2nd Nile Bridge at Jinja, Uganda – Independent Design Check

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Summary

The 2nd Nile Bridge at Jinja, Uganda will be built across the River Nile in order to relieve traffic from the deteriorating existing crossing. The new bridge will be a cable stayed bridge with a 290 m long main span. The cellular concrete deck will be supported by a central plane of multi-strand stay cables from inverted Y-shaped concrete pylons incorporating steel anchor boxes.

Design studies included a geotechnical site investigation and a search in the surrounding area to find materials suitable for concrete aggregate and for construction of the approach roads. Wind tunnel tests were undertaken in Korea. The Independent Design Check was carried out concurrently with the Final Design so as not cause delay to approvals. Project specific design criteria were determined to supplement and enhance those in the local design standards, including the use of Eurocode traffic load models, in conjunction with design to methodologies from British Standards.

This paper describes the design process and the Independent Design Checking work performed to review and verify all structural and geotechnical aspects of the design.

Keywords: *cable-stayed bridge; design; wind tunnel testing; independent check*

1. Introduction

A new bridge will be constructed across the River Nile at Jinja, Uganda. The existing crossing at this location is part the Nalubaale Dam which was commissioned in 1954 and is now in a deteriorating condition. The crossing forms a key link along the Northern Corridor Route (NCR), Uganda's most important highway. As the only Ugandan road connection across the Nile, this is vital link in the region's transport network. The new bridge will relieve traffic loading from the existing bridge and ensure safety and reliability of the NCR transportation system.

The construction of the 2nd bridge across the Nile at Jinja is a high profile project under an ambitious program of the Uganda National Roads Authority. The selected design for the new crossing is a cable stayed bridge with a main span of 290 m just to the south of the existing crossing.

The Feasibility Studies, Preliminary and Detailed Design have been carried out by a Joint Venture of Oriental Consultants Co. Ltd and Eight-Japan Engineering Consultants. The Independent Check has been completed by Arup. A construction contract is planned to be let at the end of 2012 so that the bridge can be completed by 2016.

2. The Site

Jinja is located approximately 70 km east of the capital Kampala, at the mouth of the River Nile, on the north bank of Lake Victoria. The existing dam and bridge is aligned east-west, and has a total length of approximately 800 m. The river width varies considerably in this area and an alignment for the new bridge was chosen approximately 500 m to the south of the existing crossing. This permits a narrower crossing whilst limiting the extent of new road works either side of the bridge.

The ground conditions at the site are quite variable although sound rock is found at a reasonably

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