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REFURBISHMENT OF THE MASONRY ARCH ON MERXEM STREET BRIDGE

AMELIE OUTTIER¹, BART DE PAUW¹, PHILIPPE VAN BOGAERT²,
and HANS DE BACKER²

¹TUC Rail, Brussels, Belgium

²Dept of Civil Engineering, Ghent University, Belgium

ABSTRACT

Due to the widening of the Albert Canal, several railway bridges were replaced by longer spans on new embankments. With a change in overall length profile, two railway bridges needed refurbishment. The Merxem Street Bridge, a classic masonry arch bridge, had a new tubular arch bridge built adjacent. Due to time, increased traffic, ballast, loads, and volumes on the bridge since the early 1900s, it was strengthened because of the bridge's historical value and structural soundness. A new concrete deck was installed on top of the masonry arch ensuring that the higher live as well as dead loads would be spread over the arch length. This new deck was a combination of precast concrete elements with on-site concrete construction. This research focuses on this combined concrete design and its realization. The ultimate load-carrying capacity of both the existing and strengthened situation was verified using rigid block analysis. Critical failure modes were checked and the strengthening avoided the most precarious modes.

Keywords: Precast concrete elements, Rigid-block analysis, Concrete deck, On-site concrete construction.

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