Newmarket Connection Viaduct Replacement Project

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(Project Alliance Board Chairman)

REAAA NZ Chapter Roadshow - November 2011
Background & construction staging

Minor structures

New viaduct

Existing viaduct deconstruction

Management of key risks
Newmarket Viaduct
SH1- View south at Gillies Ave exit
Reasons for replacing the existing viaduct

• Improve seismic capacity
• Improve edge barrier protection capacity
• Allow heavy vehicles onto the viaduct
• Improve urban design amenity
• Network integrity
Northern Gateway Alliance (NGA) Participants

- NZ Transport Agency
- Beca Infrastructure
- Boffa Miskell
- Fulton Hogan
- Leighton Contractors
- Tonkin & Taylor
- URS New Zealand
- VSL New Zealand

- Proven relationship and understanding with NZTA/NGA
- Opportunity for second generation alliance
- Experience at Waiwera
- Key skills held within parent organisations
- Proven high performance team
- Technical ability – best of local and international
- Good understanding of project risks and management processes.
Construction Stages

Original situation
Construction Stages

Stage 1

Existing 3 southbound lanes – width reduced

Construct new southbound
Construction Stages

Stage 2

Shift traffic to new southbound
Reduce lane width on existing northbound to 3.1m
Deconstruct existing southbound
Construction Stages

Stage 3

New southbound to 4 lanes with tie-ins at each end
SH1- View south at Gillies Ave exit

$1,000,000 per week!
Construction Stages

Stage 3

New southbound to 4 lanes with tie-ins at each end
Construction Stages

Stage 4

Construct new northbound and connect to new southbound
Construction Stages

Stage 5

Northbound traffic relocated to new structure at 3.1m
Widen 4 lanes southbound to 3.5m
Deconstruct existing northbound
Widen northbound shoulder
Construction Stages

Stage 6

Final lane configuration 3.5m northbound
Background & construction staging

Minor structures

New viaduct

Existing viaduct deconstruction

Management of key risks
Other Structures – northern end

Gillies off ramp retaining walls

Gillies Ave bridge
Gillies off ramp retaining wall

New southbound motorway

Realigned Gillies off ramp
Gillies Ave off ramp retaining wall
Gillies Ave off ramp retaining wall
Gillies Ave off ramp retaining wall
Other Structures - southern end

- St Marks Retaining Wall
- Mt Hobson noise wall
- Southern approach wall
St Marks on ramp retaining wall

New southbound motorway

Realigned
St Marks on ramp
St Marks on ramp retaining wall
St Marks on ramp
Background & construction staging

Minor structures

New viaduct

Existing viaduct deconstruction

Management of key risks
New Viaduct

- New 29.7m wide viaduct
- Balanced cantilever precast concrete box girders – max 62m spans
- 12 spans with a total length of 690m
- 4 southbound lanes, 3 northbound lanes
- Future option to upgrade to 4 northbound lanes
Viaduct foundation layout

Gillies Ave

Broadway

South abutment
Pad foundation construction
- exposure and grouting of basalt
Pad foundation construction
- exposure and grouting of basalt
Pad foundation construction
- exposure and grouting of basalt
Pier construction
New viaduct – typical cross section

- Internal cantilever post-tensioning
- External continuity post-tensioning
- Insitu pier diaphragm
New viaduct – typical pier diaphragm
New viaduct – typical pier diaphragm
Erection of 1st pier segment
New viaduct – balanced cantilever construction
New viaduct – balanced cantilever construction
New viaduct – connecting cantilevers together

‘external’ post-tensioning (inside deck segments)
‘External’ post-tensioning
‘External’ post-tensioning
Precasting of deck segments
Precasting of deck segments
Launching ‘Big Blue’
Viaduct construction
Viaduct construction above Broadway
Viaduct construction