Railway Development in Hong Kong

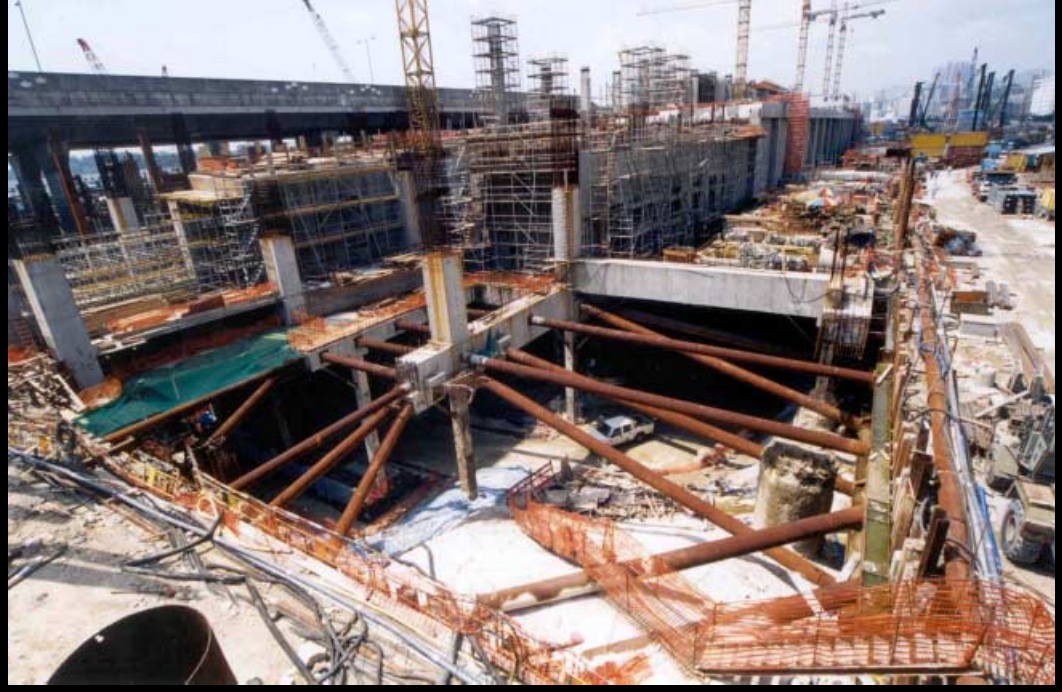
KCRC West Rail

Nam Cheong Station

Overview of the Nam Cheong Station site and the development stage of the nearby West Kowloon Reclamation in 1999.

Early stage of station construction work. Under common practice, this kind of semi-buried underground structure is often constructed using a top-down approach. This photo shows the forming of the first slab at ground level before commencement of full scale station construction.

Station construction at its peak period. Note the elevated West Kowloon Expressway on the left and a temporary access ramp on the right side of the station, which was used as the only access point into the underground structure which was constructed using a top-down arrangement.



An opening for plant and material access into the station interior. The opening was later used as a shaft for a pedestrian entrance, accommodating the stairs and escalators.

An external view of Nam Cheong Station. The podium-type structure of the station is designed to hold future property development above.

Mei Foo Station

Overview of the Mei Foo Station site and its neighbouring environment. Note the temporary footbridge which provided access for the general public living at the other side of the site.

Close-up view of the station structure which was constructed in carefully phased sections to accommodate various co-ordinated activities.

Layout and construction arrangement of the site in early 2001.

Mei Foo Station is intersected by two major transport routes: the Mei Foo Flyover, as shown in this photo, and the tunnel tubes of the MTRC Tsuen Wan Line. Difficulties encountered during the construction process can easily be imagined.

The north end of the station was built near a busy highway. The photo shows the protection measures provided to safeguard the construction work alongside the highway, in particular for the forming of the northbound tunnel.

An aerial view of Mei Foo Station with the basic structure being completed pending the final stage of external touch-up works.

Tsuen Wan West Station

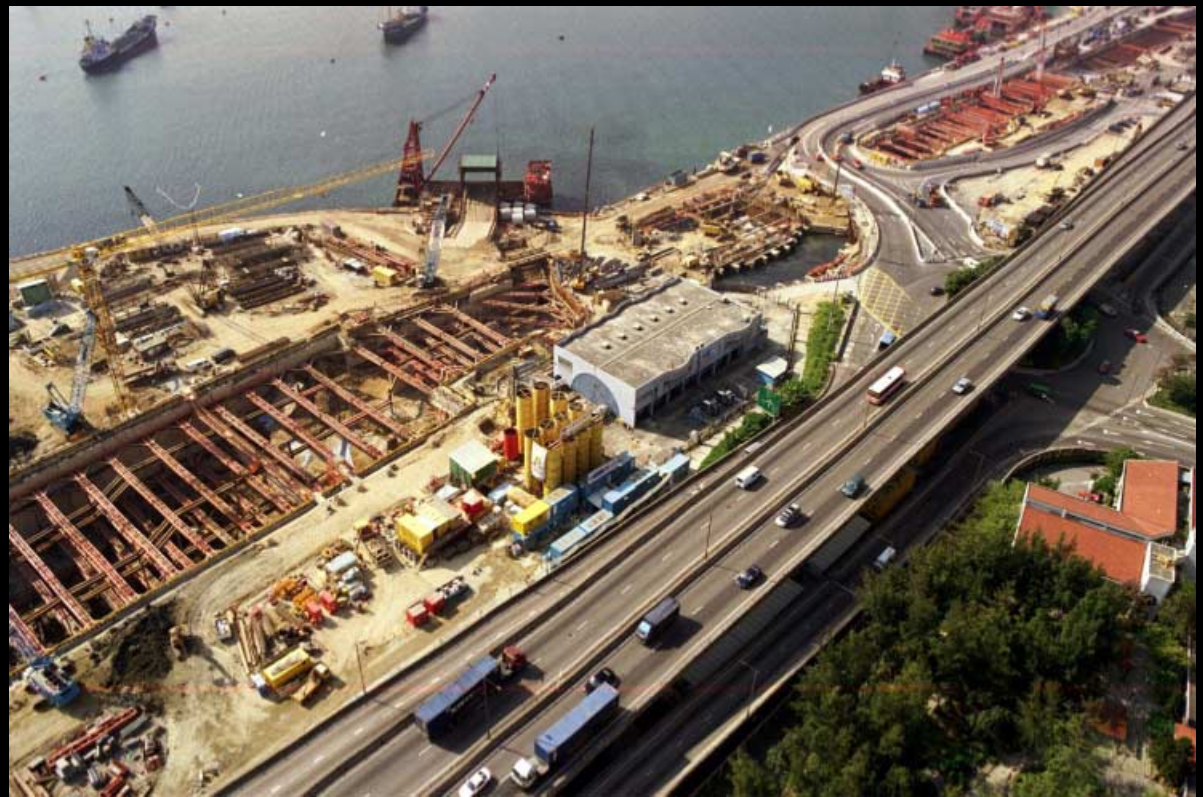
Aerial view of Tsuen Wan West Station. The new station is located in a narrow strip of reclaimed land on the west side of the Tsuen Wan Bypass.

