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CHALLENGES IN PROCUREMENT, DESIGN AND CONSTRUCTION OF THE ERASMURAND PEDESTRIAN BRIDGE

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Keywords: pedestrian bridge; arch; steel composite; dynamics; vibration, damping, buckling; non-linear analysis

The new Erasmusrand Pedestrian bridge replaced the previously impact-damaged pedestrian bridge spanning across the National Route 1 Freeway in Pretoria, South Africa for the South African National Roads Agency SOC Ltd (SANRAL). The structure consists of a steel arch supporting a composite steel/concrete deck with inclined square hollow steel struts. The bridge spans 73m across a 10-lane dual carriageway freeway providing access to a local school from the suburbs. Several challenges were presented in the project with procurement, design and construction.

An initial assessment report explored the possibility of saving the badly twisted portals on the old steel bridge. Although the costs were slightly cheaper than a new construction, there were inherent risks with the approach and the decision was therefore taken to demolish. However, in terms of the procurement rules of SANRAL, the design of the new structure had to be put out to tender but not as a design competition. Once appointed the new design consultant had to put at least 3 different proposals on the table about costs and aesthetics.

The inclined sides of the road cutting profile at the site favoured an arch or frame type of solution. However, the road cut formation was relatively shallow resulting in a low rise to span ratio. With the low rise to span ratio a number of design challenges were presented such as susceptibility to buckling, susceptibility to vibrations under dynamic footfall forces and sensitivity to variation in temperature and support conditions.

Construction challenges included fabrication of plate elements with complex geometry, handling and transport of massive assemblies and stability during erection.

The paper discusses the procurement, design development and construction challenges and how these were overcome.



Fig. 1. Elevation View of Erasmusrand Pedestrian Bridge