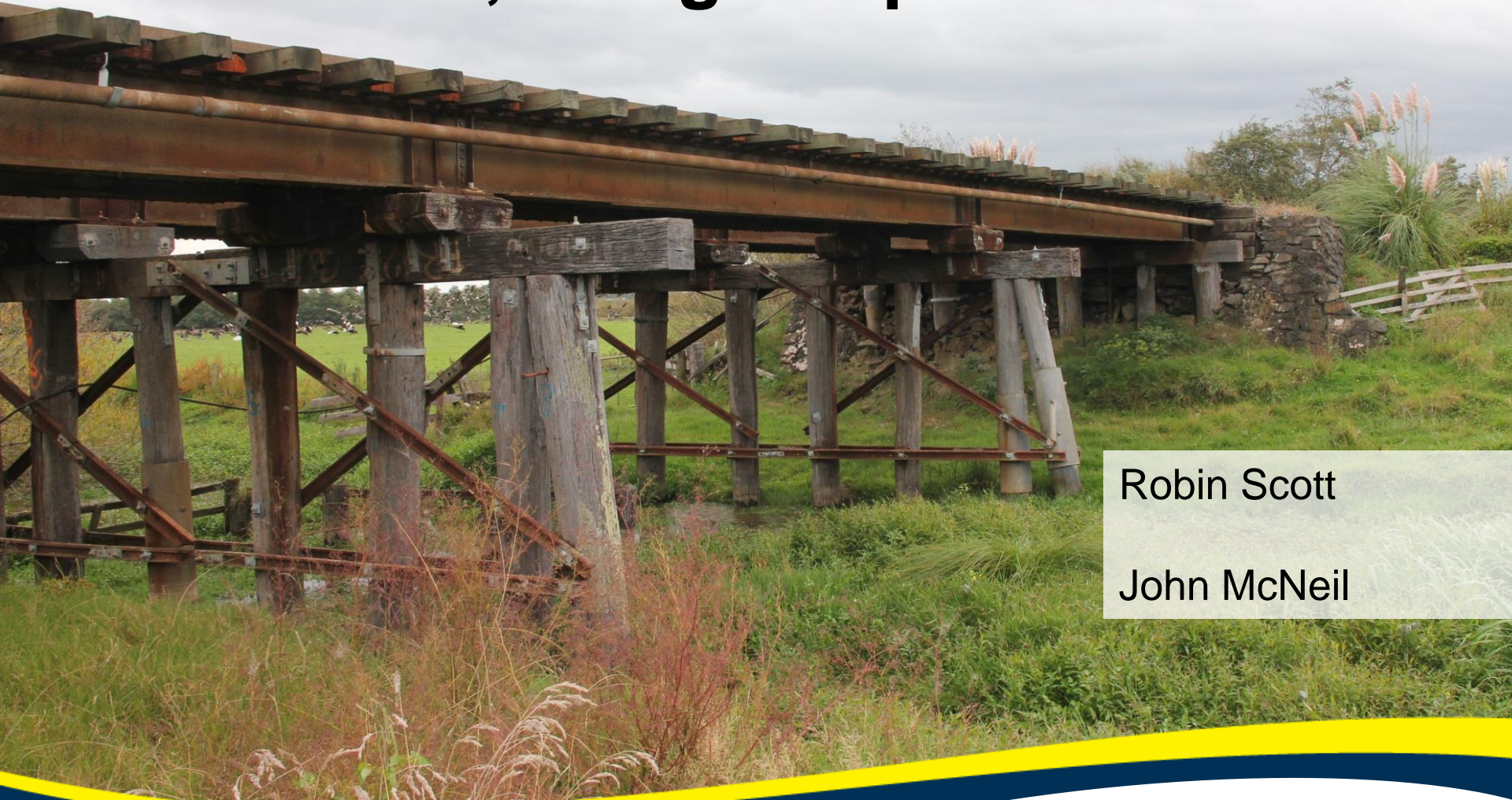


ECI on the NIMT, Waikato, Bridge Replacements



Robin Scott
John McNeil

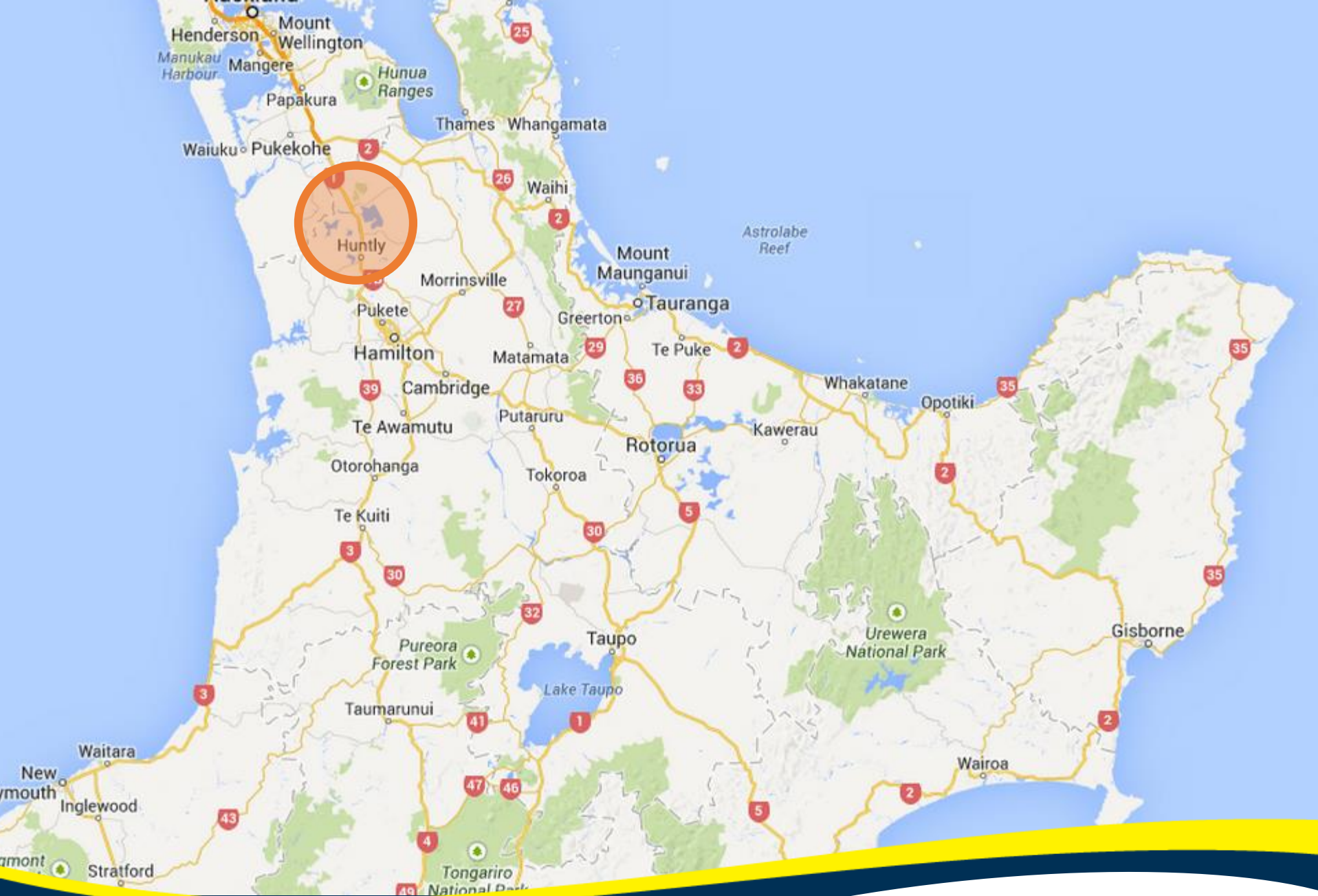
Reasons for The Project

- **Background to Project**

- KiwiRail bought by NZ Government 2008
- Turnaround Plan 2010- Golden Triangle & NIMT
 - "Step change" on the Auckland – Wellington – Christchurch NIMT route
 - Improve reliability and capacity

- **The Project Objectives**

- Replacement of 4 Timber Piered Bridges on the NIMT
- 100 year design life ballast deck
- Tight Design and Construction Timeframe:
 - Project Commenced November 2011
 - Block of Line programmed for December 2012
- Contract to be completed under NZS 3910:2003



BR 280



BR 281



BR 282



ECI - Procurement



Procurement Strategy Analysis

- Engaged Specialist Help

Procurement Selection

- Procurement Strategy. Considered:
 - Design and construct Construct only
 - Alliance Early Contractor Involvement

Key Requirements

- Scope of work Schedule
- Flexibility Cost certainty
- Resources Competitiveness
- Third party influence

Recommendation

- Early Contractor Involvement (ECI)
- Unknown scope Tight programme
- Unknown Risks Flexibility with Stakeholders

Procurement Process

Process

- GETS
- 1- Marketing Briefing
- 2- Expression of Interest
- 3- Request for Proposal (3 Tenderers)
- 4- Award

Request for Proposal

- ECI divided into two distinct stages:
 - Stage 1: Development (executed under a cost reimbursable basis under short form agreement)
 - Stage 2: Delivery (executed under negotiated lump sum based on tendered contractors margin and risk cap)

Tender Evaluation and Award

1. Tender documents including Principal's Requirements released to Tenderers
2. Interactive process with site walkovers and individual meetings with Tenderers. KiwiRail provided a panel of experts
3. Evaluation undertaken by experienced KiwiRail team.
4. Weighted attribute evaluation:
 - Resources 10%
 - Proposed methodology and approach 35%
 - Design 25%
 - Commercial 30%
5. Interactive sessions held with Tenderers post tender opening
6. Recommendation

