



RED ZONE RENAISSANCE: ŌTĀKARO/AVON RIVER CORRIDOR REGENERATION

Learnings from the Waitaki Street Stormwater Project

Mark Penrice (Christchurch City Council)
Zoe Evans (GHD)



Proudly brought to you by Water New Zealand

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Agenda

- **Overview**
- **The OARC Regeneration Programme**
- **Waitaki Street stormwater upgrades**
- **Constructing in the red zone**
- **Lessons learned**
- **Questions**

An aerial photograph showing a large area of flooding in an urban or semi-urban setting. A wide river flows through the scene on the left. The surrounding land is mostly submerged in brownish water, with some trees and structures partially visible above the surface. In the background, there are residential areas and distant mountains under a clear sky. The text is overlaid in the center of the image.

Urbanised areas rarely return to their natural state once they are developed

Overview – Waitaki Street

- **Re-development of the red zone**
ŌARC regeneration programme
- **Stormwater Treatment**
Constructed treatment wetland
- **Flood protection**
Long-term stopbank
- **Tidal wetland**



OARC Regeneration Programme

History of the Avon River, Canterbury earthquakes and Residential Red Zone

OARC Historically Significant

2010 and 2011 Earthquakes

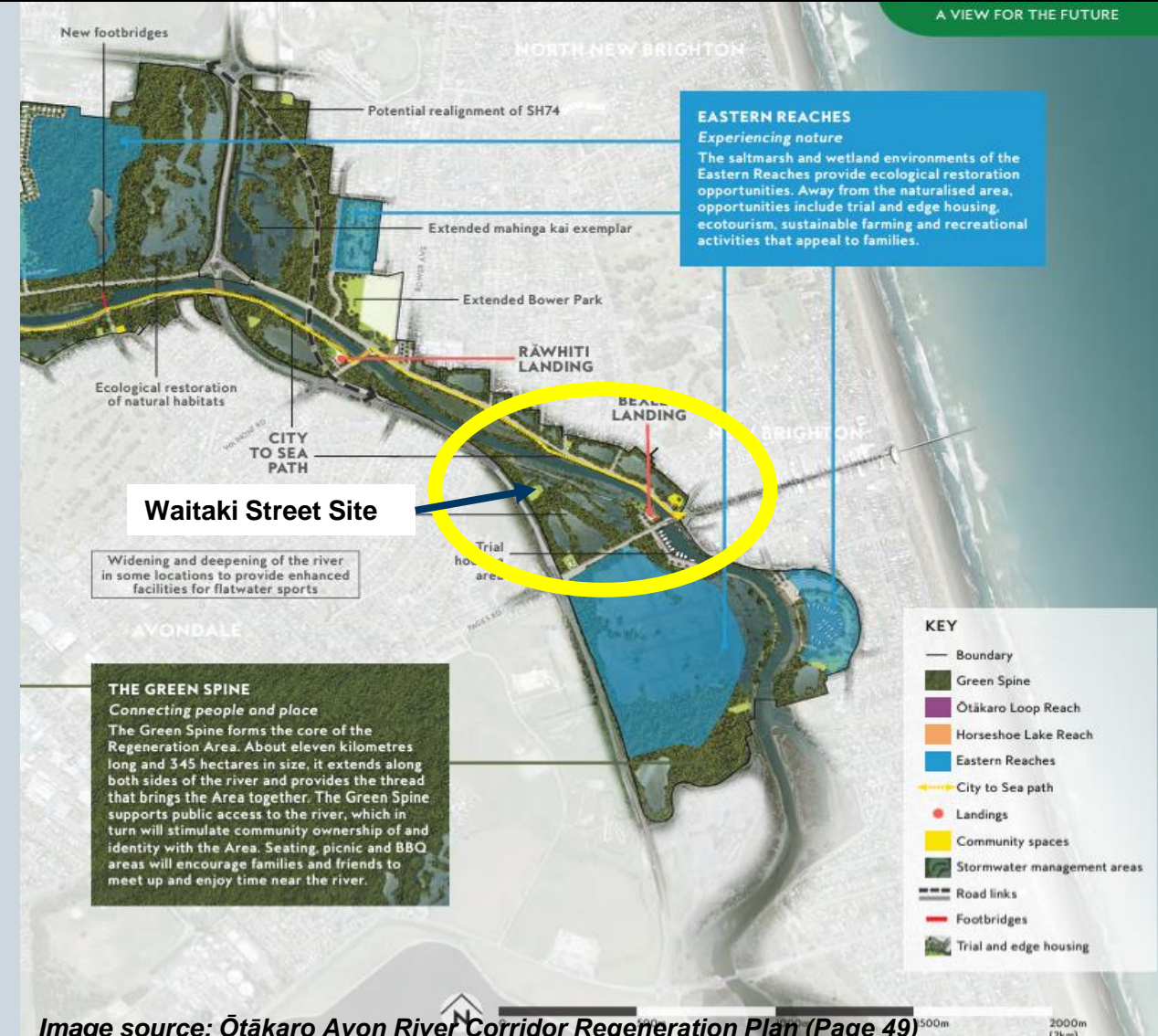
- Extensive damage and liquefaction

Residential Red Zone

- 602 Hectares
- ~5,500 properties

OARC Regeneration Plan

- Joint venture between CCC and the Crown
- Restoration and community-focused objectives





