



## Post-installed shear connectors – coiled spring pins

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### Abstract

Many existing bridges were not originally designed for the traffic loads and the number of load cycles which they now experience. In order to increase the load capacity of steel-concrete bridges, post installed shear connectors can be used. This paper presents a state-of the art study of post-installed shear connectors in general and coiled spring connectors in particular.

**Keywords:** Shear connector; composite bridge; composite action; coiled spring pin; bridge strengthening; rehabilitation.

### 1 Introduction

Traffic density and vehicle weight have been increasing in recent decades. Many existing road bridges, all over the world, were not designed for the high service loads and the increased number of load cycles that they are exposed to today. Some bridges will have to be either strengthened or replaced in the next decades. The first alternative can save money and can also lead to less traffic disturbance if a suitable strengthening method is chosen.

As late as the 1980s, steel girder bridges in Sweden were often constructed with a non-composite concrete slab on top of steel girders. One way of strengthening these bridges is to connect the existing concrete slab and the steel girders to permit the development of composite action. This means that the steel girders and the

concrete can carry traffic loads more efficiently than in the original non-composite condition.

This paper presents a brief overview of different alternatives to create composite action in existing structures, followed by a more detailed state of the art review of coiled spring pins since the authors believe that this type of shear connector can reduce the traffic disturbance significantly compared to the other methods described.

### 2 Post-installed shear connectors

Over the years, different types of shear connectors suited to post-installation in existing steel-concrete structures have been used. A selection of some of these connectors, and the research performed, is presented below. There is no attempt to cover all possible types of shear connectors.