The Tsuen Wan West reclamation as seen in mid-2000. The excavation for the station structure and the approach tunnel on both sides formed by a cut-and-cover arrangement had just begun.

Reclamation to form the required land as seen in late 1999. Note that there was a public ferry pier which needed to be relocated to meet with the reclamation schedule. Some storm water discharge networks were also extended to the new seawall as part of the overall reinstatement.

Construction of a storm water discharge culvert in place. The most difficult part of this work was that the culvert, which is situated on the top level, was built almost at the same time as construction of the approach tunnel passing below it.

Construction of Tsuen Wan West Station along the side of the Tsuen Wan Bypass.



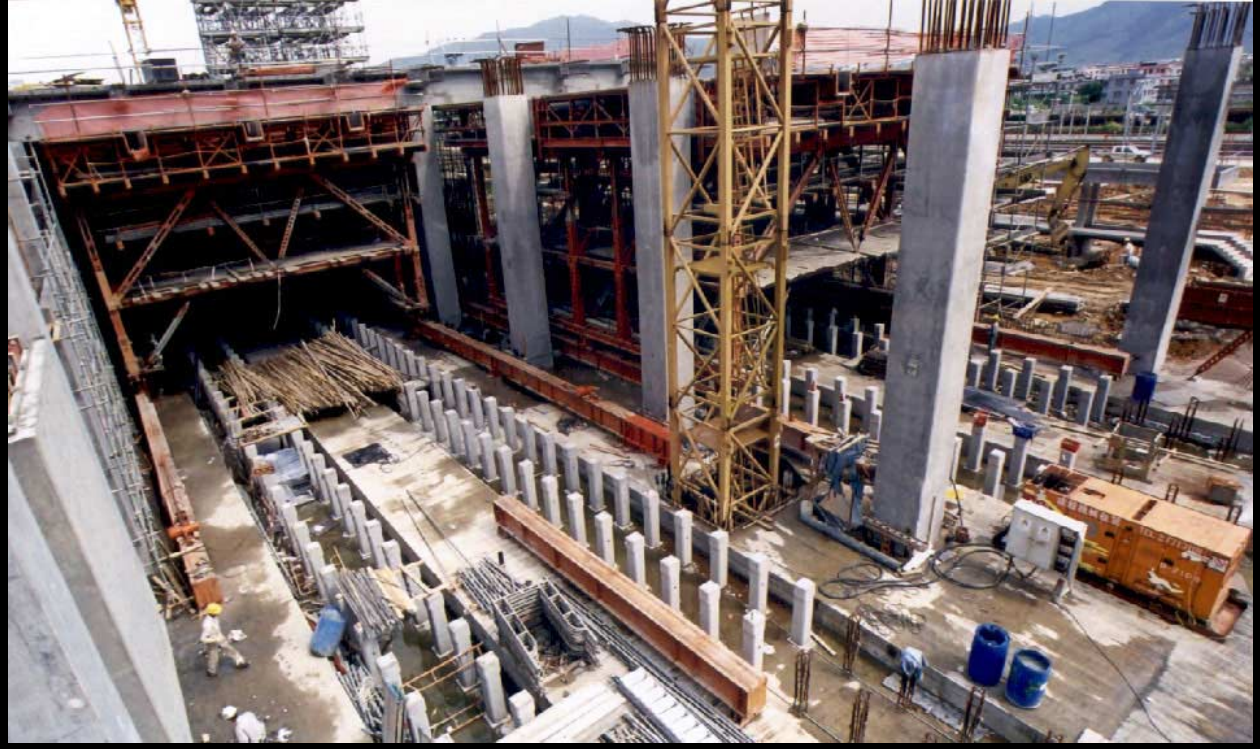
Another critical spot in Tsuen Wan West Station: the interruption by a six-cell storm water discharge culvert box and the salt water intake station. The diversion arrangements carried out to rectify the disturbed services, as shown in the middle of the photo, took 12 months to complete.

Tsuen Wan West Station and the nearby external landscape treatment as seen after the opening of West Rail in late 2003

A panoramic view of the open area and promenade newly provided at the Tsuen Wan West reclamation in front of Tsuen Wan West Station.

Kam Sheung Road Station and the Maintenance Centre of West Rail at Pat Heung

Construction of the Maintenance Centre of West Rail on the Pat Heung Plain, 800 m away from the north portal of the Tai Lam Tunnel.



The structure of the Maintenance Centre has a one-level podium design with repeated frame sections supporting the podium deck. This photo shows the use of travelling formwork in creating the repeated deck sections.

A panoramic view of the Maintenance Centre in early 2004.

An external view of Kam Sheung Road Station. The station is situated on the Kam Tin Plain, so flood control was one of the prime concerns in the overall design of the station. In the foreground is a newly completed flood water discharge channel that was part of the project's environmental design.

