

MTRC Tseung Kwan O Line

Construction of the Stations of the New Line

Formation of the land required for construction of Yau Tong Station. A 1.2 km drill-and-blast tunnel, known as the Sai Tso Wan Tunnel, was formed at the background of the photo to link the existing Lam Tin Station to the new station at Yau Tong.



The station trough at its formation level before commencement of construction work on the partially-buried station structure.





Construction of Yau Tong Station in mid-2000. Immediately after leaving the station, the rail line cuts into the Black Hill Tunnel, formed by the drill-and-blast method. The background of the photo shows the entrance of the tunnel.

The station structure gradually took shape in mid-2001. The upper level of the approach tunnel coming from the Kwun Tong Line entering into the station platform can still be seen. The new buildings on the hillside are public housing which forms part of the redevelopment scheme at Yau Tong.

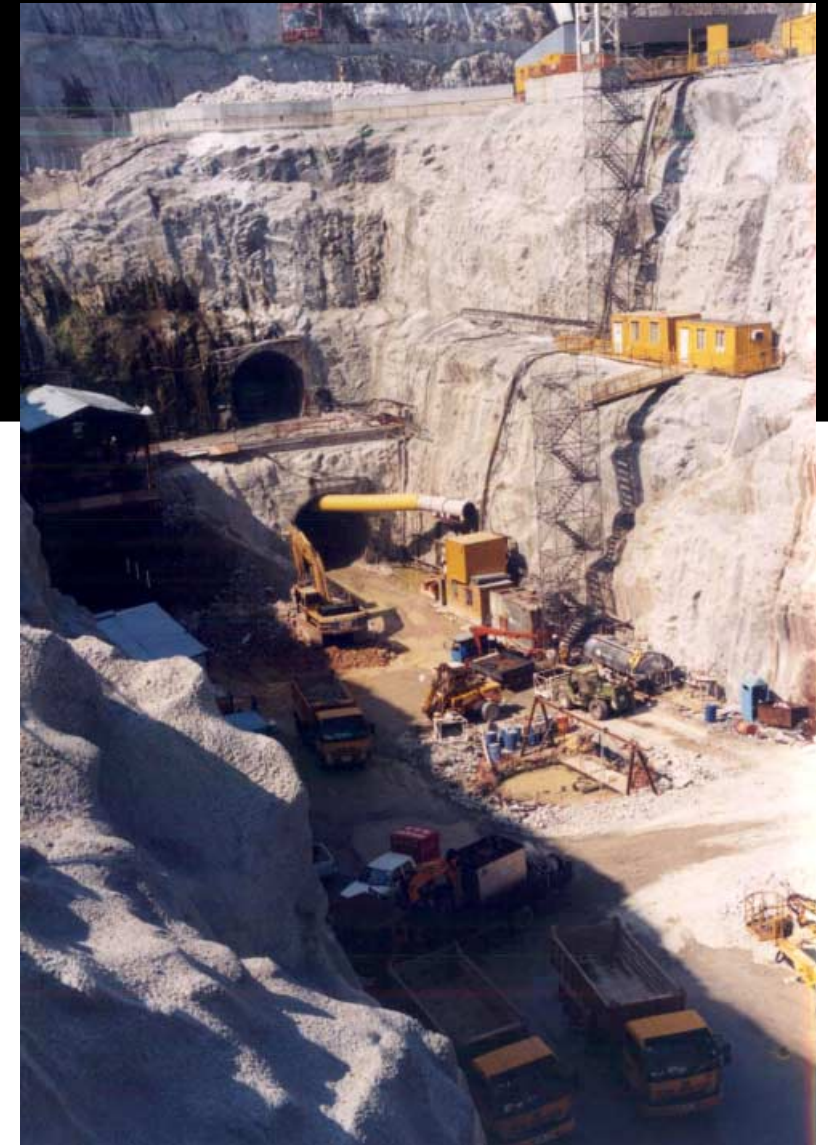


An aerial view of Yau Tong Station showing the overall condition of the nearby Yau Tong Bay. Besides serving as an interchange station between the MTRC's Kwun Tong and Tseung Kwan O Lines, the station also serves as a centre point for the redeveloping district of Yau Tong.



