Difficult start for Vancouver's twin tunnels

There is still much to do before two Robbins TBMs can begin work on the Seymour–Capilano water tunnels project in Vancouver. *T&TNA* contributor **Tonia Jurbin** visited the project to report the scope of works and causes for delays.

Mixed-face conditions complicated shaft sinking excavation

Mobilization and initial shaft sinking at the start of the Seymour-Capilano Filtration Project in Vancouver has taken longer than expected. Following notice to proceed in September 2004, excavation of the 180m deep x 11m diameter (600ft x 36ft) access working shaft by the Bilfinger Berger/Frucon JV was scheduled for completion by end of May 2005. It was early November however before the shaft reached tunnel elevation and drill+blast of the TBM assembly chambers and launch tunnels could begin.

Bilfinger Berger (Canada) (BBC) Inc.'s contract is at the heart of the Greater Vancouver Regional District's $Can600 million water supply upgrade. When complete the project's new filtration plant at the Seymour site will be Canada's largest. The two 7.2km long, 3.8m diameter tunnels (4.3 mile x 12.5ft) will connect two of the District's three reservoirs to carry raw water from the Capilano reservoir to the Seymour filtration plant and deliver treated water back to Capilano for supply into the District's distribution network. With the tunnels, the project includes a new pump station, an energy recovery plant and three deep operating shafts.

Drill+blast of the TBM assembly chambers and starter tunnels started in November

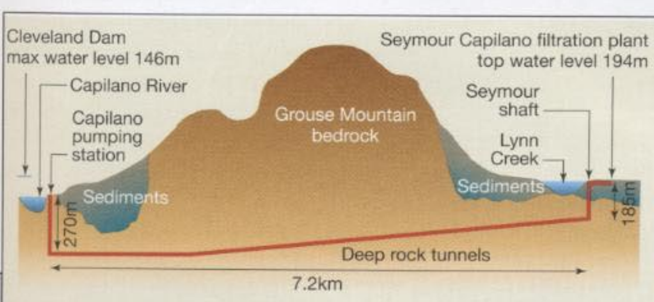
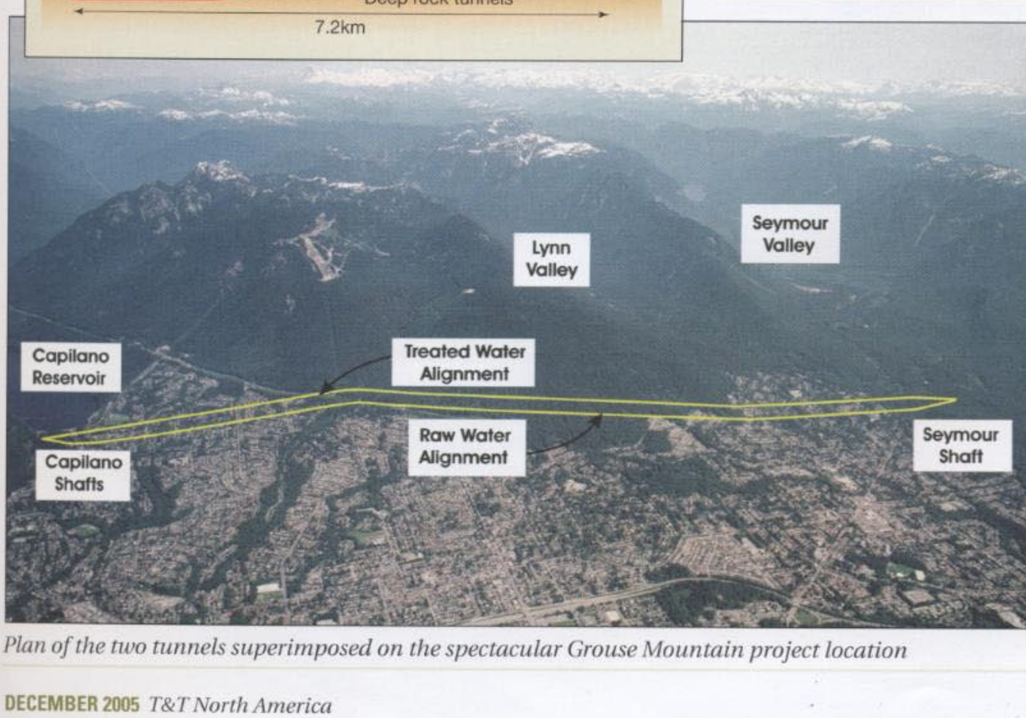


Fig 1. Longitudinal section of the twin downhill TBM drives from Seymour to Capilano



Plan of the two tunnels superimposed on the spectacular Grouse Mountain project location

The meat of the undertaking is the tunneling but before 160 trailers loaded with TBM parts can be delivered to site, work concentrated on sinking the Seymour access shaft. Preliminary drilling at the original site of the shaft revealed 300ft of saturated sands and gravels that would have made for tough shaft sinking. Ground freezing was considered but geotechnical testing showed the groundwater was moving so quickly it would add heat to the freeze wall faster than the freeze plant could remove it. Geophysical methods, backed up by drilling, allowed the shaft to be relocated by about 200ft to an identified rock knoll under about 100ft of bouldery overburden.

After casting the shaft collar, the