

Press kit

Bouygues Construction, 60 years of presence in Hong Kong

March 2015



**BOUYGUES
CONSTRUCTION**

Shaping a **Better Life**

Dragages Hong Kong, a long-standing presence

Presentation of Dragages Hong Kong

This year, Dragages celebrates the 60th anniversary of its presence in Hong Kong. Its first local project was the runway for Kai Tak airport, way back in the 1950s.

The company now numbers 2,500 employees and is present across the complete construction life cycle: design, engineering, construction, financing, long-term operation and maintenance, electrical and mechanical engineering.

Throughout its history, Dragages Hong Kong has demonstrated its know-how across all types of building works: increase of available land, construction of exhibition centres, residential housing, bridges, educational buildings, railways, commercial or industrial buildings, tunnels. The company has recognised know-how in the construction of complex building works. It stands out for its contribution to many innovations in Hong Kong and for its requirements in terms of safety.

Dragages has been involved at every stage of the island's development: connection by air in the 1950s, water management and development of road tunnels in the 1960s, deployment of the rail system in the 1970s and 1980s and development of the services sector in the 1990s and 2000s. It is also a major player in the reclamation of land from the sea, an ongoing operation in Hong Kong to try and remedy the scarcity of land.

Dragages Hong Kong is currently taking up new challenges, such as the strengthening of links with mainland China (construction of a high speed rail link) or with major cities in the region (construction of part of the bridge between Hong Kong Zhuhai and Macao).

After its takeover by Bouygues in 1986, Dragages Hong Kong has been able to benefit from the Group's power and experience in order to boost its development. The company has often provided Hong Kong with major technological innovations, particularly in terms of tunnel boring machines.



2,500

employees

History

- **1955:** first contract for Dragages in Hong Kong: the reconstruction and extension of Kai Tak airport runway. This work required the reclamation of land from the sea, which is a long-standing activity of Dragages. First airport reaching out over the sea.
- **1961:** start of work on the Lion Rock Tunnel, allowing Dragages Hong Kong to demonstrate its expertise in large-scale road tunnels.
- **1964:** start of work on the Plover Cove reservoir, at a time when Hong Kong was investing heavily in order to improve its water management. First reservoir in the world to be built in the sea.
- **1975:** first work on underground railway stations and tunnels for Dragages Hong Kong. This activity is still ongoing today.
- **1986:** acquisition of Dragages by the Bouygues group. Dragages was at the time part of the Screg group (Colas, Screg roads, Sacer, Dragages and Smac Acieroid), purchased by Bouygues. This transaction enabled Dragages to benefit from Bouygues' international experience and to carry off operations that were more technical and of much greater size.
- **1990s:** a period of strong growth for the company, with many worksites in all sectors.
- **1990:** creation of BYME in Hong Kong, enabling Dragages to extend its range of skills to include electrical and mechanical engineering know-how.
- **1995:** started the construction of the extension of Hong Kong's convention and exhibition centre, where two years later the ceremony handing Hong Kong over to China was to be held.
- **2003:** start of construction of AsiaWorld-Expo, first public-private partnership conducted by a private consortium in Hong Kong. Biggest exhibition and event centre in Hong Kong at the time when it opened. The success of this experience set the tone for future commercial development of Dragages.
- **2009:** Dragages Hong Kong won the contract for building the new Civil Aviation Department Headquarters, the seventh project won by the company in the context of developing the new international airport, located on Lantau Island.
- **2010:** Dragages Hong Kong won the contract for the Kai Tai Cruise Terminal Building and two tunnel contracts for the construction of the high speed rail link between Hong Kong and Guangzhou (Express Rail link contracts 820 and 821)

2011: creation of the Dragages Hong Kong training centre on safety (1,000 m², possibility of training up to 70 people a day)
2012: signature of a contract for the construction of a 9 kilometre section of the bridge that will link Hong Kong to Zhuhai and Macao
2013 : signature of a 1.15 billion euro contract for the construction of a 4.2 km long undersea road tunnel in Hong Kong. It is the largest design-build contract ever awarded in Hong Kong.

Iconic projects in progress

Two tunnels for the underground train line Shatin to Central Link



This contract, worth around 490 million euros, covers the construction of 2X2 tunnels that will form part of a 6-kilometre extension of the Shatin to Central Link metro line. These tunnels are among the major infrastructure projects currently under way in the city, connecting tourist sites and the financial district.

The two eastern tunnels, each approximately 540 m long, will run from the south ventilation building and the new Exhibition station on the Shatin to Central Link. The two western tunnels, each approximately 450 m long, will be bored between the Fenwick Pier emergency egress point and the existing Admiralty station. Bouygues Construction will also construct the ventilation building.