Design Process



HEB Construction

KiwiRail

aurecon

Key Design Constraints and Criteria

Construction around operating trains

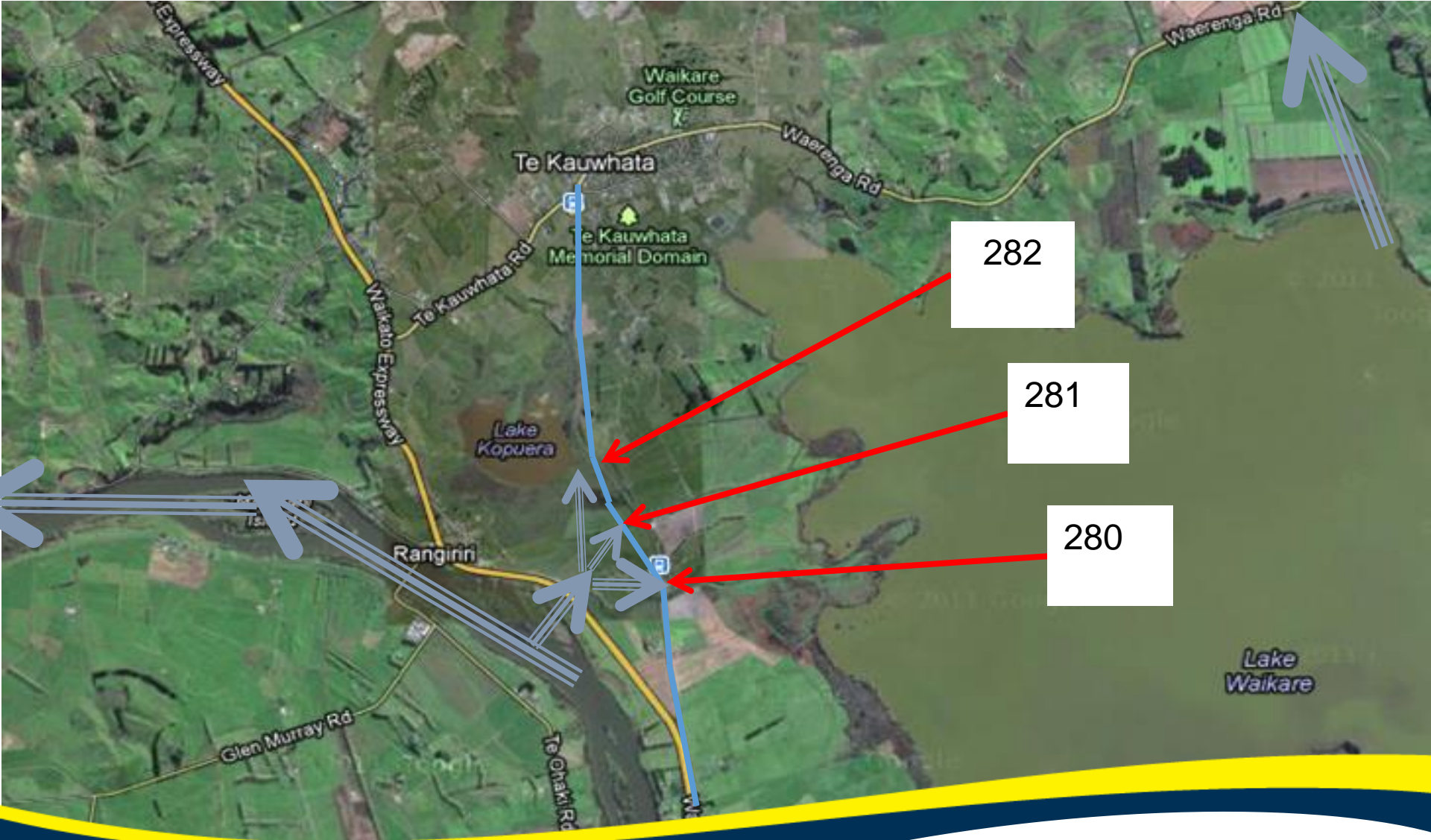
Flood levels

Foundation and Seismic design

Modular design

Alignment options and future proofing

Extreme Flood Flows



Design Process

Design office with HEB, KR and design team

Collaboratively with KR and Stakeholders

Independent design review team. Shearing of knowledge

Iwi attendance at design workshops.

Enabling works

Value engineering

Track works & Approaches

Enabling works

Walkways

Services

Programme

16 Week design programme April – July

Preliminary design	2 weeks	
40% complete submission	4 weeks	Stage 1 Development T&E
KR approval	1 week	
80% complete submission	4 weeks	Stage 2 Delivery LS.
KR approval	1 week	
independent peer review	2 weeks	
IFC drawings submission	2 weeks	

Aug – Dec – 5 Months Construction Programme

Our solution

Use of standard PSC girders adapted for Rail.