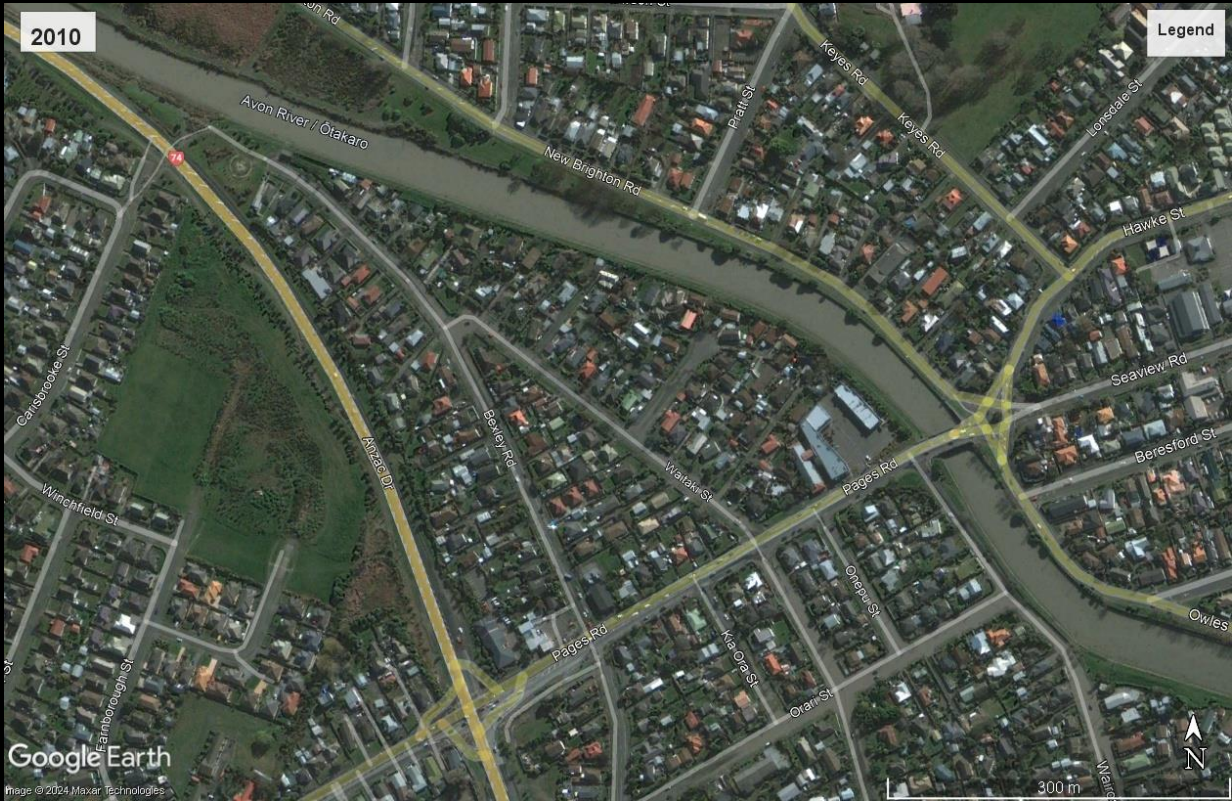
OARC Objectives

- Restore habitat
- Safe and healthy communities
- Recreation
- Attractive destination
- Research and learning
- Adaptability

CCC River Catchment Vision and 6 Values

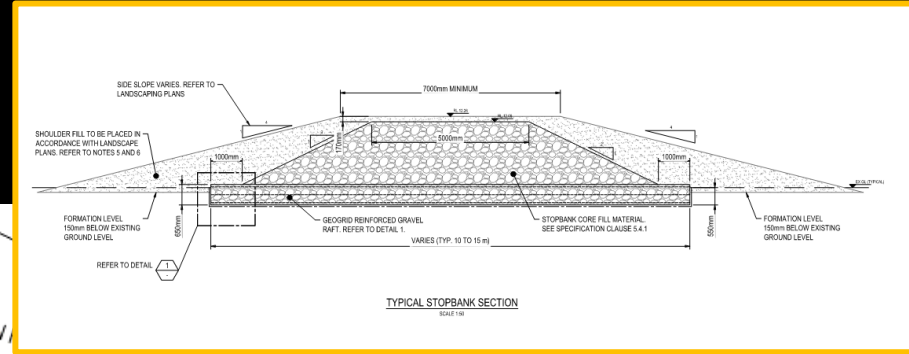
- Ecology
- Drainage
- Culture
- Heritage
- Landscape
- Recreation