Yuen Long Station

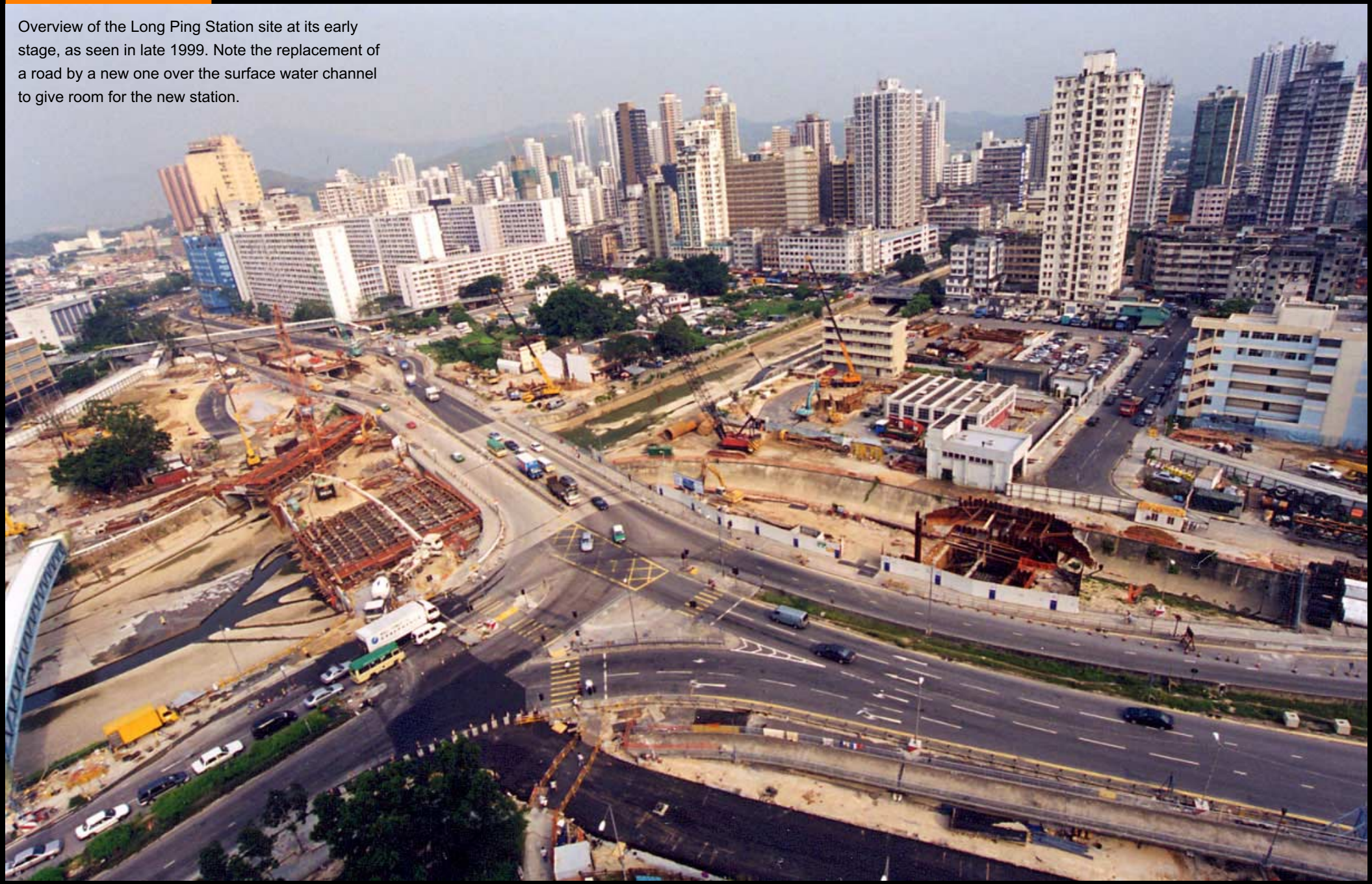
Aerial view of the Yuen Long Plain, showing the site of Yuen Long Station and the nearby rural environment. The high-rise building in the centre of the photo is Sun Yuen Long Centre, a private residential development with a Light Rail terminus on the ground level.

Construction of the station structure at its early stage. Note the rural village houses in the background.

A closer look at the station construction. This station is an elevated podium-type structure connected to viaducts at both ends. Public transportation interchange facilities are provided on the ground level for passengers to transfer to nearby districts using the Light Rail network.

Long Ping Station

Overview of the Long Ping Station site at its early stage, as seen in late 1999. Note the replacement of a road by a new one over the surface water channel to give room for the new station.



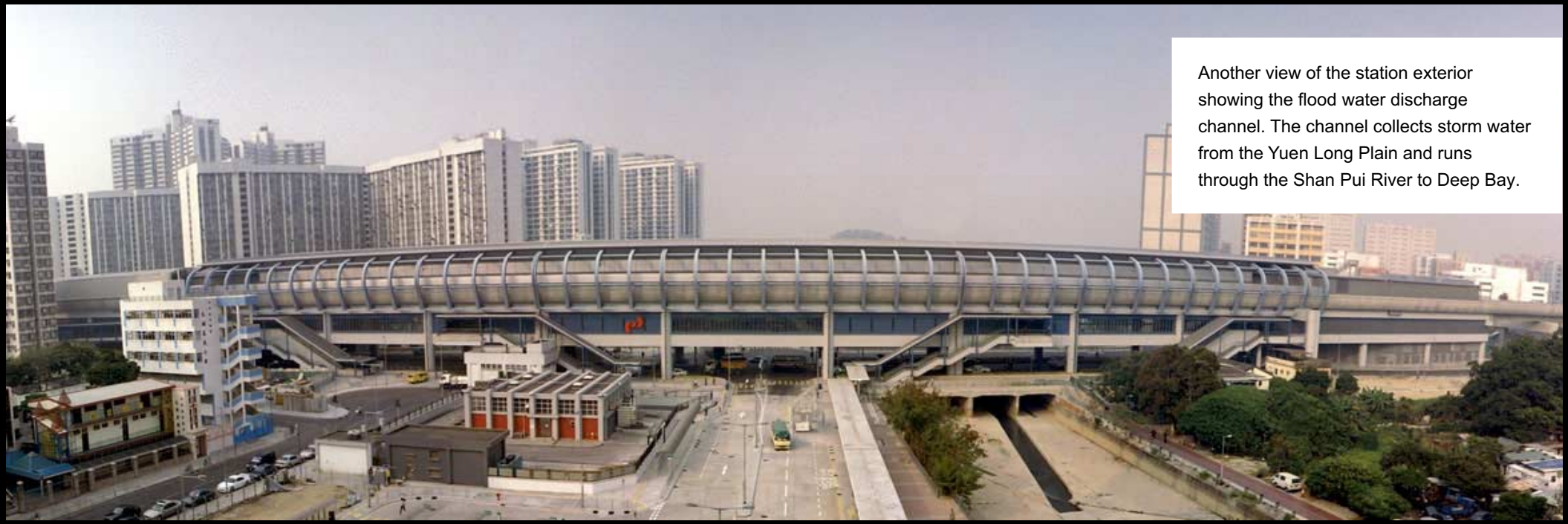
Construction of the station structure advanced to cover the area previously used as a road and an open flood water discharge channel.