The work, which started in September 2014, will last for 6 years, with delivery expected in 2020. Some 500 people will be working on-site at peak periods.

The 17-kilometre Shatin to Central Link is designed to enhance the entire railway network of Hong Kong by connecting several existing railway lines. When complete, road traffic congestion will be relieved, and travelling time between the New Territories and the city centre will be reduced to around 40% of the time currently taken.

The "Tuen Mun Chek Lap Kok" underwater road tunnel

This contract worth 1.15 billion euros for the construction of a 4.2 km long road tunnel is the largest design-build contract ever awarded in Hong Kong.

The project consists in constructing an undersea twin-tube tunnel, each tube with two traffic lanes and 14 metres in diameter. The tunnel will link the New Territories, north of Hong Kong, to Lantau Island, where the international airport is located. It will be bored 50 metres below sea level, which will constitute a record depth for Bouygues Construction. Two tunnel boring machines (TBMs) - rotary drilling machines for excavating and building the structure - will be used. One of these tunnel boring machines, which has just been brought into service, is the biggest in the world, with an outside diameter of 17.6 metres



The project is particularly complex and will also entail working in an environment in which pressure is high (over 5 bar). Maintenance operations, particularly with respect to the cutting heads of the TBMs, will be carried out by teams of divers who will live in a hyperbaric base camp for four weeks at a time to allow them to deal with any issue that may arise at any time. This new method of organisation avoids them having to undergo decompression too frequently.

Two innovations developed by the Bouygues Construction Research & Development Department will be used on the project in order to reduce the need for manual operations in hyperbaric conditions. Mobydic, a system of sensors incorporated into the disc cutters in the heads of the TBMs, will make it possible to permanently monitor the state of wear of the cutters while allowing real-time geological mapping of rock faces. Snake, a remote-controlled exploration arm equipped with a high-pressure jet, will clean the TBM heads and eliminate clogging to enable them to be inspected.

Handover is scheduled for the end of 2018.

First section of the bridge between Hong Kong, Zhuhai and Macao

This contract, worth around 1.25 billion euros (half of which for Bouygues Construction) includes the construction of the first part of the bridge between Hong Kong and the cities of Zhuhai and Macao, two cities located on the other side of the Pearl River delta.

Bouygues Construction is constructing a section of the bridge measuring 9.4 kilometres, from the International Airport Island to the boundary of Hong Kong territorial waters. This bridge will support a three-lane dual carriageway over Hong Kong's deep western waters. The Group also carries out electrical and mechanical engineering work, along with the installation of marine navigational aids, a ship impact protection system, and the maintenance and monitoring management systems for the structure of the bridge..

The completion of this project represents a number of major challenges. The bulk of the works are to be completed using marine-based equipment, requiring special logistical arrangements. At the same time, navigational channels must be maintained open throughout construction. Lastly, because of its proximity to the airport, very strict height restrictions will also need to be observed.



Work started in mid-2012 and will involve 800 staff at peak periods and close to 400 people in the manufacture of the structural components. The project will last nearly four and a half years (54 months), with handover planned in 2016.

The Hong Kong - Zhuhai - Macao bridge is one of ten major infrastructure projects which have been launched by the Hong Kong Government since 2007. It forms part of the Chinese programme intended to strengthen links between cities in the region.

High speed railway line Express Rail Link 820 and 821

Worth a total of 500 million euros, these two contracts include the construction of two sections of the new high speed railway line linking Hong Kong to Canton (MTRC Express Rail Link nos. 820 and 821). This is one of the city's ten largest infrastructure projects.



The projects carried out by Dragages Hong Kong consist of two parallel single-track tunnels each of over 3.5 km in length and a two-track tunnel of 3 km in length. These form part of the future railway line that will link Hong Kong to Shanghai and Peking in 2015. One of the biggest difficulties to be overcome is the considerable number of obstructions (deep-laid foundations of current structures, metro lines, etc.) which punctuate the route and must be evacuated before allowing the tunnel boring machines to be used.

The works, which started mid-2010, are currently coming to an end and have required 1,000 people on site during peak periods. On the first part of the contract (MTRC Express Rail Link no. 820), two tunnel boring machines are necessary for constructing the two tubes of nine metres in diameter. On the second part of the contract (MTRC Express Rail Link no. 821), the tunnels are excavated by blasting.