Formation of the required land to contain Tiu Keng Leng Station and its nearby development as part of the land extension to Tseung Kwan O New Town.

The underground portion of Tiu Keng Leng Station rising from the rock trough, as seen in late 1999. The lower right corner of this photo shows the approach tunnel to the Black Hill Tunnel.



The portal of the Black Hill Tunnel, situated less than 100 m east of Tiu Keng Leng Station.



The connecting tunnel between Tiu Keng Leng Station (in the foreground) and Tseung Kwan O Station, constructed in a cut-and-cover arrangement with sides lined with diaphragm walls or soldier pile walls as supports during the excavation process.



External view of Tseung Kwan O Station. The station concourse is at ground level while the main structure accommodating the station platforms is buried underground.

Land previously used as a bus terminus being cleared in mid-1999 for construction of Hang Hau Station.



Layout of the Hang Hau Station site in mid-2000. On the left side of the site was the main structure of the station with the underground portion used as station platforms constructed using the bottom-up method. The right side was a public transport interchange constructed in a bottom-up arrangement.



An external view of Yau Tong Station with the public housing estates in the neighbourhood being completed for occupation in early 2003.



Yau Tong Station and the newly redeveloped neighbourhood as seen from Yau Tong Bay.

The terminus station of the Tseung Kwan O Line at Po Lam Estate.



A panoramic view of the station interior at Po Lam Station.

Cut-and-Cover Tunnels in the Tseung Kwan O Line



An aerial view of a section of cut-and-cover tunnel connecting the Tiu Keng Leng and Tseung Kwan O stations located in the newly reclaimed land of Tseung Kwan O New Town.



Another section of cut-and-cover tunnel linking Tseung Kwan O Station and Hang Hau Station. The area in this strip of land was formed by reclamation about eight years ago. A series of existing roadways were passed by the tunnel. Temporary diversions to the traffic were required during the entire tunnel construction process.



Typical excavation arrangement to form the tunnel trench with the sides supported by sheet piles and struted by steel H-beams.



A section of cut-and-cover tunnel passing a flyover at the junction of Wan Po Road and Chiu Shun Road. A temporary steel deck was erected, as seen on the far side of the flyover, as a diversion arrangement during the tunnel excavation.



Forming the tunnel tube inside the excavated trench in phases using simple large-panel formwork.



Typical excavation support used in the Tseung Kwan O Line project with the insertion of the modulated steel strut frame.



A section of the cut-and-cover tunnel located within 20 m of the temporary seawall. The construction here was further complicated by the positioning of a storm water outfall. Temporary diversions were provided not only for the existing roadway but also to the storm water drain in the form of a two-cell culvert box.



