

Emergency Rehabilitation of Bridge N7 in Kerouane, Guinea

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1 Introduction

WSP was appointed by Rio Tinto Iron Ore Atlantic to undertake the inspection and assessment of 24 existing bridges situated along the N1 and N2 highways in Guinea. The work was divided into three phases, namely:

Phase 1: Inspections

Phase 2: Laboratory sampling and testing

Phase 3: Structural forensic analysis

Bridge N7 is a single carriageway, 2 x 8.5m span composite structural steel beam and reinforced concrete slab bridge. The deck has a total carriageway width of 4.3m. The abutments and piers are of the wall type comprising of brick and mortar with reinforced concrete bearing seats. The bridge is located at Latitude: 9°17'37.4"N and Longitude: 8°59'18.5"W.

2 Findings

The findings of the inspection have been finalized in the table below, the findings have been filtered to only include structural defects.

Table 1. Inspection findings

Component	Comment
Bridge Rail- ing/Barriers	Steel railing is damaged seemingly from impact. The steel is also rusted and corroded. No end block structure for railing.
Bridge Kerbs	Cracking and spalling is visible throughout the length of the kerb. Large transverse crack is visible at South-Western end.
Footways	No dedicated footways.
Open Expan- sion Joint	Joints at the approaches are in very poor condition with large cracks and settlement. Some parts of the joints have been covered with fill.
Deck Slab	Decking is settling, in poor condition with cracks visible throughout the surface. Most of the deck scuppers are blocked.
Batter protec- tion	No batter protection in place.
Pier Walls	Pier is settling and failing in rotation resulting in only southern deck being supported. The northern deck is supported on temporary propping also showing signs of failure.
Bridge Ap- proaches	Bridge approaches are in a poor condition with damaged concrete.

Based on the visual inspection conducted in Phase 1 of the project, Bridge N7 was given an overall rating of 5 – UNSAFE due to settlement and rotation of the pier. It was deemed that the bridge should be taken out of service as a new one is being built upstream. The existing temporary support, by propping, was also failing. Figure 1 and Figure 2 below show the failing substructure.



Fig. 1. Bridge N7 Elevation



Fig. 2. Bridge N7 View of pier

3 Remedial works and Recommendations

As a temporary measure, the bridge is to be propped by the following steps:

1. Deviate river to span 1, excavate span 2
2. Construct base and install propping for span 2
3. Deviate river to span 2, excavate span 1
4. Construct base and install propping for span 2
5. Restore normal river flow under span 1 and span 2

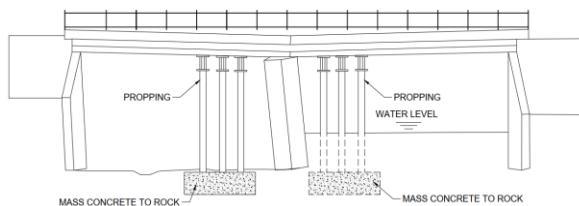


Fig. 3. Bridge N7 Propping

References

1. Part 1: Structures Inspection Policy of the State of Queensland (Department of Transport and Main Roads) (2016).
2. Part 3: Structures Inspection Procedures of the State of Queensland (Department of Transport and Main Roads) (2016).