Brentwood Rise Wetlands

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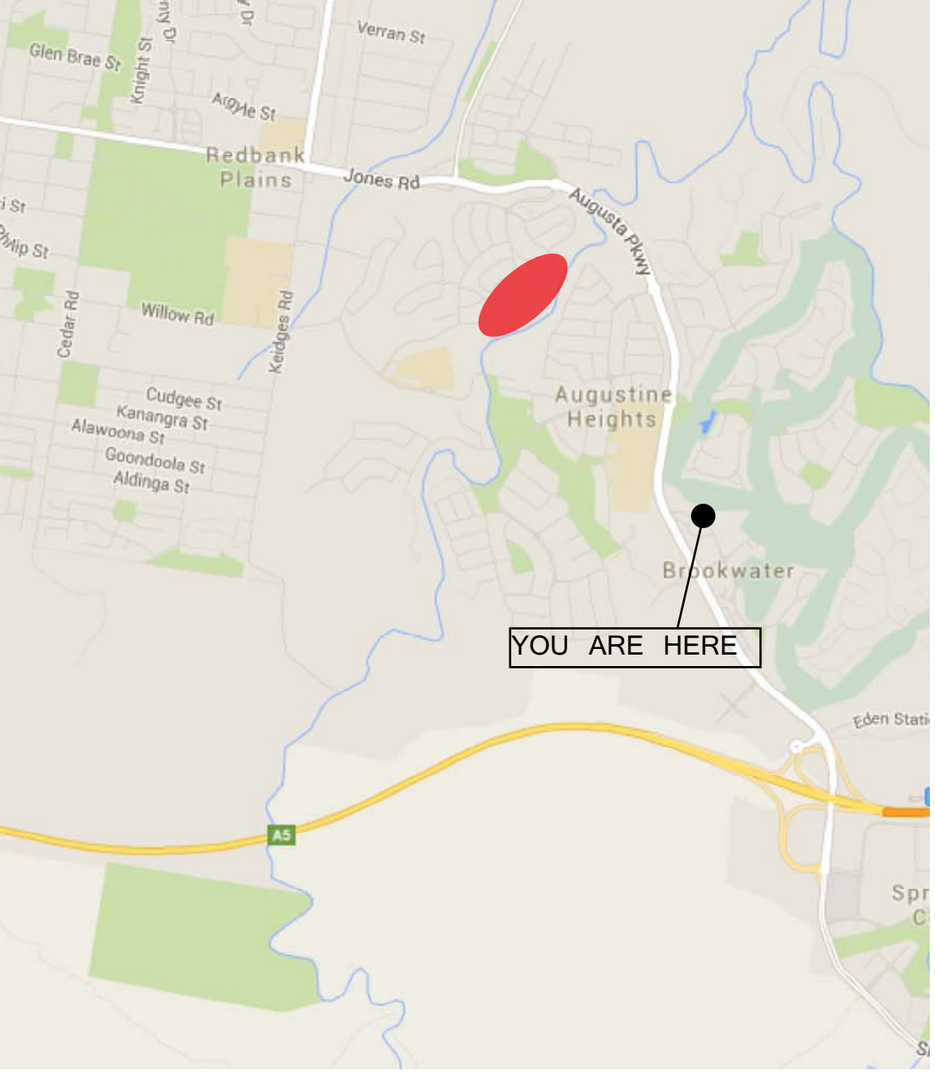
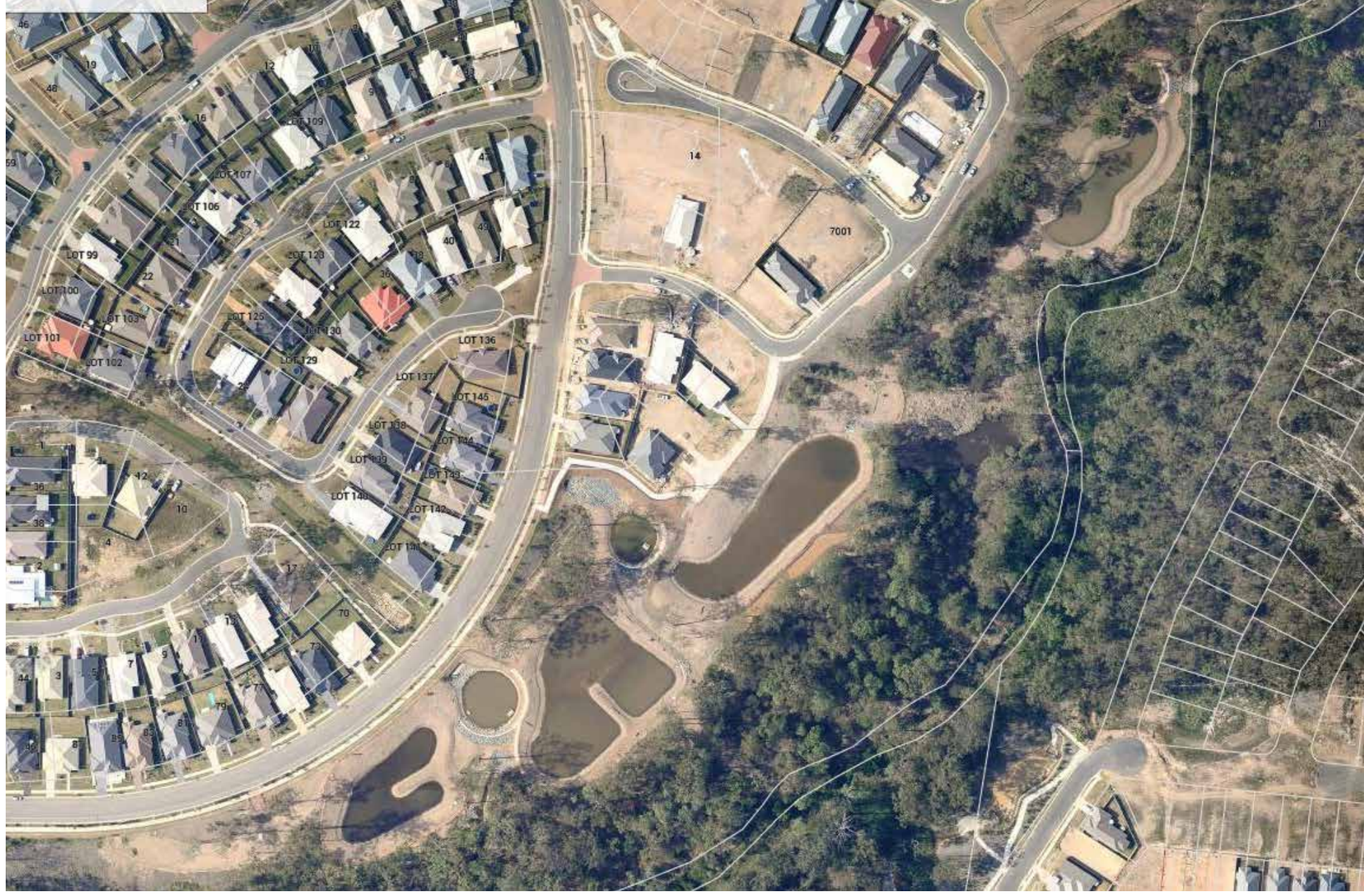
Images courtesy of AECOM, Jason Daley & Christoph Pester

