1950s

The 1950s were a period of huge change for Hong Kong. The end of Japanese occupation, the establishment of the People's Republic of China, the U.S. and U.N. trade embargoes on China and a mass influx of Mainland immigrants bringing low-cost labour to the city, shaped much of Hong Kong's social and economic landscape during this decade.

Coupled with ambitious infrastructure plans and investment-friendly policies, Hong Kong laid the foundations that, over the coming decades, were to create one of the world's greatest trading hubs.

It was during this time that Dragages was awarded the contract to construct what was to become an internationally recognised Hong Kong icon: the runway jutting out into Victoria Harbour for Kai Tak Airport.

Other major projects soon followed, including the Shek Pik and Plover Cove Reservoirs, which became essential lifelines providing fresh water to Hong Kong's rapidly growing population.

For Dragages, it was a decade which was to establish its credentials as a leading partner in Hong Kong's modernisation for the next 50 years.

香港在五十年代幾經巨變，從日據時代結束，中華人民共和國正式成立，到後來美國及聯合國共同對華實施貿易禁運，內地同胞洶湧南下，外圍環境的種種變化，塑造了香港日後的社會和經濟面貌。

隨著內地形勢轉變，大批民眾源源南下，正好為香港的工業提供了廉價的勞動力，配合多項高瞻遠矚的基礎建設工程，以及政府自由開放，鼓勵投資的政策，奠定了香港今後數十年逐步發展成全球最主要貿易樞紐的穩固基礎。

寶嘉與港一同成長，就在本地經濟發展的重要時刻，承辦了舉世知名的建設項目——香港國際機場跑道擴建工程。新擴建的啟德機場跑道伸延進維多利亞港，是香港的矚目地標之一，為未來經濟起飛做好準備。

除機場擴建工程外，因應社會人口增長需要，寶嘉亦參與興建石壁水塘及船灣淡水湖等多個與民生息息相關的項目，解決食水儲存的問題。

從機場跑道擴建工程到石壁水塘、船灣淡水湖項目，寶嘉在五十年代的不懈努力獲得了社會的信任和認同，令公司成為香港往後五十年發展的重要伙伴。

The runway at Hong Kong's Kai Tak Airport was the first of its kind in the world to be constructed over the seabed
香港是世界上首個地方在海床上興建飛機跑道

1955 – 1958

Kai Tak Airport Runway
啟德機場跑道

Demand for marine expertise brings Dragages to Hong Kong

Increasing demand for air travel combined with the growth in airplane size led the Hong Kong Government to plan the reconstruction and extension of the existing Kai Tak runway. By extending the runway two kilometres into Victoria Harbour, Hong Kong was the first city in the world to attempt such an ambitious project.

The challenges of the project, requiring extensive dredging and more than 120 hectares of reclamation, called for a construction company with strong marine and dredging experience. Dragages (which translates as "dredging") was such a company and having won the contract started its first Hong Kong project.

After only 20 months of intensive work, Dragages successfully created the foundations for an airport at Kai Tak that was to become an icon for the aviation industry and a regional aviation hub.

Kai Tak remained in operation for more than 40 years until it was decommissioned in 1997 following the relocation of the airport to Chek Lap Kok.

寶嘉乘海上工程專業優勢登陸香港

隨著航空交通日趨繁忙，加上航機體積漸廣，香港政府遂決定擴建啟德機場原有跑道。新機場跑道伸延兩公里深入維多利亞港。這個劃時代的構思開創建造技術的先河，首次於海床上興建跑道。

啟德機場跑道擴建工程涉及大規模的淤泥挖掘工作，並需填土超過 NOM公頃，承辦商必須具有資深的海事及挖泥經驗才能勝任。寶嘉的法文名是 "aê~Ö~ÖÉé" ，正是「挖泥」的意思。公司憑藉其海事工程及挖泥專長，承辦啟德機場跑道擴建項目，是為在港參與的首項工程。

在工程小組孜孜不倦的努力下，寶嘉以短短 OM個月完成有關工程，為啟德機場的發展奠定穩固的基礎。

擴建後的啟德機場持續服務香港逾四十年，成功確立香港作為區內航空樞紐的地位，直至新機場於 NVVT年遷往赤鱲角。

Client: Public Works Department, Hong Kong Government • **Project:** Extension of the Kai Tak Airport runway • **Runway:** 2 km
客戶：香港政府≈工務局 • **項目簡介：**啟德機場跑道擴建工程 • **跑道：**長O公里

Almost 8,500,000 m³ of rock was used in the runway
興建跑道需要約 8,500,000 立方米填石

1,850,000 m³ of mud was dredged from the seabed
由海床挖出 1,850,000 立方米淤泥

Getting the rocks...
開採填石

...and placing them into the sea
⋯ 傾卸填海

Asphalting the runway
在跑道上鋪上瀝青

After 20 months of intensive work, the Kai Tak Airport runway emerged from the sea
跑道擴展工程歷時 20 個月

Hong Kong's growing population demands new fresh water supplies
香港人口急速膨脹，急需要開發新水源

1959 – 1963

Shek Pik Reservoir
石壁水塘

Bringing new fresh water supply to growing population

Rapid population growth and economic development from the mid-1950s, fuelled a need for additional sources of fresh water. The Government selected the Shek Pik Valley on Lantau Island as the most suitable location to build a new reservoir and works began in 1959.

Located in a semi-basin, a huge dam and a network of outfall channels were constructed to funnel water from the surrounding mountains. Within five years, the ambitious project was completed and Hong Kong Island received its first Shek Pik water in late 1963. Other projects to further develop the reservoir were awarded to Dragages in 1962 and 1964.

The Shek Pik Reservoir sits in the valley below one of Hong Kong's most popular tourist sites, the massive seated bronze Buddha. Thousands of visitors cross the Shek Pik dam every week on their way up to the Buddha's mountain-top home.

應付人口上升 開發新水源

50 年代中，香港人口急速膨脹，經濟發展迅速，社會需要開發新水源，解決食水問題。政府選址大嶼山石壁谷，於 1959 年動工興建新水塘。

新水塘位處半盤地，工程涉及興建一道主壩和周邊的出口水道網絡。寶嘉以 5 年時間完成了這項浩大的工程，而香港島的市民自 1963 年底起便開始飲用來自石壁水塘的供水。往後，寶嘉在 1962 及 1964 年再於水塘的周邊地帶進行相關工程，進一步拓展水塘區的設施。

今天，石壁水塘位處香港著名旅遊點 — 天壇大佛的足下，每週途經水塘主壩登山遊覽的旅客絡繹不絕。

Client: Public Works Department, Hong Kong Government • **Project:** Construction of a fresh water reservoir with outfall channels and catchwaters • **Main dam height:** 54.3 m • **Capacity:** 24,000,000 m^3
客戶：香港政府 工務局 • **項目簡介：**興建淡水水塘、出口水道及引水道 • **主壩高度：**54.3米 • **容量：**24,000,000立方米

1960s

The 1960s were a turning point for Hong Kong's economy, with a surge in its manufacturing capabilities. Textiles were particularly strong, aided by continued immigration from China.

GDP per capita, which was still relatively low in 1960, started to rise. Standards of living, including education and healthcare, saw substantial improvement.

However, things were not all rosy. Droughts in 1963 and 1967, coupled with Hong Kong's rising population, severely affected the territories' water supply. During harsher periods, water supply was restricted to four hours a day over four days.

The growing population and booming economy, fuelled demand for highways, housing, industrial buildings, tunnels and reservoirs.

Dragages leveraged its expertise in dredging and marine works to assist the Government in water management projects, including the massive Plover Cove Reservoir in the New Territories.

In addition, the Lion Rock Tunnel, originally planned as a water pipe tunnel and later expanded to a twin tunnel project, allowed Dragages to demonstrate its tunnelling expertise on larger projects.

六十年代是香港經濟發展的轉捩點，乘南下勞動力源源不斷，製造業發展興旺，當中以紡織業尤其蓬勃。

從六十年代初開始，本地人均生產總值漸見起色，社會整體生活水平，無論在教育及醫療衛生方面均有顯著改善。

然而，好景背後尚有連串問題有待解決。香港於 NVSP 及 NVST 年先後出現旱情，加上人口漸多，水荒問題嚴重。在最困難的時刻，香港一度需要嚴格限制供水，實行每四天一次，每次僅供水四個小時。

與此同時，隨著人口增加，經濟活動頻繁，社會對道路、住屋、廠廈、隧道及水塘的需求日益殷切。

寶嘉以其挖泥及海事工程專長，全力協助香港政府展開不同的供水管理項目，包括參與工程浩大的船灣淡水湖項目。

此外，寶嘉亦參與興建獅子山隧道工程。這個原擬定為輸水管隧道項目的工程，最終發展成包括兩條管道的行車隧道。透過是次項目，充分體現寶嘉承辦大規模隧道開鑿工程的卓越能力。

1961 – 1964, 1973 – 75

Lion Rock Tunnel - Phases I & II
獅子山隧道 — 第一及二期工程

First road tunnel links Shatin with Kowloon

As Hong Kong's population grew and economic development continued unabated, the Government sought new ways to pump fresh water from Plover Cove in the New Territories to the dynamic manufacturing heart of Kowloon.

Originally conceived as a water tunnel, the project was later extended to include the first road link through the granite mountain separating Kowloon from the New Territories. Using a jumbo tunnelling machine along with 150 tonnes of explosives, the 10.5 metre diameter tunnel was completed in 1964.

As the first road tunnel linking Kowloon and Shatin, the route opened a new social and economic lifeline to the far reaches of Hong Kong. Ten years later a second Lion Rock Tunnel was commissioned, a project again awarded to Dragages.

首條貫通沙田及九龍的行車隧道

隨著人口增長及經濟發展興旺，社會積極研究把食水從新界船灣海運送到市區，供應九龍區製造業的心臟地帶。

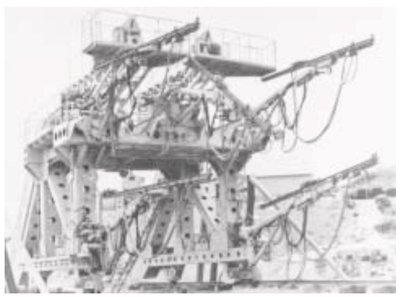
香港政府原來計劃透過隧道，鑿通分隔九龍和新界的花崗岩山嶺，將食水運往市區，後決定進一步把隧道發展成為第一條貫通九龍和新界的行車隧道。

寶嘉運用了大型隧道開鑿機和 150 噸炸藥建造隧道，於 1964 年竣工。隧道直徑 10.5 米。

獅子山隧道作為首條連接九龍和沙田區的行車隧道，縮窄了香港和新界之間的距離，在推動整體經濟發展上發揮重要角色。十年後，寶嘉承辦第二條獅子山隧道工程。

Client: Public Works Department, Hong Kong Government • **Project:** Construction of a road and water supply tunnel between Shatin and Kowloon • **1st tunnel:** 1,400 m • **2nd tunnel:** 1,400 m
客戶：香港政府 工務局 • **項目簡介：**興建連接沙田和九龍的行車及供水管道 • **第一條隧道：**長1,400米 • **第二條隧道：**長1,400米

In the early 1960s, the quiet village of Shatin was separated from Kowloon by rugged peaks
60 年代初的沙田，位處偏僻，被巒山分隔



Jumbo tunnelling machines
大型隧道開鑿機

Tunnel blasting was completed in 1963
1963 年，最後一次爆破工程

1964 – 1968

Plover Cove Reservoir
船灣淡水湖

Remote site brings new challenges to dam project

Plover Cove is located in the remoteness of the far north-east New Territories. The reservoir plan was based on a very simple idea. After damming the natural entrance to Plover Cove bay, Dragages was to pump out the sea water and then allow the reservoir to be filled with fresh water.

Despite the simplicity of the idea, the location and the sheer scale of the project created significant resource and logistical problems to be overcome. The two-kilometre dam was formed using alternate layers of sand and gravel. Over 5,000,000 cubic metres of decomposed granite and 950,000 cubic metres of hard rock were excavated to create a reservoir up to 30 metres deep. By 1967, Dragages had finished the main dam plus two subsidiary dams.

Over 40 years later, Plover Cove Reservoir remains Hong Kong's second biggest dam and has now evolved into a natural marine habitat.

在偏遠灣區建堤築壩 寶嘉喜迎挑戰

船灣淡水湖位處新界東北的偏遠地區。淡水湖的設計概念十分簡單——在灣區入口築起堤壩堵住海水，再將堤壩內的海水抽乾，儲存淡水。

知易行難，由於淡水湖位處人跡罕至的灣區，加上工程規模龐大，涉及大量建築材料，如何安排物資運送正是工程小組的一大考驗。

寶嘉團隊先用沙泥及石礫相間，築起一道長O公里的主壩。工程小組共挖去逾RIMMMIMM0M方米泥土和VRMIMMM立方米岩層，造成一個PM米深的水庫。於NVST年，寶嘉先後完成淡水湖主壩及兩條輔助壩的建造工程。

船灣淡水湖落成至今已逾四十載，是香港第二大水庫。淡水湖更成為一個魚類的自然棲息地，孕育不少自然生態。

Client: Public Works Department, Hong Kong Government • **Project:** Construction of one main dam, two subsidiary dams and one spillway • **Main dam length:** 2 km
客戶：香港政府—工務局 • **項目簡介**：興建一條主壩、兩條輔助壩和一條溢水道 • **主壩**：長O公里

1970s

Economically, the 1970s were a period in which Hong Kong began to reinvent itself from a purely manufacturing base into a financial centre. Land prices were on the rise and economic policies introduced in China allowed Hong Kong companies to move manufacturing facilities to lower cost cities across the border. Real estate and investment became the new buzz words.

Major infrastructure projects centred on improving transportation networks, opening up new areas for residential, commercial and industrial developments.

The Cross Harbour Tunnel, Hong Kong's first underwater tunnel, opened in 1972. This was followed later in the decade by the city's first underground railway connecting eastern Kowloon to Kwun Tong.

Dragages was responsible for much of the tunnelling and station construction works throughout Kowloon and Hong Kong Island.

Linking the north and south sides of Hong Kong Island via the Aberdeen Tunnel was another Dragages project that changed the way people travelled between work and home.

Port facilities were also upgraded significantly in response to increased global trade. Dragages played a leading role in reclamation work for private port operators during this period.

香港在七十年代重新探索發展方向，逐步由純製造基地走上成為金融中心的道路。眼見本港土地價值漸高，加上內地調整經濟政策，香港公司開始跨界北上到內地設廠，以求降低營運成本。一時間，房地產及投資市場成為當時得令的城中熱話。

期間，配合社會開發計劃，多項旨在改善交通運輸網絡的大型基礎建設工程陸續展開，連繫新開發的住宅、商業及工業區。

NVTO年，香港第一條海底隧道通車；數年後，首條地底鐵路正式落成啟用，貫通東九龍至觀塘區。

寶嘉積極參與地鐵建造項目，負責港九多條隧道開鑿及車站建造工程。此外，寶嘉亦承辦香港仔隧道項目，打通香港島南北交通的大動脈，改變港島區的發展面貌。

鑑於國際貿易活動日趨頻密，香港需要全面提升港口設施。寶嘉全情投入，參與多個私人營運碼頭的填土工程。

Mass Transit Railway (MTR) Stations
地鐵車站

Dragages entrusted with expansion of transport network

By the early 1970s, with an ever growing population and increasing industrialisation, the Government pushed ahead with its plan for a wide-reaching and highly-efficient mass public transport system.

An original plan to award the entire first tranche of the network to one consortium was later replaced by a Government decision to divide the contract into 25 civil and 10 electrical and mechanical sub-contracts.

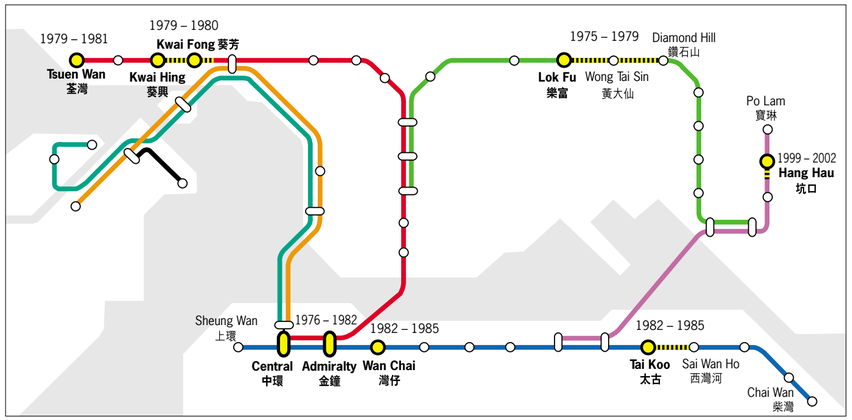
Work began in late 1975 on the pioneering project, with Dragages joint ventures responsible for the pivotal Lok Fu, Admiralty, Central, Kwai Fong, Kwai Hing, and Tsuen Wan stations, etc.