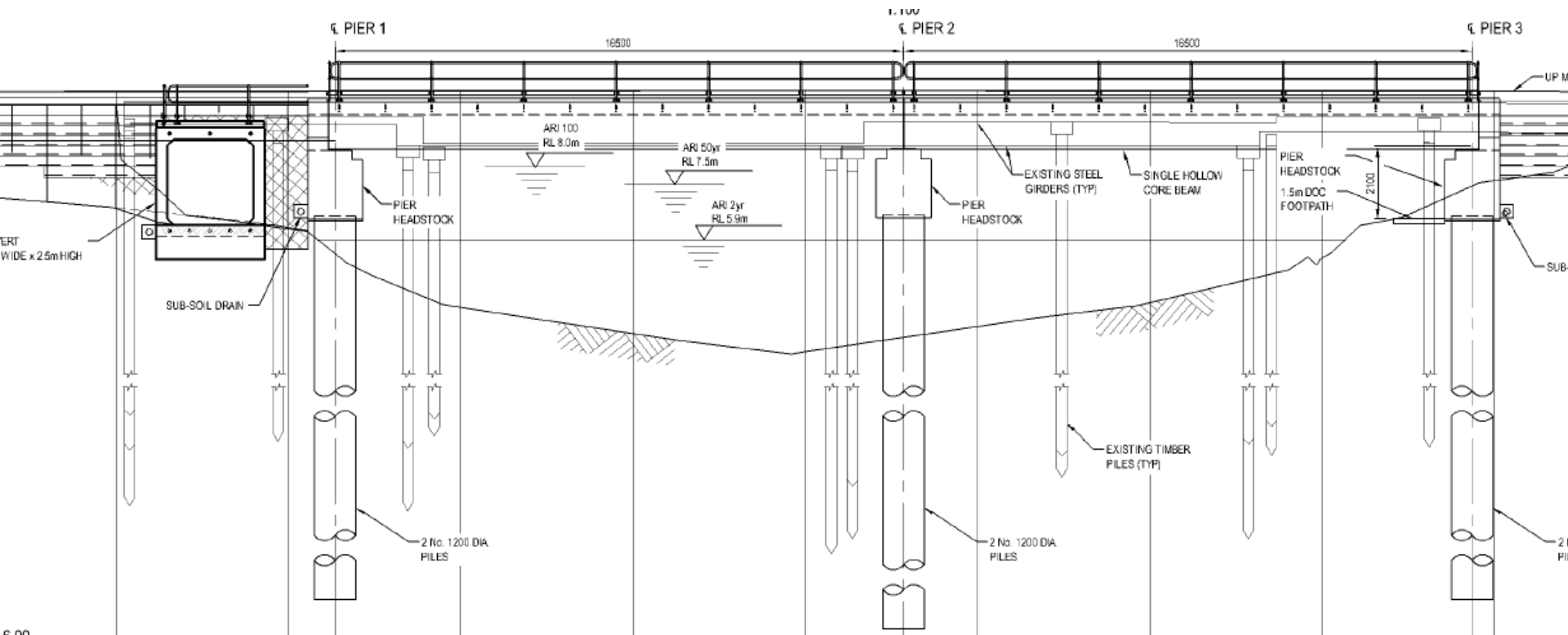
Modular design for cost and programme.

Substructure and girders delivered before Block of Line

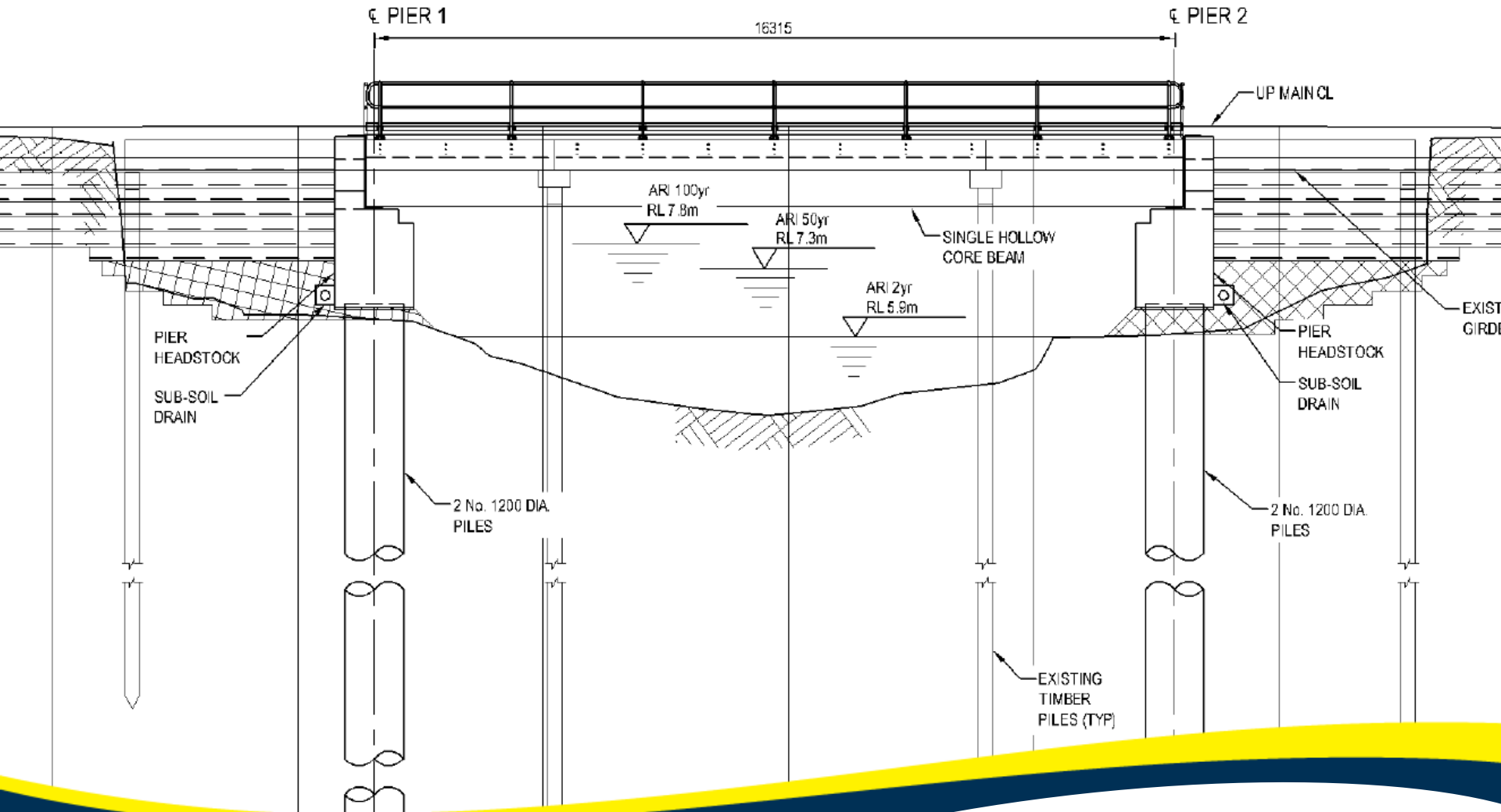
Back walls and approaches over 72hr block of line