Close-up showing the construction arrangements to form the elevated station structure.

The station structure with its roof feature in a simple portal frame design, as viewed from a nearby building.

The 400 m long station structure spanned a floodwater discharge nullah. Diversion of the nullah and replacement of it with a covered box structure were carried out in a well co-ordinated schedule to cope with the construction of the station.

External view of the station before the opening, as seen in mid-2003.



Another view of the station exterior showing the flood water discharge channel. The channel collects storm water from the Yuen Long Plain and runs through the Shan Pui River to Deep Bay.

Tin Shui Wai Station

The northern portion of Tin Shui Wai Station facing the Yuen Long direction, as seen in early 2000. In the vicinity is the heritage site of Ping Shan Village.

A closer look at the station platform from an elevated position with the portal-frame roof under construction.

A view from the approach viaduct with the station structure basically complete.

An aerial view showing the Ping Shan vicinity with Tin Shui Wai Station soon to complete. Note the container handling yards in the foreground — a common example of rural land misuse in the New Territories.

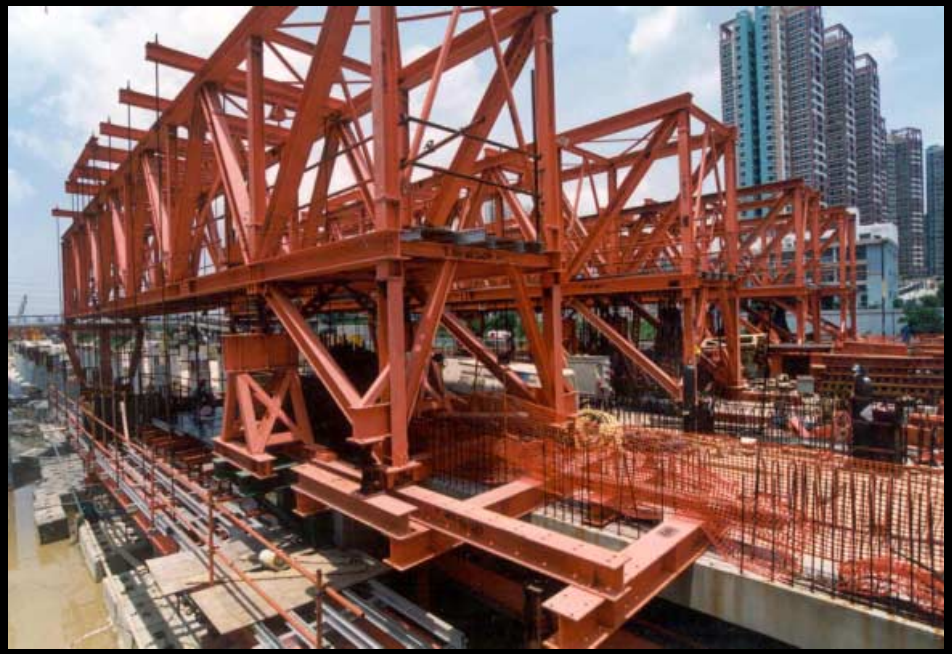
The station exterior as seen from a nearby public housing tower in early 2004.

Siu Hong Station

Siu Hong Station is located above the Tuen Mun Nullah. This photo shows the forming of the elevated deck, using gantry formwork, on which the upper structure of the station is seated.

