KVMRT Challenges – Elevated Viaducts and Station Structures

ChongLing, Wong

Gamuda Engineering Sdn Bhd, Malaysia

Contact: clwong@gamuda.com.my / clwong@mgjv-kvmrt.com.my

Abstract

Malaysia's capital city Kuala Lumpur has been experiencing urbanization growth spurts in the last two decades, in tandem with her rapid economic expansion and progress towards a developed nation. Trailing this economic trend is the need to improve and expand public transportation, particularly in the railway sector. The Klang Valley Mass Rapid Transit (KVMRT) rail transit system was conceived to meet that need and complement the existing public transportation network.

The first KVMRT metro line commonly known as the SBK line which connects Sg Buloh township in the northern-west and Kajang in the southern-east, was delivered and fully opened to the public ahead of schedule on 17 July 2017. The success of the project was achieved through significant efforts in surmounting many challenges in different aspects. This paper shares the experiences from the perspective of the Project Delivery Partner (PDP) in the planning, design and construction of the viaducts and station structures.

Keywords: viaducts, stations, elevated, challenges, structures, standardization, prestressing

1 Introduction

The KVMRT SSP line commences from Sg Buloh in the northern-west end of Kuala Lumpur city, and travels eastward direction before intercepting with SBK line at Tun Razak Exchange station. From there, it goes southbound towards the government's administrative centre of Putrajaya. The line is segmented into four (4) sections namely

- Northern Elevated Segment (14km)
- Underground Segment (13.5km)
- Southern Elevated Segment 1 (14.8km)
- Southern Elevated Segment 2 (9.9km)

The SSP line will be integrated with existing LRT, KTM Komuter, Monorail, Express Rail Link (ERL) and the proposed High Speed Rail (HSR). From the total alignment length of 52.2km, 38.7km is elevated and predominantly viaducts, made up of segmental box girders. The remaining length comprises mainly bored tunnels, and other miscellaneous structures like cut and cover tunnels, short span precast beams and pipe arch tunnels. Being an urban rail line, the alignment runs through densely developed areas with major need to avoid and coexist with many existing obstacles, constraints and restrictions.

In the elevated sections, there are 26 stations; out of which, 2 are provisional stations. To maximize station space usage and improve passenger movements, majority of these stations are of island platform typology.

The design and construction of the SSP line comprising guideways, stations, underground tunnels, power supply and utility buildings, multi-storey cark parks, ancillary roads and utility upgrading, together with the rail systems integration and rolling stocks, is scheduled to be

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