IABSE SYMPOSIUM
7-9 October 2020
Synergy of Culture and Civil Engineering
- History and Challenges
IABSE 2020
WROCŁAW POLAND

GEOMETRICAL CONTROL IN SPAN BY SPAN CAST IN SITU CONSTRUCTION OF BRIDGE DECKS

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SUMMARY

Geometric control of concrete bridge decks under construction is strongly dependent on the construction method. Different construction methods demand for different geometrical control strategies and different geometric control technologies. Geometric control is usually a major concern in segmental construction solutions, both in precast and cast-in situ. Geometric control dependency is apparently lesser in span by span cast in situ construction. The consequences of a defective control are apparently affordable and as a result this issue is often neglected. However, defective geometric control often leads to expressive costs with surface regularization, either by overconsumption of materials or corrective milling works.

This paper focus on geometrical control in span by span cast in situ construction of bridge decks, referring to practical cases using movable scaffolding systems (MSS). A global control strategy is discussed, identifying the most significant factors, the relevant steps and the involved parties.

Keywords: *Bridge Construction, Cast in Situ, Geometric Control.*

1. INTRODUCTION

Geometric control of concrete bridge decks under construction is strongly dependent on the construction method. Different construction methods demand for different geometrical control strategies and different geometric control technologies. Geometric control is usually a major concern in segmental construction solutions, both in precast and cast-in situ. For precast segmental solutions there is a plethora of bibliography on this subject. Geometric control is even more demanding if the short-line method is used in the precast yard. The final fit between the segments and the actual final full span geometry is strictly dependent on the accuracy of each single segment geometric control.

In cast in situ segmental construction, material rheological properties are assessed during construction so as to be accounted in the camber design and geometric control performed in this type of construction. The final outcome of the deck´s geometric control is strongly dependent on the actual construction schedule. Iterative corrections are usually required, and consistency of topographic survey is a key factor. Inefficient control usually results in gross deviations, which in extreme cases cannot be corrected by simple adjustments while casting the closure segment.

Geometric control dependency is apparently lesser in span by span cast in situ construction. The consequences of a defective control are apparently affordable and as a result this issue is often neglected. However, defective geometric control often leads to expressive costs with surface regularization, either by overconsumption of materials or corrective milling works. In this type of construction, the complexity of geometric control may vary significantly, depending on features such as deck geometry (constant or variable), construction stages (full or partial section), span length or bridge type (railway or highway). In the simpler cases, a tight survey of the first spans and a timely implementation of formwork adjustments may prevent significant correction costs.

The main purpose of this paper is to identify a geometrical control methodology for span by span cast in situ bridge decks construction. A set of recommendations are put forward, identifying the most significant factors,

https://doi.org/10.2749/wroclaw.2020.0438
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