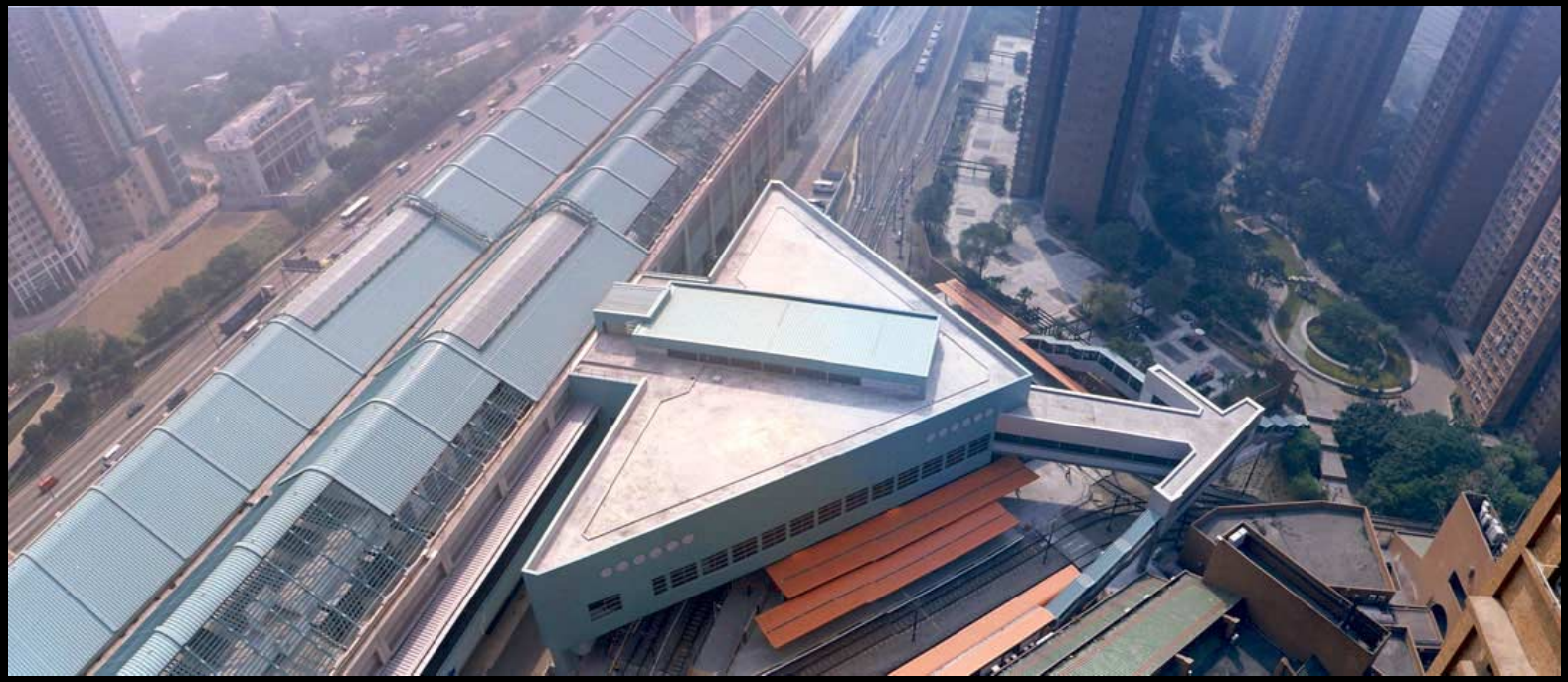
Overview of the Siu Hong Station site showing nearby facilities including the Tuen Mun Highway, a series of pedestrian footbridges, the floodwater discharge nullah and the Light Rail stops surrounding the site.

The station construction work was near the Light Rail network, which serves as a major public transport system for the northwest part of the New Territories.



Detailed look at the gantry form system used for casting the station deck. This form system can slide to the next span after completion of the last deck.

The completed station structure as viewed from the rooftop, pending installation of the roofing deck.

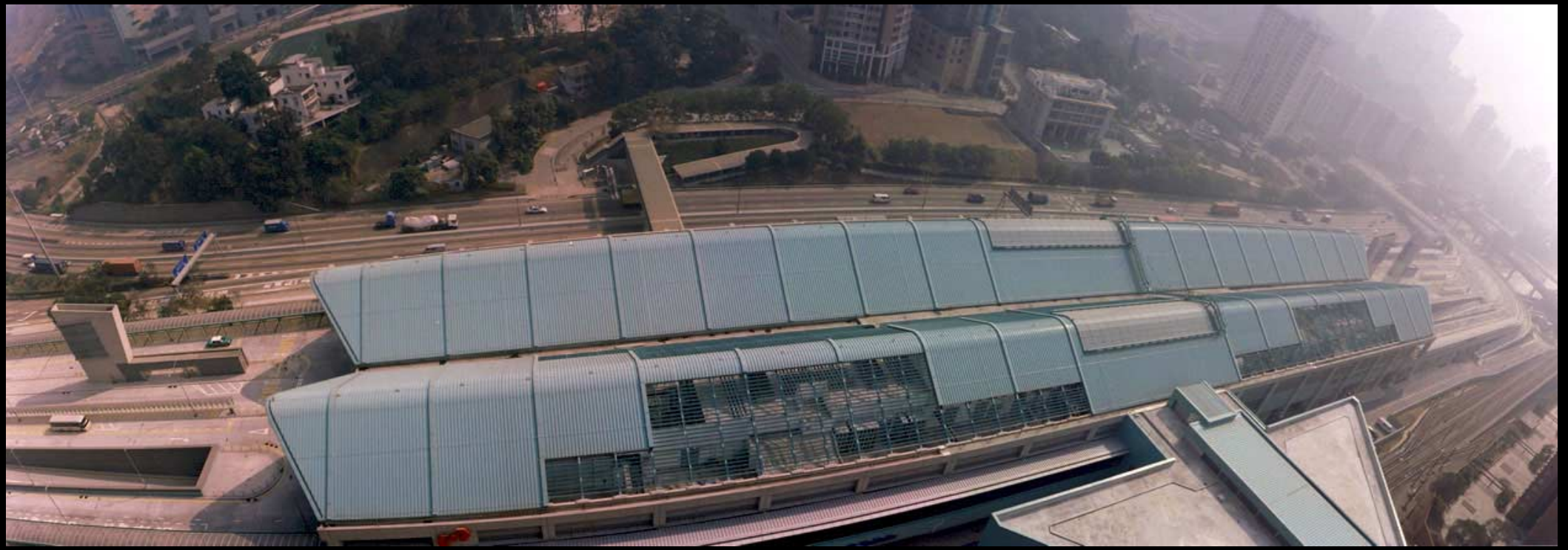


The station complex as seen from a nearby public housing tower. The original Light Rail stops have been covered and linked by footbridges to facilitate interchanges between the rail and Light Rail networks.

Siu Hong Station and its passenger interchange facility, as seen from the Light Rail stop.

The underside of Siu Hong Station as viewed from Tuen Mun Nullah with the structural layout of the station and viaduct system clearly shown.

Siu Hong Station as seen from above. The station measures more than 600 m in length, including the public transport interchange platforms at both ends of the station.



Tuen Mun Station

Site of Tuen Mun Station at its early stage in mid-1999. Pui To Road in the foreground of this photo was preserved but has the station structure spanning across it. The public housing estate in the background was demolished afterwards to provide room for a public transport interchange.