與香港交通網絡一同茁壯成長

TM年代初，香港人口激增，工商業發展一日千里，政府落實興建快速集體公共運輸系統，覆蓋港九各區。

地鐵發展計劃原本擬定由單一財團承辦，隨著政策改動，項目最後劃分為OR個土木及 NM個電機及機械工程。

這項劃時代的工程於 NVTR 年底正式動工，寶嘉以聯營方式負責承辦樂富、金鐘、中環、葵芳、葵興，以及荃灣等多個車站工程項目。



Stations built by Dragages
由寶嘉興建的車站

Tunnels built by Dragages
由寶嘉興建的隧道

1975 – 1979

Lok Fu MTR Station and Tunnels
樂富地鐵站及隧道工程

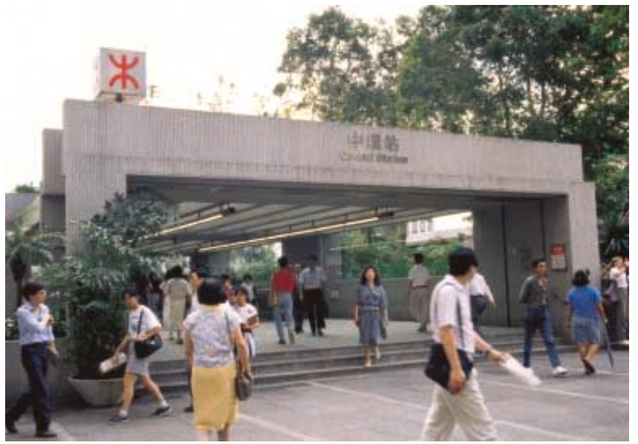
Lok Fu Station and its tunnels formed an essential link between the Wong Tai Sin and Diamond Hill Stations in the busy Kowloon district.

Dragages tunnelling engineers faced a series of challenges associated with the differing conditions in the site areas. A number of methods and techniques were adopted to cope with ground conditions, which varied from soft ground to hard rock.

樂富車站及其相連隧道是黃大仙站和鑽石山站之間的重要聯繫，接駁九龍鬧市。

寶嘉的隧道工程師在建造樂富車站及相連隧道時，面對因地質環境各異所帶來的挑戰。小組因此需要就不同的地質，以不同的技術施工。

Client: MTR Corporation • **Joint-venture project:** Construction of the Station and twin track tunnels (connecting Lok Fu and Wong Tai Sin Stations & Wong Tai Sin and Diamond Hill Stations)
客戶：地鐵公司 • **聯營項目：**建造車站及雙軌隧道 (連接樂富和黃大仙車站以及黃大仙和鑽石山車站)



1976 – 1982

Admiralty and Central MTR Stations
金鐘及中環地鐵站

Located beneath two of the busiest streets on Hong Kong Island and alongside the foundations of some of the city's most prestigious buildings, precision was essential in the design and construction of both stations.

The Central site adopted a top-down method allowing excavation to take place below ground, while building works began above. The site also required special excavation techniques to avoid damage to adjacent buildings.

More than 30 years on, the stations remain essential arteries in Hong Kong's busy MTR, transporting generations of commuters from their homes to their work places.

金鐘及中環地鐵站位處港島最繁忙街道的地下，接壤城內多幢名廈，車站的設計及施工尤其講求精密、準確。

在建造中環站時，寶嘉的工程隊伍以逆做法施工，一方面進行地底發掘，另一方面在地面展開建造工程。由於工地被多幢大廈環抱，工程師在進行開鑿工作時，需要特別謹慎。

中環及金鐘地鐵站落成至今已逾三十年，一直是地鐵系統的要塞，接載幾代香港市民，與社會發展息息相連。

Client: MTR Corporation • **Joint-venture project:** Design and build the Stations
客戶：地鐵公司 • **聯營項目：**車站設計及建造

1979 – 1980

Kwai Fong and Kwai Hing MTR Stations
葵芳及葵興地鐵站

As Hong Kong's urban area continued to extend into the New Territories, new MTR stations were commissioned to link the expanding communities. The Kwai Fong and Kwai Hing station foundations and viaducts involved a design-and-build contract.

The 1,200-metre viaduct segment was designed using a continuous pre-stressed structure. The average length of each span was more than 30 metres.

Both stations were designed with the passenger concourse below an elevated platform deck.

社會不斷發展，地鐵網絡亦進一步擴展到新界，拉近社區之間的距離。

葵芳及葵興站工程合約包括車站地基及高架橋的設計和建造，當中1,200米長的高架橋段採用連續式預應力結構設計，每個跨度平均長逾30米。

葵芳及葵興車站同樣採用架空月台設計，月台位處車站大堂之上。

Client: MTR Corporation • **Project:** Construction of the elevated stations and a 1,200 m viaduct
客戶：地鐵公司 • **項目簡介：**建造架空月台及1,200米長的高架橋

1979 – 1981

Tsuen Wan MTR Station and Depot
荃灣地鐵站及車廠

The Tsuen Wan MTR station and depot, at the end of the Tsuen Wan line from Central, involved extensive clearing of old factory sites and the excavation of almost 2,000,000 cubic metres of rock and debris.

Of primary concern to Dragages was the preservation of the Tin Hau Temple within the site boundaries. During the excavation process, great care was taken to design supports for the structure, while the surrounding water table was gradually lowered.

荃灣站是地鐵荃灣線的終點站，車站及車廠座落在工業區，施工前需清拆多幢舊廠廈，挖掘約200萬立方米岩石及瓦礫。

寶嘉特別注重工地範圍內天后廟的保育工作。在進行挖泥工程時，地下水位會逐步降低，工程師以大量支柱支撐結構，保護古村落的遺跡。

Client: MTR Corporation • **Joint-venture project:** Site formation and construction of a MTR depot including a twin railway tunnel and a two-lane bridge above the station • **Tunnel:** 350 m • **Bridge:** 350 m
客戶：地鐵公司 • **聯營項目：**工地平整及建造荃灣車廠，包括雙軌隧道及橫跨車站上蓋的雙線天橋 • **隧道：**長350米 • **天橋：**長350米

1971 – 1973

Kwai Chung Container Terminal Reclamation Works – Berth No. 1
葵涌貨櫃碼頭填海工程 — 一號泊位

Manufacturing boom fuels container port development

With Hong Kong taking off as a manufacturing powerhouse, the demand on the city's port was growing daily.

The Government identified Kwai Chung, with its easy access to Hong Kong's natural deep water harbour, as a suitable location for its first large scale container terminal.

In keeping with the Government's free-market policy, it was decided that each private terminal operator would design and contract their own terminal. A Dragages joint venture was tasked with the construction of quay walls and reclamation work for the first container berth.

Such was the success of the project, Dragages was subsequently selected for the dredging works at Terminal 4 and Terminal 5.

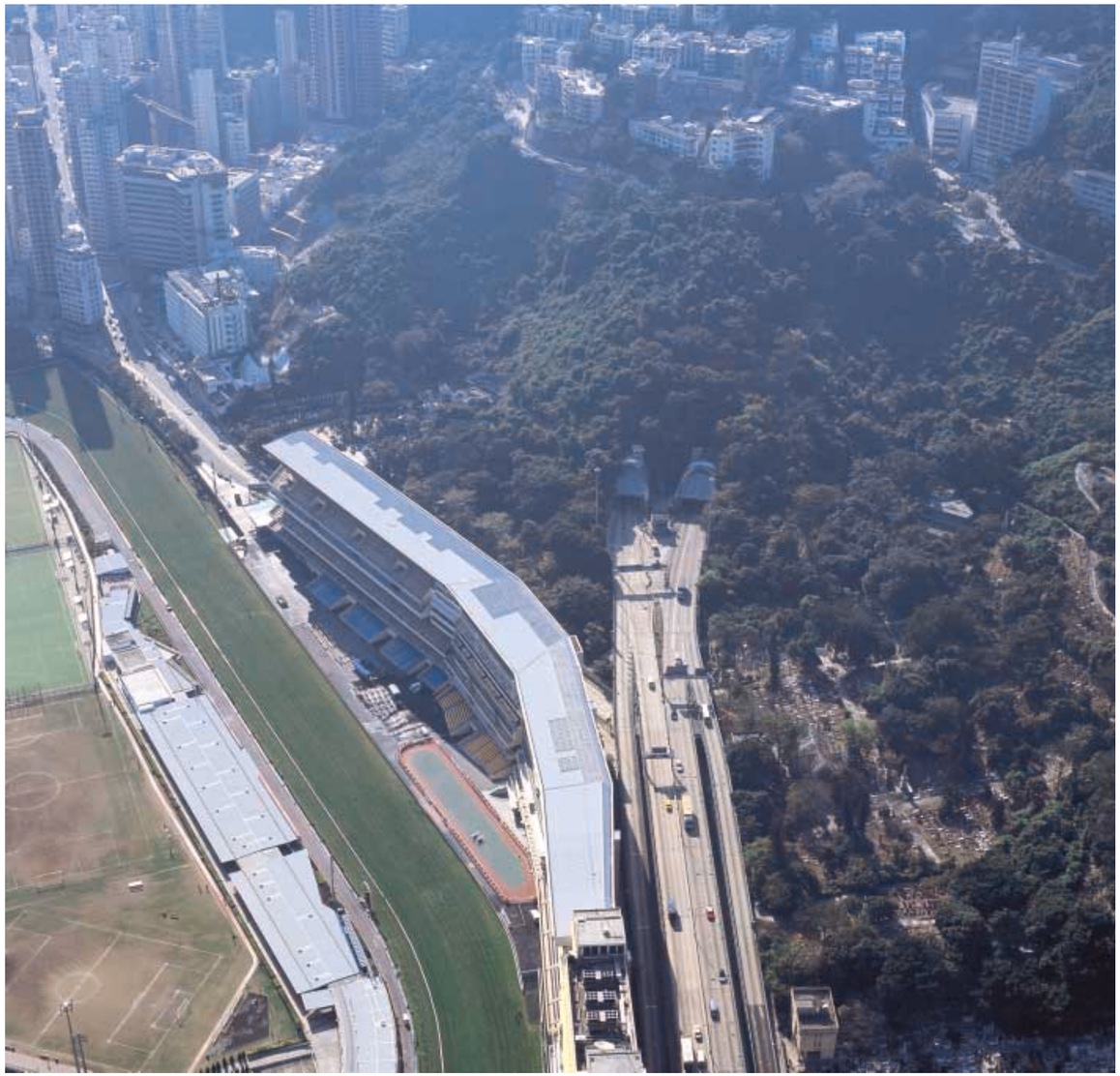
製造業景氣 推動貨櫃碼頭發展計劃

製造業發展推動香港經濟全面起飛，社會對港口服務需求與日俱增。葵涌鄰近維多利亞天然深水港，香港政府遂於此地興建首個大型貨櫃碼頭。

秉承自由市場的原則，政府容許私營碼頭營運商自行設計及批出所屬碼頭的建造合約。寶嘉以聯營方式負責承辦一號泊位碼頭岸牆建造和填海工程。

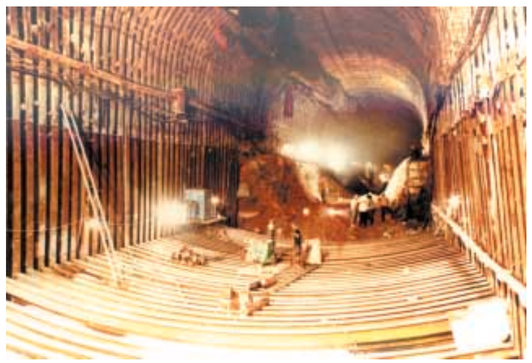
一號泊位落成啟用，寶嘉的努力獲得業界認同，繼續承辦四號及五號貨櫃碼頭的挖泥工程。

Client: Modern Terminals Limited • **Joint-venture project:** Construct quay walls and reclaim land at Berth No. 1 • **Quay Surface:** 15,000 m² • **Quay Length:** 300 m
客戶：現代貨箱碼頭有限公司 • **聯營項目：**建造一號泊位碼頭岸牆及填海工作 • **碼頭面積：**15,000平方米 • **碼頭：**長300米



1977 – 1981

Aberdeen Tunnel
香港仔隧道



Heavy arch ribs support the tunnel
巨型拱肋架就位，支撐隧道

First tunnel brings south of Hong Kong Island within easy reach

The Aberdeen Tunnel, which was to create a major time-saving route for travelling from the north to south sides of Hong Kong Island, was plagued by hard rock and poor soil drilling conditions.

Dragages overcame the difficulties by using heavy arch ribbing and hand-excavation for the poor ground section. The rest of the tunnel was formed by excavating 660,000 cubic metres of rock and soil using hydraulic and pneumatic jumbos.

The completed project is now part of Route 1 which links the south side of Hong Kong Island to Shatin and onwards to Sheung Shui.

首條貫通港島南部的隧道

香港仔隧道貫通港島南北兩端，有助縮短區內居民的交通時間。唯項目設計之初，因管道範圍遍佈堅硬的岩石及鬆軟的泥土，難以鑽探，為工程師帶來不少挑戰。

寶嘉有見及此，起用大量人員進行人手發掘，及以龐大拱肋架作支撐，再逐步以水壓及充氣式隧道鑽孔機，挖出達660,000立方米的岩石和泥土，成功鑿通隧道管道。

時至今日，香港仔隧道已成為一號幹線的一部份，接駁南區與沙田以至上水。

Client: Public Works Department, Hong Kong Government • **Joint-venture project:** Construction of two dual-carriage road tunnels linking the south and north of Hong Kong Island • **Tunnel:** 1,870 m
客戶：香港政府 工務局 • **聯營項目：**建造兩條雙線行車隧道，貫通港島南北地區 • **隧道：**長1,870米

1978 – 1981

Tsuen Wan Bypass – Phase I
荃灣繞道 — 第一期工程

The first highway project

In 1978, Dragages broke new ground with its first major Hong Kong highway project.

The dual three-lane expressway, which weaved its way through an existing busy network of roadways, required complex at grade construction work and rock excavation.

The post-tensioned concrete viaduct was poured on site and rock excavation was done by a rock splitting technique.

The completion of the new bypass successfully upgraded the road network and alleviated congestion.

首個高速公路項目

1978 年，寶嘉正式參與首個香港主要高速公路項目。荃灣繞道一期包括雙程三線分隔快速公路，接駁原來的公路網。複雜的路面工程和高難度的岩層挖掘是工程師所面對的其中兩大挑戰。

工程師在建造高架橋時，於現場澆灌混凝土，配合後拉法施工；並以岩石擊割技術開鑿堅硬的岩石。

荃灣繞道一期落成後，不但有效紓緩交通擠塞的問題，更進一步完善整體的交通網絡。

Client: Highways Department, Hong Kong Government • **Project:** Construction of a curved box girder viaduct bypass • **Bypass:** 6,000 m
客戶：香港政府 路政署 • **項目簡介：**興建曲箱形大樑高架橋繞道 • **繞道：**長6,000米

1980s

The 1980s saw Hong Kong rise to global prominence based on its reputation for international trade and sky-rocketing real estate deals. Commercial success prompted a construction boom, with heavy investment in refurbishment and new civil and building developments.

International firms flooded into the city, attracted by 'laissez-faire' economic policies and low tax. For the manufacturing sector, however, the tide had turned, with production increasingly taking place across the border in China, although trade continued to be funnelled through Hong Kong's efficient sea and air ports.

The 1984 signing of the Sino-British Joint Declaration agreed the terms under which Hong Kong would revert to Chinese sovereignty. The perceived risks surrounding the territory's future caused uncertainties among the local population, with an estimated 21,000 people leaving Hong Kong each year between 1980 and 1986.

However, despite the political backdrop, the 1980s remained a period of unprecedented economic growth. GDP rose strongly and construction projects flourished.

