

Kap Shui Mun Bridge, Hong Kong



Kap Shui Mun bridge is a large cable stayed bridge which carries both road and rail traffic and together with the Tsing Ma bridge forms an integral part of the Lantau Link. The main span deck is a novel double-composite box girder with concrete slabs top and bottom with a composite connection to external steel webs and internal longitudinal trusses. The side spans are formed from a triple cell, concrete box section constructed by incremental launching.

Like the nearby Tsing Ma bridge, it carries dual three lane carriageways on its upper surface. Inside the box itself are two airport railway lines and two emergency traffic lanes for use during strong winds. The bridge and its approach viaducts have a total length of 1.32km with a main span of 430m and 150m high concrete towers. The bridge was constructed by the KMYH Joint Venture, a consortium of four major Japanese contractors, and was opened in 1997.

Flint & Neill Limited has been involved with the bridge from an early stage, having performed the independent check of the abandoned original 1981 designs for the Lantau crossing. Since then, our continuing role has included:

- Derivation of traffic loading criteria which were subsequently extended for use on all long span highway bridges in Hong Kong.
- Study of the local wind climate leading to the determination of design wind speeds and associated partial load factors for typhoon winds.
- Determination and specification of the aerodynamic stability criteria.
- Derivation of design criteria for thermal effects based on local climatic data.
- Full Independent check of the detailed design.
- Investigation of the aerodynamic performance of the structure involving extensive wind tunnel testing.
- Specialist advice on stay cable technology and the review of fatigue testing.
- Assessment of the design economy and efficiency and a review of operational security.
- Development and implementation of a sophisticated full scale Wind and Structural Health Monitoring System.
- Advice on bridge maintenance regimes and procedures.