Like Siu Hong Station, Tuen Mun Station is also located above the Tuen Mun Nullah, though nearer the sea. This photo shows construction of the first phase of the elevated deck of the station structure during the dry season. A temporary dam was constructed inside the nullah as a diversion for water during this period.

Completion of the lowest station deck above the nullah surface and advanced construction of the upper structure.

Construction arrangements for the station structure during the wet season. During this period, the contractor had to hand back the entire nullah surface to allow for full discharge of floodwater.

A closer look at the giant station structure with provisions for the intersection of a series of pedestrian crossings.

The station being topped-out, as seen from the upper roof level. Note the portion in the foreground constructed in structural steel, which is the linking section spanning Pui To Road and the Light Rail tracks.

A temporary dam erected at the south end of the station as tidal control to prevent water from getting into the nullah during high tides.

Overview of the station structure and its surrounding environment in mid-2002. Note the cleared land vacated by the previous Sau Fat Estate at the rear of the new station.

Close-up view of the portion spanning Pui To Road and the Light Rail stop.

Close-up view of the structure spanning Pui To Road with the layout of the steel structural frame in clear view.

Construction of elevated carriageway in front of Tuen Mun Station as part of the interchange re-alignment for the nearby Light Rail system.

The new elevated Light Rail carriageway network connecting into the interchange platform of Tuen Mun Station as seen from the roof of an adjacent building.

The Tunnels of West Rail

The south portal of the Tai Lam Tunnel as seen in early 2000. The portal provided access into the tunnel which was formed by the drill-and-blast method. The portal cut directly into the underside of the elevated carriageway of the Tuen Mun Highway where underpinning to the bridge piers was required before the full scale commencement of tunnelling works.

Forming the south portal. The sides of the portal pit were supported by diaphragm walls and horizontally strutted with rows of universal beams. The obstructing piers supporting the carriageway of the Tuen Mun Highway can be seen clearly in the background of this photo.

Viewing into the south portal with the excavation supports and access ramp in place. The ramp descended from road level into the tunnel tube 20 m from the ground surface.

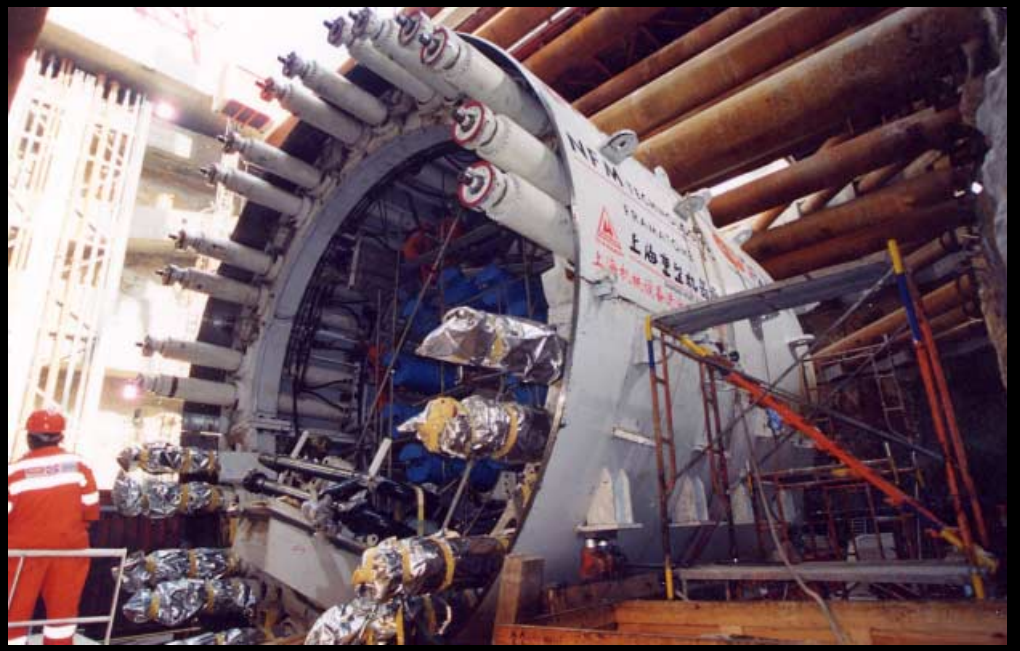
The launching of a tunnel lining formwork gantry from the portal into the tunnel tube.

The approach section of the Tsing Kwai Tunnel which cut across a busy highway near Mei Foo Station. In order to facilitate construction works, the tunnel was subdivided into three main phases to allow diversion and temporary replacement of the roadway without interruption to traffic.

Forming the tunnel portal at the south end of the Tsing Kwai Tunnel. The 3.5 km Tsing Kwai Tunnel was constructed in two sections. The south section was done using the drill-and-blast method. The north section was formed by the use of an 8.5 m diameter tunnel boring machine. The portal here provided an access route to allow drilling equipment to enter the tunnel level for drilling and placing of explosive agents for blasting, as well as a route for dumping vehicles to remove excavated spoil.

The north portal of the Tsing Kwai Tunnel at Tsuen Wan. Two 20-year-old industrial buildings were located on top of the tunnel alignment (at the rear of the portal crane) and were demolished later to make way for the tunnel.

A view inside the north portal of the Tsing Kwai Tunnel. The portal measured about 50 m by 180 m and 35 m from the ground surface, and was used as a work station for the erection of the tunnel boring machine as well as the equipment and material handling yard before and during the tunnel boring process.



Installing the tunnel boring machine inside the portal. The boring machine needed to be erected twice. The first time was before the drilling of the up-bound tube and the second time was after its dismantling and redelivery back from a service shaft at Lai King after completion of the up-bound tube.

This 30 m diameter service shaft, located at the junction of Lai King Hill Road and Kwai Chung Road at Lai King, is a half-way meeting point for the 3.5 km Tsing Kwai Tunnel. On the eastern portion of this shaft (towards Mei Foo), the tunnel was formed using the drill-and-blast method. On the western side, the tunnel was formed using a tunnel boring machine. When the machine completed the first (westbound) tunnel from Tsuen Wan to Lai King, it was dismantled in the shaft here and transported back to Tsuen Wan again for reassembly to form the second tunnel section.