Dragages was brought into the French Bouygues Group, a move which injected further international expertise into the company. The move allowed Dragages to win larger scale and more technically demanding projects, as well as building on its pioneering work on tunnels, bridges and roads.

踏入八十年代，香港經營環球商貿有道，加上房地產價格飛升，東方明珠逐漸在國際市場綻放耀目光芒，贏得舉世注目。受惠於商業發展蓬勃，公、私營重建、土木及建造發展計劃相繼出籠，建造業一片興旺。

香港奉行自由經濟，實行自由貿易及低税率政策，吸引國際企業紛紛在港設立支部。與此同時，製造業隨發展大勢，將生產工序北移至中國大陸，再乘香港海空運輸之便，經港出口貨品。

NVUQ年，中英簽定聯合聲明，中國落實收回香港主權。港人眼見前景未明，焦慮頓生，遂興起移民潮。一般估計，從NVUM年至NVUS年間，平均每年有ONIMM名港人移居海外。

政治環境縱不明朗，港人在八十年代仍然奮發向前，取得豐盛的經濟成就。本地生產總值增長強勁，大型建造項目更如雨後春筍。

寶嘉在八十年代正式成為法國 _çióÖiÉë 集團的一員，公司內的國際專業團隊陣容更加鼎盛，並成功以此雄厚實力贏得多項大型基建工程，承辦更多講求先進技術的建築項目，並繼續參與興建隧道、橋樑及道路等工程項目。

The bronze lions being covered by crates
把銅獅安放於木箱內，為搬運工程作好準備

1982 – 1985

HSBC Main Building
滙豐總行大廈

Architectural showpiece presents a variety of challenges

A building as architecturally complex as the Sir Norman Foster-designed headquarters of the Hongkong and Shanghai Bank required a contractor with expertise and vision.

The project involved the creation of a massive basement, ancillary building works and the support works for the eight main masts, making up the iconic structure of the building.

Running from the foundations to the top of the building, these eight masts were secured by 32 massive caissons sunk 37 metres into the granite bedrock. A combination of machine and manual digging was needed to complete the heavy excavation work. In all, these substantial works were completed within a tight five-month schedule.

A further challenge came with the relocation of the famous bronze lion statues, two sculptures commissioned to mark the opening of the Bank's original headquarters. In accordance with Fung Shui traditions, both lions had to be moved at the same time to avoid one taking precedence over the other, and neither could make eye contact, for fear that a fight would break out!

大師級的設計 工程師的嚴峻考驗

滙豐總行大廈是由世界著名建築大師 Norman Foster 爵士設計，工程要求十分嚴格，承辦商必須具備專業知識和魄力。

項目包括開拓一個龐大的地庫、附屬建築工程，以及有關八條支柱的預備工程。

八條支柱環抱總行大樓，是大廈的標記之一。寶嘉的工程隊伍為鞏固八條主要支柱，起用了32個大型沉箱，深入地底37米深的花崗岩石基，支撐總行大樓拔地而起，聳立在維港岸邊。為應付龐大的開鑿工程，工程師同時以機械及人手發掘，最終以短短五個月時間完成了大部份的工程。

支柱以外，總行大門旁一雙氣宇軒昂的銅獅也是銀行的重要標誌。新總行大樓落成入伙，寶嘉負責銅獅的安放工程。工程師需配合傳統風水習俗，包括必須同時遷移兩頭獅子，並避免雙獅有眼神接觸，取其並駕齊驅，和諧共處的意思。

Client: The Hongkong and Shanghai Banking Corporation Limited • **Project:** In charge of the foundation and substructure works of the basement and the ground level • **Basement:** 19 m deep, 15,000 m²
客戶：香港上海滙豐銀行有限公司 • **項目簡介：**負責大廈地面及地庫的地基及底層結構工程 • **地庫：**19米深，佔地15,000平方米

1982 – 1985

Tai Koo MTR Station and Tunnels
太古地鐵站及隧道工程

The expansion of the MTR system through the Island line was necessary to accommodate the increased demand for housing and commercial space on the Island as economic development hit high speed in the 1980s. The Tai Koo twin tunnels and station were located at the eastern end of the line to serve the increase in demand from the nearby developments.

The works comprised twin tunnels and a station built in a 24-metre span rock cavern.

八十年代，經濟發展步伐加快，對住屋及商廈的需求日增，地鐵公司遂批出位於港島東線的太古車站及雙隧道工程合約，以應社會需求。

項目包括興建兩條隧道，以及在一個闊24米的洞穴內興建車站。

Client: MTR Corporation • **Joint-venture project:** Construction of twin tunnels and cavern enlargements to accommodate station facilities • **Tunnel:** 1,600 m
客戶：地鐵公司 • **聯營項目：**興建雙隧道、開拓洞穴，及興建車站設施 • **隧道：**長1,600米

1982 – 1985

Wan Chai MTR Station
灣仔地鐵站

Building on its success with the MTR Corporation, a Dragages joint venture was tasked with constructing a station concourse to link the existing underground network with a pedestrian subway under the busy streets of the Wan Chai district.

Using a top-down method and a 1.2-metre thick diaphragm wall, the station was constructed 26 metres below street level.

隨著多個車站圓滿落成，寶嘉以聯營方式繼續承辦相關項目，包括興建灣仔站車站大堂，接駁灣仔鬧市的地下行人隧道。工程師以逆做法施工，並以1.2米厚的地下連續牆圍繞整個車站，而車站則建於26米深的地下。

Client: MTR Corporation • **Joint-venture project:** Construction of a station concourse
客戶：地鐵公司 • **聯營項目：**建造車站大堂

The first and second box girders in their final positions
首兩座箱形大樑就位

1986 – 1987

Liu To Bridge
寮肚橋

Launching across a steep valley

As environmental issues moved up the agenda in Hong Kong, Dragages was a pioneer in incorporating these considerations into their projects. For the construction of the Liu To Bridge, across an unspoiled ravine on Tsing Yi Island, Dragages developed a technique which would avoid the need for scaffolding in the valley below.

The process, introduced by Dragages, involved launching incrementally four separate sections of the deck from both ends of the bridge. Once the four sections were in place across the valley, engineers were able to stitch them together in the midpoints to create the final structure.

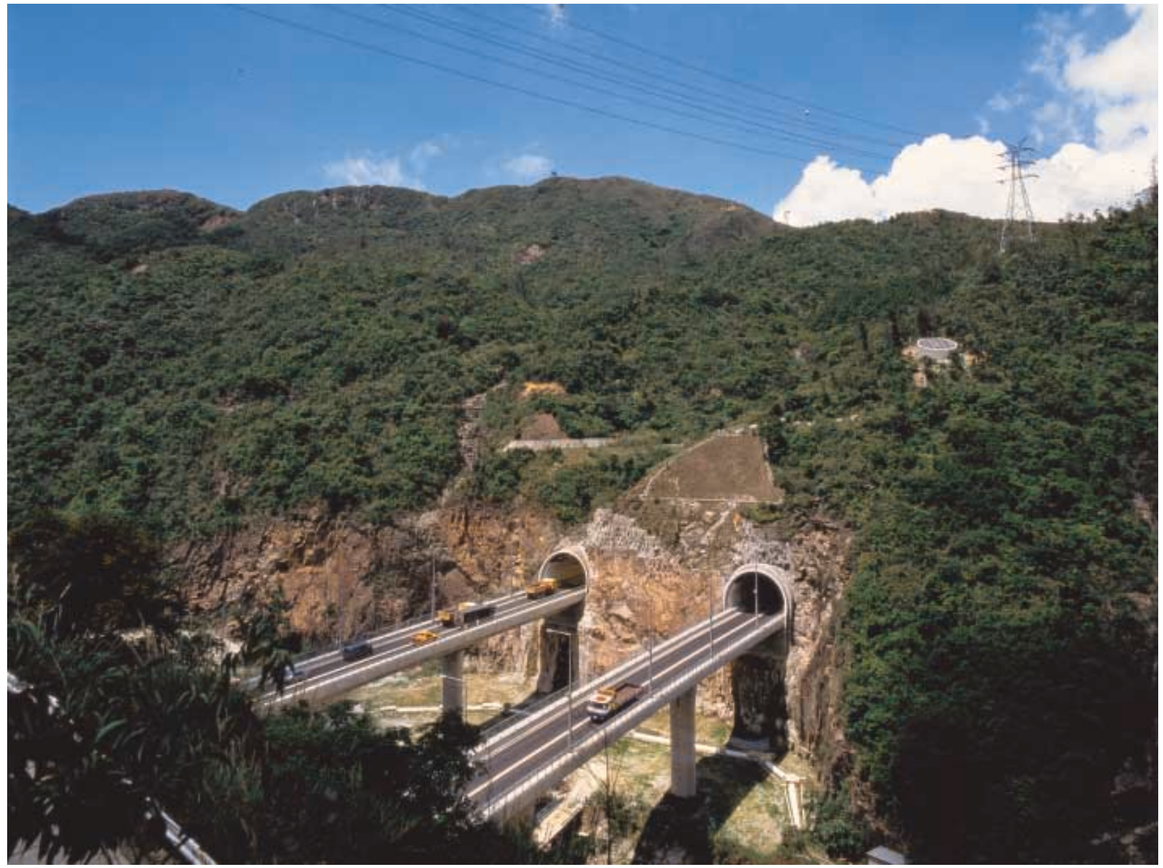
穿過深谷闖新天

社會發達，市民益發關注環保問題，寶嘉率先在工程界引入環保概念。

早在興建青衣寮肚橋時，寶嘉即採用突破性的頂推施工法，將大橋四段獨立組件並排架置在高架橋的兩端，橫跨深峽。待組件安放妥當，工程師再在中間部份進行縫合，完成整座高架橋的橋架工程。此舉的優點是不用搭建棚架，減少對環境造成的影響。

The third box girder was moved carefully into place
安裝第三座箱形大樑

Client: Highways Department, Hong Kong Government • **Project:** Construction of a 4-lane bridge • **Central span:** 70 m
客戶：香港政府 路政署 • **項目簡介：**建造 4 線高架橋 • **大橋中央跨度：**70 米



1986 – 1991

Route 5 – Shing Mun Tunnel
五號幹線 — 城門隧道

Green concerns prompt innovative construction method

Protecting the natural environment was high on the agenda for Dragages in the construction of the Shing Mun section of Route 5, a project that involved twin tunnels linked half way by viaducts through two separate mountains.

With the scenic Shing Mun River, and rainwater catchment areas in the steep valley below, it was essential to minimise contamination from the tunnel drill and blast operations.

To tackle the issue, Dragages devised a prefabricated system of formwork to replace timber formwork, creating a cleaner site area. In addition, rather than using diesel mobile cranes, two huge electrical tower cranes were used for the bridge and tunnel works.

以突破性建造方法保護環境

五號幹線城門隧道段途經風景優美的城門河，以高架橋連接貫通山脈的兩條隧道，寶嘉在承辦工程之初，即以保護自然環境為項目重點。

由於山峽深谷下是水塘集水區，工程小組慮及環境需要，在鑽挖隧道及爆破時尤需小心奕奕，減少對自然環境的影響。有見及此，工程師特別放棄使用傳統的木製模板，而改用預製模板系統，保持工地環境整潔；同時又以兩台大型的電動塔式起重機取代柴油流動吊機，興建大橋和隧道。

Client: Highways Department, Hong Kong Government • **Joint-venture project:** Construction of 2 tunnels and 2 bridges • **Tunnels:** 1,100 m and 1,600 m • **Bridges:** 213 m
客戶：香港政府 路政署 • **聯營項目：**建造兩條隧道及兩條橋樑 • **隧道：**長 1,100 米及 1,600 米 • **橋樑：**長 213 米

1988 – 1992

Hong Kong Park
香港公園

The Aviary
觀鳥園

Park project combines conservation with new public attractions

When Dragages took over the rugged eight-hectare site, once part of the Victoria Barracks, it was dotted with almost 700 trees and a number of historic buildings. The site also included a number of valleys and spurs, which would require extensive site reformation.

The challenge was to preserve as many of the trees and buildings, while also adding more than ten new attractions, all within a practical green space for public usage.

The park's new features – including an artificial lake, a waterfall and a distinctive aviary – each required their own unique design methods. Former barracks were also renovated to house the Hong Kong Visual Arts Centre, the Marriage Registry and the Park Management office.

The project was awarded on a Guaranteed Maximum Price basis, requiring the contractor to complete the project at, or below a specified cost. Dragages involved architects, consultants and suppliers at the earliest stages to help identify cost and time-savings, a process that contributed to Dragages completing the project HK$17 million below budget.

鬧市中的保育及休憩新焦點

香港公園的前身是域多利軍營，佔地約八公頃。營地範圍地勢崎嶇，高低錯落，除包括多幢具歷史價值的建築物外，更遍植了逾 700 棵樹木。

承辦商在重整這幅綠色工地的環境之餘，還需在有限的空間內加入逾 10 個新景點，同時全心保育四周的樹木及古建築，為公眾提供舒適的休憩空間。

寶嘉的工程隊伍費盡心思，採用獨特的設計，先後完成人工湖、瀑布，以及觀鳥園等公園多個主要地標；並改建舊營房成香港視覺藝術中心、婚姻登記處和公園辦事處。

香港公園項目以保證工程上限形式批出，承辦商需在指定成本上限內完成有關工程。寶嘉於項目初期即邀請建築師、顧問及供應商積極參與，以便盡早確定項目造價及施工期。公司最後以低於成本上限 1,700 萬港元完成所有工程。

Client: Royal Hong Kong Jockey Club / Urban Council • **Project:** Site formation and construction of a landscaped park • **Park area:** 8 hectares
客戶：英皇御准香港賽馬會 / 市政局 • **項目簡介：**工地平整及建造公園多項設施 • **公園佔地：**8 公頃

1988 - 1991

Pacific Place – Phase II
太古廣場 — 第二期工程

New technologies shorten construction cycle on challenging site

Phase II of Pacific Place involved the construction of an integrated complex comprising retail, hotels and offices in one of Hong Kong's busiest districts.

To minimise disruption to the surrounding area, Dragages brought in the best technology available worldwide to speed up construction time. An innovative phased approach to the multi-level excavation work allowed building work to start on completed stages, while further excavation continued concurrently.

To accelerate the building works, Dragages' parent company, the Bouygues Group, introduced the table form system, as well as powerful tower cranes allowing for the rapid lifting of table forms. The result was a four-day-per-floor construction time, and completion of the two hotel towers' structure within 13 months.

嶄新建造技術 縮短施工周期

太古廣場第二期工程集商場、酒店及辦公商廈於一身，座落在香港的中心地段。

寶嘉為減少對鄰近環境造成的影響，特別引入新的技術，加快工程進度。工程師一方面在已完成挖掘的地段展開建造工程，另一方面同步於其他部份進行挖掘工作。

為進一步縮短施工期，寶嘉母公司Bouygues Group引入枱模技術，並採用重型塔式吊機，提升運輸速度。新技術令工程隊伍可於四天內完成興建一層樓房，最後只用了13個月時間便完成了兩幢酒店大樓的結構建造工作。

Client: Swire Properties • **Project:** Construction of 2 hotels, service apartments, offices, a shopping mall and car park • **Conrad Hotel:** 61-storey • **Island Shangri-La Hotel:** 56-storey
客戶：太古地產 • **項目簡介：**興建兩幢酒店、服務式公寓、辦公室、商場及停車場 • **港麗酒店：**樓高61層 • **港島香格里拉酒店：**樓高56層

The 60-year old banyan tree was protected in a tailor-made pot
以特製花盆保護 60 歲老榕樹，施工之餘不忘生態保育

The application of table forms accelerated building works
工程小組以枱模施工，加快工程進度

The 120-metre launching girder weighed 450 tonnes
曳進吊樑機全長 120 米，重 450 噸

1989 – 1991

Kwun Tong Bypass – Phases II & III
觀塘繞道 — 第二及三期工程

Dragages brings new technology to Hong Kong bridge-building

The construction of the Kwun Tong Bypass transformed bridge-building in Hong Kong.

For the first time a 120-metre long "launching girder" was seen in operation. The specialist equipment was brought to Hong Kong following its successful use by the Bouygues Group in projects overseas.

The 450-tonne, steel structure was designed to move both forward and transversely, allowing for the lifting of two segments at one time.

