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Stay-cable Bridge Construction Accelerated
The New Bridge over the Ohio River

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ABSTRACT

The standard cast-in-place segmental balanced-cantilever construction technique for long-span, cable-stayed bridges has been well known and widely used; however, it can lead to extensive construction time and places the construction of the pylon on the critical path of the schedule. The Oakley C. Collins Memorial Bridge over the Ohio River (between Ironton, Ohio and Russell, Kentucky, USA) was built with a new construction technique targeting this issue and accelerating construction by implementing several innovative value engineering ideas proposed by COWI, the Contractor's Construction Engineer. These include the use of back-span falsework, allowing the side span superstructure to be cast-in-place on falsework during pylon construction; the use of precast stay anchor blocks for rapid installation and better geometry control of the stay anchorages; and guide pipes and unidirectional cantilever casting, reducing the casting cycle duration to as little as one segment per week. This paper presents the construction details that significantly reduced the superstructure casting schedule and design modifications to the superstructure.

Keywords: Cable-stayed, balanced cantilever, value engineering, segmental

1 INTRODUCTION

The new Oakley C. Collins Memorial cable-stayed Bridge over the Ohio river, connecting the cities of Ironton, Ohio and Russell, Kentucky, was opened to public in November 2016 and instantly became a landmark of the region and surrounding communities. It replaced a 100-year-old, structurally obsolete steel truss bridge that was demolished soon after the opening in 2017.

The request for proposal planned to build the cable-stayed bridge by conventional balanced-cantilever method: first build pylons founded deep in the Ohio riverbed, then cast-in-place segments the superstructure segments in a symmetrical manner at each main pier with form travellers. The Contractor and COWI, the Construction Engineer, worked together to identify the riskiest aspects of the project and introduced several innovative construction techniques to allow acceleration of the construction and to reduce the complexity of the common constructability challenges. These included the modification of the erection method to unidirectional cantilever with the back-spans cast on modular falsework towers, and the use of precast elements such as transverse floorbeams, precast stay anchor blocks, and precast coffer cells. All these ideas have proven to be of great value to the

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