

Project No. and Title of the Project: SSP 41341: Assessment of structural adequacy of selected spans of RDSO's standard composite girder of 12.2m constructed Bridge No. 203 & 213 between Muzaffarpur-Sagauli Section of Samastipur, East Central railway

Client : East Central Railway, Bettiah, Bihar

The field investigations and numerical simulation studies carried out on the super-structure of two composite bridges, namely BR 203 and BR213, to evaluate the structural adequacy of the super-structure under 25T of loading. During the field investigations, instrumentation on various parts of the superstructure, i.e., rail, concrete slab, two I-girders, and bearings, was carried out to evaluate the response under static and dynamic test cases conducted using the test train formation provided by ECR. Non-destructive testing (NDT) on the concrete slab was also conducted using ultrasonic pulse velocity (UPV) and rebound hammer to assess the overall quality of the concrete. As the field study could not be conducted using the intended 25T loading, it was assessed using a validated numerical model. Numerical simulation is carried out for response evaluation (both static and dynamic) of the superstructure under 25T loading. It is found that the composite superstructure performs well under all the load cases considered in the present study. The interface behaviour (steel-concrete interface near mid- and quarter-span) shows the required integrity for complete force transfer.

Benefits to Client: The field and numerical investigations ensure the safety of the two composite bridges (BR203 and BR213) superstructures under the present and 25t load scenarios.

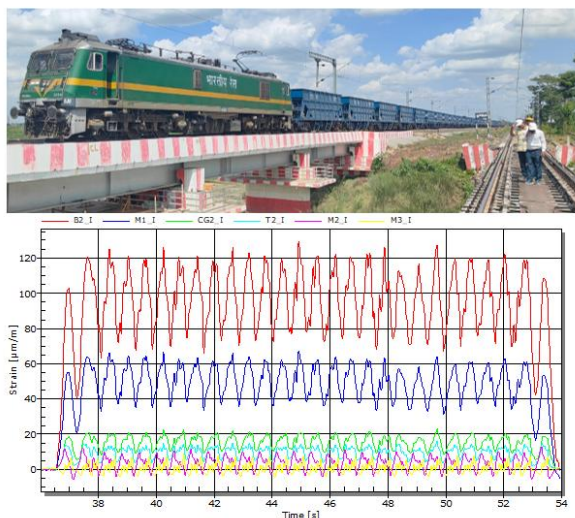


Figure 1: General view of the bridge BR213 with Test Train and Strain Response

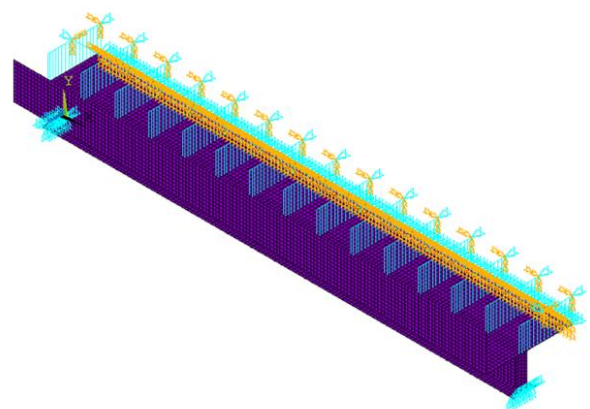


Figure 2: Numerical Model of Bridges No. 203 & 213