

Epping - Chatswood Rail Line

Project Report - New South Wales

In Sydney, the Main West Rail Line and the Main North Rail Line were currently operating close to capacity, with considerable congestion on the network between Strathfield and the Sydney CBD.

The NSW government awarded the Thiess Hochtief Alstom group an \$850 million contract for major tunnelling and track works on the Epping to Chatswood component of the Parramatta Rail Link project, to alleviate this congestion.

The group was responsible for the design and construction of two tunnels each 13km long and four stations, as well as the design, construction and



commissioning of track, signal, and communication works for each of the tunnels along the Chatswood to Epping section of the line. The main tunnel was driven by a tunnel boring machine and a special lining was designed to facilitate movement of rail stock. Readymix (now Holcim) was awarded the contract to supply major structural components within this project.

Specification requirements

The project covered the following:

- Cut and cover method of tunnel construction
- chloride Diffusion limit of $2.0 \times 10^{-12} \text{m}^2/\text{sec}$ in accordance with Nordtest 443 for 40MPa concrete, and
- tunnel shotcrete requiring extended slump life for up to 12 hours.

A large proportion of the concrete supplied was to underground locations. Logistical concerns needed to be managed with agitator movement from supply plants

in high congestion city locations. Extensive specified requirements for shotcrete included flexural strength, slump life and toughness measurements for steel fibre concrete. There was a high chloride environment for concrete under the Lane Cove River. In addition, construction of thick concrete elements meant that there was a need to mitigate thermal cracking and control heat of hydration at early stages of construction.

Solutions developed

Holcim provided a complete inducted testing team dedicated to the Epping-Chatswood Rail Line project. Diesel testing vehicles were used in concrete sample preparation and testing underground. Extensive onsite testing was done on various shotcrete designs incorporating multiple admixture and steel fibre reinforcing strategies. Significant R&D was carried out on concretes used in this project.



Location	North-Western Sydney
Client	Transport Infrastructure Development Corporation
Contractor	Theiss-Hochtief Joint Venture
Engineer	Parsons Brickerhoff
Products supplied	116,000m³ of premixed concrete: <ul style="list-style-type: none"> • 36,000m³ steel fibre shotcrete • 13,000m³ 40MPa RTA specified bridge concrete • 6000m³ 40MPa tremmie concrete.
Commencement	February 2003
Completion	September 2006