

KCRC Light Rail – Grade Separations and Extensions Project

INTRODUCTION

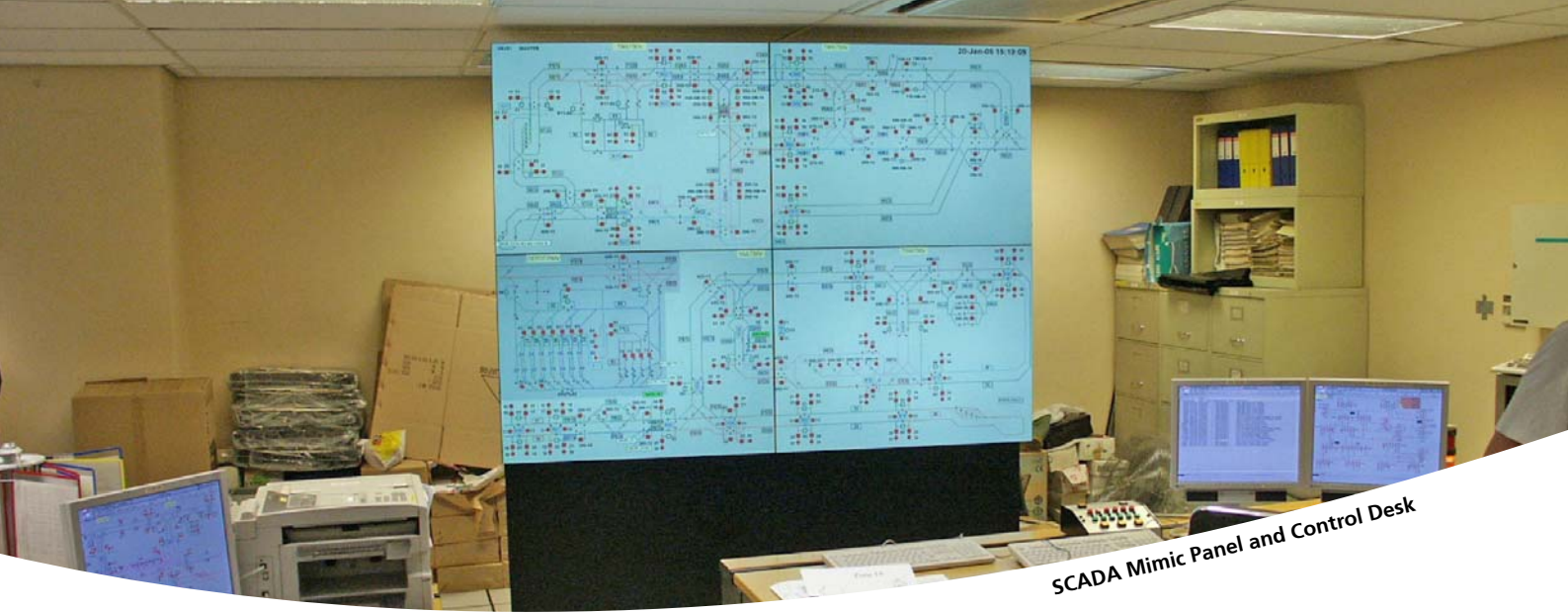
The KCRC Light Rail system serving the new town areas of Tuen Mun, Tin Shui Wai, and Yuen Long in the North West New Territories of Hong Kong was opened in 1988 and as the development of the area progressed additional sections were added. The system mainly runs at grade in either a segregated corridor or on street. As part of the West Rail scheme, two extensions to the network totaling 4.4km of route were planned to serve the high density development area Tin Shui Wai new town.

In a couple of areas around significantly congestion road junctions it was decided to grade separate the Light Rail from the road traffic, requiring 1.5km of viaduct structure and replacement trackwork. In addition the opportunity was taken to upgrade major electrical and mechanical systems including the Vehicle Identification System, signalling and telecommunications systems and traction power SCADA. Atkins won the commission to undertake the detailed design of the civil works and the outline design of the system works involved, together with the site supervision of the construction work.

The project was highly complex as the works had to be carried out in extremely congested areas, at the same time as the construction of the adjacent new KCRC West Rail line works, whilst maintaining the operation of the existing services. Similarly the systems enhancements had to be migrated into the existing system without interference or loss of service.

*New Elevated Light Rail Stop Integrated
with Shopping Centres and Housing*





SCADA Mimic Panel and Control Desk

OUR SOLUTION

Atkins design included a number of features to facilitate the construction process.

A wide variety of complex viaduct structural forms were employed in response to the severe construction constraints created by the need to construct a new viaduct directly above and in close proximity to an existing Light Rail system and above heavily trafficked road junctions.

A number of improvements were made to the scheme to reduce cost, make it more buildable and increase patronage:

- Significant patronage benefits were gained by relocating an existing stop onto a new section of viaduct which provided direct access to major shopping Centres.
- A modular form of construction with a prefabricated deck was adopted to allow erection above the existing railway during non-traffic hours.
- Temporary diversion of the existing Light Rail onto an existing highway flyover provided room for easier construction and avoided major diversion costs.



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New viaduct construction above existing operating railway



OUR APPROACH

By early consideration of the highly complex construction issues, and by clearly understanding the operational aspects of the light rail system, the design team was focused on producing practical buildable designs. Inclusion of detailed design of some of the major elements of "temporary" works also ensured constructability.



OUTCOMES

The works were completed to the original programme and were completed in advance of the interconnecting West Rail commencement of service. Throughout the construction period the existing system was able to be operated safely and efficiently.



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