

Discussion: Design of the Dubai Metro light rail viaducts – substructure and superstructure

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I refer to the papers by Smith *et al.* (2009) and Smith and Hendy (2009) on the Dubai Metro light rail viaducts.

My question relates to design and detailing of the structures for control of stray currents and corrosion prevention, as I understand that the rolling stock is powered by a 750 V d.c. third rail system.

Authors' reply

The authors thank the contributor for his kind remarks and for raising the query of stray currents. The rolling stock for the Dubai Metro is indeed powered by a 750 V d.c. propulsion system by way of a third rail, and the project specification required the contractor to mitigate the deterioration of buried metallic structures as a result of stray currents.

While stray currents cannot be eliminated, the metro system is designed to minimise and control their flow and thus control the corrosion risk to the concrete structures. This was achieved by designing suitable details to ensure that the stray current is collected at deck level and is suitably isolated from the substructure. Within the decks, longitudinal segment reinforcement is connected between segments with additional

tack-welded bars in pockets subsequently in-filled with concrete. At the ends of simply supported decks, longitudinal deck reinforcement is connected by way of a cable link (which for some spans is removable for future testing and monitoring). Prestressing tendons, continuous through the segments in steel ducts, are connected to the reinforcement at their anchorages by way of further cable links. Approximately every six spans, the reinforcement is connected to the stray current collector cable, which runs longitudinally at track slab level.

Stray current test points are incorporated in selected pier locations, bonded to reinforcement cages within the pier to monitor the effectiveness of the isolation concept.

REFERENCES

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