The 2,206 pre-cast segments, some weighing as much as 80 tonnes, were then glued together and secured by prestressing. The new method allowed Dragages to complete a bridge span in three days by laying approximately 20 segments.

Such was the success of the new technique, the project was completed within 29 months, a full year ahead of the original plan.

本地高架橋建築技術的新篇章

觀塘繞道的建造為本地高架橋建築翻開新篇章。寶嘉參考母公司 Bouygues Group 海外項目的成功經驗，率先在香港引進長達 120 米的曳進吊樑機。吊樑機以鋼鐵鑄造，重 450 噸，可前後移動，能同時提升兩段橋樑組件。

在整個觀塘繞道第二、三期項目中，吊樑機先後載負 2,206 段預先組製的高架橋組件，部份組件重達 80 噸。工程師在完成組件安置後，便展開接合工程，以預應力扣緊組件。

在新技術下，工程隊伍只需三天時間，便能鋪設一段約有二十件組件的跨度。寶嘉用了 29 個月便完成了觀塘繞道工程，較原定計劃提早一整年。

Client: Highways Department, Hong Kong Government • **Joint-venture project:** Build 2 elevated highways, 2 ferry piers and a 1-km quay • **Bypass:** 3,700 m
客戶：香港政府 路政署 • **聯營項目：**興建兩條高架高速公路、兩座碼頭，以及一公里長的堤岸 • **繞道：**長 3,700 米

The launching girder was able to place two segments at a time
工程師運用曳進吊樑機，同時間安裝兩段橋樑組件

Workers applying extra strength segment glue
工人施加特製強力膠

1989 - 1991

The University of Hong Kong Main Library – New Wing
香港大學圖書館大樓新翼

New Wing brings modern space to historic building

As Hong Kong grew in economic strength, so too did the demand for excellence in education. The University's expansion fuelled by the demands of an increasing student population for a wider academic curriculum created a need for more resource materials.

The University decided to build a new wing for the existing Main Library. Dragages created a new section of the library worthy of its place alongside the historic 1911 Main Library building. The New Wing successfully added much needed space, allowing the University to expand its educational resources in line with its increased student body.

歷史大樓添新翼　思考空間更廣闊

香港邁向知識型經濟發展，社會對高等教育需求殷切，香港大學亦隨之開辦更多不同類型的課程。

隨著學生人數不斷增加，原來的圖書館大樓逐漸不敷應用，大學遂決定加建新翼。寶嘉負責承辦新大樓工程，力求配合毗鄰近百年歷史香港大學圖書館的建築，為校園營造和諧氣氛，擴闊學生活動及思考空間，配合社會發展需要。

Client: The University of Hong Kong • **Project:** Construction of an 8-storey academic building for lecture rooms, offices and library, together with covered walkways, access roads and underground drainages

客戶：香港大學 • **項目簡介：**興建八層高教學、辦公室及圖書館大樓，以及相關的有蓋行人通道、車路及地下排水設施

1990s

The 1990s were marked by a climate of concern in Hong Kong. Events in Tiananmen Square cast a shadow over the transfer of Hong Kong's sovereignty to China and business and social confidence was weak.

Despite these uncertainties, the 1990s was a period of expansion for Dragages. The company was heavily involved in civil and building works associated with the new airport development, including a number of road and rail links connecting the out-of-town airport with downtown commuters.

During this period, BYME was set up as the company's electrical and mechanical (E&M) arm. This vertical expansion enhanced Dragages' E&M capability and offered improved cost-savings on building projects such as Cathay Pacific's headquarters and catering centre, as well as massive aircraft maintenance hangars among many others.

Across Hong Kong Island and the New Territories, Dragages was equally busy building schools, residential, sporting and leisure facilities, as well as undertaking essential land reclamation work for new ferry piers and linking Hong Kong's central districts with the New Territories via rail and tunnel links.

Putting Dragages on the international map was the visually distinctive extension to the Hong Kong Convention and Exhibition Centre. The project permanently changed the shoreline of the city's famous Victoria Harbour and was seen the world-over during the 1997 Handover Ceremony.

踏入九十年代，港人更加關心身邊的人和事。天安門事件令香港主權回歸蒙上陰霾，港人對經濟及社會發展失去信心，朝氣頓失。

前景縱不明朗，寶嘉於九十年代大力擴展。公司積極投入參與新機場發展計劃及相關的土木及建造工程，包括參與多項機場與市區接駁道路和鐵路系統的建造工作。

在此期間，寶嘉成立 _vjb　，提供機電工程服務，進一步提升成本效益。寶嘉與 _vjb　攜手合作多個大型建築項目，如國泰航空城及航膳廚房、維修飛機庫等。

同時，寶嘉亦承辦多個不同類型的建設項目，如學校、住宅、文娛設施，以至新碼頭的填海工程和有關交通運輸的項目。

香港會議展覽中心新翼落成，為耀目的維港景緻加添了一道永恆的印記，也為寶嘉寫下了光輝的一頁。NVVT年香港主權回歸在會展新翼圓滿舉行，與世界各地的人共同見證歷史性的一刻。

1990 – 1992

Cityplaza – Phases III & IV
太古城中心 — 第三及四期工程

Height restriction prompts space-saving innovations

Positioned at the periphery of the flight path of Kai Tak Airport, a major construction consideration for the project was to maximise floor space within the height restrictions enforced by the government.

Extra strength post-tensioned floor slabs were used, allowing for a full 2,300 square metre floor span without the need for supporting beams. On the lower floors, high-strength concrete was used which allowed for narrower load-bearing columns.

These space-saving features increased usable floor space, and allowed for an additional floor, per building, to be added.

To meet the tight deadlines, Dragages used steel table form to build the office towers, the same method adopted during the Pacific Place development. Together with the adoption of early-strength concrete, the two office towers were completed within 23 months in a four-day-per-floor cycle.

高度限制迸發創新建築意念 開拓更廣闊空間

太古城中心的第三、四期工程範圍位於啟德機場航道之內，工程受嚴格高度限制，承辦商必須在此規限下盡力拓展可使用的空間。

工程師起用加固的後拉法樓板建造整幅達2,300平方米的地台跨度，因此毋須使用支撐樑，大大擴闊建築物的可使用空間。此外，在興建低層樓面時，工程師採用高強度混凝土，從而縮少柱的體積。

採用這兩項施工技術，增加了可使用面積，令每幢大樓可額外加建一層樓面。

寶嘉為配合緊迫的施工期，借鑒太古廣場項目的建造方法，以鋼製模板興建辦公室大樓。配合使用早強混凝土，工程隊伍在23個月內完成蓋建兩幢辦公室大樓，以平均四天時間完成興建一層樓面。

Client: Swire Properties • **Project:** Construction of two 23-storey office towers with a common basement • **Floor area:** 107,000 m² • **Height of the building:** 79 m
客戶：太古地產 • **項目：**建造兩幢23層高的辦公室大樓及相連地庫 • **樓面面積：**107,000平方米 • **樓高：**79米

1990 – 1991

Modern Terminals Warehouse – Phase II
現代貨箱碼頭 — 第二期工程

An identical extension was built alongside the existing warehouse
在現有的貨倉旁「複製」新翼大樓

Identical building houses specialist storage facilities

Hong Kong's continued role as a regional export centre fuelled demand for increased container capacity at the Kwai Chung Container Terminals. Modern Terminals, one of the private container terminal operators, turned to Dragages to increase its warehousing capacity.

Instead of opting for a separate stand-alone building, the decision was made to extend the existing warehouse by building an identical block adjacent to it.

Project challenges included meeting the technical requirements of the client, such as the design and construction of storage space for dangerous industrial products, laboratory facilities and high-tech office suites. The project also required access ramps capable of bearing trucks of up to 30 tonnes in weight. Despite these complications, Dragages successfully completed the project within 16 months.

「複製」貨倉大樓　滿足現代倉存要求

物流業發展暢旺，香港逐漸成為區內主要的出口中心，而業界對葵涌貨櫃碼頭貨櫃儲存空間的需求與日俱增，就在這時，寶嘉承辦現代貨箱碼頭貨倉大樓的二期擴建工程。

現代貨箱碼頭希望在原有的貨倉旁，興建一幢相同的倉庫大樓。新大樓既需沿用舊貨倉的面貌，其設計及建造亦要配合現代物流需要，滿足多項技術要求，包括可儲存工業用危險品、配備實驗室及高智能辦公室設施等，是對工程師的一大挑戰。此外，項目尚包括興建可負重30噸的斜道，方便重型貨車進出。面對重重困難，寶嘉的工程隊伍仍能在16個月內順利完成是項工程。

Client: Modern Terminals Limited • **Project:** Extension of an 11-storey warehouse building with two access ramps
客戶：現代貨箱碼頭有限公司 • **項目簡介：**擴建11層高的貨倉大樓及興建兩條斜道

Preparing to pour the concrete
準備就緒，注入混凝土

1991 – 1993

City University of Hong Kong – Phase II
香港城市大學 — 第二期工程

New buildings using 'waffle mould' technique

The common practice, during the early 1990s, was to install the interior service ducts after completion of the building structures. On the City University project, Dragages employed the 'waffle mould' technique to enhance efficiency and flexibility. Slabs and beams were formed in the same pour by using fibre glass moulds. This technology created voids within the structures to accommodate the building services.

Another advantage of the technique was the creation of smooth surfaces that required neither plastering nor paint. Not only did this save time, it also satisfied the client's request for exposed surface concrete finishes.

In all, 63,000 square metres of floor space were added, with interior work requiring the installation of 116 laboratories, four theatre rooms, canteens and three fully-equipped kitchens.

起用「威化模」蓋建新大樓

九十年代初，建築界一般先建成樓房，再鋪設內部管道設施。

寶嘉在承辦香港城市大學項目時，起用「威化模」技術，透過纖維玻璃模，在注泥時同時建造大樓底板及大樑，以及預留管道縫隙，方便日後鋪設不同設施，提高施工效率和彈性。

「威化模」技術的另一優點是可塑造平滑的外牆，省卻塗灰及油漆工序，切合院校的要求。

是項工程為大學帶來 63,000 平方米樓面面積，當中包括 116 所實驗室、4 個演講廳、學校食堂，以及 3 個裝置完備的廚房。

Client: City University of Hong Kong • **Project:** Construction of Academic Building, Amenities Building and Sports Complex • **Floor area:** 63,000 m²
客戶：香港城市大學 • **項目簡介：**建造教學樓、康樂樓及綜合運動場館 • **樓面面積：**63,000 平方米

1992 – 1994

Hong Kong Stadium Redevelopment
香港大球場重建工程

Build with the greatest speed and to the highest standard

Among the challenges in the redevelopment of the Hong Kong Stadium was to increase the seating capacity to 40,000 with a roof covering 75 percent of this area – and all within 36 months. By streamlining the design and construction process, Dragages committed to finishing a full year earlier than the contract schedule.

By the end of the first year, the concrete structure was substantially completed, allowing the site to be cleared for the 1993 Hong Kong Sevens Tournament.

The second stage focused on the roof construction. An immense structure was created using structural steel and a stronger-than-steel Teflon-coated membrane.

As the main contractor, Dragages also oversaw the construction of an office ancillary building, a lecture theatre, installation of public address system and the large vision screen.

以最短時間 打造超水準建築

香港大球場重建工程要求並不簡單，承辦商需在短短 36 個月內，興建共 40,000 個觀眾座位、一對可覆蓋四分之三場館面積的巨型天幕，以及其他相關設施，對承辦商來說絕對是艱巨的挑戰。

寶嘉的工程師發揮群策群力的精神，全力協調項目設計及建造工序，在首年年底，已完成了大球場的主要混凝土結構工程，趕及在 1993 年舉行香港國際七人欖球賽。

重建項目的第二階段主要涉及興建球場天幕。寶嘉起用較鋼鐵更加堅固的 Teflon 作為幕頂的塗膜，輔以鋼鐵承托，成功打造巨大天幕。

而作為項目的主要承建商，寶嘉同時需負責監管球場附屬大樓、演講廳的建造工作，以及場內公眾廣播系統和彩色大螢幕的安裝工程。

寶嘉最後以 23 個月時間完成香港大球場重建工程，較原定時間提早一年。

Client: Royal Hong Kong Jockey Club • **Project:** Demolition of the existing stadium and construction of a new 40,000-capacity stadium
客戶：英皇御准香港賽馬會 • **項目簡介：**拆卸舊場館，興建一個設有 40,000 個座位的大球場

Permanent seating was in place within the first year of construction
寶嘉以短短十二個月時間，完成主要的看台工程

The roof spans more than 240 metres
天幕跨度超過 240 米

The bridge was built to accommodate two Boeing 747-400Fs
大橋可承受兩架波音 747-400F 型飛機的重量

1992 – 1993

Kai Tak Airport Taxiway Bridge
啟德機場滑行道橋樑

Short-cut bridge alleviates congestion on busy runway

Such was Hong Kong's popularity as a business and leisure destination, Kai Tak was, by the early 1990s, facing heavy congestion. The decision was taken to construct a bridge, providing a short-cut from the runway, thus reducing taxiing time.

To accelerate the project, Dragages began to work on the foundations while the bridge design details were still being finalised. Special requirements included a load-bearing capacity equivalent to two fully-laden Boeing 747-400Fs and a bridge platform height sufficient to allow a fireboat to pass underneath.

During the construction process, Dragages had to overcome a number of constraints. Some construction activities were strictly limited between midnight and 5:00 am and tall equipment had to be lowered rapidly to facilitate takeoff and landing of planes.

增建滑行道橋樑 提升運作效率

九十年代初，香港作為東方明珠，每年吸引大批旅客到港工作或旅遊，直接增加飛機起降量，政府遂決定增建一條滑行道橋樑，以提升運作效率。

寶嘉明白工程的迫切性，為加快進度，在天橋設計大綱初步確定後，即開始平整地基工作。配合機場獨特的環境，新建橋樑的負重力有極嚴格要求，必須能承受兩架載滿乘客及貨物的波音 747-400Fs 飛機的重量；橋底高度亦需足夠消防船通過。

施工期間，工程師還需遵守多項施工限制，包括建造工程只能在凌晨進行，並於每日早上五時完結；項目所使用的高架器材亦須具有快速升降功能，避免影響飛機升降。

Client: Civil Engineering Department, Hong Kong Government • **Project:** Design and build a bridge • **Bridge length:** 230 m
客戶：香港政府 土木工程署 • **項目簡介：**設計及建造橋樑 • **橋樑：**長 230 米

1993 – 1997

Central Reclamation – Phase I
中環填海工程 — 第一期工程

Creating Hong Kong's most valuable land

Central Reclamation, extending from the heart of Hong Kong's Central Business District, 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.

To ensure the seamless operation of the ferry piers, Dragages first built 'bunds' at the extremity of the reclamation site onto which it relocated the piers and a temporary walkway. The remainder of the land was then back-filled to create the total land area. To accelerate the process, more than 50 vessels were employed to perform the reclamation works.

Meanwhile, huge precast sections for the underground transport links were being constructed off-site. The 9,000-tonne tunnel section of the Airport Express station was brought to site on a large barge before being submerged into place.

Despite the scale and complexities of the project, Dragages completed it eight months ahead of schedule.

於中心地帶再添土地

中環填海區由中環商業區黃金地段開始向海伸延，佔地 20 公頃。

工地範圍包括多個渡輪碼頭，為免影響渡輪運作，寶嘉先在新填海區的盡頭築起一道「沙堤」和臨時行人道，搬遷碼頭，然後才展開其他工程。為加快施工進度，工程隊伍出動逾 50 艘船艦進行填海工作。

中環填海項目尚包括興建地下交通設施。寶嘉起用預製組件，當中包括一段重 9,000 噸的機場快綫隧道部份，經大型躉船運送到海面，沉降到新填海區的海底。

雖然填海工程規模龐大，建造技術複雜，寶嘉仍能較原定計劃早八個月竣工。

時至今日，新填海區上多幢甲級商廈、購物商場、酒店和地鐵車站已先後落成啟用，成為中環最新的尊貴地段。

Client: Territory Development Department, Hong Kong Government; MTR Corporation • **Joint-venture project:** Formation of reclaimed land, creation of a tunnel unit, construction of 6 new ferry piers and other facilities • **Reclaimed area:** 20 hectares • **Sea wall length:** 1,100 m
客戶：香港政府 拓展署、地鐵公司 • **聯營項目：**負責填海工程、興建隧道組件、建造 6 個渡輪碼頭及其他設施 • **填海範圍：**20 公頃 • **海堤：**長 1,100 米

New piers were being constructed while the old piers remained in use
在興建新碼頭的同時，舊碼頭繼續為市民服務

Creating the land within the raised bunds
在土堤之間，開闢土地

A massive precast tunnel segment, part of the Airport Express, was towed to site
起用躉船，運送機場快綫隧道預製管道

Sinking the tunnel segment into place
隧道沉降至擬定位置

1993 – 1997

Cheung Tsing Tunnel and Viaducts
長青隧道及高架橋

Computerised jumbos ensure precision

The Cheung Tsing Tunnel was 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.

