



Working with what we have
**Resilience for
the Future**

Whakamahinga ki ngā mea kei a tātou:
He manawaroa mō ngā rā anamata
Transportation Conference 2026

8 – 11 March 2026
Tākina Convention Centre
Te Whanganui-a-Tara Wellington

Can Nature-based Solutions Hold Our Slopes?

Developing a trial on the Auckland Motorway
Network

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Group Ltd

RESOLVE
GROUP



Landcare Research
Manaaki Whenua



What's the problem?

- › Landslips are disrupting the state highway network more often
- › Climate instability has increased the frequency and severity of weather events, resulting in less stable highway side slopes and increasing the likelihood of slips:
 - In 2023, we had a 200-year storm, followed by a 100-year storm two weeks later
 - Higher rainfall intensity and atmospheric river events
- › We could get to the stage where transport authorities cannot afford to repair slips by conventional engineering practices, we need to try something cheaper
- › Road networks are more congested; the cost of journey disruption is increasing
- › We need to find a solution to reduce the likelihood of slips, but in a cost-effective way

About the Crown Resilience Programme

- › Established in response to the 2023 severe weather events (Auckland Anniversary floods and Cyclone Gabrielle)
- › \$419 million, seven-year programme focused on proactive resilience improvements
- › Aims to reduce the impact of severe weather on state highways and local roads
- › Seeking to keep communities connected



What are Nature-based Solutions?



