SH77 Rakaia Gorge Bridge No.1

- 55m span wrought iron truss constructed circa 1882
- One of the oldest structures on NZ’s State Highway network
- Category 1 Heritage Structure
- Deck replacement and seismic strengthening works currently underway
Overview of Final Solution

New deck consists of:

- Modified steel UB transoms
- Laminated Timber Panels (140mm thick)
- BRP road patch surfacing
- 50 year expected remaining life following deck replacement
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Limited Capacity of Existing Structure

- Limited live load and seismic capacity
- Dead load of new deck a critical consideration and constraint
- Detailed seismic assessment undertaken to enable seismic strengthening to occur in parallel with deck replacement
- Diaphragm action from Laminated Timber Panels in larger earthquakes (Return Period > 1000 yrs.)
Form of Existing Structure

- Riveted girders with rivets protruding through top flange
- Bearing plates with oversized holes used to accommodate rivets
Form of Existing Structure

- New deck has a more continuous surface
- Originally, water drained through many gaps between deck planks
- Cross-fall in new deck allows water to drain off edge of structure
Heritage Considerations

• Existing visual appearance deemed to have exceptional heritage significance
• New steel transoms designed to have spliced timber ends
• Enables reuse of original material
• Outward appearance sympathetic with original design
Access and Future Maintenance

- Deck approximately 16m above river below
- Scaffold installed across entire structure to complete works
- Provides safe access to underside of deck between trusses
Access and Future Maintenance

- Single lane bridge and only alternative route to SH1 across the Rakaia River
- Night closures required for majority of works
- Staged deck replacement methodology
Access and Future Maintenance

- Chosen materials have improved durability over original
- Maintenance of timber decks a constant challenge
- Hold down detail enables tightening from deck surface
Breakout of headwall at Christchurch end of structure during night closure (Source: Downer NZ)