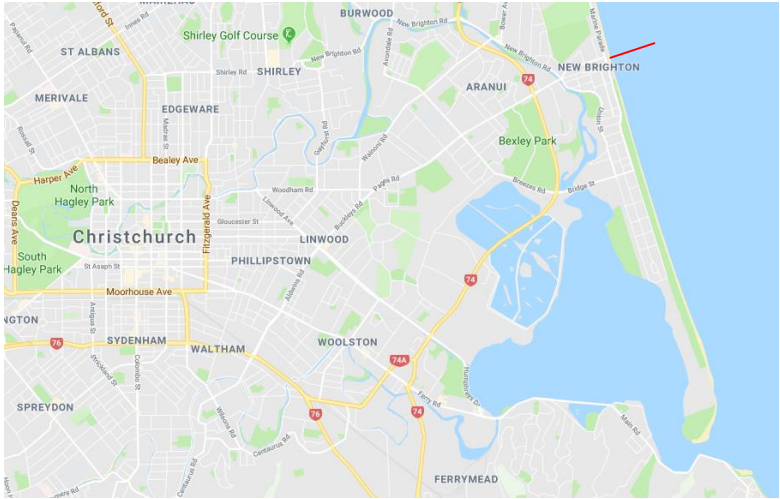


New Brighton Pier Earthquake Repairs

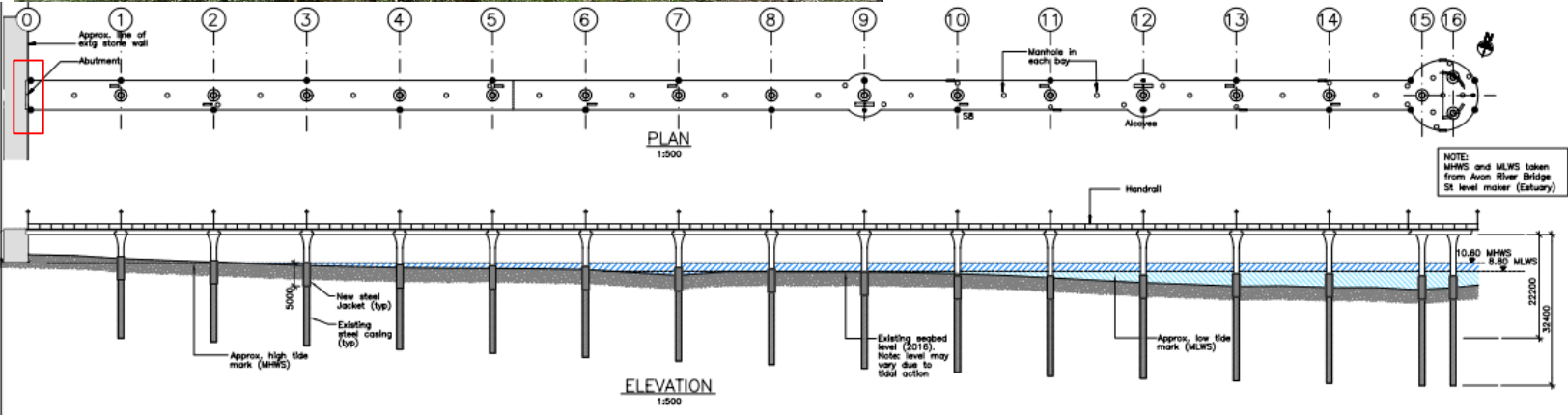
Safety in Design Considerations

Mark Humphery
Senior Structural Engineer
CCC Facilities & Structures Team

New Brighton Pier



