



## Study on Fatigue Durability of Steel Box Girder Corner Plate Weld with Peening

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### Abstract

Corner plates are sometimes added to the web-to-flange joints of box girder bridges by welding on a single side to increase stiffness. In the case of the Minatogawa Bridge on the Hanshin Expressway, a steel box girder with low girder height and corner plate was used to reduce the weight of the superstructure. In this bridge, many fatigue cracks were observed in the welds of the corner plates.

As a crack suppression measure, the end of corner plate was cut-out in U-shape. Although the stress concentration relaxation reduced the risk of crack initiation, the risk of crack initiation starting from the un-welded area still remains.

In this study, we focused on peening as a countermeasure to improve the fatigue endurance. As a result, it was confirmed that peening to the un-welded area was effective in improving the fatigue endurance.

**Keywords:** Steel box girder, Corner plate, Fatigue crack, Cut-out in U-shape, Peening

### 1 Introduction

In steel bridges, "Single Side Welded" is sometimes used, where two steel components are joined by welding on a single side only. The problem with

single-side welded is that stress concentration occurs in the un-welded area on the back side, which can cause fatigue cracks.

Corner plates are sometimes added to the joint between the web and the flange of a box girder