Design of Waitaki Street

Resilience

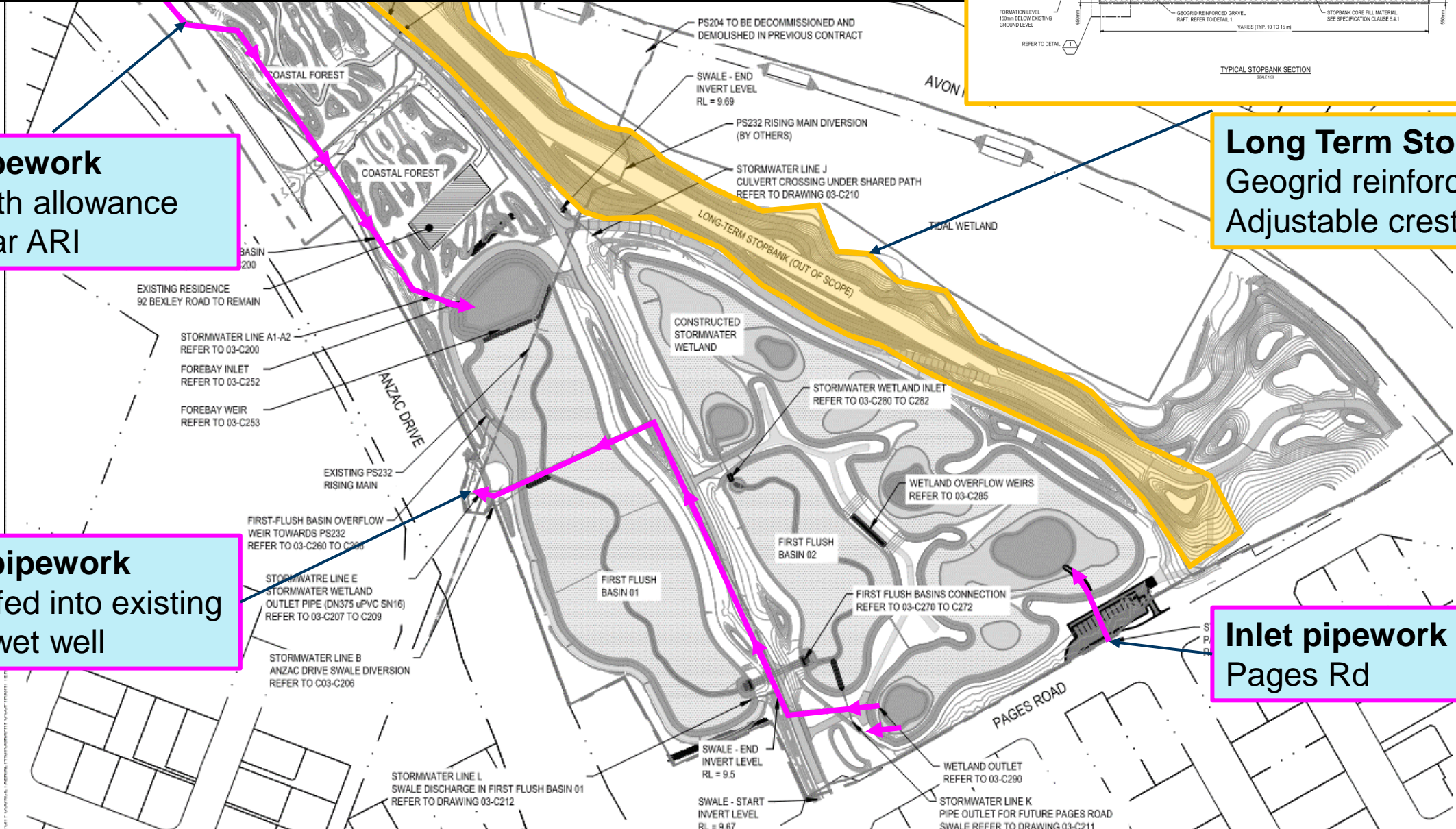


Inlet pipework
WQF with allowance
for 5 year ARI

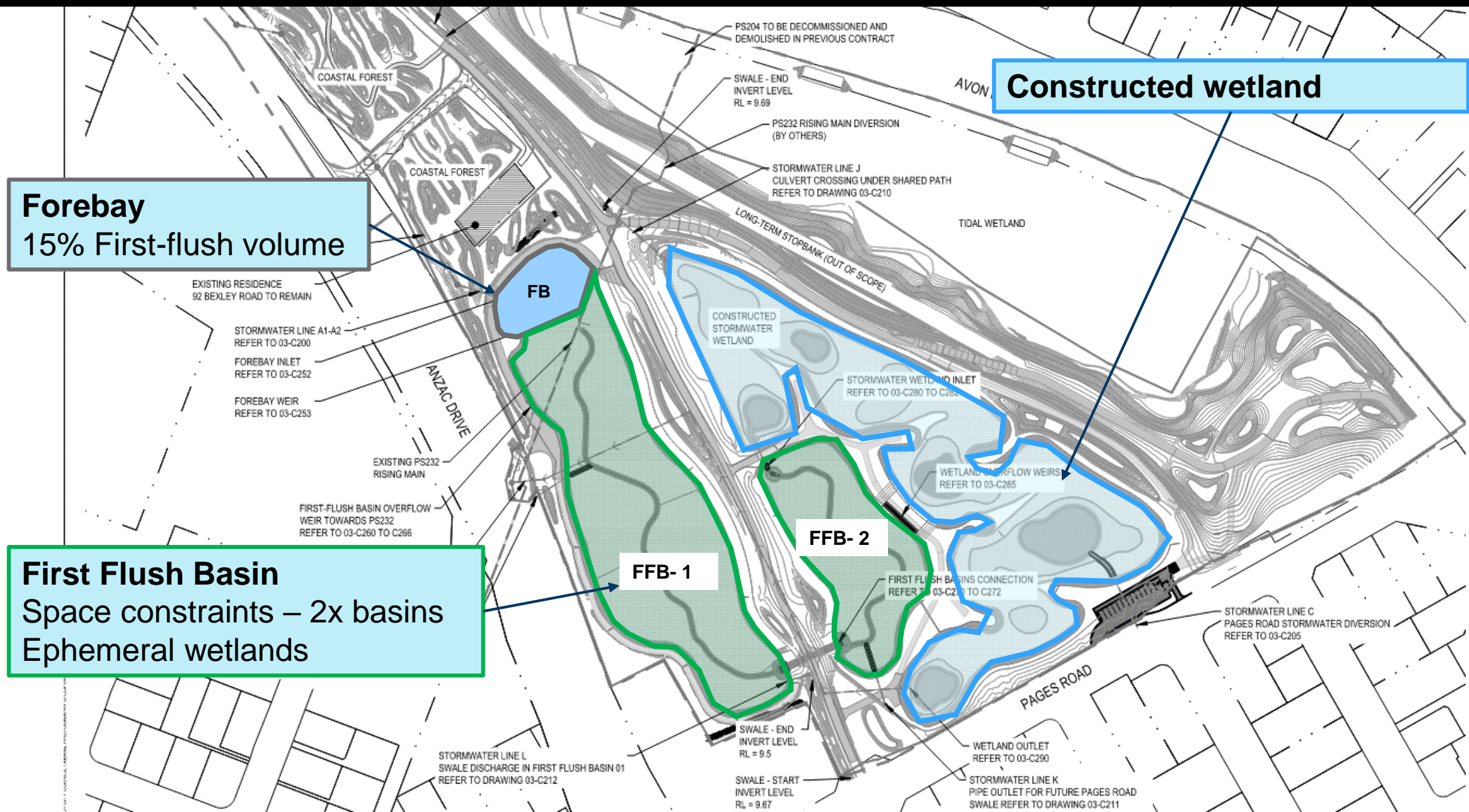
Long Term Stopbank
Geogrid reinforced raft
Adjustable crest height

Outlet pipework
Gravity fed into existing
PS232 wet well

Inlet pipework
Pages Rd



Stormwater Treatment



Forebay
15% First-flush volume

First Flush Basin
Space constraints – 2x basins
Ephemeral wetlands

Constructed wetland

Habitat Restoration and Recreational

Tidal wetland

Roosting islands, sand piper pools, salt meadow, salt marsh

Bird viewing area and coastal forest

Re-use of contaminated land

City to sea pathway



Constructing in the Red Zone





Soft, wet ground conditions

CSS bearing capacity of 50kPa unable to be met along most pipe lengths

Nesting birds

Bird habitat already established



Working in an area previously urbanised



Buried Treasure

- Evidence of memories shared before us
- Archaeological standover

Contaminated Land

- Only 2000m³ suitable for re-use on stopbank
- Design allowed for some storage
- Further cause for delays due to PPE, protocols etc



Dewatering and Flooding

Biggest cause for delays
Combined delay of 85 days

Dewatering

Difficult for stopbank – trial and error
Consenting limitations – 100 mg/l

Flooding

Site and access road
Wastewater contamination





Existing Live Services

- Unmarked 11kV cables on Mitcham Place
- Poorly capped drainage pipelines (flooding)
- Live watermains
- Service detection difficult

**“Abandoned” infrastructure
not properly abandoned**



Lessons Learned



Thank you!
Questions? Patai?





Thank you