

Rototuna Reservoir

Securing water for the future



Introduction

- Hamilton's Population in 2017 was 160,000 and forecast to reach 236,500 by 2046.
- Waikato River divides the city with majority of residential on the eastern side and industrial on the western side
- Geographically 95% of the cities water storage is on the western side.

How we got here

- Rototuna Reservoir was:
 - Recommended in a 2002 water strategy report
 - Land purchased and designated 2002
 - Designed 2010 – expected build 2012
 - Deferred due to GFC
 - Design reviewed 2015
 - Construction began 2016

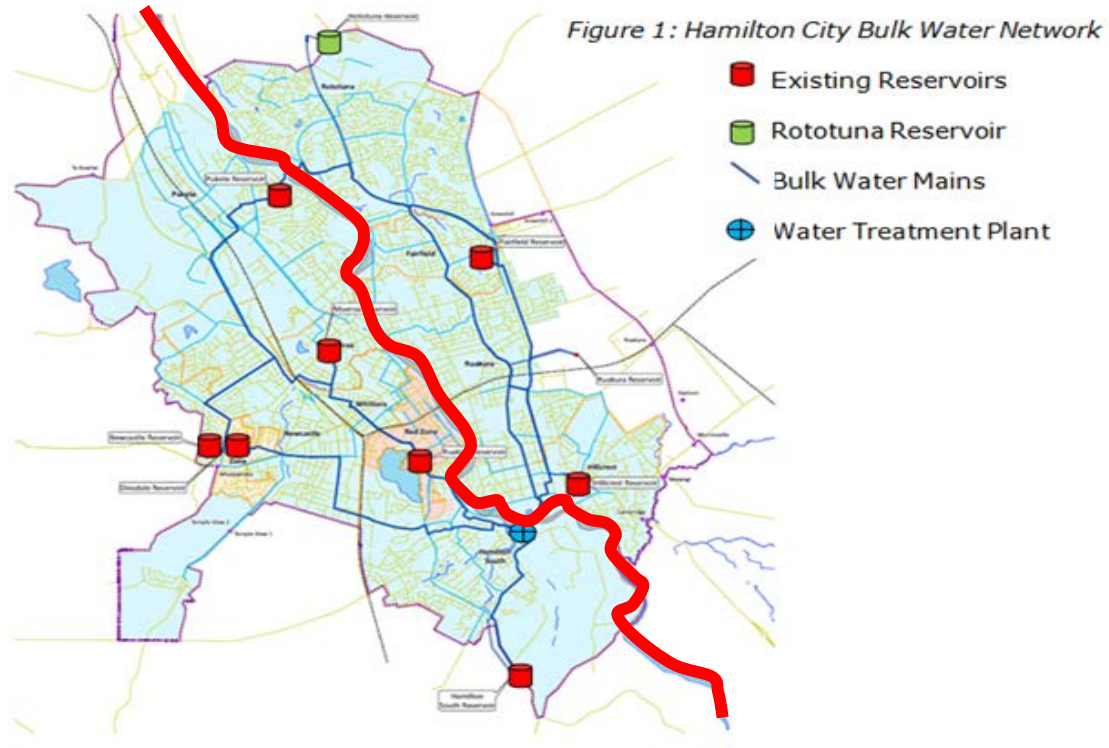
Current Operational Philosophy

- Water Treatment Plant supplied volume and pressure to the network
- Reservoirs only providing storage for emergency
- Vulnerable to power failure
- Relies on the Water Treatment Plant to absorb daily and seasonal pressure fluctuations

Network Challenges

- The Water Treatment Plant must;
 - Absorb fluctuations in demand
 - Push water 12km to the north
 - Supply elevated areas
 - Cater for increased population growth
 - Manage bias in east/west water demands
 - Manage peak demand periods over summer

