The Edithvale Integrated Stormwater Solution

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154000 residents 13km beaches 1960's residential











Stormwater Management at Kingston









January 2016











Background





- Part of Carrum Carrum Swamp, drained in late 1800's
- Drains to RAMSAR Edithvale
 Wetland

Background





- Prone to extensive flooding in larger events
- Nuisance flooding in smaller events



City of KINGSTON

Background





- Aging infrastructure
- Flat grades and inadequate outlet conditions

Background

Centre Swamp Drain

- Flat grades
- Level constraints (AHD)
- Limited capacity
- Silt and maintenance
- Pumped system









Project flood extents







Design Considerations

Desired outcomes

- Improved level of service to residents
- Improved water quality through treatment of stormwater
- Water reuse for council objectives



Design Considerations

Specific constraints and concerns

- Environmental considerations
- Cultural Heritage
- Coastal Acid Sulfate Soils
- Limited space for construction
- Groundwater and saline conditions

Flood Mitigation Solution

- Detailed flood modelling
- Storage and surcharge approach
- Pump station for low flow





City of KINGSTON

Flood Mitigation

Key Features:

- Pipe network sized to store road flooding in minor event
- 1.6km of pipes up to 1500mm diameter
- 6m deep pump station
- Surcharge in events greater than 1:2yr up to 1800l/s
- Tideflex valves to prevent backflow







Flood Mitigation













Treatment and Reuse

Objectives:

- Remove gross pollutants
- Reduce suspended solids
- Treat nitrogen and phosphorus
- Provide alternative water source for council's needs







Treatment and Reuse

Main Features:

- 10m³ gross pollutant storage in storage sump
- In-line gross pollutant trap (GPT)
- 800m² elevated bioretention system
- 1200m³ on-site water storage



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Conclusion



- Feasible, cost-effective and sustainable stormwater harvesting
- Water quality component leveraged off of drainage upgrade
- Multiple benefits to a range of stakeholders
- Strengthened position on developer contribution towards treatment and reuse projects
- Benchmark for overcoming difficult conditions to achieve sustainable outcomes

Questions