Protect



Manage



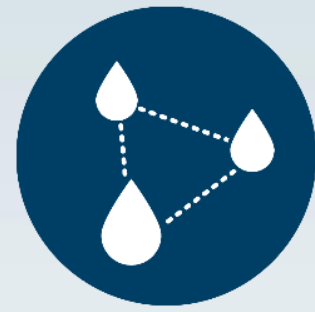
Restore



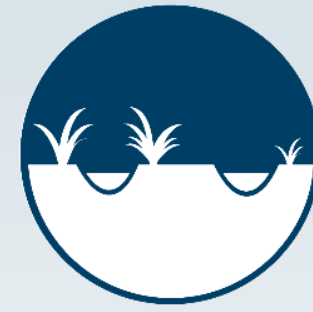
Adapt



Restore natural water systems



Raingardens and artificial wetlands



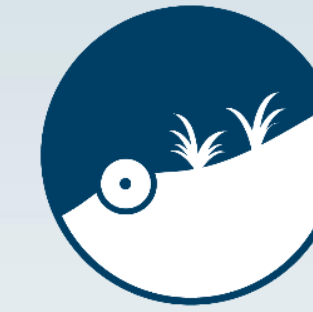
Bioremediation



Planting forest



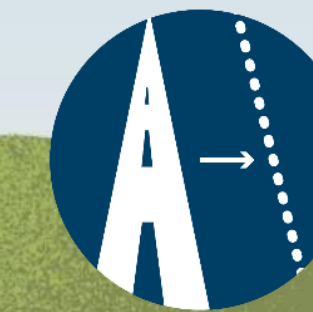
Protecting & enhancing existing habitat



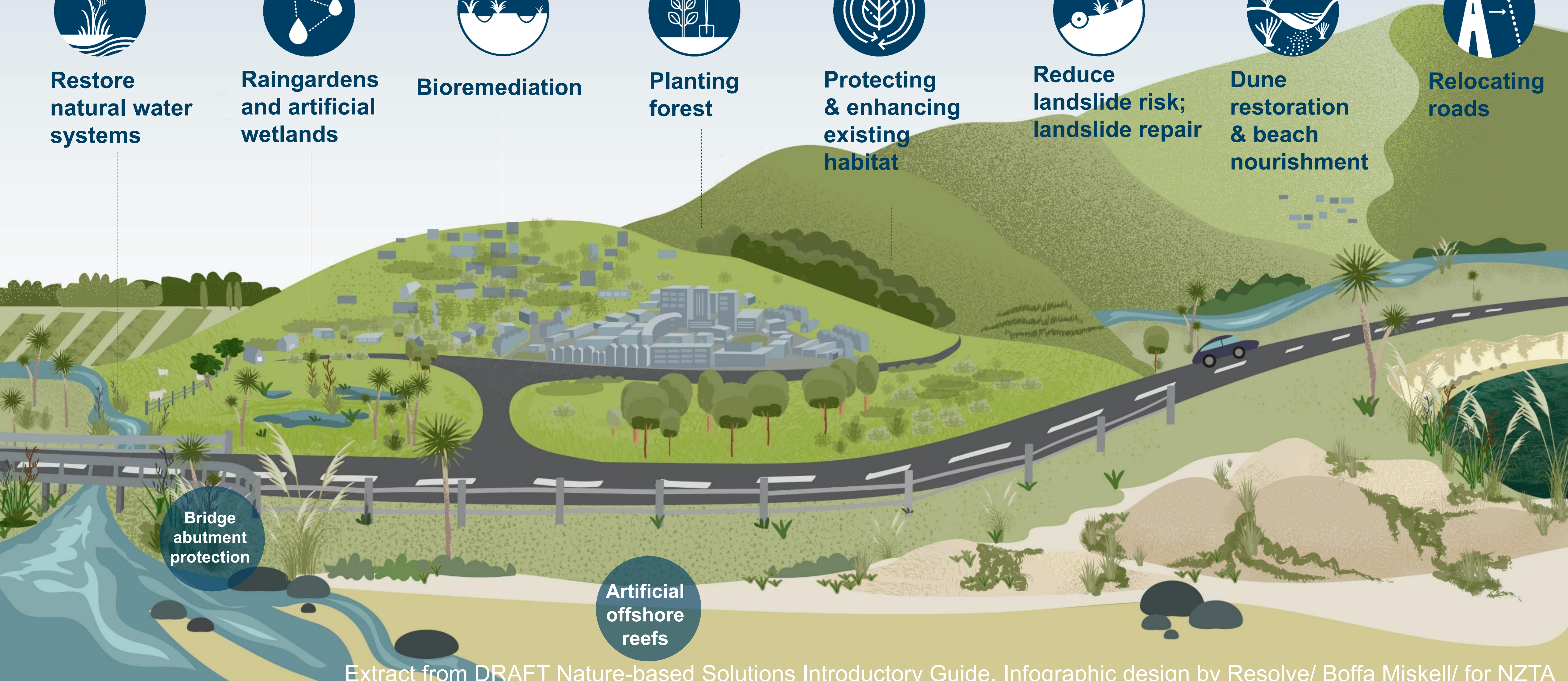
Reduce landslide risk; landslide repair



Dune restoration & beach nourishment



Relocating roads

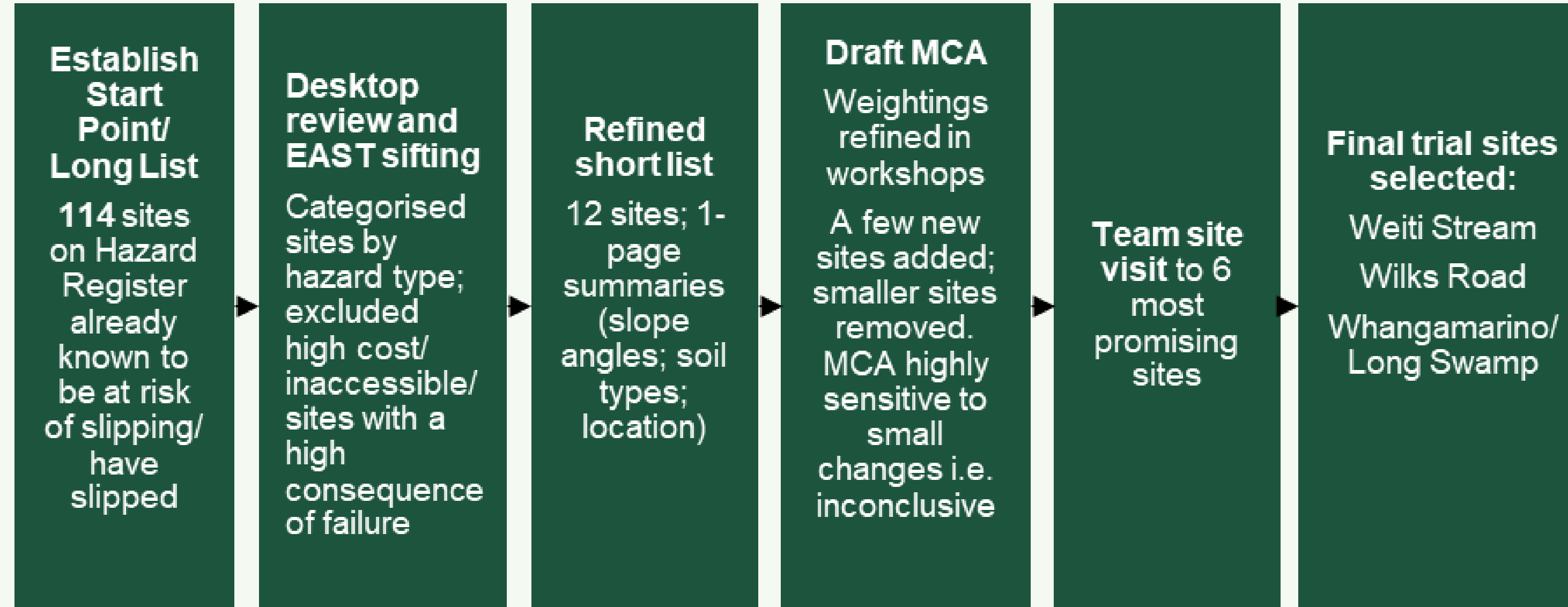


Bridge abutment protection

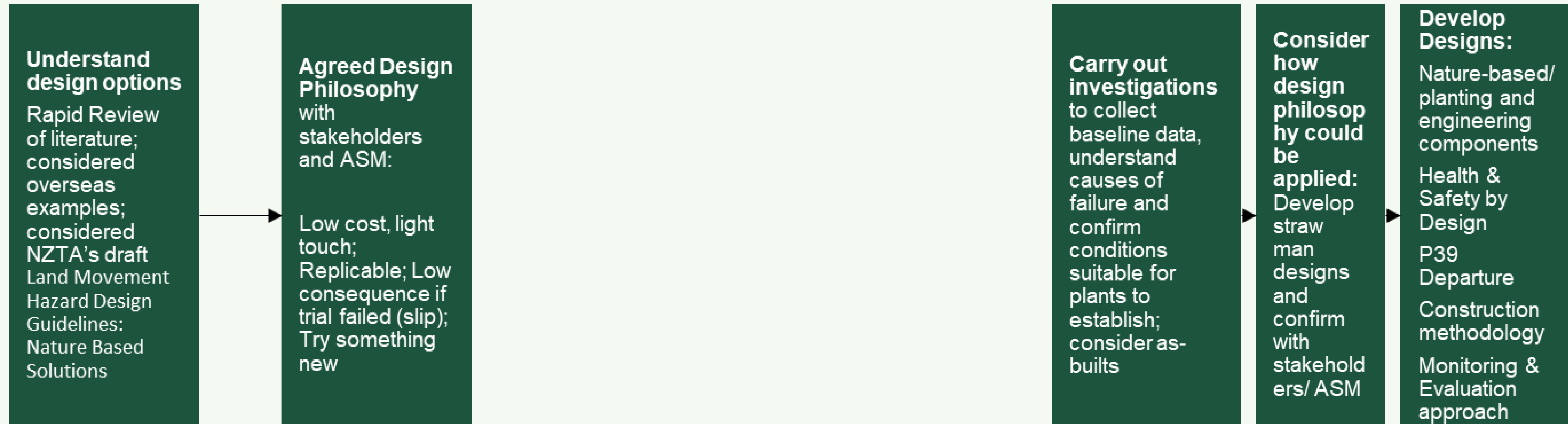
Artificial offshore reefs

What process did we follow?