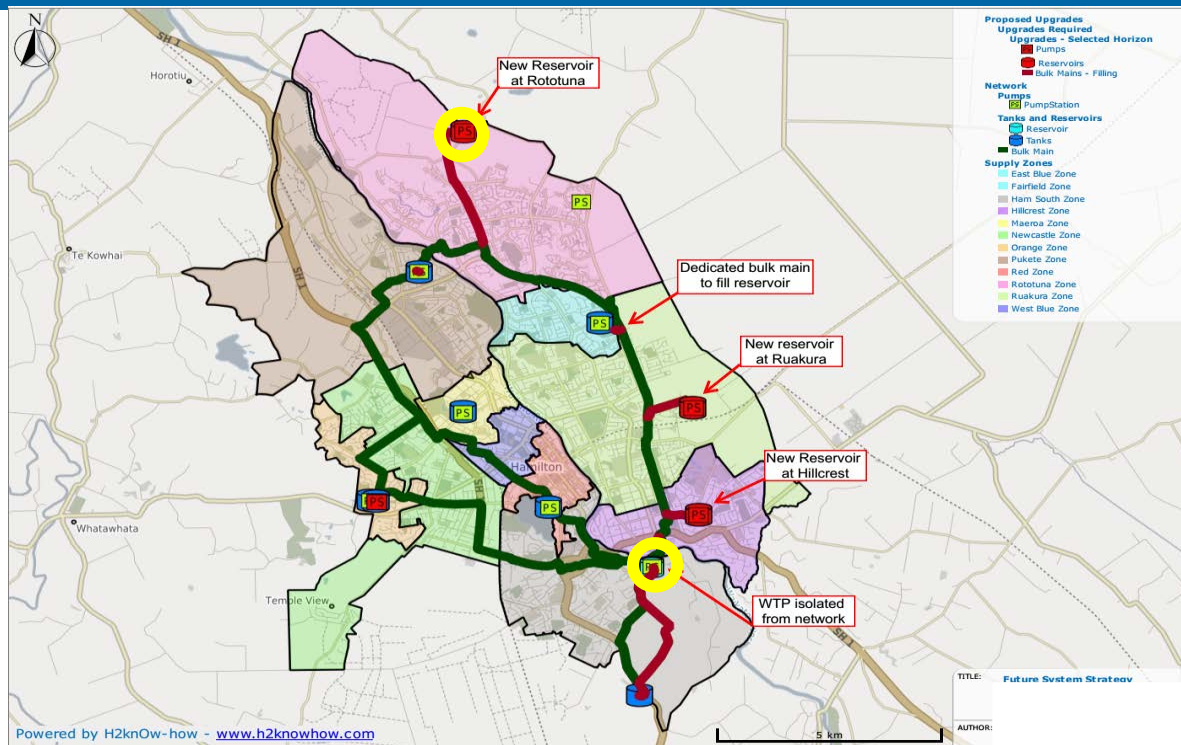
Bulk Water Network



Proposed Operational Philosophy

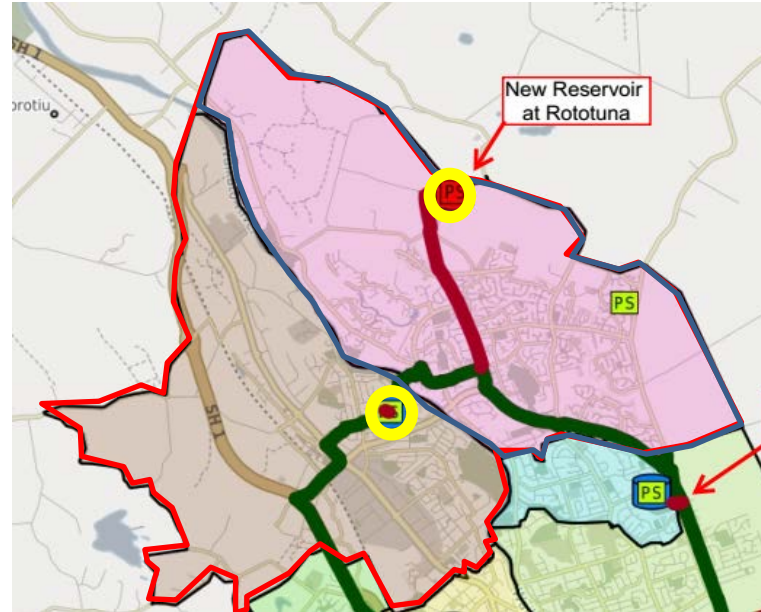
- Decouple the Water Treatment Plant (WTP) from the network
- Create Demand Management Areas (DMA's)
- Supply DMA's with dedicated reservoirs
- Reservoirs supplied by dedicated Bulk Water Mains
- Bulk Water Ringmains supplied by the WTP