The north portal of the Tai Lam Tunnel heading to the Maintenance Centre at Pat Heung.

The breaking through of the 5.5 km Tai Lam Tunnel in April 2001.

The crushing machine and the conveyor belt system used in the Tai Lam Tunnel for the handling and removal of the excavated material during the drilling process.

Gantry used as a work platform to assist workers in the fixing of steel bars and waterproofing membrane.

Final touch-up of the tunnel interior after laying the rail tracks inside Tai Lam Tunnel.

Fixing the four-hour FRP (Fire Resistant Period) partition located at the tunnel cross-over. The cross-over section was provided to facilitate the regulation and diversion of trains within the tunnel. The fire partition consists of a pair of sliding doors, each measuring 27 m long by 6 m high and weighing 30 tonnes.

Viaduct Construction

Forming the portal frame to support the viaduct near Long Ping Station.

Portal frames constructed over the Yuen Long Nullah in Yuen Long.

A pier-head segment set erected in an advanced stage for the onward fixing of the viaduct segments using the balanced cantilever method.

Typical falsework set-up to erect the work platform for forming the portal frame for the viaduct.

Fixing of the viaduct segments with the use of a two-side supported truss frame. Segment adjusting pads operated by hydraulic jacks were placed on top of each frame to allow for fine adjustment of the alignment and level of each segment.

Erection of the viaduct segment over the Tuen Mun Nullah using an underslung gantry type of launching machine.

Detail of the segment adjustment pads on top of a supporting frame before the placement of the viaduct segment.

Detailed look at an underslung gantry with part of the precast segments placed in position near the Tin Shui Wai section.

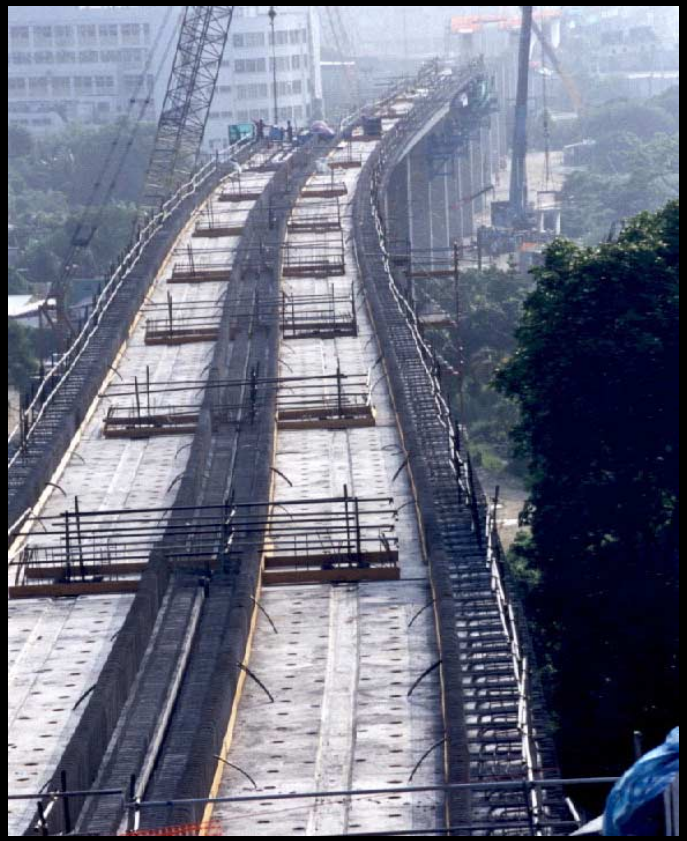
Placing the segments onto a set of underslung gantries to form a span section near the Pok Oi Interchange in the Yuen Long Plain.

A simple portal crane gantry provided for work on top of the viaduct for handling precast parapet panels, float slabs and other track stock for onward fixing.

A 30-tonne capacity portal crane mounted on tracks at ground level for the delivery of heavy equipment and track laying components to the viaduct level.

A section of elevated viaduct crossing the Au Tau Interchange at the Kam Tin Plain. The expressway below the span is the Yuen Long Highway and the Tsing Long Highway. A few hundred metres further behind is the Kam Tin River and the fish ponds of the wetland area.

The viaduct passing through an abutment hood at the Au Tau Interchange.



A section of viaduct near Pok Oi Interchange with the segments in position and temporarily stressed, waiting for the final adjustment of the alignment and level.

A section of provisional change-over tracks located at the northbound direction of Kam Sheung Road Station for future extension to the Northern Link which will connect the West Rail to Lok Ma Chau at the China border.

A section of viaduct located near the Light Rail tracks along the Tuen Mun Nullah (on the other side of viaduct) near Siu Hong Station.

Detail showing the up and down tracks of the viaduct joining the Siu Hong Station structure.

Overview of the viaduct alignment along the Tuen Mun Nullah showing the environment of the neighbourhood.

Final stage of viaduct fixing and touching up work on the bed of the Tuen Mun Nullah during the winter dry period.

Forming a 500 m noise barrier hood section in reinforced concrete outside Tuen Mun Hospital. The deck cover of the hood was later used as part of the road realignment for the nearby area.

Placing the precast parapet panels. The panels were fixed in position afterwards using in-situ rigid jointing with steel bars connecting to the viaduct segment.

Forming a portal beam for the viaduct at Lam Tei near Siu Hong Station. The construction environment of the portal system was quite difficult, with a pedestrian footbridge located within 15 m and the existing tracks of the Light Rail immediately below. The covered box structure shown in the lower right corner was a temporary hood erected to protect Light Rail trains.

Final Touch-up Works

Final checking of the power supply cable network.

Installing the tracks inside the platform of a station.

Final touch-up of the Light Rail tracks and platforms in the station interchange of Tin Shui Wai Station.

Fine-tuning of the track alignment in the station interchange.