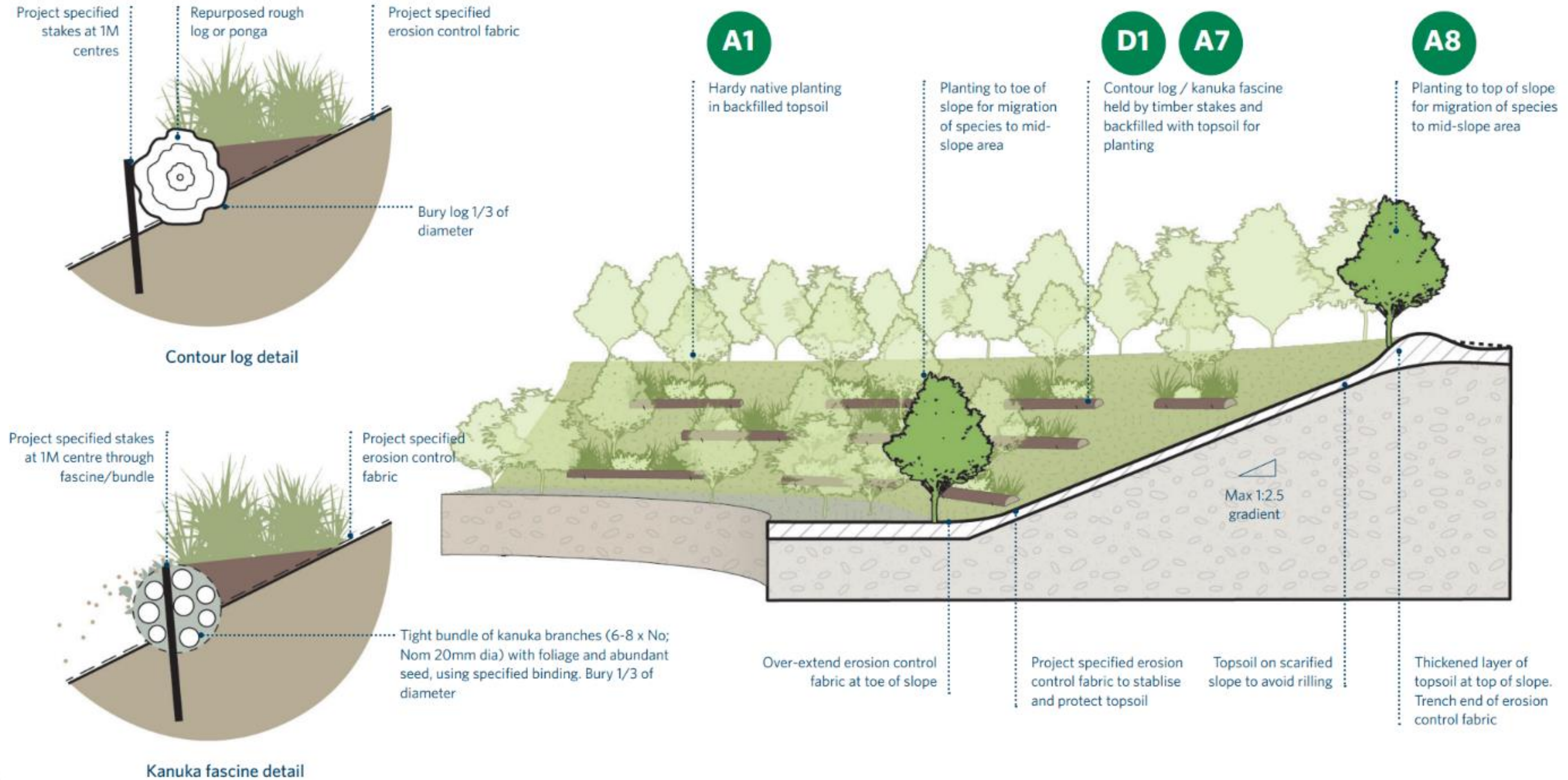
Selecting a location for the trial



Determining the trial design

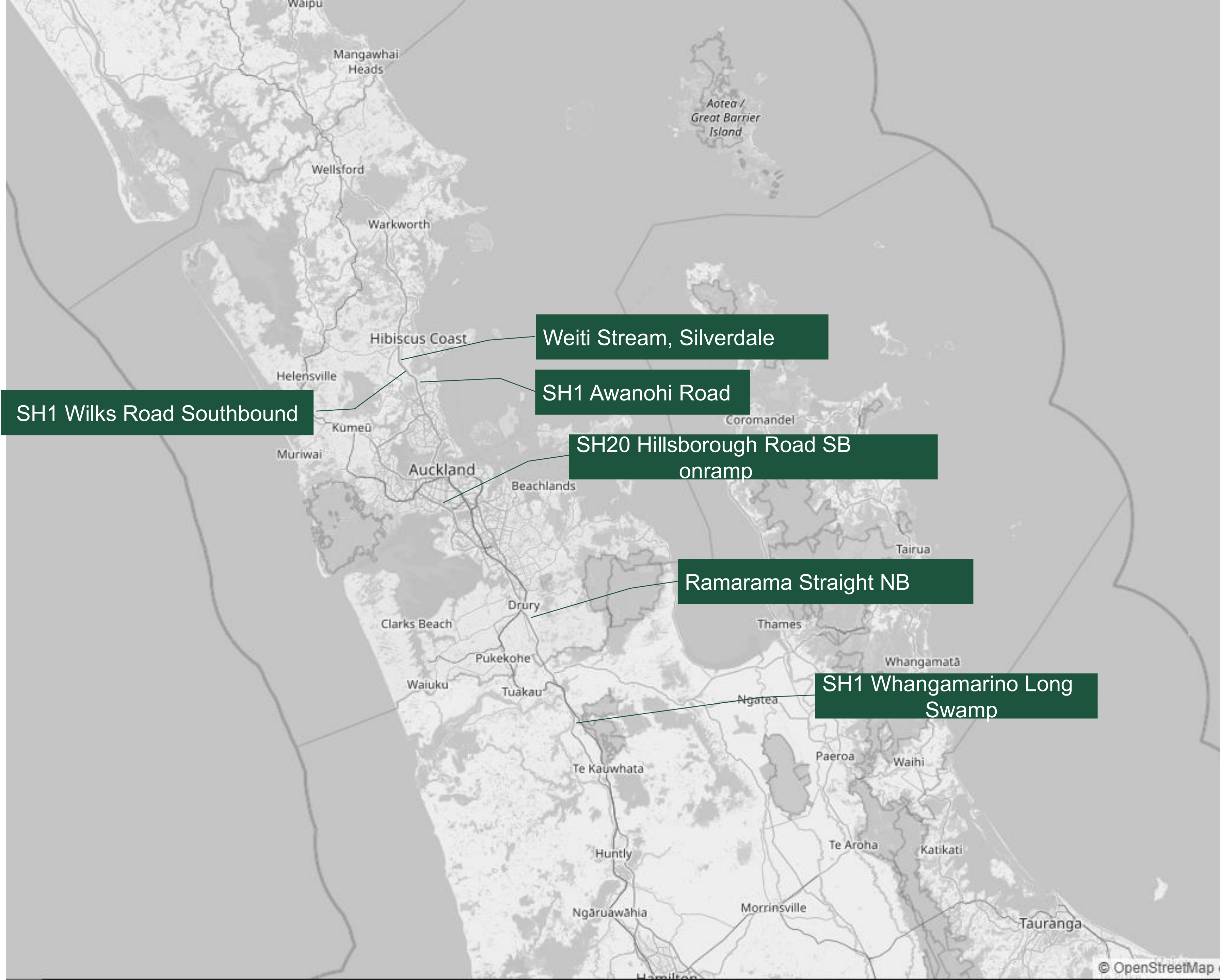


Design philosophy based on the draft guide



