Use of Advanced Fibre Composites in Concrete Rehabilitation

The Main Roads Experience

by

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Queensland Main Roads
The Main Roads Experience

- Houghton Highway Pile Rehabilitation
- Australia’s first fibre composite bridge
- Main Roads design requirements
Houghton Highway

- Cracking of pre-stressed concrete piles due to alkali-silica reaction was detected in 1991
- In total, 500 piles were repaired. The rehabilitation was completed in 2000.
The vertical cracking of piles due to alkali-silica reaction
Carbon fibre wrap
Glass fibre wraps
Fibre Composite Bridge

- Main Roads design requirements
- Adaptability into current bridges
- Cost of materials and manufacture
- Ease of Manufacture and assembly
Fibre composite “deck unit”
Main Roads Requirements

• Environmental
  - Fire protection
  - Robustness and damage repair
  - Ultra violet light resistance
  - Temperature cycling
  - Chemical inertness
  - Routine maintenance
  - Resurfacing
  - Quality Assurance of materials
Main Roads Requirements

- Graffiti
- Loading – T44, HLP, MS1600
- Deflection limits – Span/500
- Dynamic response of the fibre composite deck unit
The finished product