The AsiaWorld-Expo international exhibition centre, currently in operation

Inaugurated in December 2005, AsiaWorld-Expo is the biggest exhibition centre in Hong Kong. After having completed all the design and works for a total of around 250 million euros in just twenty eight months, Dragages Hong Kong, via its subsidiary AsiaWorld-Expo Management Limited, will continue to run this centre for another 18 years (out of 25 in all).

This operation was carried out as a PPP (Public-Private Partnership) on behalf of the Government of the Hong Kong Special Administrative Region, in liaison with the Airport Authority and a top Chinese bank (ICBC). The PPP formula has seen little use in Hong Kong, and this first project has opened up new perspectives for Dragages.

AsiaWorld-Expo offers almost 70,000 m² of usable exhibition surface area including ten halls, a conference centre and the island's biggest multi-purpose concert arena that can hold up to 15,000 people. All of these areas adapt perfectly to the needs of the exhibitors and event organisers as they are very customisable. There is direct access to the new international airport and even a subway station specially integrated into the centre.

The operating company, wholly owned by Dragages Hong Kong, has hosted many international and regional events at AsiaWorld-Expo during the past six years, such as ITU Telecom World, the biggest jewellery and precious stones exhibition in the world, the Asian aerospace exhibition and several hundred concerts and corporate events.



The SkyCity Marriott hotel, currently in operation

In the context of a PPP project, Dragages Hong Kong has been put in charge of the design and construction of a 5 star hotel with 658 bedrooms and suites, and then its operation for 40 years, for a total amount of around 100 million euros. Connected by a covered walkway to the AsiaWorld-Expo site, the hotel is located at the edge of Hong Kong's international Airport.

Completed in 30 months between 2006 and 2009, the building is comprised of:

- a main building 13 storeys high on a surface area of 42,000 m² including 658 bedrooms
- an annex building 2 storeys high on almost 2,000 m² consisting of a banquet hall, meeting rooms, a 25 metre long indoor swimming pool as well as a spa and fitness centre.

Some notable achievements in the past

Extension of the Kai Tai Airport Runway (1955-1958)



First Dragages worksite in Hong Kong. Reconstruction and extension of the existing airport runway at Kai Tak. The company was selected for its extensive experience with regard to the sea and dredging. The project certainly presented many challenges, in particular major dredging work and the reclamation of more than 296 acres of land from the sea. The first airport in the world to be built out over the sea, Kai Tak remained in operation for more than 40 years, until it was relocated to the Chek Lap Kok site in 1997.

Plover Cove reservoir (1964-1968)

Construction of a reservoir of two kilometres going down as far as 30 metres in depth, which is still today the second biggest reservoir in Hong Kong. The remoteness of the site (to the extreme north-east of the New Territories) and the landscape created significant problems with regard to procurement and logistics, handled successfully by Dragages.



Lion Rock Tunnel (1961-1964, 1973-75)

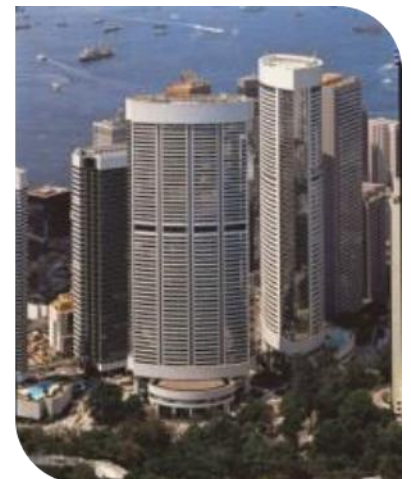


Designed as a water tunnel to bring fresh water from Plover Cove, located in the new territories, to the dynamic industrial centre of Kowloon, the project was subsequently extended to include the first road link through the granite mountain separating Kowloon from the New Territories.. This road has opened up a new social and economic lifeline to the far reaches of Hong Kong. Almost ten years later, a second Lion Rock tunnel was commissioned, a project once again awarded to Dragages.

Pacific Place (1988-1991)

Pacific Place is a group of tower blocks located in the very active business district of the island of Hong Kong. Dragages completed the 56 storey tower building that houses the Shangri-La as well as offices, and neighbouring 61 storey tower that contains 230 apartments and a 5 star hotel with 580 bedrooms, "The Conrad", delivered as a turnkey operation.

In order to limit disturbances to the outside environment, Dragages brought in the best technologies available worldwide in order to speed up the construction. These two tower buildings are raised on a ten storey "podium" infrastructure in accordance with the "top and down" method. This method, used for the first time on such a large-scale operation, allows for the simultaneous construction of floors and underground earthworks in parallel with the construction of vertical structures supporting the floor of the two tower buildings. These works were carried out during the construction of the two tower buildings. Each storey of the tower buildings was constructed in four days on average, an amazing performance.



