Competitiveness and progress in application of incremental bridge launching

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Summary

In this paper an overview and specificities of some Croatian bridges constructed with incremental launching method are presented. Competitiveness of incremental launching of bridges comparing to other traditional construction techniques (span by span method, semi-prefabricated construction, construction on fixed scaffold) are investigated. The possibilities of extending the application of this method in reconstruction of existing old bridges is to be further investigated

Keywords: bridges, incremental launching method, competitiveness domain

1. Introduction

The incremental launching is one of the highly mechanized methods used in the construction of bridges. In this method of construction, the bridge superstructure is assembled on one side of the obstacle to be crossed and then pushed longitudinally – launched into its final position. The launching is typically performed in a series of increments so that additional sections can be added to the rear of the superstructure unit prior to subsequent launches [1]. It is estimated that more than thousand bridges worldwide have been constructed using the incremental launching method. As this method requires a considerable amount of analysis and design expertise and specialized construction equipment it will never become the most economical procedure for constructing all bridges but it may often be the most reasonable way to construct a bridge over an inaccessible or environmentally protected obstacle.

In the necessity of balancing the progress of engineering with the sustainability of nature and safety of people some of the advantages of incremental launching of bridges comparing with other traditional construction techniques (span by span method or balanced cantilever method) are [2]:

– higher safety for workers (each operation, from the steel cage assembly to concrete casting or prestressing is much simpler and safer than on a scaffold or at the end of cantilever),
– faster construction (launching requires only one casting bed instead of two or more pairs of form carriers) and
– longer durability of superstructure (segments may be more than 30 m long which reduces the number of construction joints and results in less maintenance work).

In this paper an overview and specificities of some Croatian bridges constructed with incremental launching method will be presented. Competitiveness domain of this construction method will be established based on comparison with possible employment of other construction techniques (employment of precast beams and cast in situ slab, span by span construction of slab and box type superstructure on movable scaffold and construction of slab or box type superstructure on fixed scaffold) on several bridge examples.

Additionally, possibility for expansion of optimal application of this construction method will be elaborated. Example is incremental launching of composite superstructures in replacing massive superstructures of existing bridges with reduced reliability levels.