Two fully computerised jumbo machines were used during excavation, making a 5-metre excavation per blast possible with precision.

To enhance site safety, explosives were handled with extra care. Blast chemicals would only become active when mixed at the drill holes, thus eliminating the possible hazards of storing large amounts of explosives on site.

採用電腦化隧道鑽孔機 力求精確準繩

長青隧道全長 1,600 米，是香港首條三線行車的雙管隧道，也是本地第二條免費隧道。

寶嘉為求準確、安全，爆破用的藥粉只會在鑽孔內經過拌和才具爆炸威力。因此，工地內無需囤積大量爆炸品，確保工地及周邊環境安全。配合使用兩部全電腦化的隧道鑽孔機，工程師每次爆破能開鑿五米管道，精準無誤。

Client: Highways Department, Hong Kong Government • **Project:** Construction of two 3-lane tunnels and 2 viaducts • **Tunnel:** 1,600 m • **Cross section:** 135 m² • **Viaducts:** 700 m
客戶：香港政府 路政署 • **項目簡介：**建造兩條三線行車隧道及兩座高架橋 • **隧道：**長 1,600 米 • **隧道橫切面：**135 平方米 • **高架橋：**長 700 米

Loading explosives at the drill holes
在鑽孔注入爆炸品

Computerised jumbo drilling machines
電腦化隧道鑽孔機

The launching girder placing a massive pier segment
以曳進吊樑機安裝橋樑組件

1993 – 1996

Happy Valley Racecourse Redevelopment
快活谷馬場重建工程

Multi-section project creates a world-class racecourse

Extending the race track, upgrading the buildings, redeveloping roads and landscaping, involved demolition and construction on an area exceeding 18.4 hectares.

Building works on the project included new headquarters for the Royal Hong Kong Jockey Club and the Hong Kong Football Club. In each case, temporary facilities had to be constructed before Dragages could demolish, or renovate, existing buildings.

Among the major challenges was managing the requirements and schedules of multiple owners. In particular, Dragages had to take possession of the land in stages, and complete works between racing seasons.

Meeting the challenges, Dragages completed the construction of buildings a month ahead of schedule and the new race track was ready in time for the new racing season.

分段施工　建造世界級馬場

快活谷馬場重建工程佔地逾 18.4 公頃，項目包括拆卸原有設施，重建多幢大樓，以及興建新道路及綠化周圍環境。

其中，寶嘉需先興建臨時辦公室，安置受影響員工，才能清拆或翻新舊建築物，建成新香港賽馬會總部大樓及足球總會大樓。

由於工程涉及多個業主，承辦商需負責策劃及統籌各方的需要及施工時間表，為工程師帶來不少挑戰。此外，土地亦需分階段佔用，而跑道的重建工作亦只可在馬季之間進行。

在團隊的合作下，寶嘉仍能排除重重困難，提早完成大樓的建造工程；而新賽道亦趕及在馬季開鑼前竣工，讓一眾騎師使用全新賽道。

Client: Royal Hong Kong Jockey Club • **Project:** Construction of headquarters, redesign and extend the race track, creation of green spaces and a stable, develop road and sporting utilities • **Site area:** 18.4 hectares • **Floor area of buildings and structures:** 90,000 m^2
客戶：英皇御准香港賽馬會 • **項目簡介：**興建總部大樓，重新設計及擴建賽道，建造綠化帶、馬廄，開闢道路及各樣體育設施 • **工地面積：**18.4 公頃 • **樓面及結構面積：**90,000 平方米

The Jockey Club and Football Club in the final touch-up phase
賽馬會及足球總會建築工程進入最後階段

The relocation of two 120-year old trees on special tracks
以特製軌道，輔助移植百年老樹

Grass paving
鋪設草地

1993 – 1996

Rambler Channel Bridge
藍巴勒海峽大橋

External prestressing technology allows for easy maintenance

Building on the success of the launching girder technique used on the Kwun Tong Bypass, Dragages employed similar methods to build the Rambler Channel Bridge.

Engineers further enhanced the construction process by adopting external prestressing in all the segments, a technical first in Hong Kong. The method not only saved time and cost, but also allowed for ease of maintenance and upgrading works in the future.

A major constraining factor onsite was the lack of access at both ends of the bridge. To overcome this, Dragages used a heavy lifting segment elevator to raise parts of the bridge to the deck level.

The result of Dragages initiatives was a shorter project, lower material costs and minimal disruption to marine traffic in the busy Rambler Channel.

率先引進外環預應力技術 方便日後維修工程

寶嘉在興建藍巴勒海峽大橋時參考了觀塘繞道的建造方法，同樣使用曳進吊樑橋。工程師更進一步率先採用外環預應力技術於結合橋樑組件上，縮短施工時間，降低造價之餘，也可方便日後維修及擴建工程。

鑑於項目開始時大橋出入口兩端的交通配套尚未完善，寶嘉需動用重型組件升降機，將大橋組件升高至橋面水平。

在工程隊伍的努力下，藍巴勒海峽大橋項目得以在短時間內竣工，不單有效節省建築物料，也成功將工程對藍巴勒海峽航道造成的干擾降至最低。

Client: Highways Department, Hong Kong Government • **Joint-venture project:** Construction of a dual 3-lane expressway road bridge, viaducts and access roads • **Bridge and approach roads:** 1,960 m • **Precast segments:** 1,000 units

客戶：香港政府 路政署 • **聯營項目：**建造兩條三線行車的快速公路大橋、高架橋及接駁道路 • **大橋及接駁道路：**長 1,960 米 • **預製組件：**1,000 件

Huge segments were placed without disrupting marine traffic
施工期間，藍巴勒海峽航道保持暢通無阻

Installing a segment with external prestressing
利用外環預應力安裝組件

Precast segments being moved to the bridge deck
工程師把預製組件升高至橋面

1995 – 1996

Centralised Government Godown
政府中央貨倉

Dragages wins milestone design-and-build project

This two-building, purpose-built, warehouse in Chai Wan was to serve as a storage facility for multiple government departments. It was the first time that the Architectural Services Department had awarded a design-and-build contract for an entire building.

The buildings were designed with different configurations to accommodate specific user requirements. Some storeys were up to eight metres high, while others required specialised storage facilities for hazardous materials and drugs.

By combining in-situ casting and precasting methods, the project was completed within 24 months.

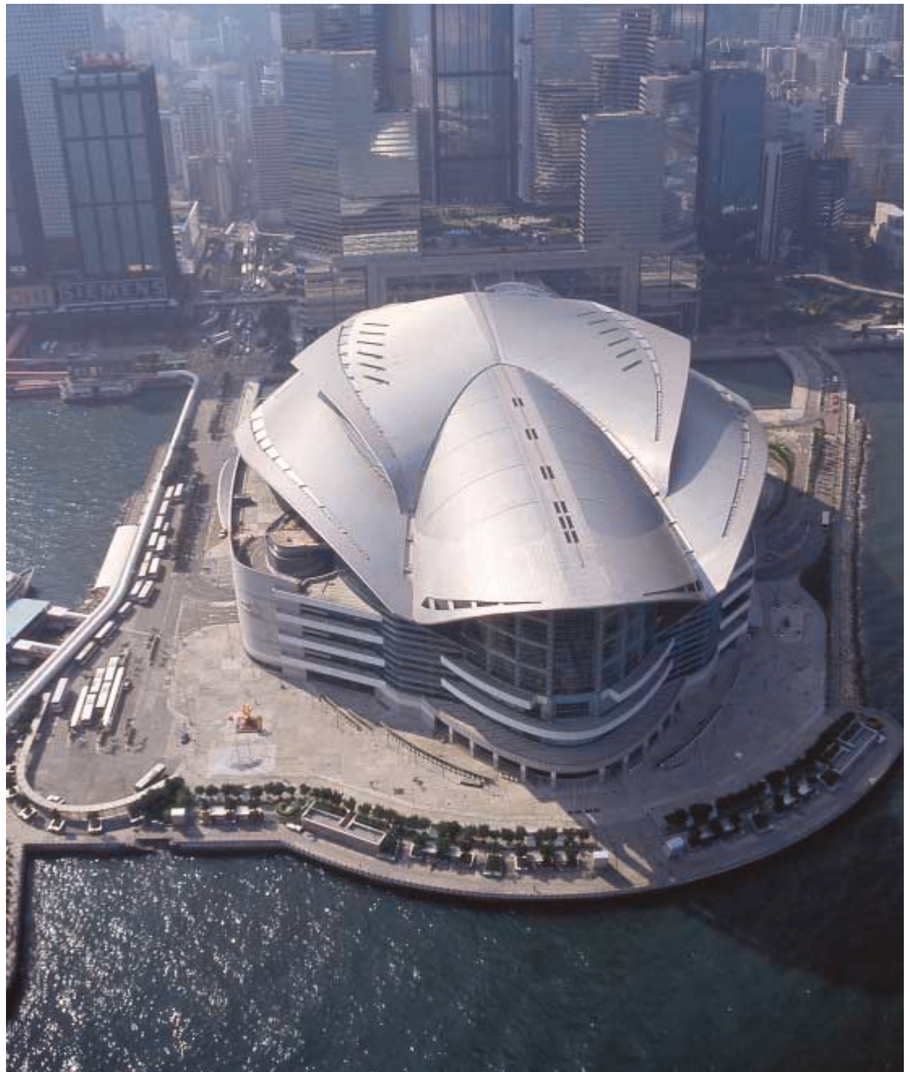
寶嘉奪設計及建造項目

政府中央貨倉項目是建築署首次給予承辦商負責設計及建造整幢大廈。中央貨倉選址柴灣，項目包括設計及興建兩幢倉儲大樓，供多個政府部門使用。

承辦商需同時滿足不同部門對倉存面積及環境的獨特要求。如興建危險品倉庫，以及樓底高達八米的樓層。

工程師混合使用即場製造及預製組件興建樓層，令項目得以在24個月內完成。

Client: Architectural Services Department, Hong Kong Government • **Project:** Design and build a godown • **Floor area:** 49,330 m^2
客戶：香港政府 建築署 • **項目簡介：**設計及建造倉庫 • **樓面面積：**49,330 平方米



The impressive 40,000 m² roof
四萬平方呎的樓頂，氣勢不凡

1995 – 1997

Hong Kong Convention and Exhibition Centre Extension
香港會議展覽中心擴建工程

Iconic building transforms Hong Kong harbour front

Bucking the trend for high-rise buildings, the extension of the Hong Kong Convention and Exhibition Centre changed the harbour front landscape with its instantly recognisable winged design jutting out into the harbour.

The iconic winged-design roof is believed to be the largest curved roof in the world, covering 40,000 square metres. To achieve the shape, steel roof trusses of various shapes were used, supporting the aluminium tiles. Space limitation was another factor in the roof construction. The six pairs of roof trusses measuring up to 81 metres long were fabricated off site and transported to the site by barges.

The Extension, completed within a tight 26-month schedule, houses three exhibition halls, a convention hall, a foyer, 26 meeting rooms and restaurants. Sitting on the reclaimed land, the Extension was connected to the existing section by the 110-metre long multi-level atrium.

At the tip of the building, where the 1997 Handover Ceremony took place, is a 30-metre tall glass façade offering a 180 degree view of Kowloon and the Victoria Harbour.

打造維港兩岸全新地標

香港會議展覽中心座落在維港海濱，四周盡是高聳入雲的商廈，中心擴建部份呈流線型設計，造形有如巨鳥迎海展翅，是維多利亞港的觸目地標。

其弧形樓頂的面積達 40,000 平方米，屬世界上同類設計之最，誠為本地建築界的輝煌印記。寶嘉為塑造這弧形翼狀的樓頂，起用不同形狀的鋼樓頂桁架。鑑於樓頂面積龐大，而工地空間有限，工程師需在其他地方預製組件，再用躉船將物料運送到工地，當中包括 6 對長達 81 米的樓頂桁架。

寶嘉以短短 26 個月時間完成擴建工程。擴建部份位於新填海區，共有三個展覽廳、一個會議廳、一個前廳、26 個會議室及餐廳，以 110 米長的多層門廊連接舊翼。

新翼設計的另一焦點是前廳臨海部份一幅 30 米高的玻璃幕牆，可從中觀賞 180 度維港景緻。1997 年香港主權交接儀式也是在這新翼前廳舉行。

Client: Hong Kong Trade Development Council • **Joint-venture project:** Construction of the extension of the Centre, and a 110-m long Atrium Link • **Floor area:** 166,000 m²
客戶：香港貿易發展局 • **聯營項目：**建造會展中心新翼擴建部份，以及長 110 米，連接新舊翼的天橋門廊 • **樓面面積：**166,000 平方米

Over 20,000 tonnes of steel were used to build the extension
新翼工程使用逾 20,000 噸鋼鐵

The multi-layered roof was designed to satisfy the most demanding structural, thermal, acoustic, and weatherproofing criteria
多層式的樓頂兼具隔熱、隔音功能，能抵禦不同的天氣環境

The 30m high glass façade of the Grand Foyer is one of the largest windows in the world
新翼大會堂前廳的向海玻璃幕牆高 30 米，是全球最大幅的玻璃幕牆之一

1995 – 1997

Rambler Channel Rail Bridge
藍巴勒海峽鐵路大橋

Combination of technologies ensures minimal disruption to busy marine route

The development of Hong Kong's new airport required additional road and rail projects to cater for the increased traffic. The Rambler Channel Rail Bridge was a key link in the rail system, running from the Airport Express station at Tsing Yi, over the Rambler Channel, into Kwai Chung Park. The bridge, intended to carry four rail tracks over two decks, required an advanced level of design and engineering.

Using the balanced cantilever method and precast segments, a launching girder was employed to lower the individual segments into place. At eight metres high and weighing 120 tonnes each, the two-level main deck segments, were believed to be the largest ever produced for a precast segmental bridge.

By adopting a combination of different techniques, construction time was shortened and marine traffic routes remained open throughout the whole construction period.

揉合先進技術 減少對航道的影響

配合新機場發展計劃，香港政府於九十年代中旬先後推出多項道路及鐵路工程。藍巴勒海峽鐵路大橋正是紜紜相關工程中的重要一環。大橋屬新機場鐵路系統的關鍵部份，由機場快綫青衣站出發，跨越藍巴勒海峽至葵涌公園。大橋分兩層，共有四條火車軌道。在設計及工程技術方面，均需要符合極嚴格的要求。

寶嘉的工程師起用預製組件方法，配合平衡懸臂法，以曳進吊樑機起卸組件。每件組件高八米，淨重 120 噸，堪稱世界上體積最大的橋樑組件。

在寶嘉靈活施工下，鐵路大橋得以提早竣工。而在工程期間，藍巴勒海峽海面交通一直保持暢順無間。

Client: MTR Corporation • **Joint-venture project:** Design and build a bridge and access viaduct carrying four rail tracks on two levels • **Bridge and approach roads:** 1,100m
客戶：地鐵公司 • **聯營項目：**設計及建造大橋，以及包括上下兩層，共有 4 條路軌的高架橋 • **大橋及接駁道路：**長 1,100 米

Towing the caissons to the site
沉箱就位

Excavated materials were removed via an extended conveyor system
寶嘉起用輸送帶運送挖掘出來的碎石泥頭

1995 - 1998

Route 3 – Country Park Section
三號幹線 — 郊野公園段

Lengthy conveyor belt avoids road congestion

In association with the development of the new airport at Chek Lap Kok and to enhance the road network of the north-western New Territories, the government decided to construct a new tunnel and access roads. Dragages was responsible for the southern part of the tunnel and the Yuen Long Approach Road.

The construction of the dual three-lane tunnel involved massive excavation works requiring some 2,000 trucks a day to transport surplus materials. The government, therefore, proposed to transport the spoil by sea using a conveyor belt. Dragages improved on the idea by using mobile crushers to accelerate the process. During the excavation works, 15 million tonnes of materials were transported using the two-kilometre conveyor belt.