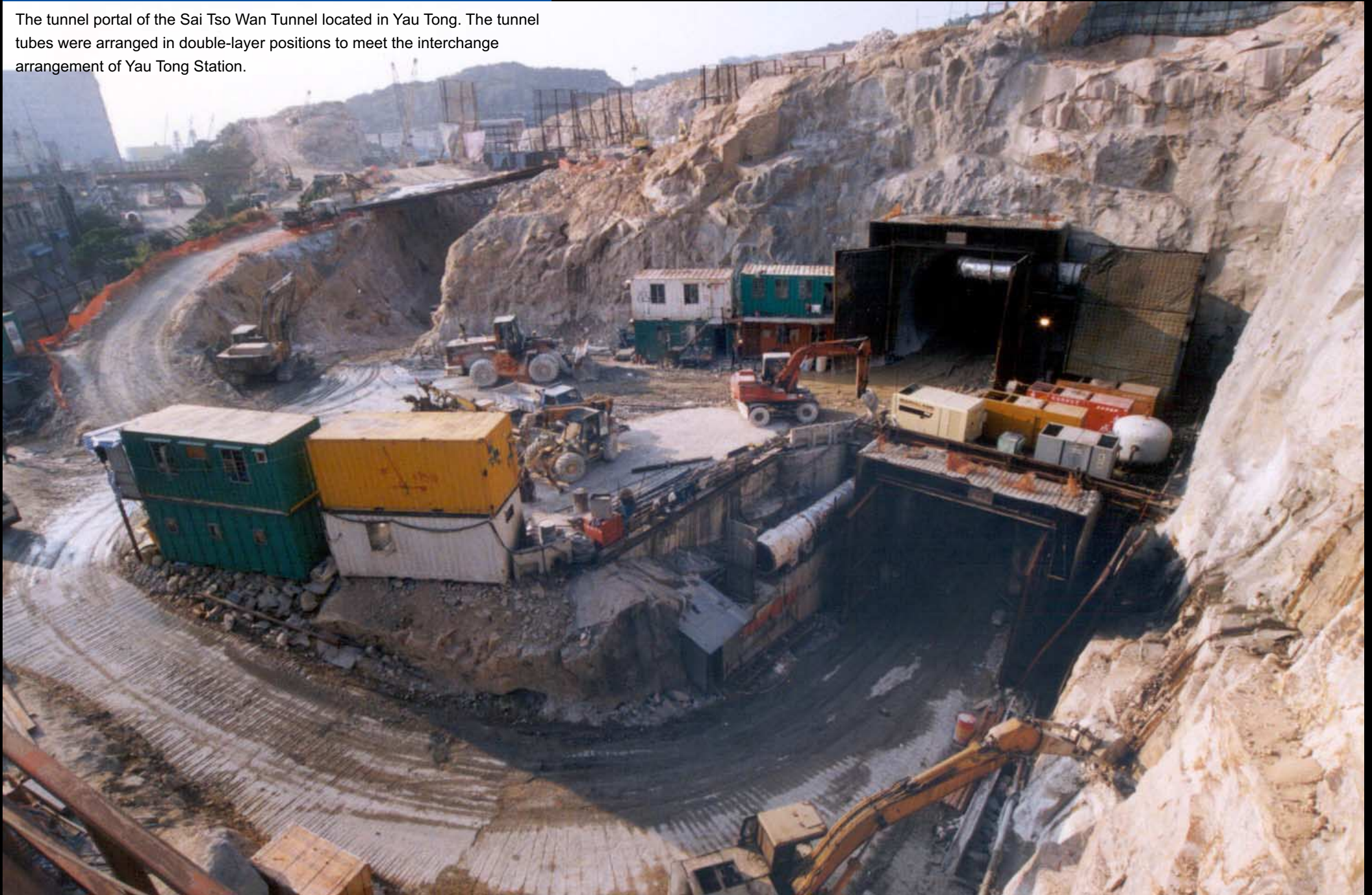
Aerial view showing the splitting of the rail line eastward from the main line to form the tunnel overrun and the linking section into the 2.2 km Pak Shing Kok tunnel towards the depot.

Tunnel formwork for forming the twin-tube tunnel section constructed in the cut-and-cover method. Under this arrangement, the tunnel section was cast in two stages with the base plate placed first and the vertical walls and the top slab following.



Drill-and-Blast Tunnelling in the Tseung Kwan O Line

The tunnel portal of the Sai Tso Wan Tunnel located in Yau Tong. The tunnel tubes were arranged in double-layer positions to meet the interchange arrangement of Yau Tong Station.





The tunnel interior with waterproofing membrane in position before final placing of the tunnel lining.



Reinforcing steel bars being erected ready for forming the tunnel lining using the travelling formwork as shown.



Final touch-up to rail tracks, power and signalling systems inside the tunnel tube.

Approach Tunnel to the Eastern Harbour Crossing



A 600 m section of approach tunnel was formed by cutting into the hard rock linking Yau Tong Station with the Eastern Harbour Crossing.

Excavation and temporary traffic arrangements at the tunnel approach at the entrance to the Eastern Harbour Crossing.



The final tunnel section cutting through the south end spur of Sai Tso Wan Hill before joining the Eastern Harbour Crossing approach.



Constructing the tunnel tubes in the formed rock level of the tunnel using large-panel gang forms. After leaving the Eastern Harbour Crossing, the tunnel tubes ascend at different levels to meet the interchange platforms for the harbour crossing line and the Tiu Keng Leng route, which are located in a double-layer position.



Detail of a tunnel tube section at the approach to Yau Tong Station.



A section of the approach tunnel heading to the Eastern Harbour Crossing with a steel deck erected on the ground level serving as a temporary two-lane traffic route during the construction period.



The end section of the approach tunnel close to the tunnel wall of the Eastern Harbour Crossing before the break through.