**BOFFA
MISKELL**

Shortlisted sites



SH1 Weiti Stream Northbound

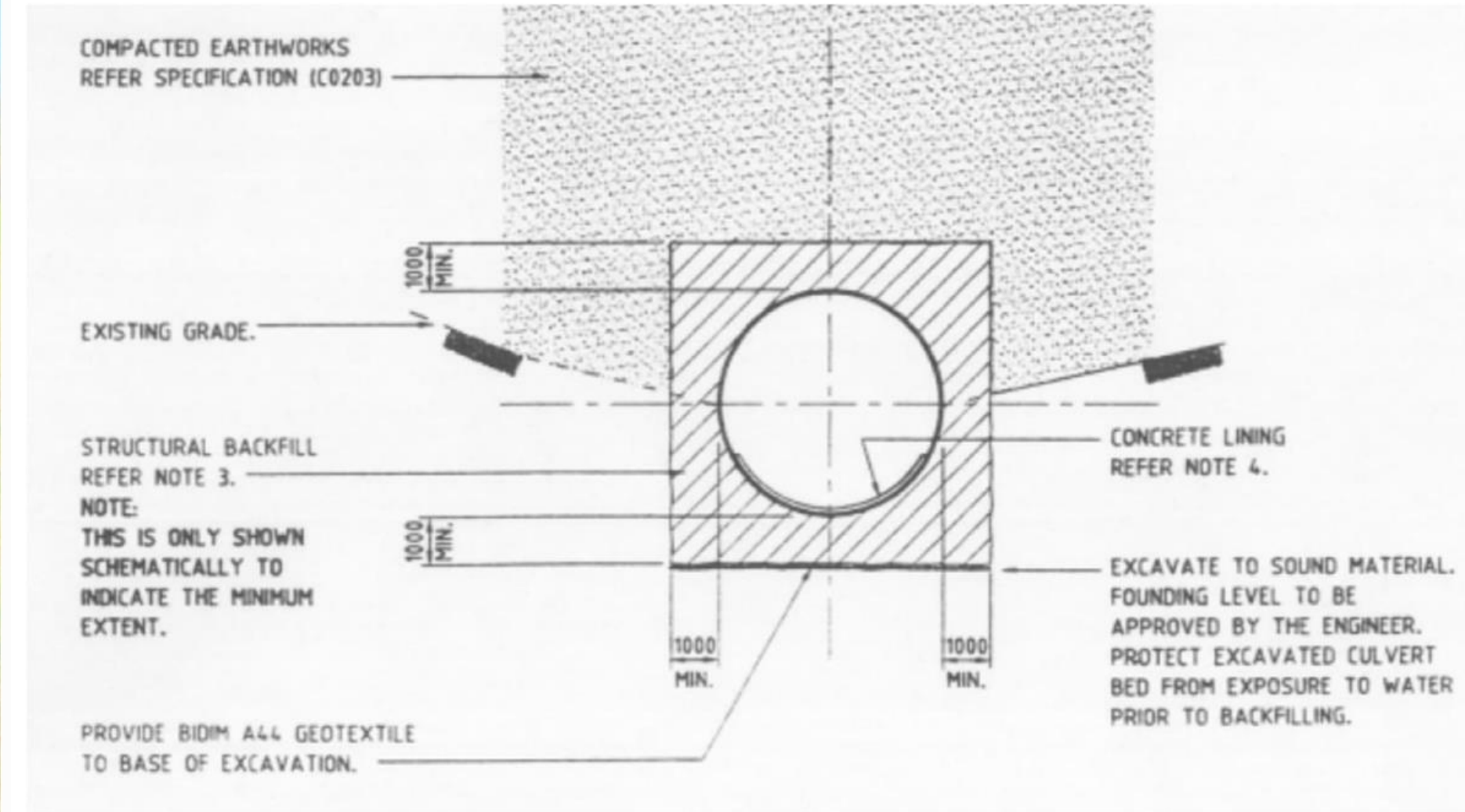


Figure 6. Culvert Asbuilt Construction Drawing (1998, from ASM).