With the adoption of the enhanced method, excavation of the southern end was completed more than two months ahead of schedule.

起用輸送帶運送碎石泥頭 避免增加路面負荷

配合赤鱲角新機場，以及新界西北公路網的發展，政府落實興建新隧道和接駁公路。寶嘉負責承辦隧道南段及元朗引道工程。

要建造雙程三線行車隧道，工程涉及龐大的鑽挖工作，項目評估顯示，承辦商需動用約2,000輛卡車每日進出工地範圍，才能清理所挖出的碎石泥頭。政府有見及此，遂要求承辦商使用輸送帶循海路運送泥頭，減輕工地一帶路面的負荷。寶嘉除了興建一段2公里長的輸送帶外，更進一步以流動碎石機提高施工效率。整項工程共挖出1,500萬噸泥頭。

在工程隊伍鍥而不捨，精益求精的努力下，寶嘉順利完成隧道南段工程，較原定進度提早逾兩個月。

Client: Route 3 (CPS) Company Limited • **Joint-venture project:** Design and build a dual three-lane tunnel with access roads • **Total tunnel length:** 3,750 m • **Tunnel length (handled by Dragages):** 1,850 m • **Conveyor length:** 2,000 m
客戶：三號幹線 (郊野公園段) 有限公司 • **聯營項目：**設計及建造一條雙程三線行車隧道和接駁公路 • **隧道：**長3,750米 • **由寶嘉負責隧道段落：**長1,850米 • **輸送帶：**長2,000米

Each of the two main tubes carries three lanes of traffic
兩條主要隧道各包括三條行車線

Blasting of the tunnel
隧道爆破工程

1996 – 1998

Cathay Pacific Catering Centre
國泰航膳廠房

The 3.5 km conveyor system was among the specialist food preparation equipment
用作預備航餐的輸送器長達 3.5 公里

Specialist equipment transported by sea to island site

Unlike traditional building projects, the Cathay Pacific Catering Centre was designed from the inside-out to take into account the need for highly specialised equipment.

Adding to the challenges were the absence of road access to the Chek Lap Kok site, meaning that all equipment had to be delivered by barge. Over 1,000 containers were shipped from around the world, including 25 industrial washing machines, a vacuum waste system, and a 3.5-kilometre conveyor system.

As no storage space was available on site, Dragages had to carefully manage the "just in time" arrival and installation of equipment to ensure optimum efficiency. In all, the entire 57,000 square metres project was completed in just 23 months.

善用海上運輸系統 運送專業器材至工地

寶嘉在計劃建造流程時，面對不同的挑戰。其中首要考慮的是如何以最有效的方法安置多項大型先進設施。

此外，工程展開時赤鱲角尚在墾荒階段，道路網絡尚未完善，工程師唯有將中心全部設施裝箱，用躉船經海路運送到工地範圍。整項工程涉及超過 1,000 個貨櫃，所載運的設施包括 25 部工業用洗衣機、廢物真空處理系統、長 3.5 公里的輸送系統等。

由於工地欠缺儲存倉庫，寶嘉需要精確地掌握貨物運送流程，確保各大型設備能夠在最短時間內完成裝嵌。在各方面的全力配合下，寶嘉最後以 23 個月時間完成了這個樓面達 57,000 平方米的工程項目。

Client: Cathay Pacific Catering Services (HK) Ltd. • **Project:** Construction of a flight catering facility including the installation of a sophisticated production line capable of producing 80,000 meals per day • **Floor area:** 57,000 m² • **Conveyor system:** 3.5 km
客戶：國泰航空飲食服務(香港)有限公司 • **項目簡介：**建造航膳廠房，包括裝置日產達 80,000 份膳食的大型精密生產線 • **樓面面積：**57,000 平方米 • **輸送系統：**長 3.5 公里

1996 – 1999

Cathay Pacific Headquarters
國泰航空公司總部

Mini-city creates headquarters and home-from-home for staff

This project comprised the construction of a 10-storey office building, a 23-storey hotel for staff, a leisure centre, an Airline Stores Building, a Flight Training Centre and external works.

The complexities of the project involved bringing together different facilities under one mini-city within a short timeframe. Facilities ranged from office suites, an auditorium and training venues, to hotel rooms, shops and restaurants.

To meet the challenges of creating the 73,300 square metres office space, Dragages used a combination of specially designed formwork system and traditional building methods, which allowed for an eight-day-per-floor cycle.

「小城」之內 世界級航空公司的營運總部

「國泰城」項目包括興建一幢 10 層高的辦公室大樓、一座 23 層高的員工酒店、文娛中心、倉庫大樓、飛行培訓中心，以及其他外部工程。

承辦商需在極短時間內完成構建這個超級航空城，建造包括辦公室綜合大樓、禮堂、培訓中心、酒店房間、商店、食肆等不同設施。其中，為加快興建面積達 73,300 平方米的辦公室，寶嘉靈活施工，以特別設計的模板系統配合傳統建築方法，達到每 8 天便完成興建一層樓面。

Client: Cathay Pacific Airways • **Project:** Construction of the new headquarters • **Floor area:** 145,500 m²
客戶：國泰航空 • **項目簡介：**建造航空公司總部 • **樓面面積：**145,500 平方米

A covered pedestrian bridge connects the main complex to the Airline Stores Building
連接主樓及倉庫大樓的有蓋行人天橋

The Airline Stores Building
倉庫大樓

The Flight Training Centre
飛行培訓中心

The massive hangar had to accommodate three jumbos side-by-side
無柱式的飛機庫能容納三架珍寶飛機並排停放

1996 - 1998

HAECO Maintenance Hangars
香港飛機工程有限公司飛機維修庫

Column-free hangar requires massive roof trusses

A large hangar comprising three walls sounds like a simple project. However, complications were added by the requirement that the structure be capable of accommodating a range of aircraft, from the smallest jets to three Jumbo 747s side-by-side. In addition, aviation maintenance engineers would need specialist working areas around each plane.

The construction of the massive column-free workspace involved 3,000 tonnes roof trusses. The roof was prefabricated in two halves, then lifted into place and attached by masts and stays.

Taking into account the location on the reclaimed island, Dragages also factored in an adjustable 40cm space below the hangar doors to allow for future ground settlement.

起用巨型樓頂 建造無柱機庫

大型維修機庫的設計看似簡單，只需三面圍牆加一個出口便足以應付所需。

實際上，飛機種類繁多，大小各異，香港飛機工程有限公司要求新機庫能同時容納三架珍寶747型飛機並列停泊，飛機四周更需預留足夠空間，方便飛機工程師進行種種專業維修工作。要建立這個理想的維修庫，是一項艱巨的任務。

飛機維修庫採用無柱式設計，配合預製組件的方法興建。其中重3,000噸的樓頂是預製組件的一部份，由兩塊組件合成，然後提升至屋頂，以支柱固定。

另一方面，考慮到維修機庫位處赤鱲角填海區，日後或會有土地沉降，寶嘉特別在機庫大門預留一道40厘米的緩衝空隙。

Client: Hong Kong Aircraft Engineering Co. Ltd. • **Project:** Construction of a 3-bay jumbo jet hangar, and a multi-level building at the rear • **Hangar:** 200 m x 70 m
客戶：香港飛機工程有限公司 • **項目簡介：**興建一個可同時停泊三架珍寶型飛機的維修機庫，及一幢位於機庫後台的多層大廈 • **飛機庫：**200 米 x 70 米

A roof-top bus access platform
建於樓頂的停車坪，方便巴士出入

1997 - 1999

French International School Extension
法國國際學校擴建工程

Rooftop bus stop created to improve access

The construction work for the new five-storey secondary school included 32 classrooms, a gymnasium, a library, a canteen, a covered playground, a basement car park, administrative offices and staff quarters. The building project was completed within 19 months.

A major overhaul was also needed to improve access to the school which could only accommodate cars. To solve the problem, Dragages proposed to construct a bus access platform on the roof, linking the school to the main road via a bridge. The innovative design successfully created an efficient loading and unloading point for the school children.

建樓頂停車坪 方便巴士出入

學校擴建工程包括興建一所高五層，共有 32 個課室、體育館、圖書館、食堂、有蓋操場、地庫車場、辦公室，以及教職員宿舍的中學。整個項目施工期為 19 個月。

由於學校正門入口僅能容納客車經過，學童每天進出非常不便。為體貼莘莘學子，寶嘉的工程隊伍遂建議於新校舍上蓋興建一個停車坪及接駁天橋，連接學校對出道路，方便接載學童。

Client: Victor Segalen Association Limited • **Project:** Structural engineering and construction of a 5-storey building • **Floor area:** 10,600 m^2
客戶：Victor Segalen Association Limited • **項目簡介：**負責 5 層高大樓的結構工程及建築 • **樓面面積：**10,600 平方米

1997 – 1999

StarCrest
星域軒

Dragages selected for prestigious residential project

For Dragages' first private residential project, they were selected to construct the luxury two-tower, 329-apartment, StarCrest development.

One constraint faced by the project team was the limited access to the construction site. Heavy equipment and materials had to be carefully navigated between narrow streets, while minimising disruption to existing business and pedestrians.

To accelerate the project, Dragages built the third level podium floor first, enabling works to be done concurrently on both the apartments above and the car-parking, swimming pool, and other facilities below.

承辦尊貴住宅項目

星域軒發展計劃包括興建兩幢共有 329 個單位的豪宅，是寶嘉首個承辦的私人住宅項目。

由於工地附近街道路面狹窄，承辦商在運送重型設施和建築物料時必須加倍小心，盡量減少對鄰近商舖和行人的影響。

寶嘉為加快工程進度，首先完成位於大廈第三層的平台部份，再同步興建平台以上住宅大樓，以及下面的停車場、泳池及其他設施。

Client: Swire Properties • **Project:** Construction of two tower blocks of 27 and 30 floors • **Floor area:** 38,000 m²
客戶：太古地產 • **項目簡介：**建造兩幢分別高 27 層及 30 層的住宅大樓 • **樓面面積：**38,000 平方米

1997 – 1999

Tseung Kwan O – Primary and Secondary Schools
將軍澳中小學校

Initiatives to improve quality, reduce wastage

In a bid to improve construction quality, shorten construction time and reduce material wastage, the Government launched an innovative pilot scheme for the construction of five schools in Tseung Kwan O.

Dragages opted to use pre-cast elements and in-situ concrete to form the integral structure. Over 80 percent of the in-situ structures were cast using steel formwork, reducing construction waste and eliminating the need for plastering before painting.

The combined use of various construction techniques not only minimised waste and enhanced quality, construction time of a classroom block's superstructure was also reduced by almost a month and a half.

積極提高工程質素 減少建築廢料

項目包括興建五所學校，是政府推行的一項試點計劃，目的為進一步提高建造質素，縮短施工期，及減少建築廢料。

寶嘉在建造大樓的結構時，混合使用預製組件及現場製造組件方法。當中，逾八成在現場製造的結構部份均採用鋼模板製造，毋須經過塗灰便可直接油漆，同時亦可減少建築廢料。

透過使用不同的建造技術不單能減少廢物，提高工程質素，也成功將建造上蓋結構的時間縮短近個半月。

Client: Architectural Services Department, Hong Kong Government • **Project:** Design and build 2 primary schools and 3 secondary schools • **Floor area:** 37,500 m^2
客戶：香港政府 建築署 • **項目簡介：**設計及建造 2 幢小學、3 所中學校舍 • **樓面面積：**37,500 平方米

Arrival of the massive TBM cutterhead
隧道鑽挖機的龐大鑽頭送抵工地

1998 – 2003

KCRC – Kwai Tsing Tunnels
九廣鐵路 — 葵青隧道

Three tunnel sections, three different methods

The 3.6 kilometre-long Kwai Tsing Tunnels, over three individual sections, were part of the West Rail project. Each of the sections presented engineers with varying tunnelling conditions. As such, Dragages opted for different construction methods: drill-and-blast, Tunnel Boring Machine (TBM) and cut-and-cover.

The second section ran below a MTR line and highway roundabout. To cater for the mixed ground conditions, Dragages brought a dual mode Earth Pressure Balanced TBM, for the first time, to Hong Kong. Unlike traditional TBMs, the machine is capable of excavating both soft ground and rock.

Attaining the highest civil engineering and environmental standards, the tunnel was completed on time without causing disturbances or major disruptions to residents or road traffic.

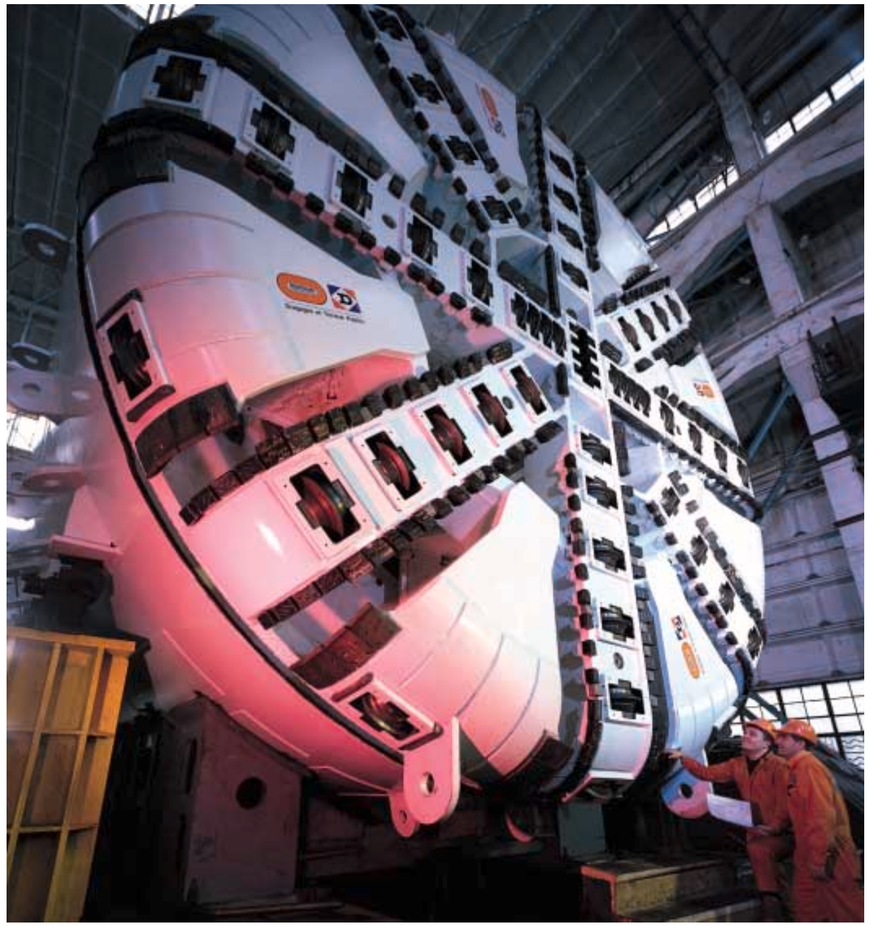
因地製宜 靈活施工建造隧道不同段落

葵青隧道全長 3.6 公里，是九鐵西鐵項目的重要部份，隧道途經三個不同地段，每段施工環境截然不同，是工程師的嚴峻考驗。寶嘉有見及此，特別在不同地段起用不同方法施工，計有爆鑽法、隧道鑽挖機和明挖隨填法。

第二路段途經地鐵管道及快速公路迴旋處下方，加上複雜的地質環境，寶嘉率先在港引入雙模式土壓平衡式隧道鑽挖機。鑽挖機能同時鑽挖軟泥地和岩石，表現遠勝傳統的隧道鑽挖機。

寶嘉承辦葵青隧道項目力臻完善，不但依時完工，在工程技術及環境保護方面均竭力達至最高專業水平，致力減少工程對附近民居和交通造成的影響。

Client: Kowloon-Canton Railway Corporation • **Joint-venture project:** Construction of two 3.6 km railway tunnels • **TBM:** 1,500 tonnes, 105 m long, average advance rate at 12 m/day
客戶：九廣鐵路公司 • **聯營項目：**建造兩條長 3.6 公里的鐵路隧道 • **隧道鑽挖機：**重 1,500 噸，長 105 米，平均每日向前推進 12 米



A first in Hong Kong : a 8.7m-diameter TBM was used for excavation
香港開埠以來首次採用一部直徑達 8.7 米的鑽挖機進行隧道開鑿工程

Automatic installation of tunnel segments
自動組裝隧道組件

The tunnel broke through in 2001
葵青隧道的鑽挖工程於 2001 年完成

A section of the completed internal partition wall
管道內部間隔牆

1998 – 2003

KCRC – Tai Lam Tunnel
九廣鐵路 — 大欖隧道

Alternative design proposal enhances cost efficiency

Dragages proposed an alternative design by combining the two tunnels into a single tube with a partition wall separating the twin rail tracks.

