ABSTRACT

UNION AND MONT ALBERT ROAD LEVEL CROSSING REMOVAL BRIDGES AND TRENCHED UNDERPASS: CONSTRUCTION LED DESIGN

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This paper explores the design and construction of the integral bridge, trench retaining wall, and baseslab structures completed within the Union and Mont Albert (UMA) Level Crossing Removal Project (LXRP) in Victoria, Australia. It discusses the design solutions used to respond to the constraints, optimise the construction program and reduce the duration of critical rail and road closures.

The UMA LXRP separates the road and rail traffic by lowering the rail line into an approximately 1.5km trenched underpass, while the construction of five integral bridges spanning the trench rail corridor completes the connection of Union and Mont Albert roads, and provides pedestrian connection across the rail corridor and to the new station platforms within the trench.

Situated on one of Melbourne's busiest rail lines, the UMA LXRP designed and executed complex staged construction and utility strategies to fascilitate the construction of the bridge and trench structures. High groundwater levels and challenging ground conditions required the implementation of a reinforced concrete baseslab with tension micropiles to withstand large buoyancy uplift loads. Design and construction challenges were further exacerbated by a narrow rail corridor and the proximity of local roads and properties, preventing the rail line for deviating around the construction works. Consequently, much of the bridge and trench construction was completed during isolated rail corridor "occupations" in a staged approach.

In facilitating such an approach, the design team collaborated heavily with the contractors to provide innovative "top-down" construction-staged solutions, while minimising road and rail closures. This paper explores the implementation and execution of design solutions such as early installation of abutment segments and service beams beneath the existing rail tracks and roadway, staged construction of bridge elements around 'live' service beams, and the use of a baseslab, tension piles and temporary props.

Opportunities for future development in design and on site are presented in this paper for future consideration.

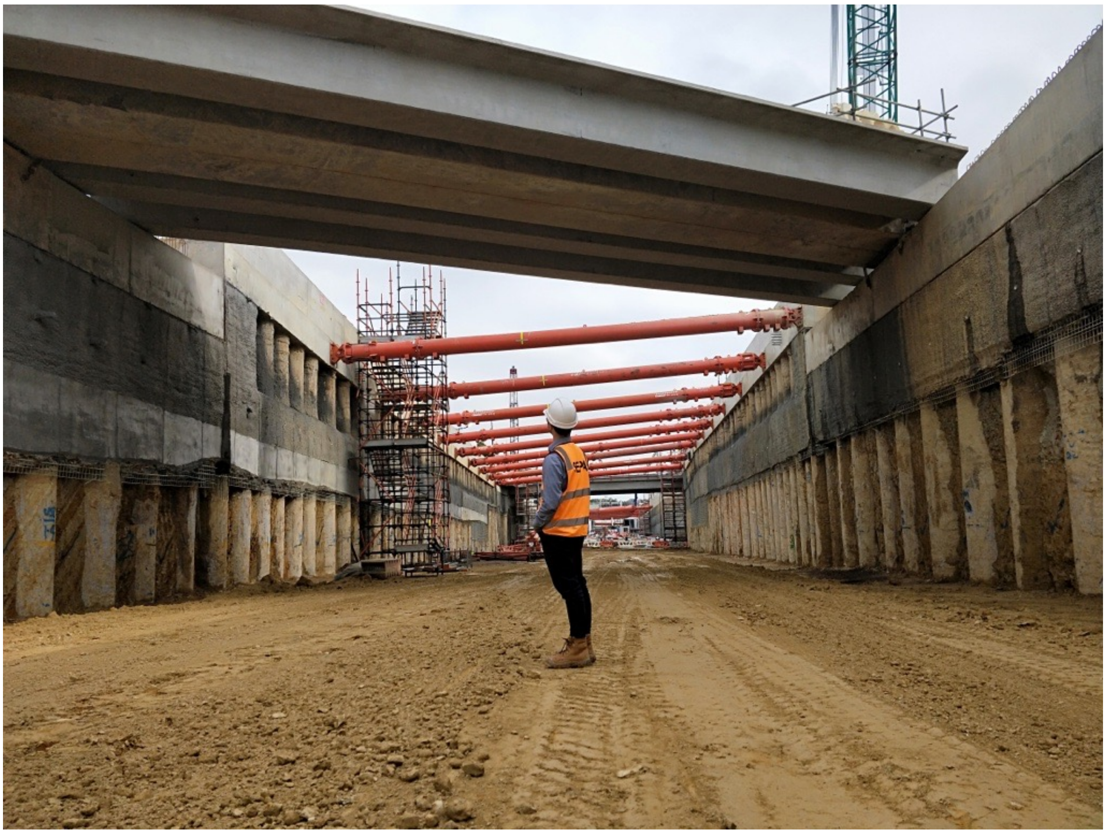

Figure 1: UMA LXRP During Construction