SH1 Wilks Road Southbound/ 1064



SH1 Long Swamp- Whangamarino (Pokeno)/ 1138

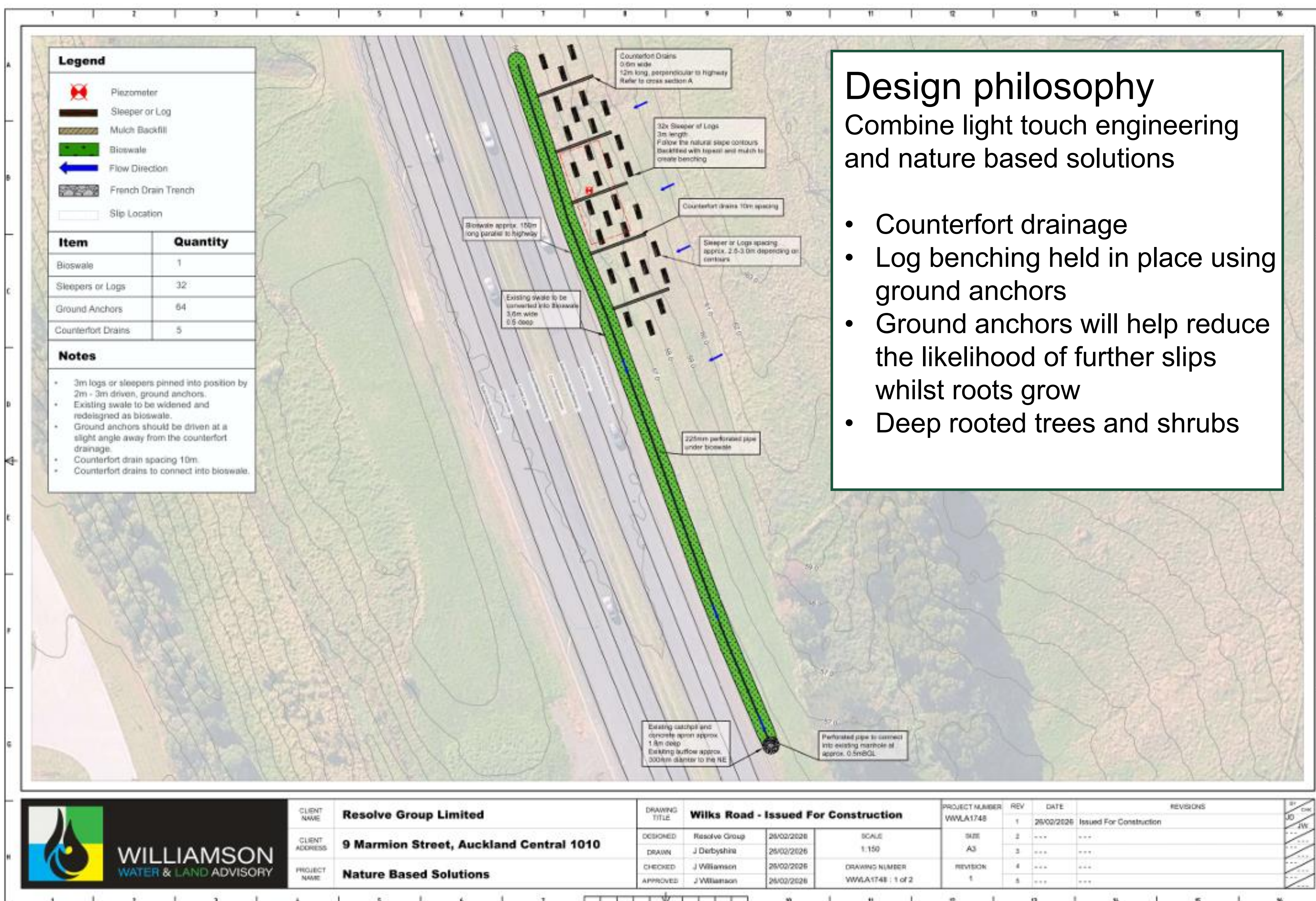
102m²

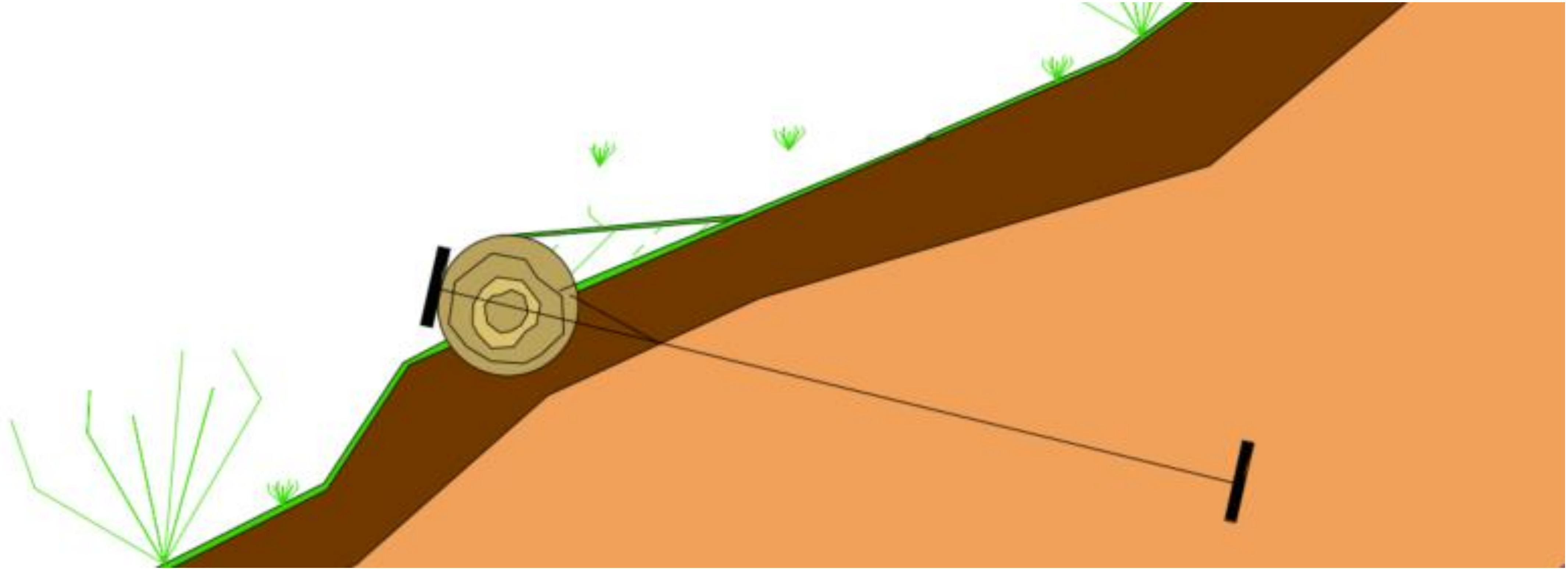


Trial Designs: Wilks Road and Weiti Stream