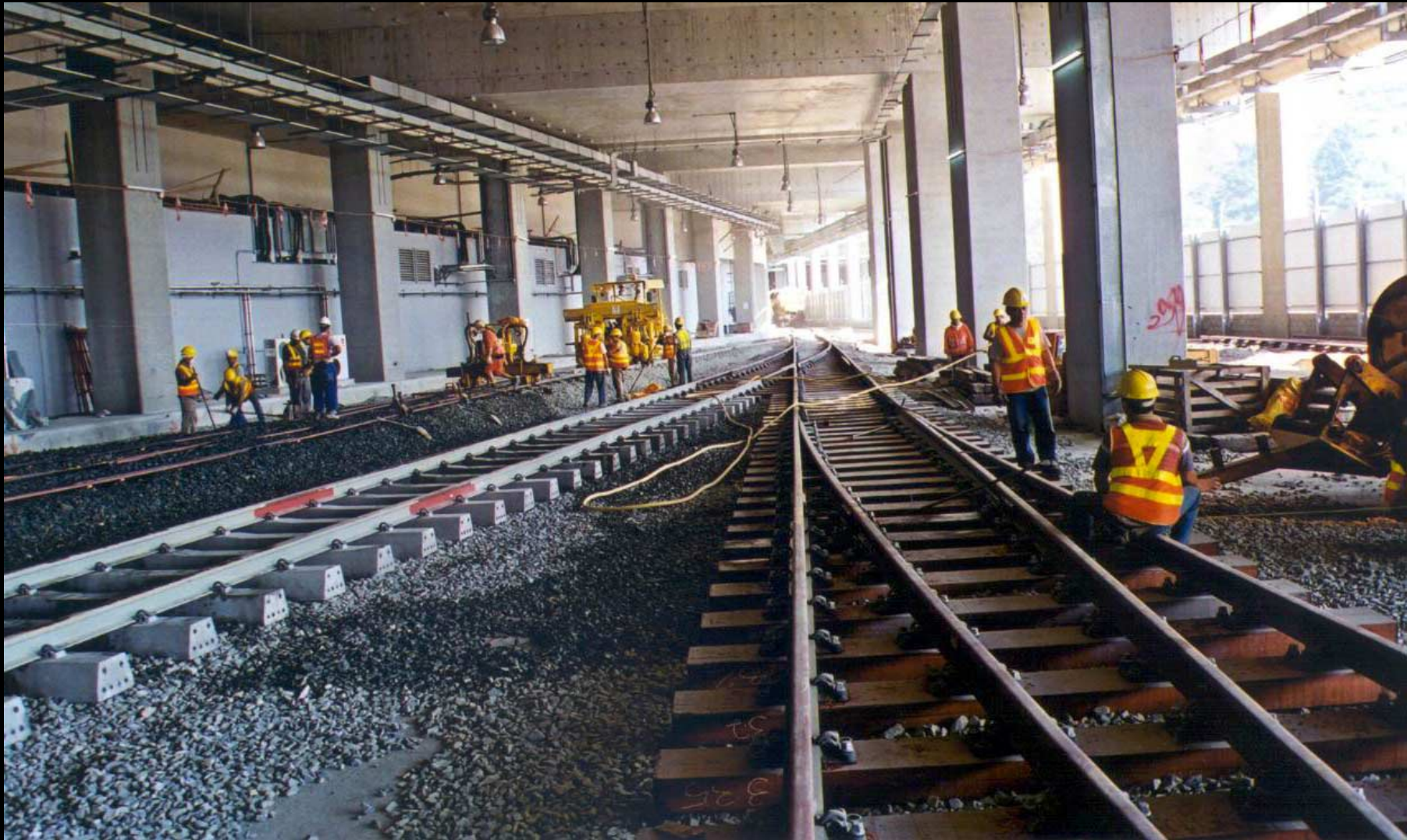
Depot of the Tseung Kwan O Line



The tunnel portal of the Pak Shing Kok Tunnel, located 200 m from the Tseung Kwan O Line depot facility.

View of the railway depot from the Pak Shing Kok hill. The depot facility is situated under a 2.5 hectares podium structure which is designed to support a large scale property development to commence construction within the coming years.





A view of the service lanes inside the depot within the podium structure.