

Lane Cove Tunnel

Project Report - New South Wales

The Roads and Traffic Authority (RTA) engaged the Lane Cove Tunnel Company to design, construct, maintain and operate the Lane Cove Tunnel for 33 years.

The project is part of Sydney's orbital road network and involved the construction of a twin 3.6km tunnel plus 3.5km of bridge and road upgrades to link the M2 Motorway with the Gore Hill Freeway. The project included two new lanes across the Lane Cove River, transit lanes on the Gore Hill Freeway, new ramps at Falcon Street, together with a new continuous cycleway and pedestrian path from North Ryde to Naremburn.

The project was also designed to relieve traffic congestion in local roads and improve pedestrian and public transport facilities around Lane Cove. Seven road header machines were used to excavate the tunnels from access points at Marden Street in Artarmon, a mid-tunnel site and from Mowbray Road at Lane Cove.

Construction was subject to stringent conditions covering management of water and air quality, noise, dust control and other environmental aspects, traffic management, community consultation and community information programs. Challenges of the project included the difficulties of working on a route that caters for around 90,000 vehicles a day and the requirement that there be no reduction in the number of traffic lanes during peak hours.



Specification requirements

Key elements of the specification included the following:

- RTA of NSW concrete design criteria including bridge mixes, paving concrete and tremmie mixes
- 100 year design life
- special requirements for steel fibre shotcretes
- steel fibre shotcrete toughness requirements for design, deemed to comply and with quality control requirements, and
- drainage layers cast using no fines lean mix concrete.

Problems encountered

Problems encountered on site included:

- traffic management
- transport delay issues due to traffic congestion that placed significant pressure on RTA specification for initial slump requirement on site, and
- a significant proportion of the concrete supplied was to underground locations providing logistical challenges with delivery times.

Solutions developed

The Artarmon Concrete Plant was in close proximity to the construction site and logistic issues were managed from the plant. Significant quantities specialist products such as steel fibre reinforced shotcretes were required. A fibre dispensing machine was installed at the plant

Location	Sydney, NSW
Client	Connector Motorways
Contractor	Theiss John Holland Joint Venture
Engineer	Parsons Brinckerhoff
Products supplied	256,000m³ of premixed concrete: <ul style="list-style-type: none"> • Steel fibre shotcrete • CRCP (35MPa) • Tremmie concrete • RTA bridge mixes • No fines drainage concrete
Commencement	May 2004
Completion	March 2007 (Stage 1)

to minimise batching problems and increase levels of control on the mix performance. All concretes supplied needed to conform to RTA specifications and were tested at the plant and at the point of discharge to ensure compliance. The entire trucking fleet was fitted with catalytic converters and the technical team supplied diesel testing vehicles. Significant R&D was conducted on the tunnel concretes to develop new knowledge on concrete mix performance in specific structures.

Results Achieved

Over 256,000m³ of concrete was supplied to the project comprising:

- 40,000m³ of 35MPa CRCP
- 31,000m³ of No Fines Concrete
- 30,000m³ of 40MPa RTA Bridge Mix
- 29,000m³ of Shotcrete

High level safety systems were adopted during the supply of products for this project. The project was a success for the customer and for Holcim (Readymix).

Lane Cove Tunnel Route