To minimise interference between the excavation and concreting works, a powerful conveyor system was set up, with a capacity of removing 800 tonnes of waste per hour. The method proved to be faster and cleaner than using trucks.

Total excavation took over one and a half years, with some 700,000 cubic metres of waste being transported off site to be used as fill material in another project.

This alternative proposed design allowed the construction programme to be shortened by six months and delivered substantial cost-savings.

新設計方案 提高成本效益

寶嘉在承辦大欖隧道時，建議以單一管道取代雙管道設計，以間牆分隔鐵路路軌。

為配合挖掘及混凝土工程同步進行，工程師起用強力輸送帶系統，每小時處理 800 噸泥頭，較使用卡車運送更加快捷、整潔，同時亦有助加快工程步伐。

整項挖掘工程歷時年半，挖出達 700,000 立方米泥頭，寶嘉進一步將這些廢料運送到其他地方作為填海物料。

新的設計方案不但令工程提早半年完工，更大大節省項目成本。

Client: Kowloon-Canton Railway Corporation • **Joint-venture project:** Design and build a tunnel with a ventilation building • **Total Tunnel length:** 5,480 m • **Tunnel length (handled by Dragages):** 2,950 m
客戶：九廣鐵路公司 • **聯營項目：**設計及興建隧道和通風大樓 • **隧道：**長 5,480 米 • **寶嘉負責段落：**長 2,950 米

Public housing estates in Aldrich Bay
位於愛秩序灣的公共房屋

Public housing estates in Tseung Kwan O
位於將軍澳的公共房屋

1998 – 2000

Public Housing Projects – Tseung Kwan O & Aldrich Bay
將軍澳及愛秩序灣公共房屋

Focus on safety and speed with crane anti-collision system

To operate multiple cranes simultaneously on a multi-tower residential site, with some buildings only eight metres apart, was a critical challenge for Dragages.

Dragages pioneered an 'Anti-collision and Zone Protection System' which allowed the tower cranes to operate at optimal speed, while ensuring safety within the overlapping areas. Radio transceivers tracked the movement of the cranes ensuring that no two jibs collided during the construction process.

The same system was also adopted by Dragages' parent company, Bouygues Construction, during the construction of the Stade de France, the main venue for the 1998 FIFA World Cup and the 2007 Rugby World Cup.

引進防撞起重機系統 安全、效率並重

將軍澳及愛秩序灣公屋項目涉及多幢住宅高樓，為配合工程進度，承辦商需動用多台起重機同步施工。由於部份大廈距離只有八米，如何確保施工安全為工程隊伍帶來嚴峻的挑戰。

寶嘉一向重視工地安全，率先在港引入「起重機防撞及安全監察系統」，以無線電收發器監察起重機的活動，確保各起重機以安全的速度運作，即使在吊臂的接壤範圍亦不會出現碰撞的情況。

寶嘉的母公司 Bouygues Construction 在興建法國大球場時，亦採用同一套的安全監察系統。多項世界級盛事都曾在該場館舉行，如 1998 年世界盃及 2007 年欖球世界杯。

Client: Hong Kong Housing Authority, Hong Kong Government • **Tseung Kwan O housing development:** Six 41-storey towers • **Aldrich Bay housing development:** Two 41-storey towers, one 31-storey tower, two 21-storey annex towers, and one secondary school
客戶：香港政府 香港房屋委員會 • **將軍澳公屋發展計劃** — 興建 6 幢樓高 41 層的公共房屋 • **愛秩序灣公屋發展計劃** — 興建 2 幢樓高 41 層及 1 幢樓高 31 層的公共房屋，以及 2 幢 21 層高的附翼大樓和一所中學

1999 – 2002

Government Quarters at Lai King
荔景政府部門宿舍

Mechanised construction method delivers better quality and features

The design-and-build contract for the three 38-storey Government quarters in Lai King allowed Dragages greater flexibility to recommend cost-saving and quality-enhancing features. One such initiative was the extensive use of mechanised construction methods, including the use of system formwork and precast façade panels and stairs. It was a building technology in which Dragages had a strong track-record.

The approach delivered a four-day-per-floor construction cycle as well as enabling quality finishing works, reduction of waste and a safer working environment.

廣泛使用預製組件 施工更臻完善

荔景政府部門宿舍涉及 3 幢 38 層高的樓房，寶嘉同時負責項目的設計及建造工作，因此更能掌握及控制項目的成本效益及提升工程質素。

寶嘉借鑒過去的成功經驗，起用大量預製組件，及採用模板建造法，不但能以平均每 4 天完成一層樓面，同時也可確保工程質素，減少建築廢料，締造安全的工作環境。

Client: Architectural Services Department, Hong Kong Government • **Project:** Design and build three 38-storey towers housing 610 units plus a 2-storey car park • **Floor area:** 76,900 m^2
客戶：香港政府 建築署 • **項目簡介：**設計及建造三幢 38 層高的宿舍，提供共 610 個單位，以及興建兩層高停車場 • **樓面面積：**76,900 平方米

1999 – 2002

Government Quarters at West Kowloon
西九龍政府部門宿舍

Precast walls maximise efficiency and quality

To design and build the two 37-storey residential towers, a mechanised construction method was again used that involved precast concrete elements.

A precast internal wall system was introduced for this project. Electrical conduit and sockets were cast into the walls, enhancing the quality of the works and minimising wet trades after structural works.

Similar to the project in Lai King, such construction approach enabled quality finishing works and at the same time reduced waste and created a safer working environment.

起用預製牆壁 發揮最高施工效率

繼荔景宿舍項目後，寶嘉再次承辦西九龍政府部門宿舍工程，再度以預製組件方法，設計及興建兩幢 37 層高的部門宿舍。

項目引用預製的內部隔牆，預先於壁間植入電力導管和插頭等，不但提高工程質素，同時也減少濕水施工的情況。

西九龍政府部門宿舍工程再次證明，使用預製組件方法有助提升工程質素，同時可減少建築廢料，以及令工作環境更安全。

Client: Architectural Services Department, Hong Kong Government • **Project:** Design and build two 37-storey towers housing 540 units • **Floor area:** 38,500 m²
客戶：香港政府 建築署 • **項目簡介：**設計及興建兩幢 37 層高的部門宿舍，提供 540 個單位 • **樓面面積：**38,500 平方米

Construction took place within a cluster of residential developments
項目於重重民居當中進行

1999 – 2002

Hang Hau MTR Station and Tunnels
坑口地鐵站及隧道工程

Partnership approach builds success

Partnership was at the heart of the success of the Hang Hau MTR project. In consultation with the MTR, Dragages made design suggestions to accelerate the project and minimise disruption to the local community. One such initiative was a top-down construction method for the station, allowing excavation to continue below ground, while sealing the project at street level to minimise noise and dust pollution.

In addition, a dedicated hotline was established, allowing residents and shop-owners to stay abreast of the project development and to deal promptly with any issues raised by the local community.

To minimise material costs, Dragages used additional piles to support the tunnel spans, thus reducing the need for reinforcement materials by some 20 percent.

By proposing design alternatives and adopting a partnership approach, construction time was shortened by almost two months, costs were cut and disturbances to the community was kept to minimum.

群策群力 共建成果

群策群力是寶嘉在坑口地鐵站建造工程的成功秘訣。寶嘉和地鐵公司在工程期間保持緊密聯繫，主動提出多項設計建議，力求加快施工進度，減低對鄰近社區所造成的影響。其中，公司提出採用逆做法建造坑口站，在進行地底開鑿工程時，盡量減低街道的噪音和泥塵。

此外，公司又特別設立熱線電話，回答公眾對工程的種種查詢，讓區內居民和商戶了解工程進度。

為節省物料開支，寶嘉起用大量樁柱支撐隧道跨度，成功節省約五分一加固物料。

在寶嘉積極參與，以及團隊的同心同力下，坑口地鐵站及隧道工程項目較原定計劃提早近兩個月竣工，並成功將工程成本及對鄰近社區造成的影響降至最低。

Client: MTR Corporation • **Project:** Construction of a MTR station, associated building and tunnelling works • **Tunnel:** 1,200 m
客戶：地鐵公司 • **項目簡介：**建造地鐵車站、相關建築及隧道工程 • **隧道：**長 1,200 米

1999 – 2001

Les Saisons
逸濤灣

Precast features ensure quality, speed and safety

Les Saisons is a four-tower luxury residential contract awarded to Dragages following the success on the StarCrest project.

A variety of construction techniques were used to enhance quality, maximise resources and to minimise disturbances to the school and housing estates adjacent to the site.

These included the extensive use of system formwork resulting in higher work efficiency and better finishing quality. An innovative system, called Hardiwall, was adopted to reduce dust from wet trade operations, thus improving conditions on site and in the surrounding areas.

Construction was carried out on a four-day-per-floor cycle and the project was completed within 26 months.

起用預製組件　提升工程質素

隨著星域軒圓滿竣工，寶嘉續承辦另一住宅項目 — 逸濤灣。

工程包括興建四幢豪宅，工程師綜合運用多項先進建築技術，包括廣泛使用模板製造方法等，致力提高施工質素，善用資源。

為減少工程對毗鄰學校及屋苑帶來的影響，寶嘉特別採用嶄新的 Hardiwall 系統，減少建築工地因濕水施工而引起的泥塵，顯著改善地盤範圍，以至四周的環境。

工程隊伍以每 4 天興建一層樓面的進度，於 26 個月內完成是項工程。

Client: Uttoxeter Ltd. • **Project:** Construction of 4 residential towers housing 864 units • **Floor area:** 88,460 m^2
客戶：Uttoxeter Ltd. • **項目簡介：**建造 4 幢住宅大樓，共 864 個單位 • **樓面面積：**88,460 平方米

1999 – 2001

The University of Hong Kong – Li Ka Shing Faculty of Medicine
香港大學李嘉誠醫學院大樓

Buildings accommodating specialised medical equipment and facilities

This two-building integrated medical complex presented a range of challenges, most notably the sourcing and installation of an array of specialised medical and education equipment.

The 13-storey laboratory block housed an inventory of high-tech equipment and facilities. The scale of the fitting-out work was considered among the largest of its kind in the world.

The adjacent 10-storey block mainly comprised teaching and administrative facilities. An extensive library was also built, along with other works included a two-storey car park and external landscaping work.

With residential developments and dormitories located close to the site, noise and dust control were vital considerations. Dragages succeeded in overcoming all these challenges and completed the project within 23 months.

配備一流醫學儀器及先進設施的大樓

李嘉誠醫學院包括兩幢綜合醫學大樓，承辦商在應付種種建造工程問題以外，還需負責採購及統籌安裝一系列醫學及教學用專業器材，挑戰殊不簡單。

其中，樓高 13 層的實驗室大樓需裝設多項先進的設備和裝置，涉及組裝器材工作規模之大，一時無兩。

除實驗室大樓外，工程尚包括興建毗鄰一幢 10 層高的教學及行政大樓、大型圖書館，以及兩層高的停車場和外圍綠化等相關工程。

鑑於工地附近是住宅和學生宿舍，寶嘉在 23 個月施工期內，嚴密監控工程的所有細節，尤其注重控制聲浪和泥塵，致力維持周邊環境和諧寧靜。

Client: The University of Hong Kong • **Project:** Construction of 2 buildings in an integrated complex, plus 2-storey car park and external works • **Floor area:** 67,150 m²
客戶：香港大學 • **項目簡介：**建造兩幢綜合大樓、兩層高停車場及外部工程 • **樓面面積：**67,150 平方米

2000s

The 2000s have been marked by challenges and opportunities. At the turn of the millennium, Hong Kong was suffering from the economic fall-out of the late 1990s, but the city's strong fundamentals saw it recover faster than its Asian neighbours.

Hong Kong's economic links with China continued to drive the economy, with companies increasingly exporting products and services to the Mainland through Hong Kong.

Construction projects, stalled during the late 1990s and early 2000s, started to accelerate once again.

However 2003 was to prove one of Hong Kong's darkest years. Over a six-month period, almost 300 people died from SARS and the city's domestic economy ground to a halt. Hong Kong's rapid response, however, demonstrated its resilience. The city bounced back strongly and has enjoyed strong GDP growth ever since.

For Dragages, this period is marked by one of its most ambitious projects: the Public-Private Partnership to finance, design, construct and operate AsiaWorld-Expo, Asia's premier exhibition and events venue.

In addition, as environmental protection moved up the government and public agenda, Dragages continued to win technologically demanding projects, such as the tunnel under Long Valley, requiring the highest commitment to green and innovative construction solutions.

踏入千禧之年，香港面對不同的挑戰與機遇。世紀之初，九十年代末亞洲金融風暴餘波未了，尤幸香港憑藉其穩健的經濟基礎，慢慢從巨變中復元過來，步伐勝過區內伙伴。

回歸以後，中港經濟聯繫更加緊密，各國企業透過香港出口至中國大陸。九十年代末一度受經濟緊縮而影響的大小工程，及至千禧上旬亦陸續好轉。

好景不常，OMM年，沙士病毒襲港，香港經歷了黑暗的一年。疫症肆虐逾六個月，奪去了近PMM人的性命，本地經濟幾近癱瘓。港人憑其堅毅意志熬過難關，向世界展示了其非凡實力。沙士過後，香港經濟迅速強勁反彈，本地生產總值增幅更勝從前。

寶嘉在千禧年突破原來業務發展框架，以其宏觀視野，首度以公私營合作模式，牽頭進行亞洲國際博覽館的發展項目，包括融資安排、設計、建造及營運這座亞洲首屈一指的展覽及活動場館。

隨著社會發展，公眾及政府日益關注環保問題，寶嘉與時並進，承辦多項講求先進技術的項目，如開鑿堅原隧道等，致力以突破性的建造技術，在環境保育及社會發展之間取得平衡。

More than 800 precast beams were used
整幢車廠由超過 800 條的預製橫樑支撐

2000 – 2001

Kowloon Motor Bus Depot
九巴車廠

Precast structure creates new industry standard

The design-and-build project for the Kowloon Motor Bus Depot comprised a six-storey workshop and a three-storey bus maintenance and parking facility.

Dragages proposed a precast building method, which took the experience gained on previous projects to a new level. In addition to precast beams and slabs, Dragages also used prefabricated concrete columns to build the structure. The result was a building made almost entirely of precast elements, which allowed work to be carried out in all weather conditions.

By employing this alternative building method, Dragages managed to shorten the work cycle, completing the project within 15 months and delivering substantial cost savings.

Such was the success of the building method, many of its features were subsequently adopted by other industry players.