Re-routing or re-alignment of traffic as a means to improve the overall traffic conditions in a district was often carried out at the final stage of station work. This photo shows the traffic improvement works at the north end of Sui Hong Station and leading into Siu Hong Estate.

Traffic diversion arrangements were required from time to time to meet the progress of work in particular for the cut-and-cover tunnel, station construction and the final touch-up stages. This photo shows the traffic diversion system at the junction of Ping Ha Road and Tin Yiu Road for the early stage of work at Tin Shui Wai Staton.

Work outside Tuen Mun Station to receive the Light Rail network into the station interchange.

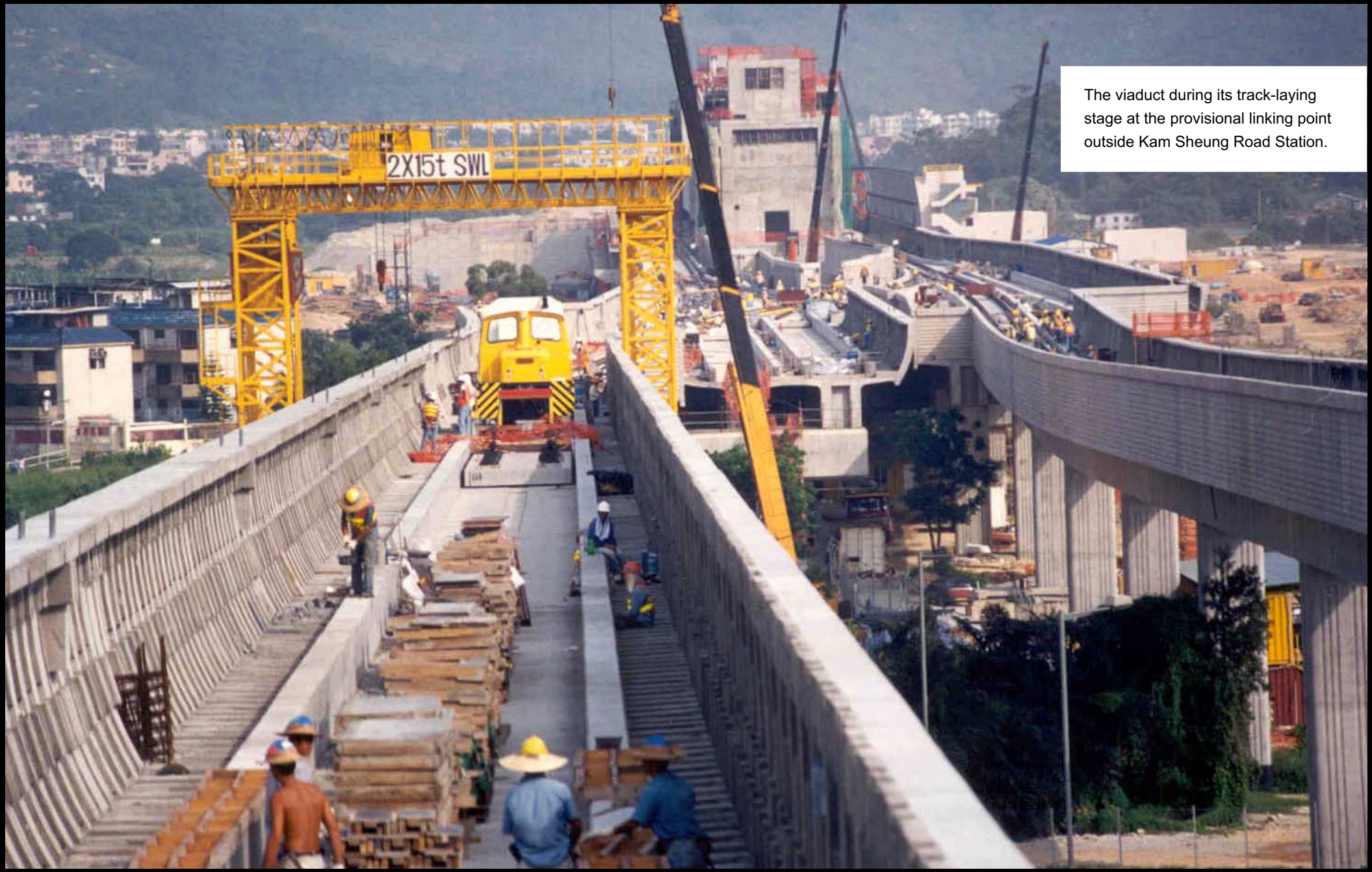
Basic structural work of the station being completed, ready for the commencement of interior fitting out works.

Another newly completed interchange point with the Light Rail system outside Tuen Mun Station near Tuen Mun Town Centre and the Town Park.

Erection of the steel frame of a noise barrier hood at the north end of Tuen Mun Station.

A view from the viaduct entering into the station platform at Siu Hong Station. The flyover in front is the roadway leading vehicles from the Tuen Mun Highway into the station's public transport interchange.

A view of the cross-over track inside a noise barrier hood near Tin Shui Wai Station.



The viaduct during its track-laying stage at the provisional linking point outside Kam Sheung Road Station.

Environmentally Sensitive Locations along the West Rail Alignment

One of Hong Kong's most preserved rural areas in Yuen Long and the Kam Tin Plain at the north face of Yuen Long Station.

The viaduct passing through a section of thinly populated rural zone between Long Ping Station and Tin Shui Wai Station.

The viaduct passing through the wetland of the Kam Tin Plain.

The scattered wetland areas with a network of storm water discharge channels and fish ponds which had been abandoned for years outside the north end of Yuen Long Station.

The viaduct passing village houses in the rural part of Yuen Long. Some of the village houses in this area date back to the mid-to-late Ching Dynasty.

The filling of an abandoned fish pond beside the viaduct in front of a rural village near Yuen Long Station.

A row of 150-year-old village houses located immediately below the viaduct near Pok Oi Hospital. This photo was taken from the viaduct's deck in 2002.

A row of 100-year-old village houses located about 80 m from the approach viaduct near Long Ping Station.

The rural environment as seen near Kam Sheung Road Station.