PROJECT SHEET

WORLEY LANE RESERVOIR REMEDIATION

PROJECT SUMMARY

Client: Queensland Urban Utilities

Location: Worley Lane (R141)

Duration: 5 Months (2020)

Project Value: $ 1.1M

Challenges Overcome: Working within COVID Safe guidelines

The Project

The reservoir was constructed circa 1974 and is a 1.2ML circular, reinforced concrete reservoir with a steel sheeting roof supported by a timber structure. The reservoir is 18.3m in diameter and has a depth of 4.4m.

Dynaciv was engaged by Queensland Urban Utilities to carry out the roof replacement, new step ladder and structural rehabilitation works.

Project Scope

The project comprised of the following work:

- Design
- Demolition of existing steel and timber roof structure
- Internal hard clean
- Rehabilitation of existing expansion joints
- Concrete and crack repairs

WORLEY LANE RESERVOIR (1.2ML)

- Abrasive blast and epoxy coat overflow and inlet pipes
- New roof installation and waterproofing
- Vermin proofing
- Installation of perimeter roof handrail
- Remove existing staircase
- Install new staircase with security cover and working platform
- Install new flow meter
- Install new inlet pipe
- Rehabilitated actuator
- Designed switchboard and Energex connection
- Earthworks and new vehicle driveway
- Install concrete Apron (1m) around the reservoir
- New perimeter fencing
- Install new driveway, retaining walls and access to neighbour's property
- Clean and sterilise

Programme

The design commenced in February 2020. Works started in May and were completed by mid-September 2020. The reservoir was back online in October 2020.

Design

All rehabilitation work, including the steel work and foundations were designed and approved by a Queensland registered professional engineer.

Designs comprised of:

- New roof structure
- Switchboard programming
- New ducting and electrical works
- Switchboard software programming
- External step ladder
- Roof perimeter handrails
- Vermin proofing
- Concrete Repairs
- Coating requirements of internal overflow pipe
- Internal stainless-steel ladder
- Waterproof joints specification (Polyurea Bandage)

Completed Works

The following works were successfully carried out:

Roof Structure

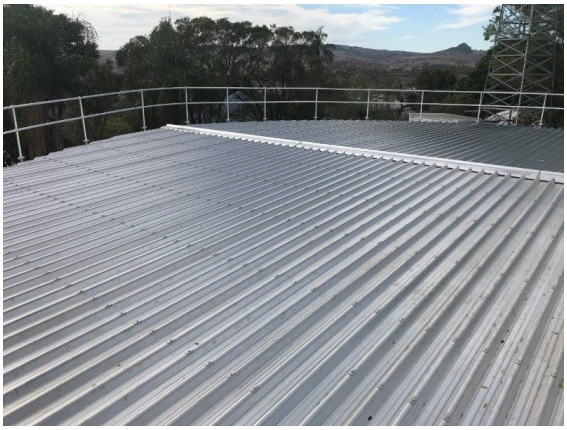
The steel and timber roof structure were removed and replaced with a new aluminium structure.

Steel and timber roof structure

New Aluminium Roof Structure

New Roof

The steel roof was replaced with an aluminium roof and a new perimeter handrail installed.



New Aluminium Roof and perimeter handrail

Earth Works and Ducting

New ducts and electrical pits were installed for the new electrical and comms cables.

Trenching for electrical ducts and service pits

Switchboard

A new switchboard was installed along with protective vehicle ram bollards. The software programming and electrical works were done by designated expert subcontractors.

New Switchboard

Stepladder

A new stepladder with landing platform was installed. This included an anti-climb security cover and a perimeter handrail around the landing platform.

New stepladder with anti-climb security

New roof platform, access hatch, probe cubicle and platform handrail

A roof platform and entry hatch were design and installed for safe access. FRP was used for the grating and the hatch and handrail form aluminium.

Roof platform and access hatch

Davit Arm

A new davit arm was installed and tested. It was rated to 125g SWL with fall arrest point to 15kN Max.

New load rated davit arm

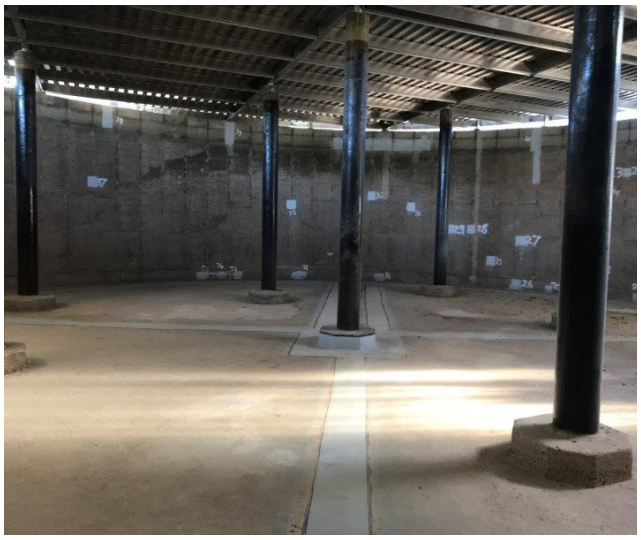
Concrete Repairs

The concrete walls had many defects where the reinforcing was corroding. Steel reinforcement was replaced in five separate repairs where the sectional area loss caused by the damage was more than 30%.

Steel reinforcement replacement

Expansion joint rehabilitation

The photo below shows the slab expansion joints that were cleaned, sealed, and sprayed with a 350mm wide polyurea bandage and concrete repairs on the reservoir internal walls



Expansion joint preparation

Overflow pipe coating, concrete apron and manhole cover

The overflow pipe required a new AS4020 coating. The previous coating was removed by sandblasting the pipe to achieve a defined surface profile and finish. The overflow pipe was coated with three epoxy coats.

A 1m-wide concrete apron was installed around the perimeter of the reservoir.

Newly coated overflow pipe and perimeter apron

A new concrete manhole frame and cover was installed over the outlet pit and a new aluminium frame and cover installed for the flow meter pit.

Manhole and flow meter covers

316 Stainless Steel ladder

A 316 stainless steel ladder was designed, fabricated, and installed at the access hatch.

Stainless Steel access ladder

Access road and perimeter fencing

New fence lines were installed, enlarging the property perimeter. The resulting increased reservoir parking area was resurfaced along with the existing access road, which was lengthened. A new driveway was constructed as an alternative access at No. 2 Worley Lane.

New access gate

Additional Work - Access to No. 2 Worley Lane

Increasing the parking and operational area in front of the reservoir the vehicle access to the property at No. 2 Worley had to be relocated. A new driveway was installed that required the following scope of works to be implemented:

- Earthworks and removal of soil for new driveway
- Removal of 3 trees
- Two new retaining walls (15m)
- Trenching and pipe for a new water connection to the water mains.
- Trenching and ducting for a new electrical connection.
- Relocation of electricity meter
- Removal of redundant electricity property pole
- Installation of new electricity property pole
- New Energex metre supply
- New security fencing
- New chip-seal access driveway