Setting the Scene

A Landscape Architect and Scuba Diving Instructor with a passion for water.





Facts

- Location - Brentwood Rise
- Team: (Investa Land, AECOM, Hyder Consulting, Shadforth Civil, Eureka Landscapes & Australian Farm Forestry)
- Catchment (45.35ha)
- Treatment area (7620m2)
- Constructed 2011 over 6 months
- 24 month maintenance

Site Overview

- Sloping catchment (mostly residential)
- Woogaroo Creek and flood plain
- 3 SW treatment wetland systems

Challenges

- Initially bioretention systems were proposed for the development
- Sloping catchment
- Adapting to flooding regimes
- Minimising flood impacts
- Managing fragile and erosive soils
- Maintaining constant water levels with permeable sub soils
- Retention of significant habitat trees
- Drainage on flat sites
- Weed infestation in adjacent bushland areas

Innovation

Hydraulics

- low profile and minimal filling to minimise flooding impacts
- resilient to flooding
- overflow weir to allow flood water to slowly backwater
- Q1 detention to preserve the natural hydrology of Woogaroo Creek.

Innovation

Soils

- soil test indicated permeable soils
- GCL-liner placed
- rapid installation of the liner vs traditional clay liners
- soil ammendment - no need for imported topsoils
- batters and swale protection

Innovation

Environment

- tree survey to identify significant habitat trees for retention - Wetland E was split into 2 cells
- logs and stumps removed were placed a as habitat for wildlife.
- Plant species for the landscaped areas surrounding the wetland reflected RE's
- Woogaroo Creek Rehabilitation Plan - reduction of weeds.

Landscape Works

- detailed landscape design
- nursery inspection
- close site supervision
- managing of water levels

Achievements

Water Quality

- 23700 kg/year of sediment,
- 38 kg/year of phosphorus and
- 145 kg/year of nitrogen from stormwater runoff
- manage the hydrology of the local catchment by delaying the release of stormwater,

Environmental and Community

- retain the majority of the existing significant habitat trees.
- provision of additional aquatic and semi aquatic habitat
- rehabilitation of riparian corridor and adjacent bushland
- small park with a picnic shelter close proximity of the wetlands


2012


2015


2012
2015

2012

2015

2012

2015

2012

2015

Lessons learned

Planning/ Design

- conduct high level flood modelling if WL located in floodplain to check velocities
- inlet pit sizing and shape - sealing off during establishment easier if longer shaped pits
- surrounding revegetation should form a dense buffer to minimise input from weeds from adjacent areas, especially during flood inundation
- investigate opportunities for public education and viewing
- fencing does not have to be expensive pool fencing, temporary 2 years is ok until vegetation has grown and can then be removed (chain wire would do the job)
- macrophyte mixes are crucial to prevent any mass plant failure
- issue with waterbirds impacting on vegetation - can't control but it apperas that if mature or larger trees are close to the wetland body the open area is reduced and this seems to keep birds away

Construction

- aim for construction in dry winter months - flood plains are normally clay and will delay site access for days/ weeks after rain events
- ensure waterproofing is achieved, conduct pearmeability testing - line if required, GCL liner • install seepage collars around pipes at outlets (bentonite)
- ensure WbDF are completed and all hold points checked during construction

Maintenance

- establishment phase - managing waterlevels is critical (pumping)
- constant CA is critical to ensure weeds are managed and any issues resolved for successful establishment