

3.2km Precast Segmental Constructed Viaduct

- Viaduct V5c, Gautrain Rapid Rail Link

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Summary

The Gautrain Rapid Rail Link is a state-of-the-art rapid rail network currently under construction in Gauteng, South Africa. Viaduct V5c is a 3,2km long segmental construction and is mostly founded in material overlying dolomite bedrock.

The route for viaduct V5c is generally underlain by dolomitic ground with occasional syenite intrusions. The area is well known for the risk of sinkhole and doline formation due to the erodibility of the in situ soil. Sinkholes inherently pose a risk to the rail service and (if left untreated) may potentially have catastrophic consequences.

This paper will reflect on the considerations behind the choice of structural type and associated construction method. The paper will focus on the key aspects pertaining to the final geotechnical solutions & structural design, associated with viaduct V5c.

Keywords: segmental construction, dolomite, viaduct, precast elements, rail project, elevated station

1. Gautrain Rapid Rail Link

1.1 Background to the project

The Gautrain Rapid Rail Link will be a state-of-the-art rapid rail network serving the Gauteng area of South Africa. The rail connection comprises two links with three anchor stations (Pretoria, Johannesburg & Oliver Tambo International Airport), as well as seven other stations which will be linked by approximately 80 km of rail along the new route. The areas along the Pretoria and Johannesburg route are considered to be a fast growing region within South Africa, with ever increase pressure on the existing transportation infrastructure. The Gautrain Rapid Rail Link is one of ten Spatial Development Initiative (SDI) projects implemented by the Gauteng Department of Public Transport, Roads and Works (Gautrans) to stimulate economic growth, development and employment opportunities in Gauteng. The Gautrain will make a major contribution towards the economic functioning of the Gauteng area. According to the 'Report on alternative alignments investigated in the feasibility study' these contributions are:

- Regeneration of central business districts (CBD): This rail project will benefit CBD areas that have experienced decline, in stimulating investment.
- Strengthening of existing nodes and infrastructure: The rail project is not developed in isolation, but in conjunction with other existing and new infrastructure and modes of transport.

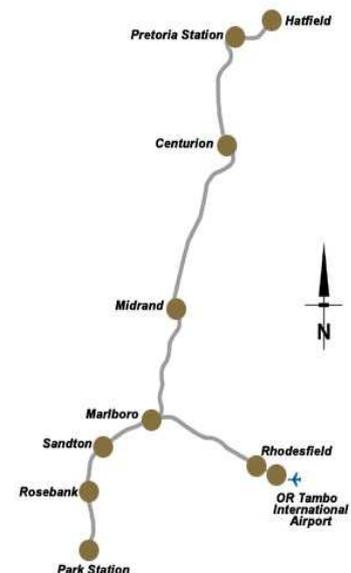


Figure 1: Gautrain Rapid Rail Link (Source: www.gautrain.co.za)