entire floor and wall surface. The client accepted the offer on condition that Epoxy Solutions completed the project within a specified timeframe. By increasing staffing resources and work hours, Epoxy Solutions was able to complete the works within the extremely limited time constraints.

Programme

The repair work commenced in late July 2017 and was completed by late November 2017. This date was critical to BSC for timely refilling of the reservoir. Although the scope of work almost doubled, Epoxy Solutions was able to address each challenge and still complete the remediation project on time.

Project Scope

The project comprised of the following work:

- Concrete repairs to: internal wall, columns, floor, jointing, buttresses and external wall
- Repair and re-filling of joints
- Protective coating to steelwork
- Anti-carbonation coating to the buttresses
- Minor steel work such as a new inlet, hand railing and new marine grade ventilators

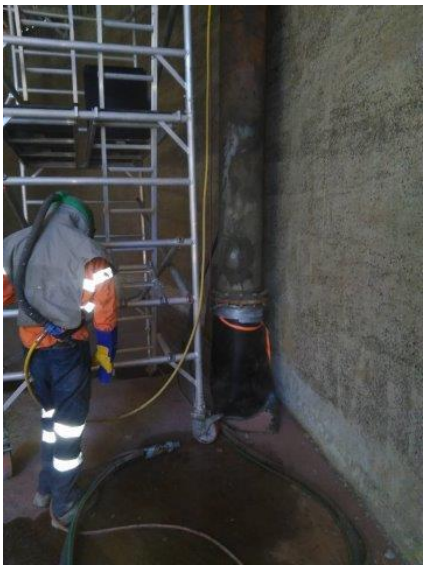
- A new polyurea membrane to the columns, wall, joints and floor
- Providing safe access

Completed Works

The following works were successfully carried out:

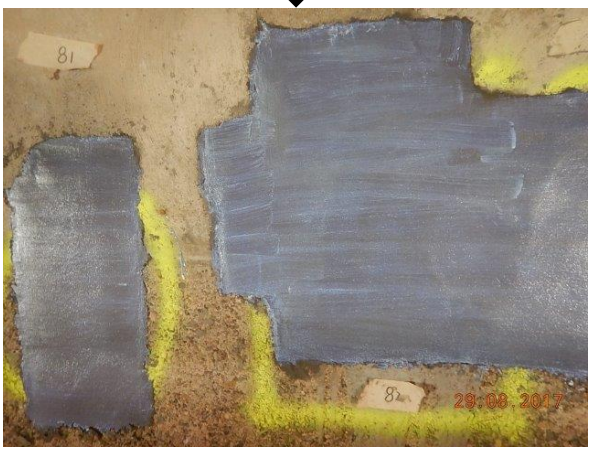
Overflow Pipe Coating

The overflow pipe was severely corroded and required a new epoxy coat of AS4020. The steel was first sandblasted and tested for salts, blast profile and whether it met the Class 2.5 Standard. It then received three coats of a high-solids epoxy and was sprayed with polyurea.



Wall concrete repairs

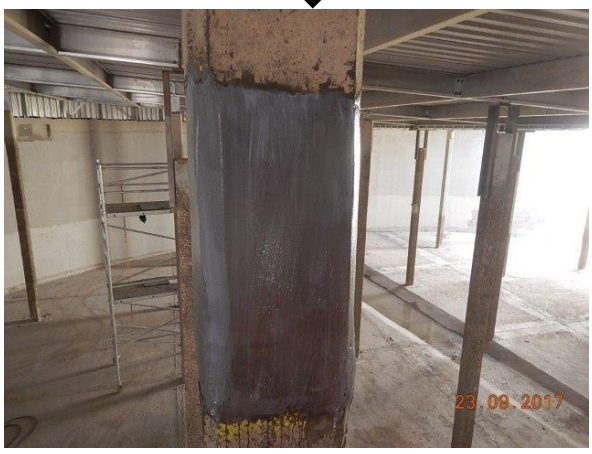
The defects were marked out, depth of steel determined, and the poor concrete removed. The steel was then coated with a zinc-rich coating and the defects repaired with a high strength cementitious compound. Where required, old reinforcing was replaced.



Column Concrete Repairs

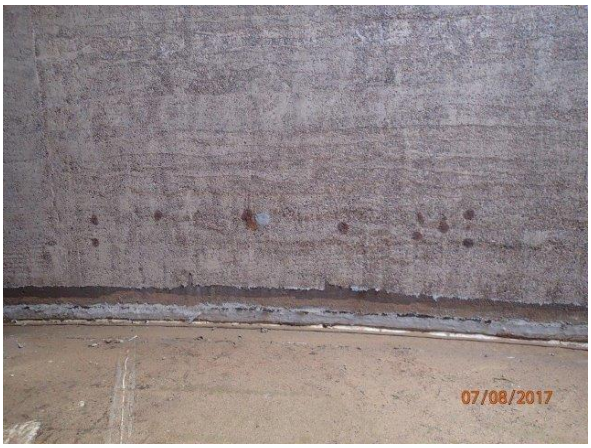
The majority of the 69 columns required repair. Many were in such a poor state that the repairs had to be staged to avoid complete failure.

As with the wall repairs, the location of the existing reinforcing was identified using a concrete scanner in order to reduce the risk of damaging any bars during the cutting. The poor concrete was then removed and repaired with a cementitious compound.



Wall Epoxy Rendering

A major challenge in applying the waterproofing membrane was the poor condition of the concrete surface. The water had etched into the concrete over time, exposing the aggregate and leaving an uneven surface. The surface was too rough to apply the membrane and needed to be levelled. Epoxy Solutions resolved this by using an AS4020 approved epoxy feathering coat, applied directly to the etched surface. This was later primed and coated with a polyurea membrane.



Floor Screeding

The floor proved to be challenging as it was etched, and also coated with a flexible waterproofing membrane that had failed in many locations. As grinding was tedious, Epoxy Solutions derived a system to remove the old membrane and remaining surface laitance. An epoxy screed was then applied to even out the surface to prepare it for the polyurea membrane.

Polyurea Coating to Floor, Joints, Walls and Columns

Once the faring coat was applied to the entire surface, a 2.5mm polyurea membrane was applied. Extensive testing ensured a watertight seal was achieved.

Photos: Polyurea membrane application and testing

Testing

Test panels were prepared for each section and each type of repair.

The following tests were completed:

- Visual inspections (all repairs)
- Soundness of repairs (cementitious high build mortars)
- Compressive strength testing (cementitious repair mortars)
- Adhesion testing (high build mortars, joint sealant and polyurea membrane)
- Continuity testing
- Environmental condition testing