Experiences from the M4 Widening, Westconnex Stage 1A

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ABSTRACT

The M4 Widening project comprised the first stage in the delivery of WestConnex. It involved the widening and upgrading of approximately 7.5 kilometres of the M4 Motorway (M4) between Pitt Street, Parramatta and Homebush Bay Drive, Homebush.

The design and construction of the M4 Widening project included the following key features:

- Construction of a new two lane viaduct for westbound traffic between Church Street, Parramatta and Wentworth Street, Granville;
- Reconfiguration of the traffic lanes on the existing viaduct structure to four lanes eastbound and two lanes westbound;
- Construction of a new bridge/viaduct over Duck River, Auburn;
- Widening of the existing westbound carriageway between Wentworth Street, Granville and Duck River, Auburn;
- Widening of the at-surface carriageway of the M4 predominantly within the existing motorway corridor (utilising the existing median and verge), between Junction Street, Auburn and Homebush Bay Drive, Homebush to provide four traffic lanes in each direction;
- Construction of a new westbound G-loop on-ramp to the M4 from Homebush Bay Drive, Homebush;
- Construction of a new eastbound on-ramp to the M4 from Hill Road, Lidcombe;
- Provision of intelligent transport systems infrastructure for motorway operations;
- Provision of infrastructure for the future implementation of smart motorway operations;
- Widening and/or lengthening of existing ramps at Church Street, James Ruse Drive, Silverwater Road, Hill Road and Homebush Bay Drive;
- Provision of new and modified noise barriers;
- Rigid pavement structural recondition and remediation works prior to resurfacing; and
- Provision of a new asphalt wearing surface to the existing M4.

The project was opened to traffic in July 2017 in line with the contract program and is considered one of the most difficult brown field pavement projects to be undertaken in New South Wales.

During construction, the project team had to overcome site constraints and conditions not typically encountered on motorway pavement projects. The project required the construction of multiple varieties of pavements so as to match the mostly unknown, existing pavement types constructed at various times in the previous 50 years, all the while conforming to the R82/R83 specifications. This presented a massive challenge for the project team. Further, site constraints such as the size of work areas, small road closure windows, restrictive out of hours conditions, and access to site via one of Australia's busiest and most congested motorways, conspired to add additional levels of difficulty to an already complex and technically challenging project.

The solutions implemented to combat these constraints were many and varied; however, an adaptive and dynamic design and construct process was by far the most effective. In light of the experiences from the M4 Widening, this paper will provide insight and learnings in an effort to lay the groundwork for a practical design and construction guide for future brown field pavement projects.