Deck Slide over 72hr block of line

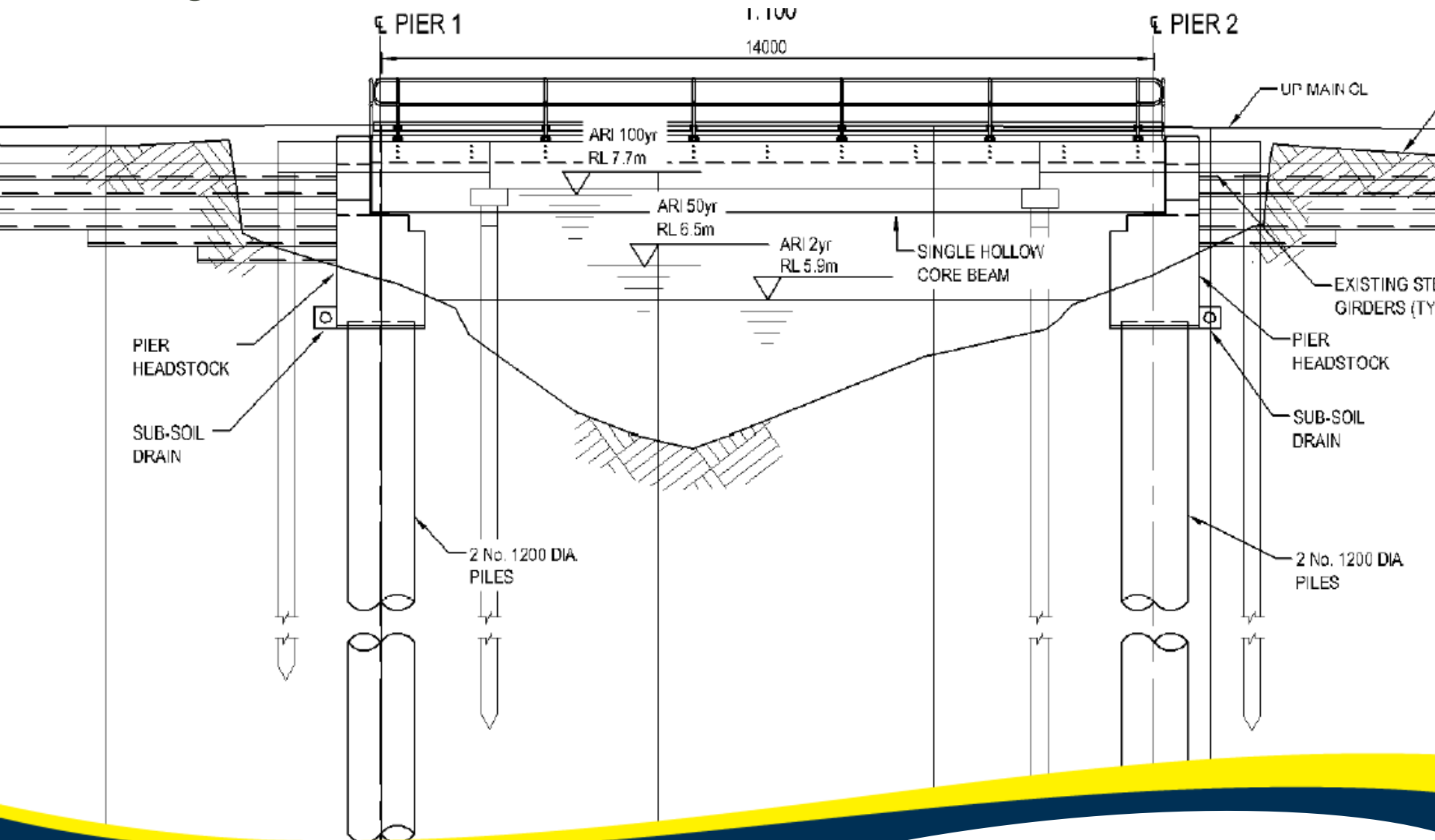
Bridge Elevation 280



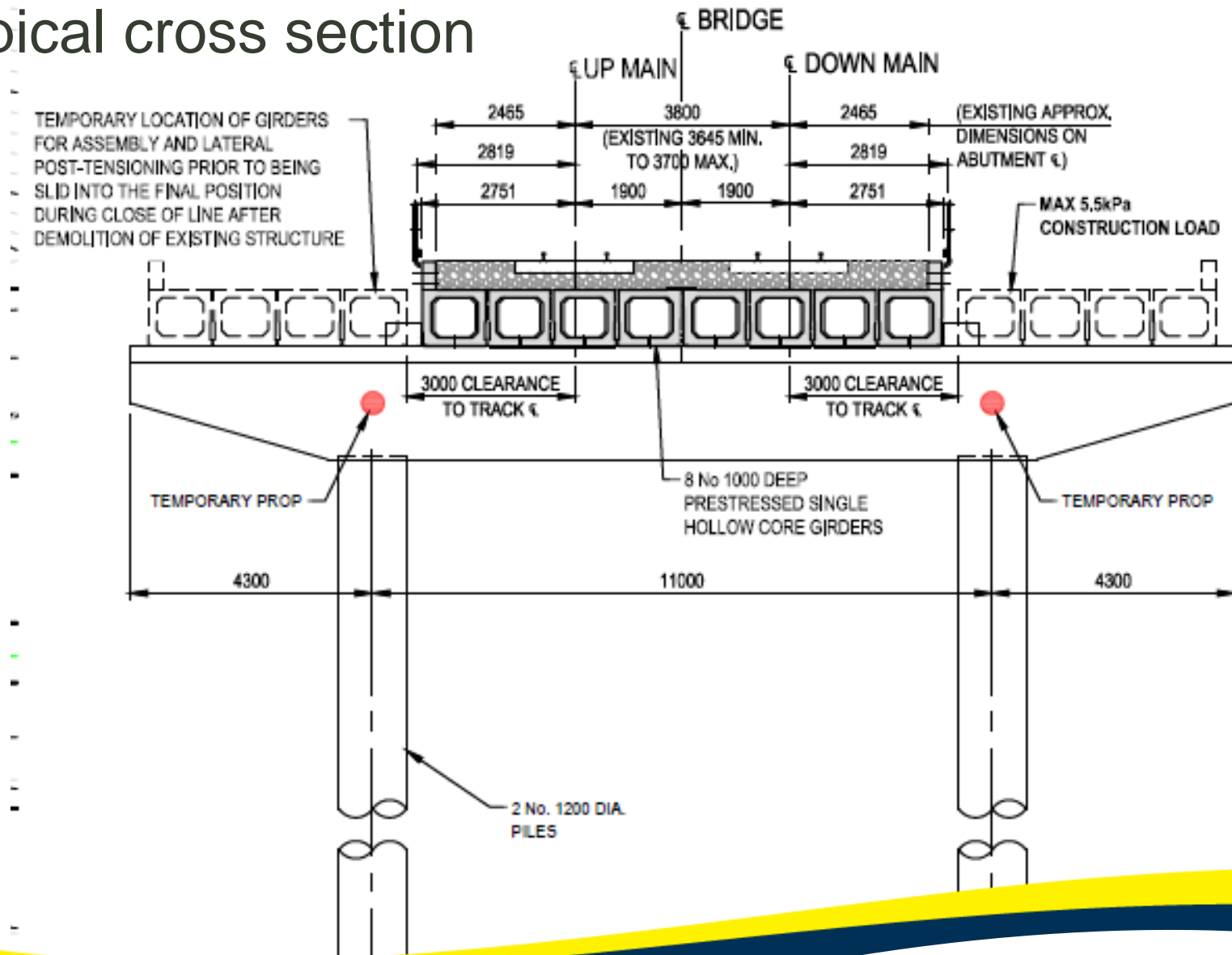
BR281



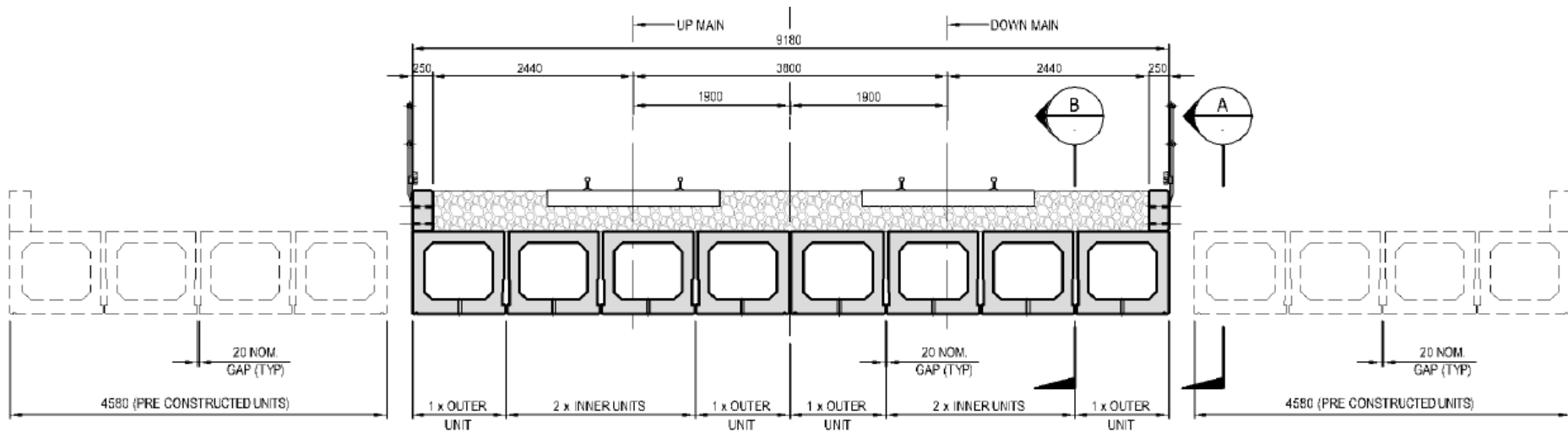
BR282



Typical cross section



Girders



TYPICAL BRIDGE CROSS-SECTION

1:50

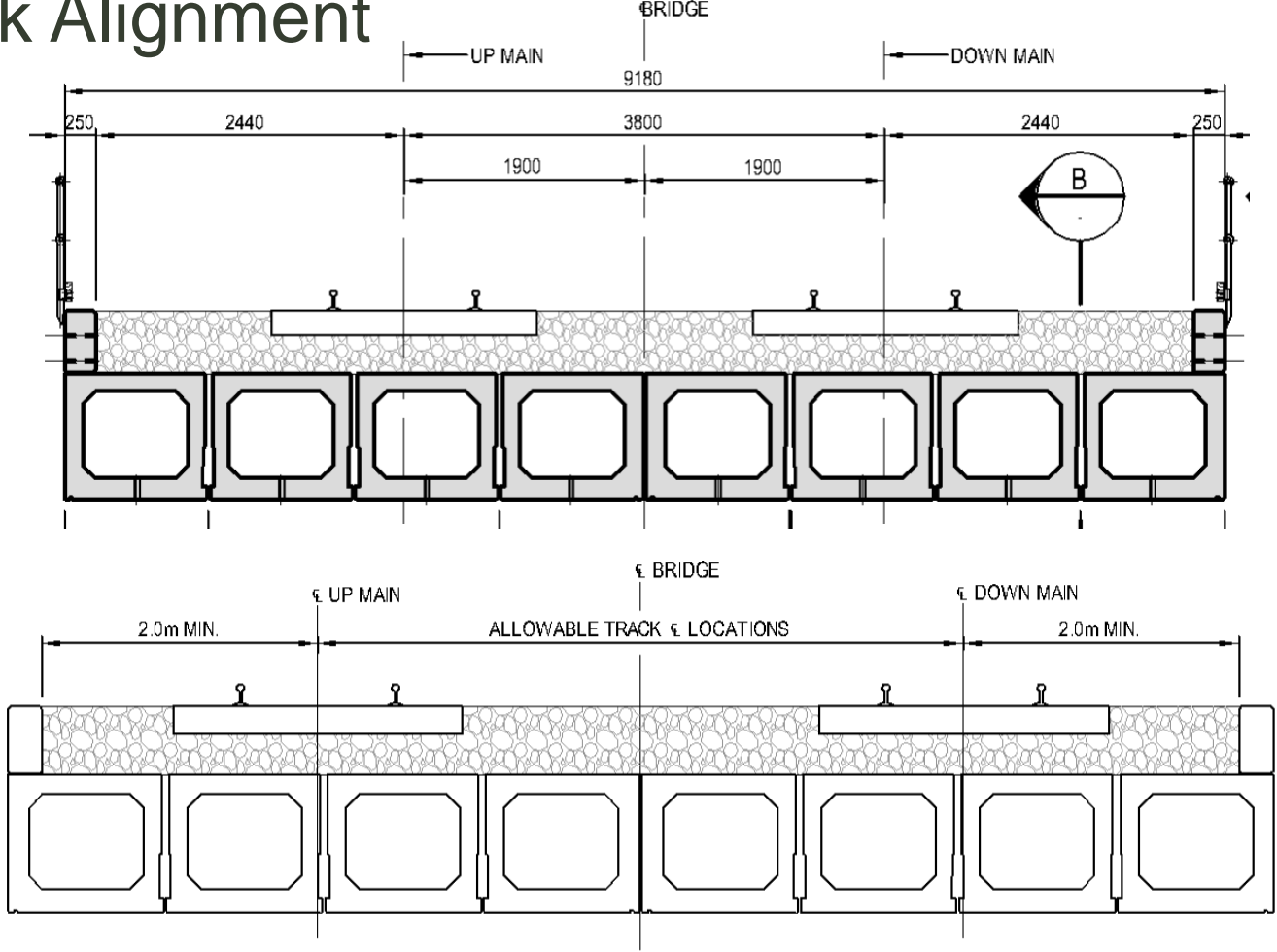


HEB Construction

KiwiRail

aurecon

Track Alignment

