Abstract

Bridge construction using segment technology offers a fast and efficient alternative to a conventional bridge erection methods. The advantage lays in the minimization of in-situ construction processes and is closely associated with prefabrication processes at specialized workplaces. UHPFRC is a modern cement-based composite with dispersed reinforcement. Key properties include tensile hardening after crack development, high compressive strength and high resistance to aggressive environmental influences. Its properties make it suitable for bridge structures which are exposed to extreme loads as well as aggressive environmental influences. UHPFRC requires high technological discipline for constructional use and for civil engineering applications is convenient to use specialized technologies. Segmental technology of bridge construction with the application of UHPFRC is therefore a logical solution for utilization of UHPFRC in bridge engineering. While designing and assessing a segmental bridge, it is necessary to pay attention to the proper function of the joints, which transmits lateral forces and protects prestressing tendons and cables. This work focuses on shear resistance of joints on segment to segment interface using UHPFRC material for both segments. UHPFRC differs from standard/high-strength concrete not only in its mechanical properties, but also in quality of surface and low roughness. The fundamental aim of this thesis is to define the best shape and distribution of shear keys on interface and determination of theoretical basis for shear resistance assessment of epoxy-sealed joint based on the results of the author's research.

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