Strengthening of bridges by post-tensioning using monostrands in substituted cable ducts

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Abstract. Post-tensioning is suitable, reliable and durable method of strengthening existing engineering structures, especially bridges. The high efficiency of post-tensioning can be seen in many applications throughout the world. In this paper the method is extended by a structural system of substituted cable ducts, which allows for significantly widening application of prestressing so it's convenient mostly for application on beam bridges or slab bridges (built in years 1920 – 1960). The method of substituted cable ducts is based on theoretical knowledge and technical procedures, which were made possible through the development in prestressing systems, particularly the development of prestressing tendons (monostrands) and encased anchorages, as well as progress in drilling technology. This technique is highly recommended due to minimization of interventions into the constructions, unseen method of cable arrangement and hence the absence of impact on appearance, which is appreciated not only in case of valuable historical structures but also in general. It is possible to summarise that post-tensioning by monostrands in substituted cable ducts is a highly effective method of strengthening existing bridges in order to increase their load capacities in terms of current traffic load and to extend their service life.