Behaviour of several fatigue prone bridge details

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Abstract. Three fatigue welded bridge joints analysed in this work are the alternative details of the bottom flange connection. This construction detail is mainly used for the erection connection for steel and composite bridges. If applied in the place, where live load is significant, the fatigue becomes the main design criterion. The detail category is thus very important factor. The aim of this paper is to analyse the possibilities of the improving the behaviour of this detail, by various methods. First solution is to modify the shape of the cope hole to the elliptic shape. Second option is to use the "Olemutz" fully welded detail. This detail is often used in bridge designing despite there is no exact information about the fatigue category, and doubts of the performance exists. "Olemutz" is a long web plate slit that is filled by the double bevel weld after the execution of the bottom flange weld. The last detail is the elliptic cope hole filled by the plate-cap welded into an empty hole. The geometry is the same, as in the first case. The conclusion of the numerical analysis and the pilot fatigue experiments is discussed with several practical recommendations for designing.