Proposed pressure zones



Network Challenges in shifting Philosophy

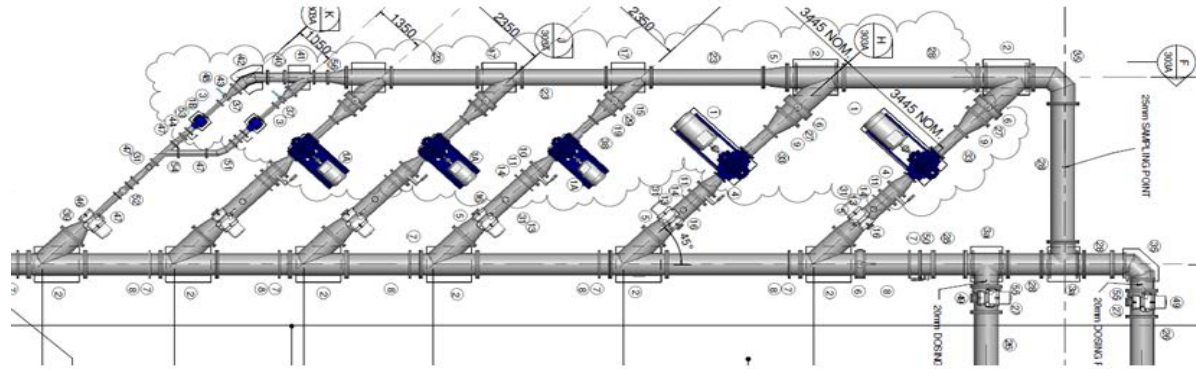
- DMA not yet in place results in;
 - Supply of open network
 - Filling of reservoir



Reservoir Challenges in shifting Philosophy

- Project deferral – time implications
 - Original intent
 - Inline with WTP shifted to Reservoir undertaking operational duties
 - Pump design from 101 l/s to 30-650l/s
 - Alteration to Designation requirements

Pump house upgrade



Reservoir Challenges in shifting Philosophy

- Health and Safety at Work 2015
 - Reviewed Safety in Design
 - Maintenance/access considerations

