



## ENHANCEMENT OF SERVICE LIFE OF STEEL BRIDGES

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### Summary

Bridge is such a structure, whose service life expectancy is more than 100 years. Any steel bridge may give such durability provided the factors influencing the durability are controlled properly. Experience shows that durability of steel bridges has substantially been extended by taking preventive measures to resist deterioration of structures during its service life.

Case study of some durable steel bridges of India which have given service life beyond expectation, have been highlighted here. Development of steel as structural material as well as technology of steel bridge (construction and maintenance) has been taking place since the middle of 19<sup>th</sup> Century. The paper highlights how these developments related to selection of material, design technique, fabrication/erection methodology, maintenance approaches and authorities' policy helped in achieving higher durability in case of steel bridges.

It is concluded that though the durability of steel bridges is about 100 years, it can further be enhanced with the implementation of new technological concepts and knowledge.

**Keywords:** Durability, Corrosion, Bridge, Maintenance, Rehabilitation, Calamity, Steel, Strengthening.

### 1. Introduction

India has glorious, long and successful history of steel bridges. Even today, many bridges are found which were constructed in the second half of 19<sup>th</sup> Century. However, in some cases, the bridges were of either cast iron or wrought iron. Fig.1 shows one such bridge (Jubilee Bridge) which was constructed in 1886 over Hooghly River near Calcutta. Though this bridge is neither strengthened nor renovated in its 120 year of service life, many other bridges existing are either regirdered or strengthened or rehabilitated. One such bridge is shown in Fig.2 which was constructed in 1861 over Krishna River but girders of this bridge were replaced in 1936.



Fig. 1 Jubilee Bridge

Bridges are constructed considering its service life will be more than 100 years. Normally technical inspection is carried out after 50 years of service life to assess remaining life of bridge. In this inspection, remedial decision is taken so that the bridge can serve at least for another 50 years.

Though there is no doubt to the 100 years service life of any steel bridge, the longer durability is achieved with regular maintenance and major technical modification.