Kwung Tong Bypass (1989-1991)



Construction as design-build of a double motorway viaduct with 3 traffic lanes, each linking the undersea Hong Kong - Kowloon tunnel, to the Taite's Carne tunnel towards the New Territories. For this project, Dragages introduced a new technology to Hong Kong. For the first time, a 120 metre long launching girder was used. The 450-tonne, steel structure was designed to move both forward and transversely, allowing for the lifting of two segments at one time.

Hong Kong national stadium (1992-1994)

Demolition of the old stadium dating back to the 1960s and construction of a new stadium with capacity for 40,000 people. VSL also participated in this project. Dragages also supervised the construction of an office building, the installation of the sound system and the big screen.



Cheung Ching Tunnel and Viaducts (1993-1997)

The Cheung Tsing Tunnel is Hong Kong's first three-lane twin tube tunnel. It runs for 1,600 metres and is the second toll-free tunnel in Hong Kong. These tunnels cross the island of Tsing Yi located between the Kowloon peninsula and Lantau Island.

Rambler Channel Rail Bridge (1993-1996)

The project consisted of constructing an access ramp, a double underground train line and a main bridge of 1.2 km in length with 2x3 lanes. VSL also participated in this project. Use of external prestressing on all segments, which makes it the first bridge with external prestressing constructed in Hong Kong. In all, 1,000 segments were required, produced by a plant installed on the site. The method provides a gain in time and money as well as easier maintenance and repair works in the future.



Central Reclamation (1993-1997)



This operation, carried out over 43 months, consisted of filling and developing 20 hectares of land reclaimed from the sea, used to construct the underground train line that services Chek Lap Kok airport, to the north of Lantau Island. By extending the land out from the heart of the central business district, Dragages has created the most valuable 20 hectares of land in Hong Kong. The land soon became home of office towers, retail complexes, hotel, and MTR stations.

Extension of the Hong Kong convention and exhibition centre (1995-1997)

Bucking the trend of high-rise tower blocks, this building has changed the landscape of Hong Kong's seafront district with its immediately recognisable architecture projecting into the harbour. Built on 16 acres of land reclaimed from the sea, the building presents an iconic roof with a winged appearance, known as the biggest rounded roof in the world. On 30 June 1997, the ceremony for handing over Hong Kong to China took place in a room at the top of this building (Grand Foyer).



Kwai Tsing Railway Tunnels (1998-2003)

These tunnels, 3.6 kilometres in length and divided into three sections, were carried out in the context of the construction of a new railway line linking the North-Western side of the New Territories to the urbanised area of the Kowloon peninsula. The design-build contract was won on the basis of a variant that proposed the use - for the first time in Hong Kong - of an earth pressure tunnel boring machine capable of excavating both soft ground and rock.

Civil Aviation Department Headquarters (2009-2012)

The Civil Aviation Department Headquarters corresponds to the robust growth of air traffic across the whole of southern China. Designed by the architect firm of Ronald Lu & Partners. This is comprised of three distinct buildings: the first contains offices, meeting rooms and a staff training centre. The second is the air traffic control centre (aeronautical information centre, rescue coordination, network management, etc.); and the third houses the technical operational elements together with a group of workshops.

The project is of unusual complexity in terms of technical equipment due to the commissioning, in this group of buildings, of the new air traffic control centre which will replace the airport control tower. The building is designed and equipped in all areas in order to enable continuity of operation in the event of technical equipment breakdowns or power cuts.

The Cruise Terminal Building (2010-2013)



Located to the south of the old runway on the Kai Tak airport site (also completed by Dragages Hong Kong), this port terminal for cruise ships can hold two super liners with capacity for 4,000 passengers simultaneously.

Designed by architects Foster + Partners and Wong Tung & Partners, the building consists of a three-storey open plan landscaped structure. This building, the only one in the world and of great complexity, comes close to a public works project in its achievement. The construction of the platforms is in fact similar to that of several bridges, built one above the other. This terminal numbers among the most modern in the world and will consolidate Hong Kong's position among the premier cruise hubs in the region.

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As a global player in construction and services, Bouygues Construction designs, builds and operates buildings and structures which, on a daily basis, improve the quality of people's living and working environment: public and private buildings, transport infrastructures and energy and communications networks. As leaders in sustainable construction, the Group and its 53,500 employees have a long-term commitment to helping their customers shape a better life. In 2014, Bouygues Construction's turnover was 11.7 billion euros.