Wilks Road

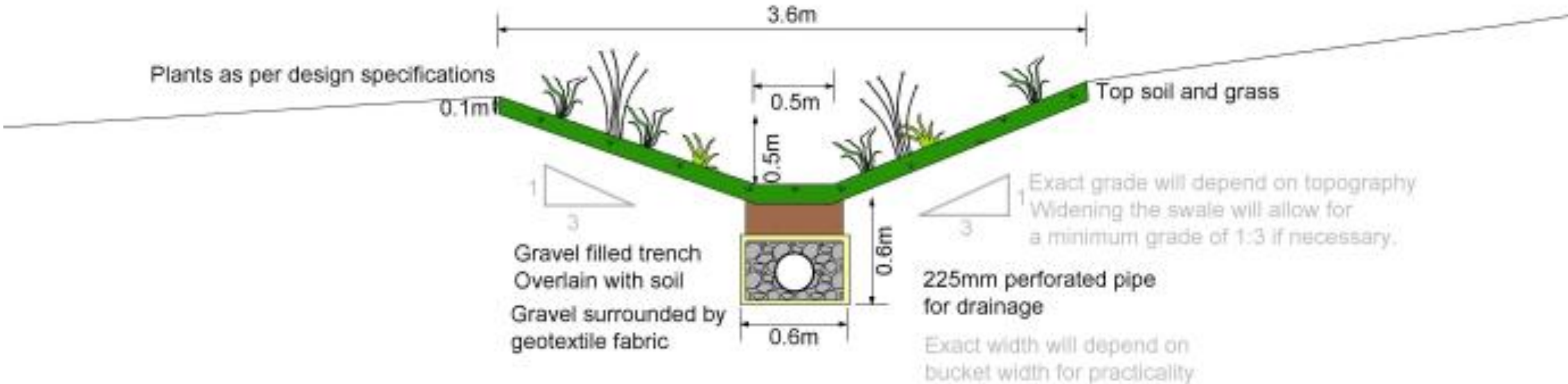
Wilks Road



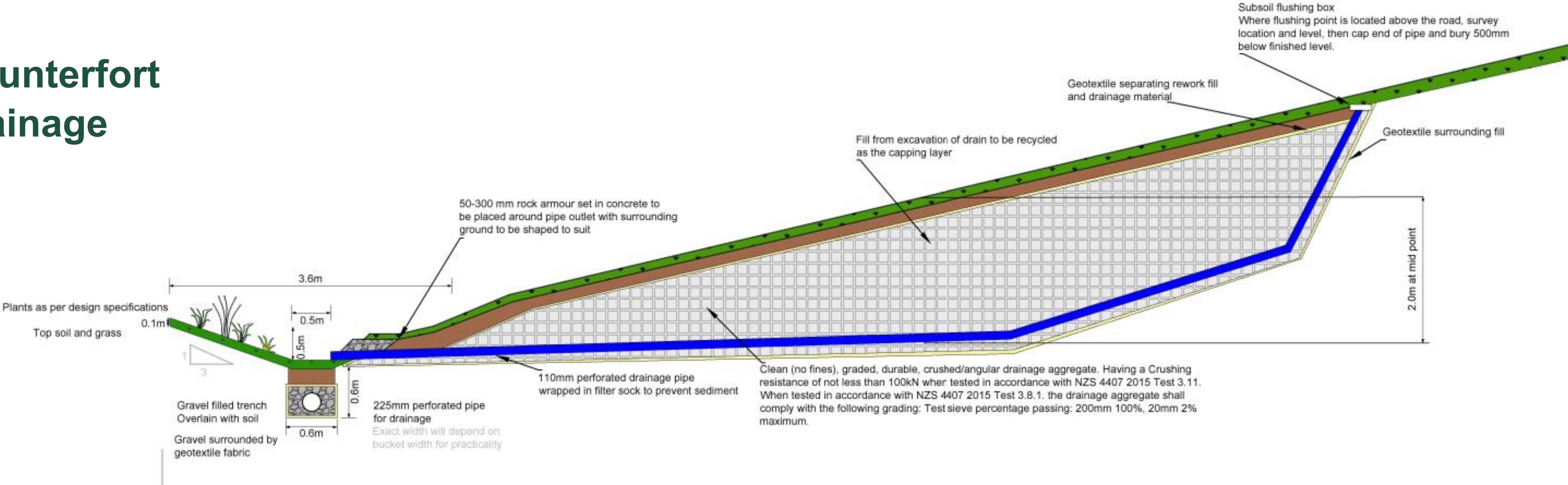


Cross section showing ground anchored logs/ sleepers and benching behind (WWLA 2025)

