

## Steel Bridge SHM in Isfahan: Bridge Over Zayandehrod River

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### Summary

Felezi Bridge was built in Esfahan on the Zayandeh-Rood River in 1957. This bridge has five spans and the bridge deck has been installed on four concrete piers in middle and two abutments on both ends. Pursuing the bridge seismic rehabilitation plan of the Esfahan municipality, a comprehensive study of the said bridge was accomplished. Visual inspection and non-destructive tests results indicate some failures including rust, efflorescence, crack, scour, and settlement in some parts of the bridge. Also modeling and computerized analysis of the bridge structure using the recommended methods by the FHWA code specified the weak points of the structure under the gravity load, service load and seismic loads.

Then the final sum-up and assessment of the bridge vulnerability as well as the bridge vibration improvement recommendations were made based on the results of visual inspection, non-destructive tests and the bridge structure analysis.

**Keywords:** bridge, visual inspection, analysis, seismic load, repair and rehabilitation.

## 1. Introduction

Felezi Bridge with 134m length, deck width of 16.80 m and the bridge freeboard of 6.5 to 7m was built in Esfahan on the Zayandeh-Rood River in 1957 [1]. Considering the position of the bridge on the north-south axis of Esfahan city with its high traffic volume, studying the seismic and non-seismic behavior of this highway crossover bridge is necessary.

In this paper attempt has been made to assess the seismic vulnerability of the Felezi Bridge using the seismic vulnerability assessment methods contained in the seismic improvement code of the present constructions as well as the seismic improvement code of the present bridges (FHWA instructions). Also considering the metallic nature of the most members of the bridge, the metallic bridges inspection methods have been used for assessment of this bridge[2-9].

## 2. Technical Properties