



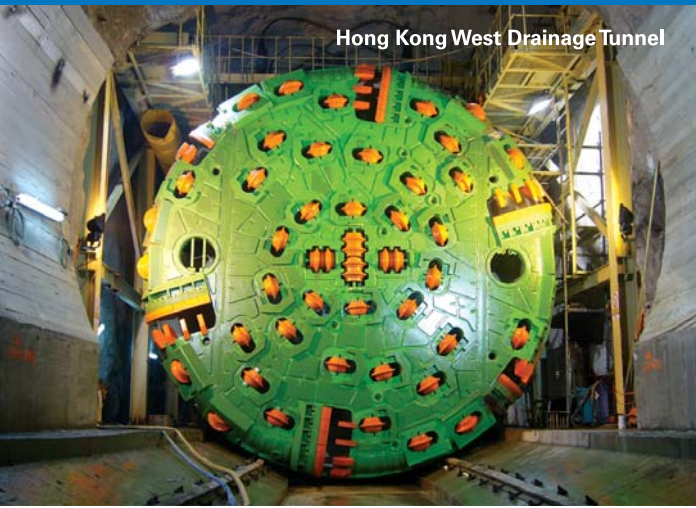
## TUNNEL

Dragages has an unrivalled track record in successful tunnelling projects across Hong Kong, dating back to the 1960s when it first connected Kowloon and the New Territories.

Since then the company has set the benchmark for innovative design and construction methods, continually striving to bring the highest standards of safety and excellence to every project.

Tapping into its global network, Dragages has been an industry leader in bringing new technologies to Hong Kong, such as the territory's first mixed ground earth pressure balanced tunnel boring machine.

Today, tunnels constructed by Dragages connect communities across Hong Kong, providing transport access as well as drainage, water and electricity networks.



Hong Kong West Drainage Tunnel



Cheung Tsing Tunnel and Viaducts



Lion Rock Tunnel

### 2007 Hong Kong West Drainage Tunnel

**An innovative solution to Hong Kong's seasonal flooding. This 11 km main tunnel will channel rainwater from the high ground directly into the harbour.**

A total of 34 intakes to intercept water, with the majority of drop shafts constructed by raise boring method. To minimise extensive road works, custom-made tunnel boring machines will be used for tunnel excavation.

### 2005 CLP Castle Peak Cable Tunnel

**A 4.5 m diameter tunnel constructed to house eight high voltage cables, bringing additional power supplies to growing urban areas and the airport zone.**

To minimise the environmental impact, a tunnel boring machine was used, more than 17,500 tunnel segments were precast off site, and waste water was collected and re-used across the project.

### 2002 CLP Cable Tunnels and Crossing

**A design and build project involving four tunnels and a crossing in five different geographical locations.**

Six tunnelling methods were needed to traverse different geological conditions. Strong community relations played a key role in the project, with regular liaison with green groups, schools and local residents.

### 1995 Route 3 – Country Park Section

**A dual three-lane design and build tunnel with access roads as part of the transportation network linking the new airport with key urban centres.**

To avoid transporting excavated materials by trucks, an environmentally-friendly 2 km conveyor belt and mobile crusher system were used. The result was a more efficient process, allowing the project to be completed ahead of schedule.

### 1993 Cheung Tsing Tunnel and Viaducts

**Construction of Hong Kong's first three-lane twin tube tunnel and two viaducts as part of the transportation network between the new airport and urban centres.**

Two fully computerised jumbo machines were used, allowing a five-metre section to be excavated per blast with high precision.

### 1986 Route 5 – Shing Mun Tunnel

**Construction of two tunnels and viaducts through two mountains, across an area of outstanding natural beauty.**

Protecting the natural environment was high on the agenda. Prefabricated formwork and electrical tower cranes were used to create a cleaner and more environmentally-friendly work site.

### 1977 Aberdeen Tunnel

**As the first tunnel running between the north and south of Hong Kong Island, this dual-carriage road link reduced travel time for commuter and business traffic.**

Challenged by a combination of hard rock and poor soil conditions, heavy arch ribbing and hand-excavation were used for precarious sections of the tunnel. The remainder was excavated using hydraulic and pneumatic jumbos.

### 1961, 1973 Lion Rock Tunnels

**Construction of two separate water mains and road tunnels between Kowloon and the New Territories, the first to link the two areas.**

Using a jumbo tunnelling machine and 150 tonnes of explosives, the first Lion Rock tunnel became a water and transportation lifeline for millions. Ten years on, Dragages was commissioned to complete the second tunnel.