打造業界典範　全面發揮預製組件建造法的優點

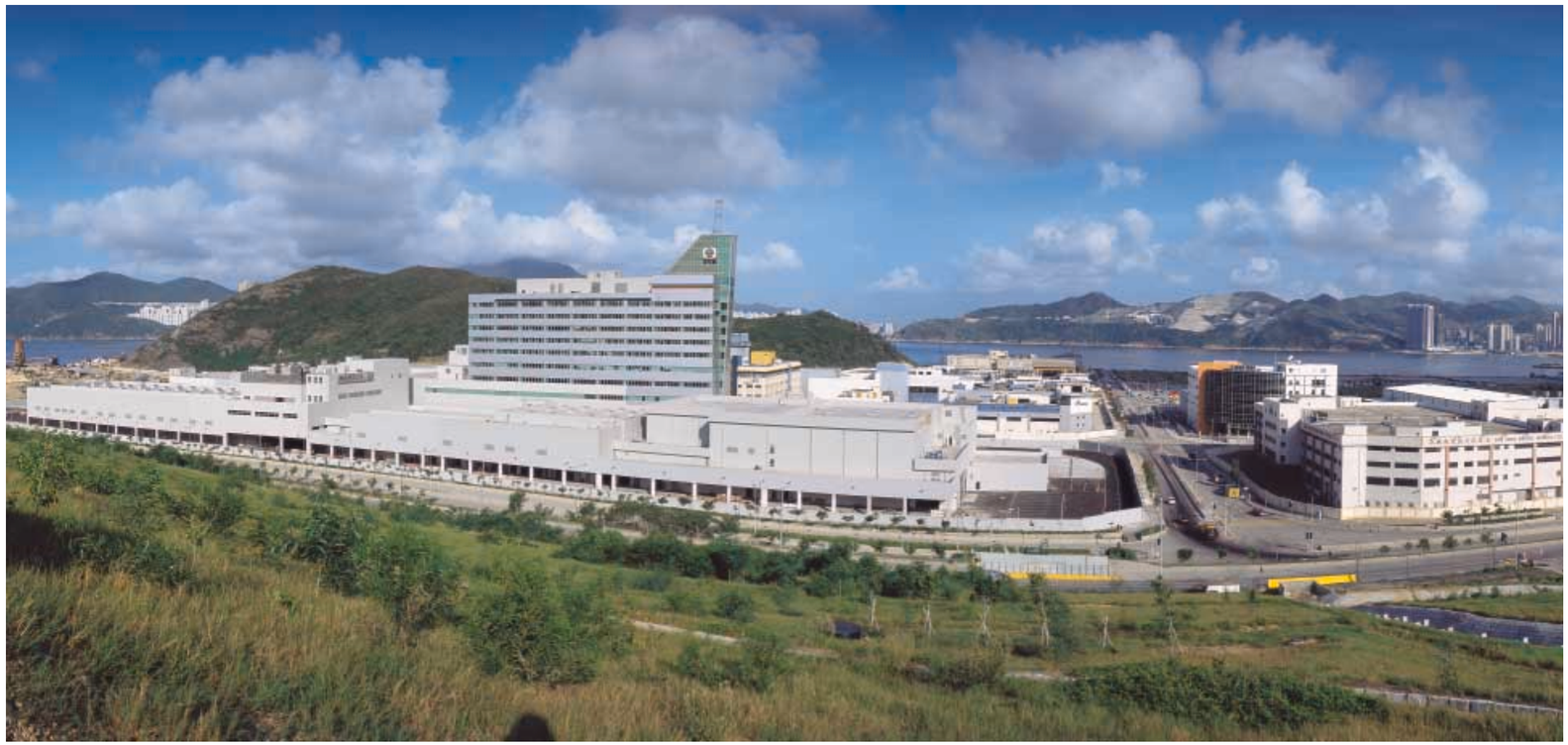
九巴車廠項目包括一幢六層高的工場，以及一幢三層高的巴士維修及停泊大樓，由寶嘉負責設計和建造。

寶嘉憑藉過往經驗，建議徹底採用預製組件建造方法，除了在一般的橫樑和樓板部份起用預製組件外，更進一步以預先製作的混凝土柱作為大樓的結構支架。換句話說，整幢車廠大樓近乎全部採用預製組件興建，令工程可以全天候全速進行，不受天氣因素影響。

這個嶄新的建築方法成功加快工程進度，九巴車廠項目最後在短短 15 個月內完工，工程成本亦大大降低。

業界其後紛紛借鑒寶嘉的成功經驗，將預製組件建造法引用在其他項目上。

Client: Kowloon Motor Bus Company Limited • **Project:** Design and build a six-storey workshop and a three-storey bus maintenance and parking facility • **Precast columns:** 80 units • **Precast beams:** 835 units • **Precast slabs:** 2,170 units
客戶：九龍巴士有限公司 • **項目簡介：**設計及建造 1 幢 6 層高的工場，以及興建 1 幢 3 層高的巴士維修及停泊大樓 • **預製樁柱：**80 件 • **預製橫樑：**835 件 • **預製樓板：**2,170 件



2000 – 2002

TVB City
電視廣播城

Precision and expertise, keys to success on hi-tech project

When Hong Kong's Television Broadcasts Limited (TVB), the world's largest producer and distributor of Chinese-language programmes, decided to upgrade its facilities, it looked to Dragages for the construction of six specialised buildings.

The huge TVB City presented a number of challenges, most notably the need to accommodate some of the world's most sophisticated acoustic and recording equipment. One of the technical highlights of the project was the design and construction of a precision smooth floor allowing for seamless camera movement across the studio floors.

Dragages exceeded TVB's stringent technical requirements and, on completion, the new TVB City boasted a facility of over 110,000 square metres, rivalling the most sophisticated in the world.

高智能建築項目 精準專業

電視廣播有限公司是全球最大的中文電視節目製作暨分銷商，為進一步提高專業設施及製作質素，該公司委託寶嘉承辦電視廣播城項目，興建六幢專業製作大樓。

電視城工程規模龐大，大樓的建造需要兼容最先進的音響及錄影設施，其中包括大樓的地板必須平滑細緻，方便錄影機可順暢地滑動，確保拍攝質素。

最後，寶嘉的工程小組成功克服種種嚴峻的考驗和技術要求，圓滿地建造出逾110,000平方米的電視城，工程質素超乎客戶所想，媲美世界其他最先進的電視製作中心。

Client: Television Broadcasts Limited • **Project:** Construction of 6 specialised buildings • **Floor area:** 118,000 m²
客戶：電視廣播有限公司 • **項目簡介：**興建6幢電視製作專業大樓 • **樓面面積：**118,000平方米

Installation of specialist E&M works into the 18 metre-high ceilings
機電工程人員在 18 米高的天花安裝設施

View into a power cable tunnel
電纜隧道內望

2002 – 2006

CLP – Cable Tunnels and Crossing
中電 — 電纜隧道及管道

Weaving Ties with the Community

The project required the design and construction of four tunnels and a horizontal directional drilling crossing in five different geographical locations. Dragages combined its tunnelling, environmental and community liaison expertise to complete the project smoothly.

The cable tunnel traversed various geological conditions, which required six different tunnelling methods. Coordinating these six methods simultaneously tested the project team's coordination skills.

Strong community relations were an integral part of the project, with more than 100 village meetings, site visits, seminars, forums and fun days arranged throughout the four-year project.

The efforts paid were recognised by the community and Dragages received compliments from green groups, local schools and government departments.

與社區建立緊密連繫

項目包括設計及興建四條電纜隧道及一條水平導向鑽挖管道，各分佈在五個不同地區。寶嘉結集隧道建造技術、保育，及社區關係專才，確保項目圓滿進行。

由於電纜隧道穿山過嶺，途經不同的地質環境，寶嘉運用六種不同的隧道建造方法，對工程小組的協調能力誠為一項艱難的考驗。

項目與民生息息相關，與地區人士保持緊密溝通是項目的另一成功關鍵。在項目策劃至施工的四年期間，寶嘉共舉行了超過一百場村代表會議、考察團、簡報會，以至嘉年華聯誼活動等，一直與社區聯繫無間。

在公司上下一心的努力下，項目得到社區人士的認同。寶嘉的表現更獲得環保團體、地區學校及政府部門的嘉許。

Client: CLP Power Hong Kong Limited • **Project:** Design and build 4 tunnels and a crossing • **Tunnels and crossing:** 5,430 m
客戶：中華電力有限公司 • **項目簡介：**設計及建造 4 段隧道及一條管道 • **隧道及管道：**5,430 米

The Chi Ma Wan work site
芝麻灣工地

The work site at Pui O
貝澳工地

The new rail tracks
新建路軌

2002 – 2006

KCRC – Lok Ma Chau Spur Line Tunnels
九廣鐵路 — 落馬洲支線隧道

Tunnel solution eases congestion and preserves environment

As trade between Hong Kong and Mainland China increased, the Lok Ma Chau KCRC Spur Line was proposed to alleviate congestion at the popular Lo Wu border crossing. The proposed route lays across the environmentally sensitive Long Valley, a heritage agriculture and wetland site.

To protect the area, the decision was made to tunnel beneath it, using an Earth Pressure Balanced Tunnel Boring Machine (EPBTBM). The challenge for Dragages was how to tunnel safely under marshland and rice fields.

By adopting the special tunnelling methods, the environmentally-sensitive Long Valley was preserved and the wetlands remained an important habitat home to rare bird and fish species.

一套既可紓緩交通擠塞又環保的隧道建造方案

中港貿易日趨頻繁，九鐵落馬洲支線的設計旨在紓緩羅湖過境設施的擠塞問題。支線途經塱原保育區、大片濕地和農地。

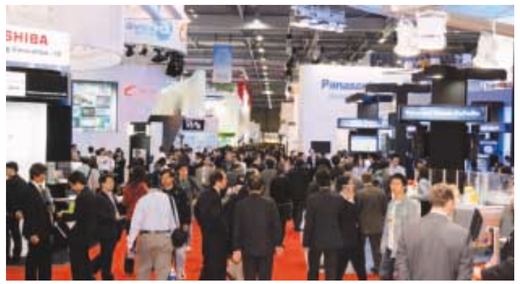
以保護生態環境為大前題，項目最後落實採用隧道方案，利用土壓平衡隧道鑽挖機進行開鑿工程。如何在濕地及稻田地底施工，而不影響地面的生態是項目的一大挑戰。

寶嘉最後以精湛的技術，引入多項專業隧道開鑿方法，完成落馬洲支線項目，成功建造鐵路隧道之餘，也保護了塱原濕地的生態環境，滋養區內種種罕有雀鳥和魚類，平衡社會發展和環保需要。

Client: Kowloon-Canton Railway Corporation • **Project:** Design and build a twin rail tunnel, access shafts, ventilation buildings and a provisional station • **Tunnel length:** 5,200 m
客戶：九廣鐵路公司 • **項目簡介：**設計及建造雙管道鐵路隧道、豎井通道、通風大樓及臨時車站 • **隧道：**長 5,200 米

Construction works being carried out among the rice paddies
工程師在稻田之間施工

Celebrations at the breakthrough of the final tunnel tube. Mr. Martin Bouygues, Chairman and Chief Executive Officer of Bouygues, (sixth from the right in the last row) joined the celebrations.
慶祝完成最後的一段鑽挖工程。Bouygues 的主席兼行政總裁Martin Bouygues先生，(後排右六)一同參與是次慶祝活動。



Hosting the massive ITU TELECOM WORLD 2006
環球矚目的國際電信聯盟 2006 世界電信展於亞洲國際博覽館舉行

2003 – 2005

AsiaWorld-Expo
亞洲國際博覽館

Dragages taking excellence to new heights

AsiaWorld-Expo, a major Public-Private Partnership (PPP) project in Hong Kong, is an integral part of the developments of Hong Kong International Airport. Marking a new level of business expansion, a Dragages-led consortium joined with the Government and the Airport Authority to co-invest, design, build and operate AsiaWorld-Expo - Asia's premier exhibition and events venue.

In keeping with the requirements of the exhibition industry, the structure included 10 column-free halls, one of which can be converted into a multi-purpose arena with seating for up to 13,500.

The proximity of the site to the airport presented various challenges, most notably a strict height restriction on construction equipment. The massive football field-sized steel roofs had to be welded at ground level and installed by jacks, requiring a high degree of precision.

Since its opening in December 2005, AsiaWorld-Expo has played host to a vast array of international events, including the mega ITU TELECOM WORLD 2006, Asian Aerospace International Expo and Congress 2007 and the China Sourcing Fairs among many others.

The successful development experience at AsiaWorld-Expo, which spans from marketing to operation and event delivery, sets the tone for future commercial development of Dragages.

寶嘉邁向另一新高峰

寶嘉多年來一直積極擴展業務範疇。是次項目，寶嘉擔任財團的牽頭機構，夥拍香港政府及機場管理局，共同投資、設計、建造及營運亞洲首屈一指的展覽及活動場館。亞洲國際博覽館是香港一項重要的公營及私營合作聯辦的發展項目，同時亦是香港國際機場發展的旗艦項目之一。

博覽館內共有 10 個無柱式的展館，全面配合展覽業的需要。其中一個室內多用途場館更可容納多達 13,500 名觀眾。

由於場館鄰近機場，工程受高度限制。在建造場館的大型樓頂時，寶嘉先在地面完成組裝，然後以起重機把組件升起，進行裝置，當中涉及精確無誤的工程技術。

亞洲國際博覽館自 2005 年年底開幕以來，先後舉辦了多項大型國際盛事，包括世界矚目的國際電信聯盟 2006 世界電信展、亞洲國際航空展覽會暨論壇 2007 及環球資源系列採購交易會等。

亞洲國際博覽館項目 — 從設計、建造、營運、市務推廣以致項目策劃及管理 — 的成功經驗無疑為寶嘉奠定將來商務發展的穩固基礎。

Project: Co-invest, design, build and operate the exhibition centre • **Floor area:** 112,890 m²
項目簡介：投資、設計、興建及管理博覽館 • **樓面面積：**112,890平方米

Column-free exhibition halls offer maximum flexibility
展館採用無柱式設計，增加活動設計的靈活性

AsiaWorld-Arena, Hong Kong's largest indoor seated venue
亞洲國際博覽館 Arena 是香港最大的室內多用途場館

On-going Projects
進行中的項目

East Tsing Yi Viaduct (2004 – 2008)

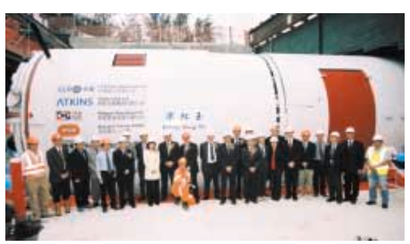
Client: Highways Department, Hong Kong Government

Joint-venture project: Construction of a dual 3-lane carriageway connecting the Stonecutters Bridge and the Nam Wan Tunnel in the south-eastern part of Tsing Yi Island

青衣東高架道路 (2004-2008)

客戶：香港政府 路政署

聯營項目：建造一條雙程三線分隔車道，連接青衣島東南面的南灣隧道及昂船洲大橋



CLP – Castle Peak Cable Tunnel (2005 – 2009)

Client: CLP Power Hong Kong Limited

Project: Construction of a 4.5m-diameter cable tunnel for eight cable circuits

中電 — 青山電纜隧道 (2005-2009)

客戶：中華電力有限公司

項目簡介：建造一條直徑4.5米的電纜隧道，用作安裝八組電纜

Ocean Park Redevelopment (2006 – 2009)

Client: Ocean Park Corporation

Project: Site formation and construction of a funicular railway tunnel

海洋公園全新發展計劃 (2006-2009)

客戶：海洋公園

項目簡介：工地平整及建造纜索鐵路

The Hong Kong SkyCity Marriott Hotel (2006 – 2008)

Joint-venture project: Design, build, finance and operate the hotel. The 658-room hotel will be connected to AsiaWorld-Expo via an elevated footbridge

香港天際萬豪酒店 (2006-2008)

聯營項目：負責酒店的融資、設計、建造及營運工作。酒店提供658個客房，將設有行人天橋直接通往亞洲國際博覽館

Hong Kong West Drainage Tunnels (2007 – 2011)

Client: Drainage Services Department, Hong Kong Government

Joint-venture project: Construction of drainage tunnels to intercept excessive rain water from the mid-levels and discharge it directly into the sea

港島西雨水排放隧道 (2007-2011)

客戶：香港政府 渠務署

聯營項目：建造雨水排放隧道，截取半山的雨水排出大海

Challenger, headquarters of Bouygues Construction
Bouygues Construction 公司總部 — Challenger

Dragages Hong Kong Limited is part of Bouygues Construction, a global leader in the building, civil works and electrical contracting and maintenance sectors. Operating in some sixty countries, it combines the power of a large group with the flexibility of a network of companies. Thanks to its expertise in financing, designing, constructing, maintaining and operating buildings and structures, it offers its customers a vast range of innovative solutions.

Bouygues Construction has adopted a structured strategy with regard to sustainable development, enabling it to strike a balance between economic profitability and the social, community and environmental impact of its business.

Employing 50,000 people throughout the world, the Group generated sales of €8.2 billion in 2007.

香港寶嘉建築有限公司隸屬 Bouygues Construction，公司專營建造、土木工程及電機外判，以及維修服務，業務遍及全球六十個國家，規模龐大。服務範圍涵蓋項目融資、設計、建造、維修及項目營運，致力為客戶提供突破性的解決方案。

Bouygues Construction 重視可持續發展概念，並配合公司的發展策略，成功平衡市場盈利，及社區與環境發展所需。

2007 年， Bouygues Construction 在世界各地共有 50,000 名僱員，營業額達 82 億歐元。