Bioswale with drainage

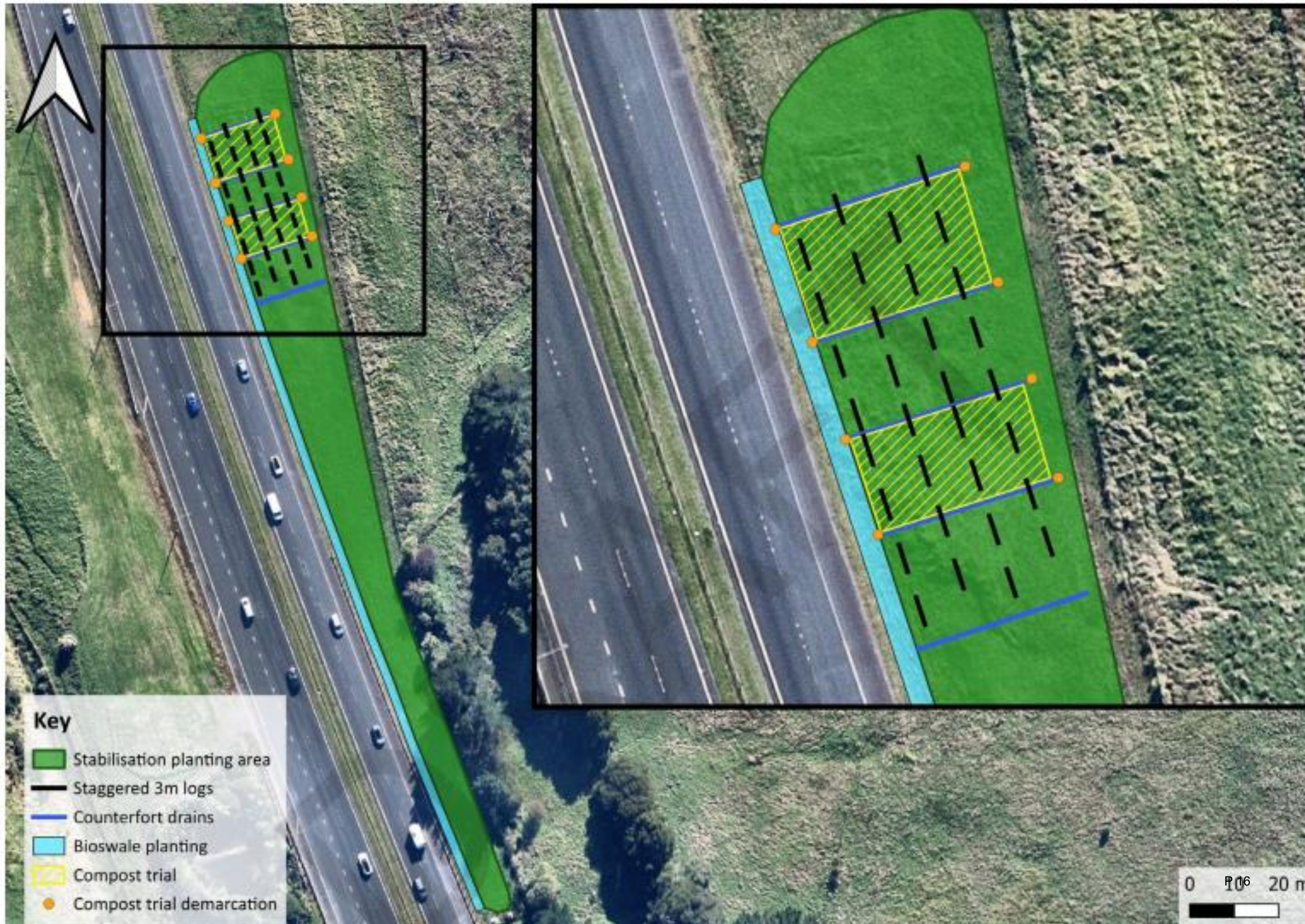


Counterfort drainage



SH1 Wilks Road Planting Plan

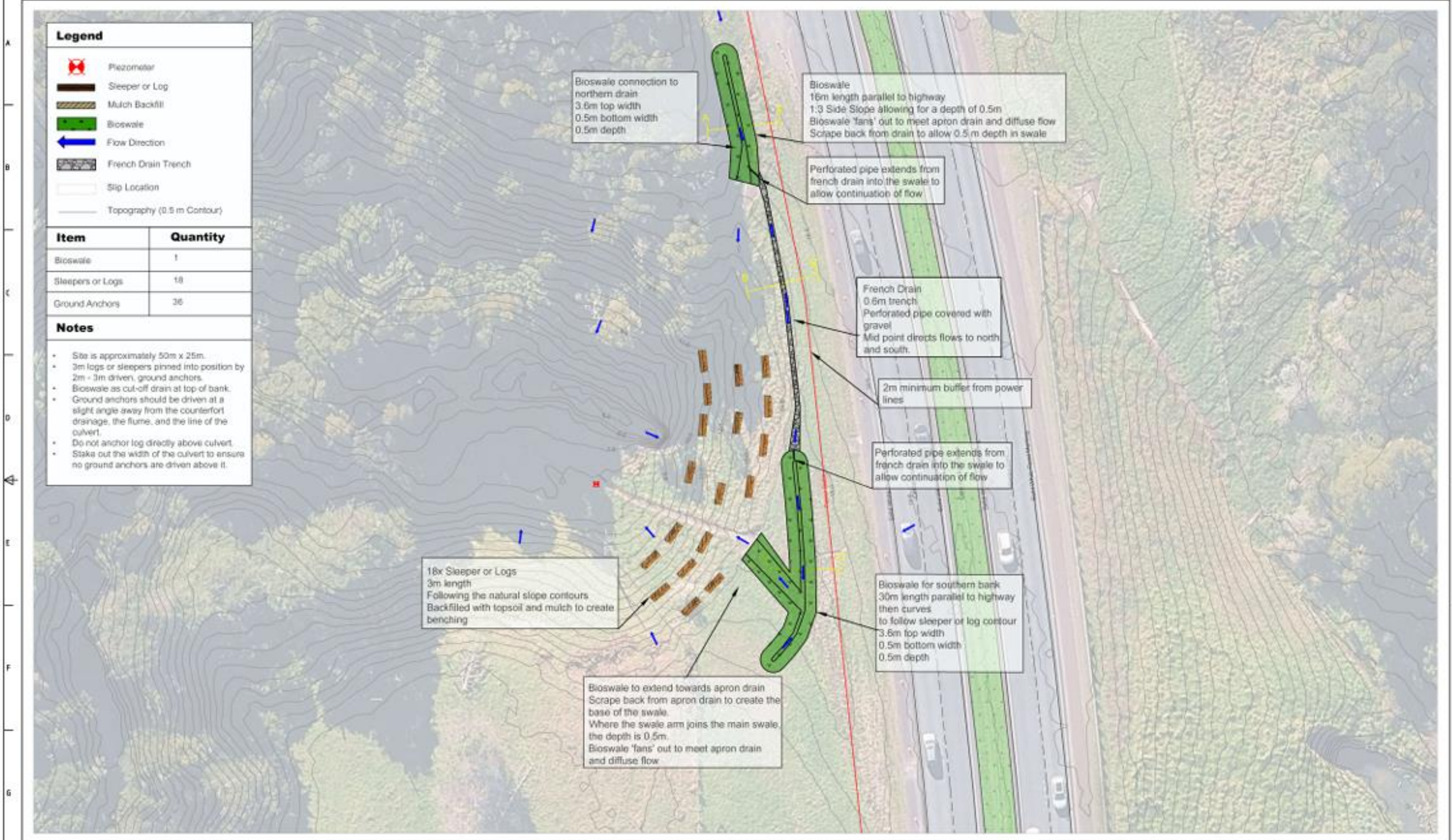
- › Mow/ trim before planting; spot spray weeds
- › mānuka/ kānuka to provide rapid canopy cover, then succession planting
- › Compost trial
- › 'T cut' planting method; taller plants



| Key | |
|-----|-----------------------------|
| | Stabilisation planting area |
| | Staggered 3m logs |
| | Counterfort drains |
| | Bioswale planting |
| | Compost trial |
| | Compost trial demarcation |

Weiti Stream

Weiti Stream



| | | | | | | | | | | | | |
|--|----------------|--|---------------|---|------------|----------------|------------------|------------|------------|-------------------------|-----------------------------|-----|
| <p>WILLIAMSON WATER & LAND ADVISORY</p> | CLIENT NAME | Resolve Group Limited | DRAWING TITLE | Weiti Stream - Issued For Construction | | | PROJECT NUMBER | REV | DATE | REVISIONS | By | |
| | CLIENT ADDRESS | 9 Marmion Street, Auckland Central 1010 | DESIGNED | Resolve Group | 19/02/2026 | SCALE | 1 : 200 | 1 | 19/02/2026 | Issued For Construction | CS | |
| | PROJECT NAME | Nature Based Solutions | DRAWN | J Derbyshire | 19/02/2026 | CHECKED | Chris Simpson | 19/02/2026 | 2 | 24/02/2026 | Update following site visit | JW |
| | | | APPROVED | Jon Williamson | 19/02/2026 | DRAWING NUMBER | WWLA1748: 1 of 2 | REVISION | 3 | --- | --- | --- |
| | | | | | | | 4 | --- | --- | --- | --- | |
| | | | | | | | 5 | --- | --- | --- | --- | |

SH1 Weiti Stream Planting Plan

- › Mow/ trim before planting; spot spray weeds
- › Plan includes planting timing & maintenance
