



The Philosophy behind the North American Railway Fatigue Life Recommendations for steel bridge evaluation

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Summary

As a result of some unexpected fatigue induced failures, it became necessary to develop a way to predict when such failures might occur and then to prioritize structures for repair, retrofit or replacement. In addition, the methodology should enable the estimation of needed future budgets to ensure long term uninterrupted railway service.

Keywords: Fatigue, North American, Railways, Fitness for purpose, Fracture, Fatigue life estimation.

1. Introduction

The vast majority of North American steel bridge spans are simple span riveted deck plate - two girder systems. A fitness of purpose study done by the writer in 1975 lead to the conclusion that using a Safe Life philosophy was the only way to ensure that critical details would be identified before there was serious risk of fracture.

Engineering managers needed to have a way of finding critical details and reducing the number of details of concern to be monitored to a manageable size.

2. Main concerns

2.1 Possible rivet fracture

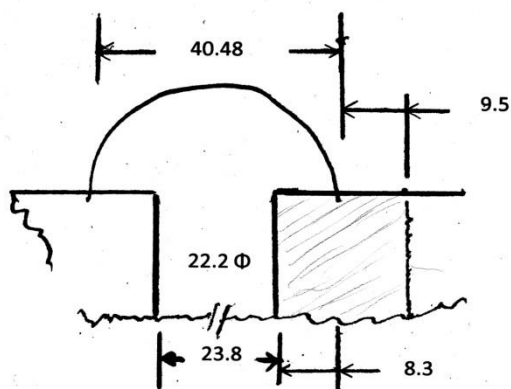


Fig. 1: Hard to find before fracture occurred