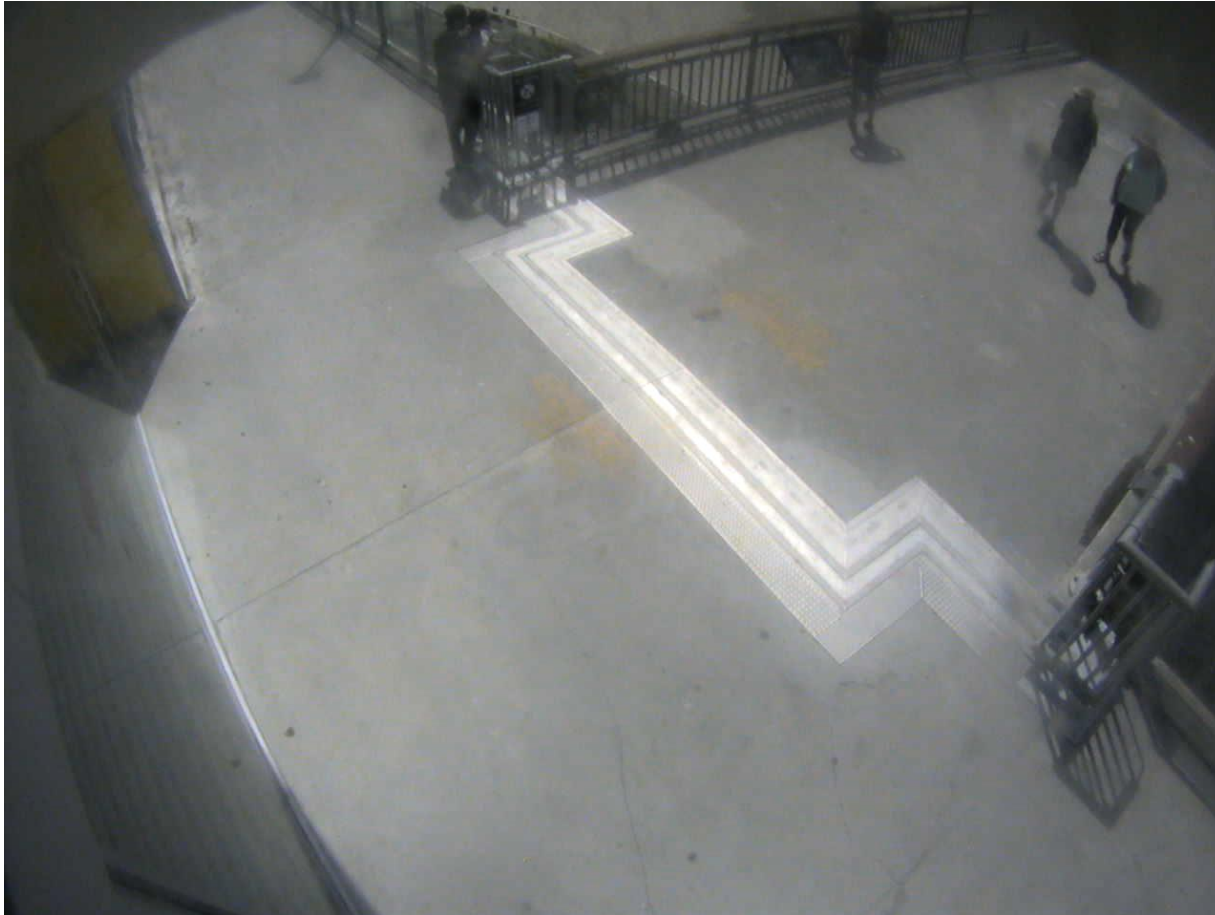
LIBRARY



February 2011 Earthquake



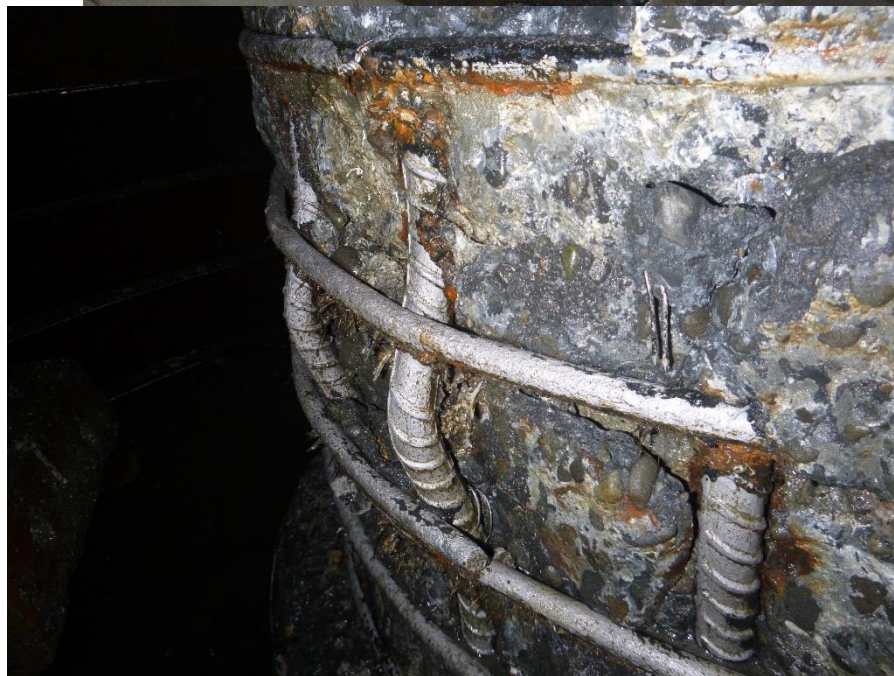
February 2016 Earthquake



4

EQ Damage

- Loss of Seismic Strength
- Corrosion of reinforcement
- Settlement of column #4