- › Species mix includes toetoe, tārata (lemonwood), and tī kōuka (cabbage tree)
- › T slot planting; taller plants
- › Extend planting to connect to adjacent bush block



What's next?

**Trials are now
under construction
& planting will
happen in in April**



Key learnings

- Soil compaction is a major constraint; topsoil depth matters; the depth of the slip plane matters; water is a major cause of failure
- Some native plants root more deeply or extensively than others- but how will they perform on our trial sites?
- There's limited evidence here and overseas, but the evidence base is growing
- Multiple disciplines and stakeholders need to work together
- You might require departures from specifications (P39- Landscape Specification; Bridge Manual) and a different tolerance to risk
- Nature-based Solutions are living assets that need to be looked after...forever



Can Nature-based solutions hold our slopes?

Yes, some of them.

In a changing climate, we need solutions that are affordable and that can be deployed at scale. Nature-based Solutions and hybrid designs won't replace engineered structures everywhere, but across lower-risk slopes, the resilience they can offer, adds up.

If we want to roll Nature-based Solutions out more widely, we need to get ready by:

- Understanding which slopes are vulnerable and which could be made more resilient via Nature-based approaches
- Allocating funding towards preventative approaches
- Sharing knowledge and building our evidence base
- Changing our guidelines, policies and standards to enable Nature-based Solutions
- Maintaining living assets over the long term



Thank you