Construction Challenges resulting in wins

Geotechnical Challenges

- Differential Settlement
- Risk of Liquefaction
- Waikato Expressway

Mitigation

- Preloading or
- Pile foundation system

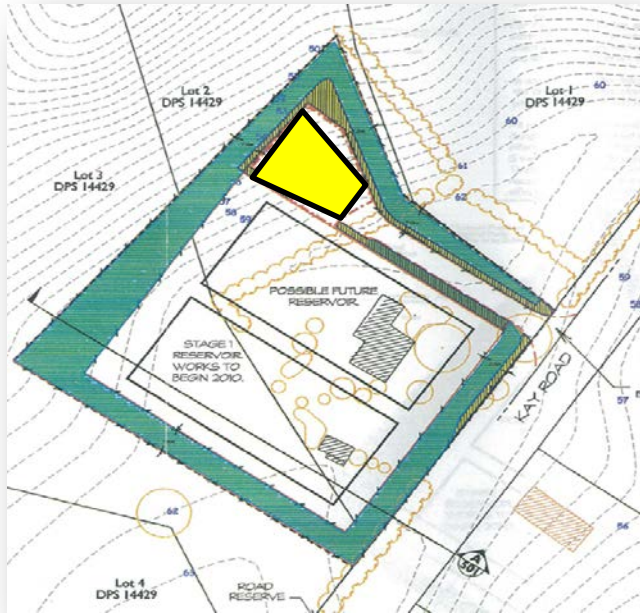
Value Engineering - preload



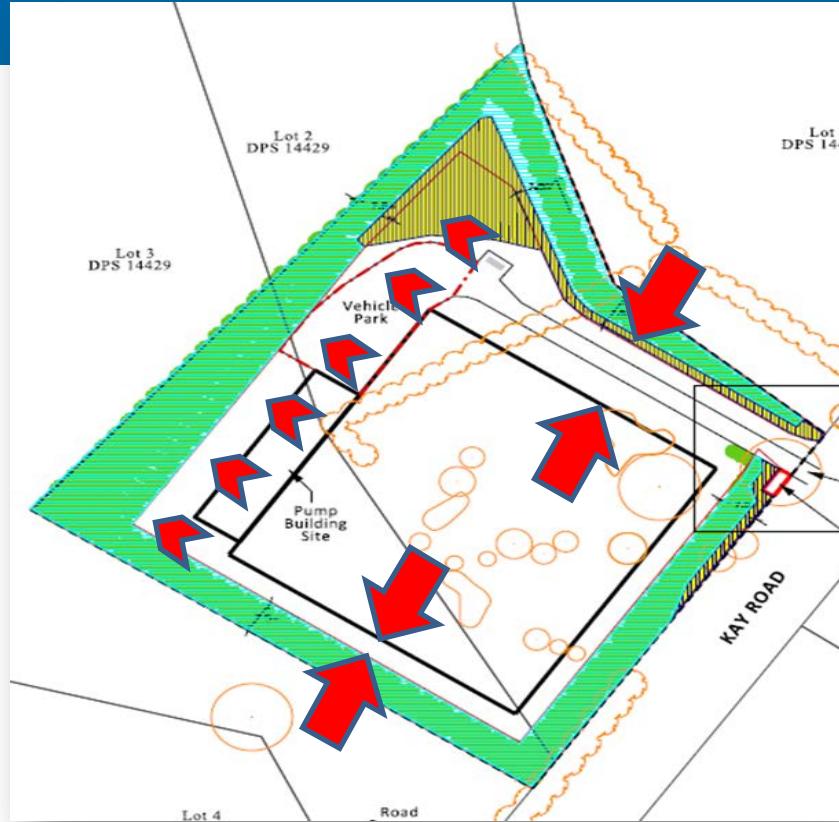
Designation Constraints

- Challenges
 - Designation 12 years ahead of civil works
 - Screen planting
 - Site Layout Plan
- Mitigation
 - Alteration to designation sought