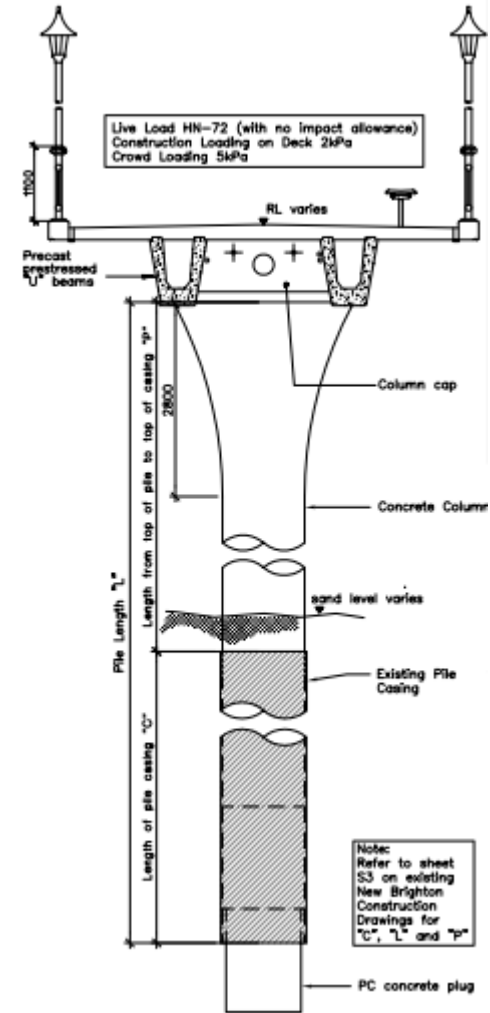
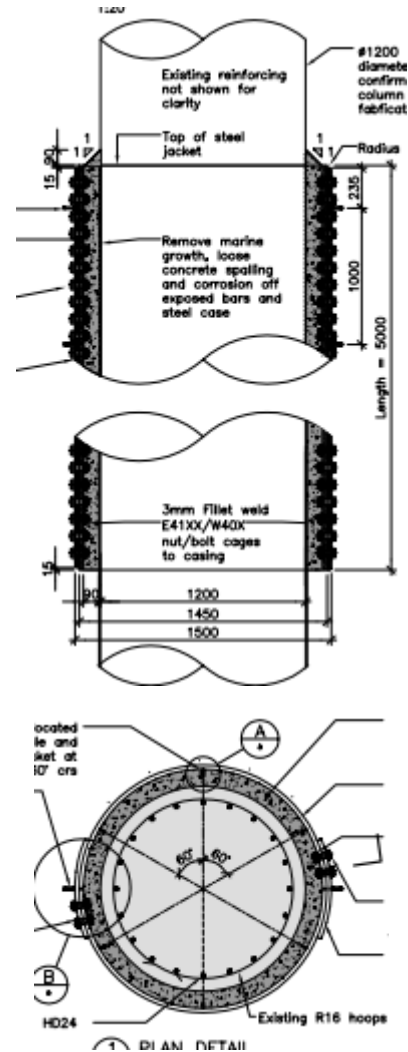
Repair Aims

1. Re-instate Pier to its Pre-Earthquake Condition
2. Repairs must be SIMPLE to construct
3. Repairs must be SAFE to install
4. Repairs must reinstate DURABILITY
5. Repairs must be COST effective

Critical Safety Issues

- Working in marine environment
- Very difficult conditions for divers
- Safety of the public
- Reduced seismic capacity and limited live load capacity of pier deck
- Deep excavations below sea bed/beach level
- Unique construction methodology for NZ

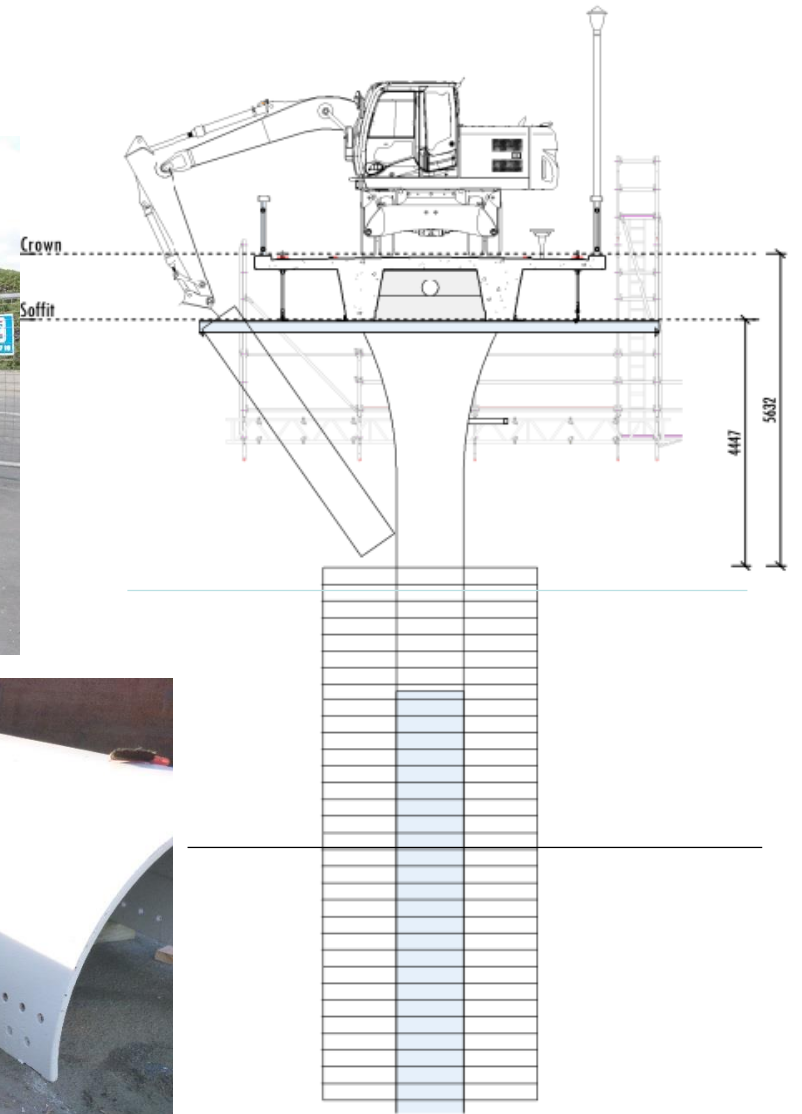
Design Solution



Contractor Selection

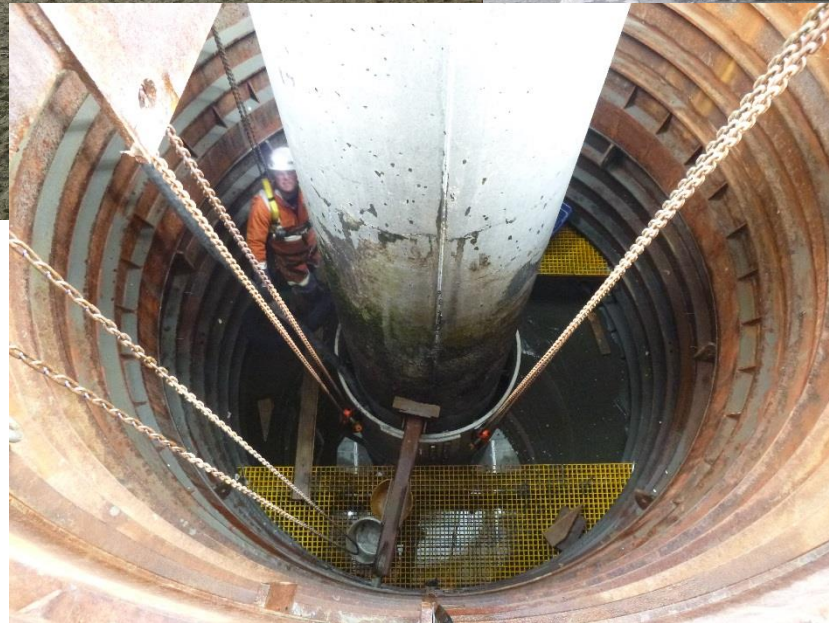
- Expression of Interest (6 Contractors)
- Evaluation & Selection (3 Contractors)
- Payment for Detailed Methodology (3 Contractors)
- Evaluation and Award (1 Contractor) – Fulton Hogan

Methodology



EXCAVATOR DELIVERING PILE JACKET
1 : 100

Construction Issues



Construction Safety



Providing a controlled environment



Flyby of Pier during Construction

What worked Well?

- Plan ahead
- Collaborative relationships throughout
- Focus on safety from initial concept
- Keep reviewing safety as works progress
- Allow inclement weather days

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Project H&S Stats

As of April 2018

- Man Hours = 32835
- Incidents = 4
- LTI's = 0
- Medical Treatment Injuries = 4
- Near Misses = 11



Any Questions?