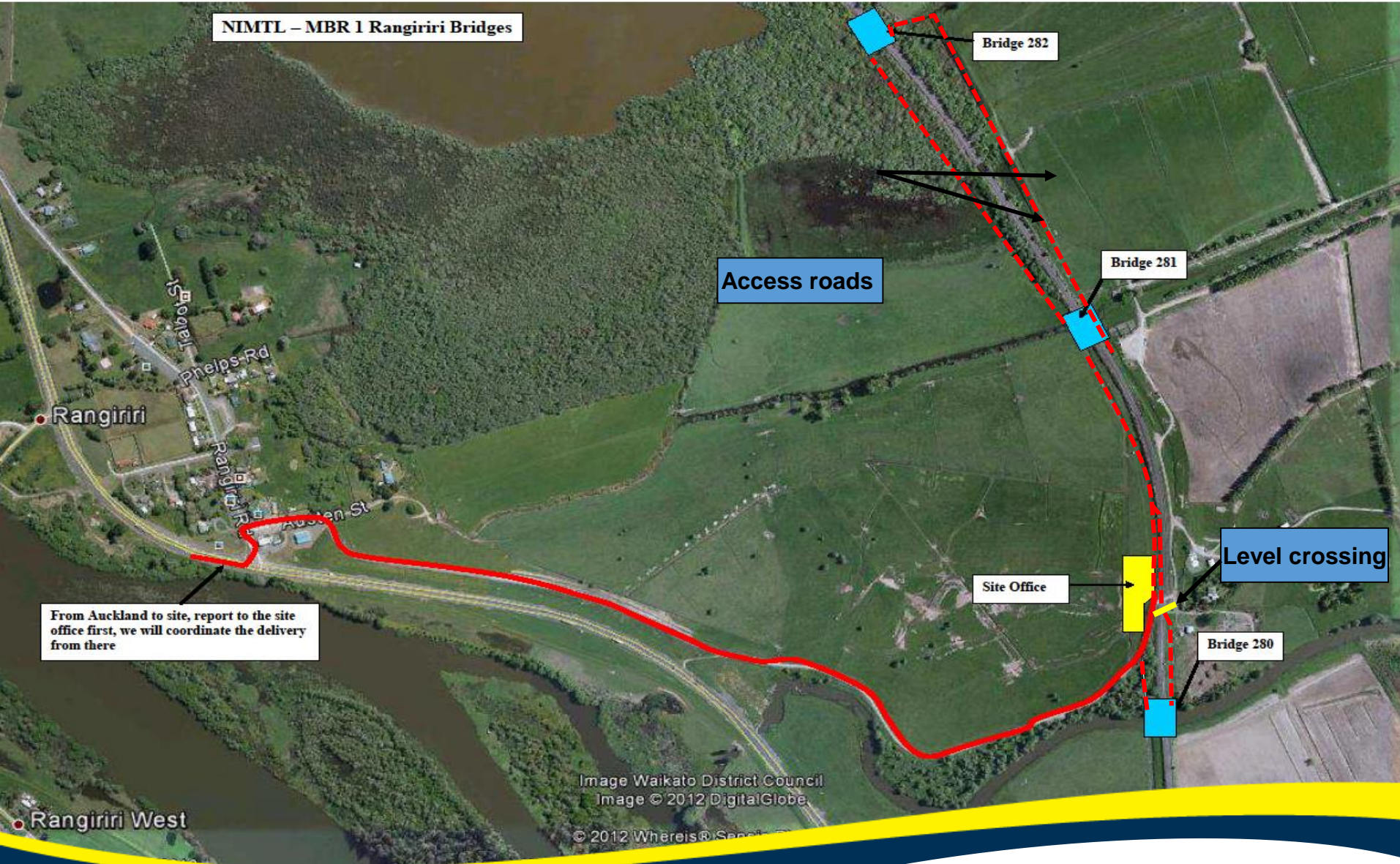


TRACK TO TRACK ϕ ASSUMED TO BE A MINIMUM OF 3.8m (WITH EXCEPTION OF EXISTING TRACK ARRANGEMENT).

Construction



Location





BOL Works

BOL Design

100 people on site over 72 hours

2 crews for 12hr shifts each

2 separate teams for structure and civil works

Separate teams for each of 3 bridge sites

Separate KiwiRail Crew integrated with HEB team

Horizontal Jacking System

- ♠ 22t jacks with 11t pulling capacity, 700mm stroke.
- ♠ The jack could operate all together or individually through a series of valves and manifold.
- ♠ Two jacks per pump
- ♠ Two 30t vertical jack per beam
- ♠ One 30t load skate per beam
- ♠ The load skates inside a 200 x 75 channel



Key Areas of Success From ECI

Planning, train control and track work combined effort from HEB & KR.

Accelerated Programme, with little up front design from KR.

Council allowed building consent waiver.

Health and safety was aligned with KR.

Collaborative approach to agreeing access with adjacent land owners.

People key issue with right culture respect from both sides.



HEB Construction

KiwiRail

aurecon

Thank you