Site Layout constraints



Site Layout constraints



Site Layout constraints



Site Layout constraints



Value Engineering – PT slab



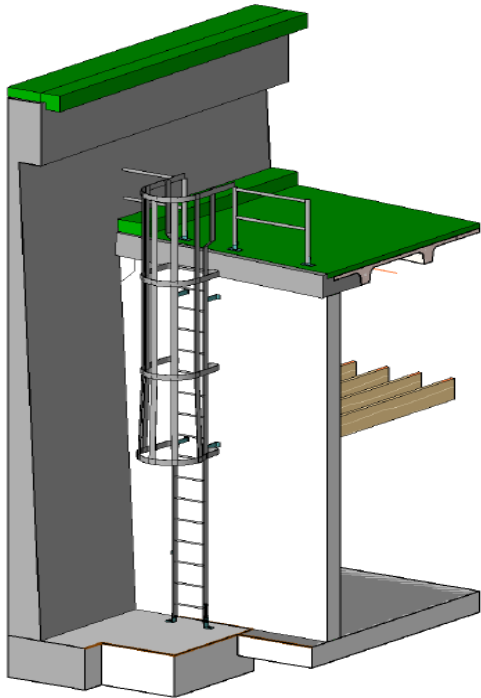
Value Engineering – Pre cast



Safety in Design



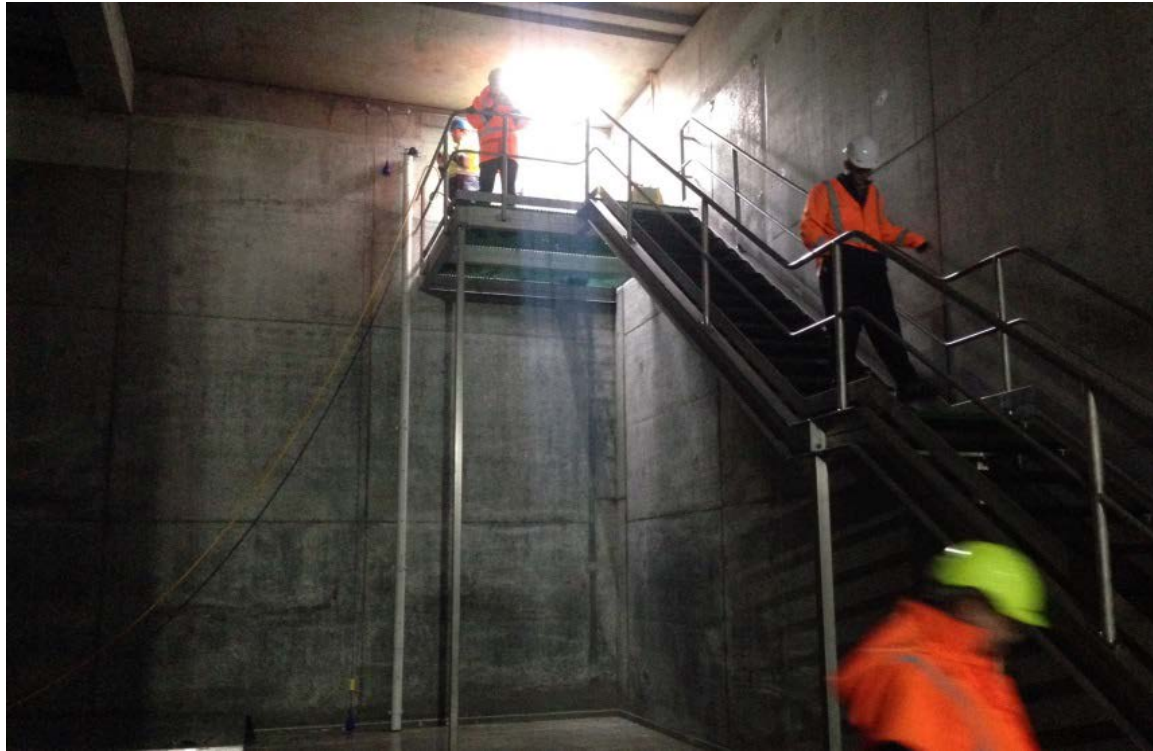
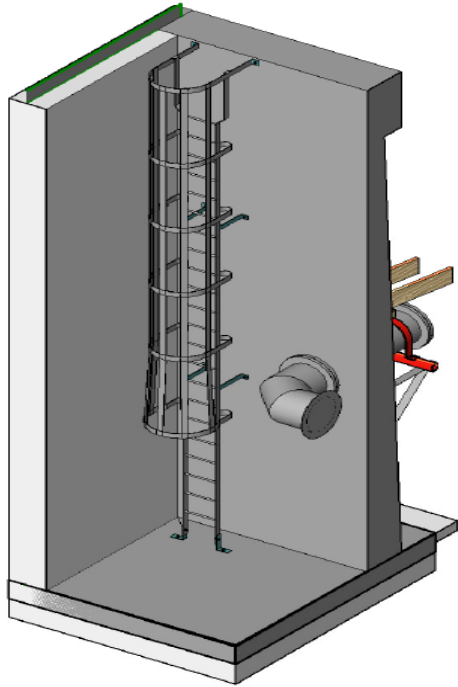
Safety in Design - access



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Safety in Design - access



Video

- Thanks to:



