



New Lynn Rail Trench

Transformation through collaboration

IPENZ Transportation Group Conference
Auckland 2011

Darren Cash
Malcolm MacDonald

Resolve Group
Fletcher Construction Company

Acknowledgements



Peter King



Malcolm MacDonald
Paper Co - Author





Resolve GroupTeam


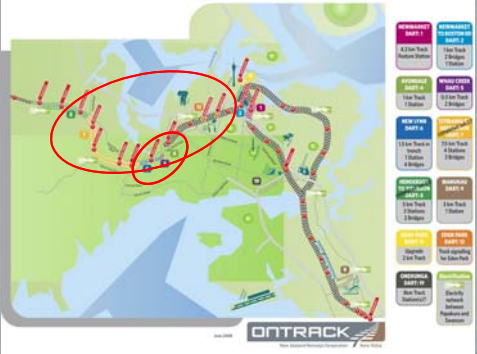


New Lynn Rail Trench – key points

- Transformation
- Collaboration
- Construction



Project outline – New Lynn Rail Trench (Dart 6)



Project Outline

Construction period

- Enabling works
December 2007,
- Main construction
August 2008 -
September 2010

Trench structure

- approx 900m length
- maximum retained
height 8m



Where is New Lynn ?



New Lynn - divided



Previously - rail through roundabout



Rail through roundabout



Safety problems



Transformation



Transformation – Improved Connectivity



Transformation - Improved Connectivity



Transformation - Integrated Hub



Transformation – how it used to be



Transformation – Wrap around Bus station



Transformation – shelter



Transformation – cycle storage



Transformation - more rail frequency



Collaboration




Collaboration – Contract Jargon Buster!

ECI = Early Contractor Involvement procurement model

TOC = Target Out turn Cost
= sum of Target Cost and Margin

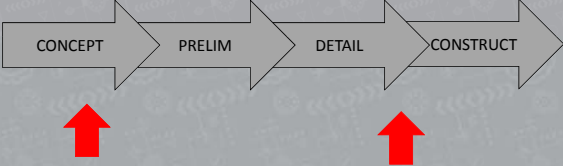

PRs = Principals Requirements
= the project specification

VE = Value Engineering



Collaboration – ECI Contract


Early Contractor Involvement (ECI) contract

Collaboration – the ECI Process

Three stage approach:

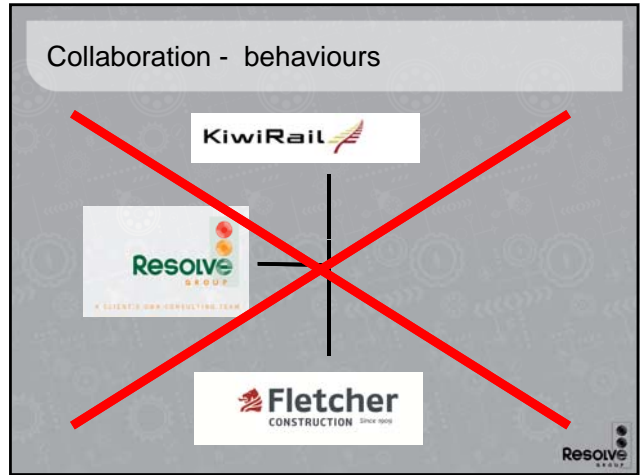
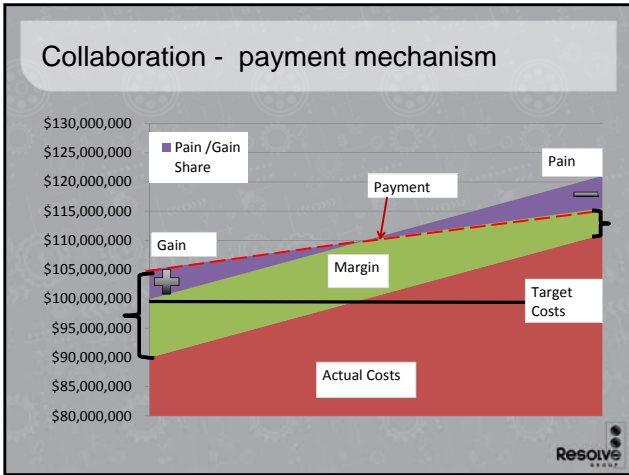
- Stage One - Proposal
- Stage Two - Concept Design
Preliminary Design
Target Out turn Cost (TOC)
- Stage Three - Detailed design and construction.



Collaboration - common goals

- strong collaborative “best for project” behaviours
 - open-book policy
 - focused on common goals
 - enhanced the collaboration



Collaboration - behaviour

Key areas of success

- Productivity gains
 - tension piling
 - diaphragm wall work
 - base slab construction
- Joint mitigation of project risks
- Early completion primary civil trench.
- Substantially under budget

The photograph shows a construction site with a large yellow crane, a white truck, and several workers in orange safety gear. The sky is blue with some clouds.

ECI Process “wins” - example

Value Engineering

- Stage 2
- Preliminary design initial PRs March 2008
- Significant Value Engineering
- joint, focused approach
- entire concept for the project was thoroughly challenged



ECI Process “wins” - example

- Key outcomes from VE :
 - Removal of “future proofing for trench over-build”
 - Relaxation of rail alignment
 - Detailed design advanced 50 % to 90%
- reduction of \$25 million (on approx \$150M)



ECI wins – No Enhanced Station ?

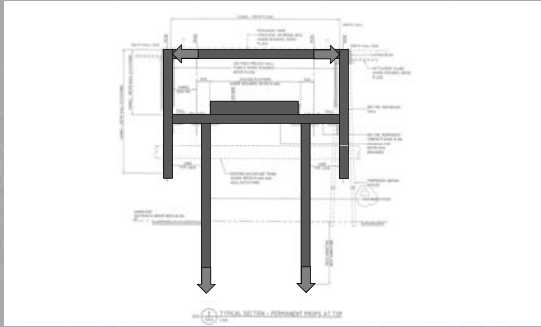
- Construction started before station was confirmed
- design challenged to keep ahead
- architecture by separate consultant, separate client
- “best for project” team behaviour allowed the package inclusion



Construction



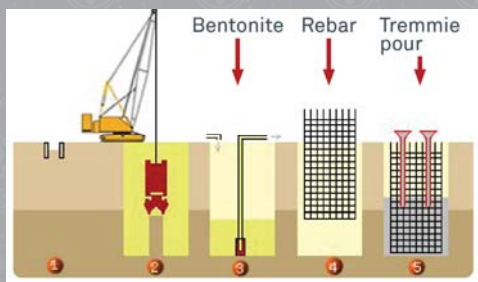
Typical Cross section



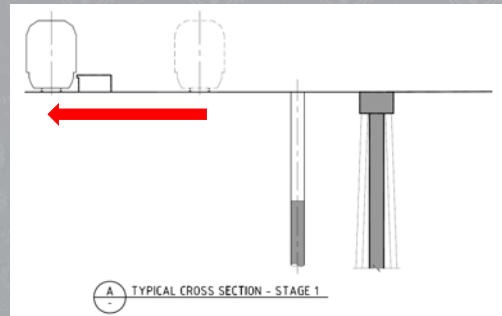
Diaphragm Wall Excavation



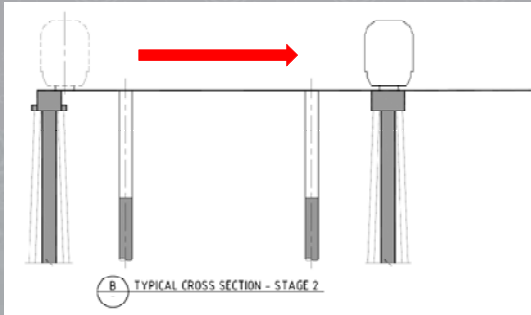
Diaphragm Wall Construction



Stage One – South slew



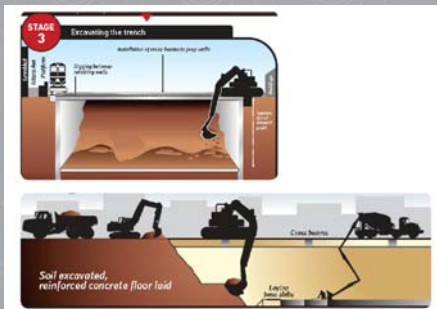
Stage 2 – North capping beam



Stage One move to Stage Two



Stage 3 – Dig out



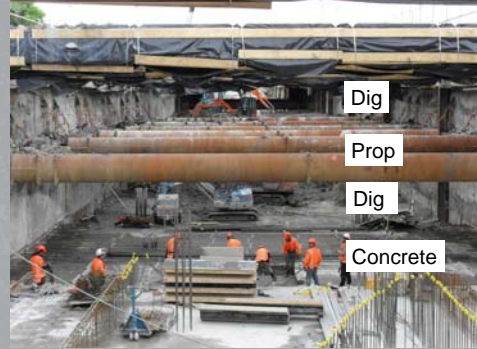
Stage 3 – Prop and dig



Stage 3 – Prop and dig



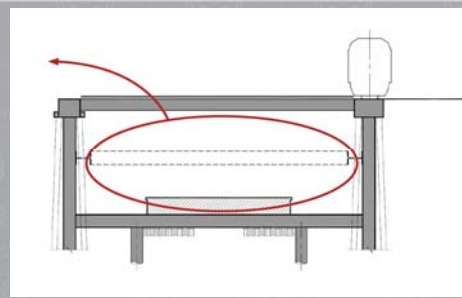
Stage 3 – in trench view



Close proximity !



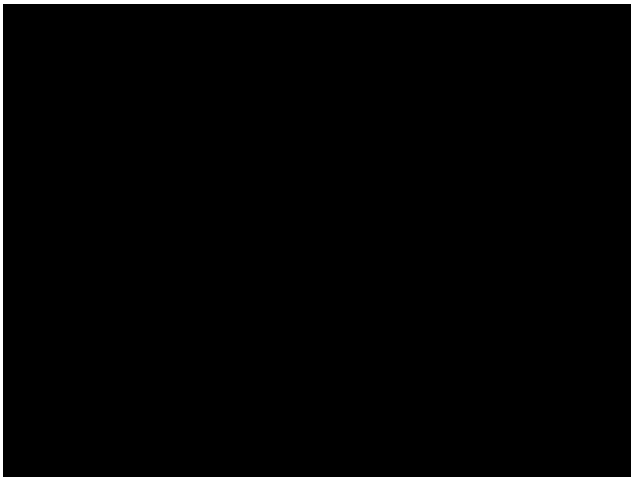
Prop removal



Excavation complete



Time lapse



Completion



Conclusion - Transformation

Successfully improved:

- rail efficiency and timetabling
- reduced traffic delays
- pedestrian and road user connectivity
- integration of travel modes
- urban regeneration



Conclusion - Collaboration

The collaborative team effort facilitated:

- inclusion of significant additional scope
- an optimised and constructible design
- a successful project under budget, ahead of time.



New Lynn Rail Trench Transformation through collaboration

- legacy of **transformational** transport infrastructure
- blue print for future **collaborative** project delivery.

Working together moving towards prosperity



Questions

