

## **Redistribution of internal forces in the double span, double combined beams**

The PhD dissertation is devoted to the double combined prestressed beams, in which the main reinforcement is specially prepared rigid steel profile. The work contains a description of experimental studies of the elements with completely surrounded by concrete steel profiles, including the Author's own research and analysis of computational results. The research and analysis of the results have been presented against the background of the history of composite structures.

The literature is dominated by the study of single span, statically determinate, composite elements and there is no information about the impact of composite connection on the work of multi-span elements. This is particularly true for the issue of redistribution of forces and cooperation of bearing elements in the cross-section in the intermediate support zone. Therefore, the author attempts to analyze these problems. Apart from the classic definition of a global redistribution of internal forces in the element, it defined the concept of a local redistribution of forces between the reinforcement in the cross-section. Consideration were carried out using the authoring program to non-linear section analysis. The calculations take into account the characteristic of elastic-plastic materials and include the fact that the beams were made in several stages. The results of analysis showed that can existed load bearing cooperation between different types of reinforcement in the double span, double combined beams in the intermediate support zone, despite the lack of continuous rigid reinforcement. The degree of cooperation depends inter alia on the correct anchorage of reinforcement, suitable adhesion between reinforcement and concrete and the amounts of the bars.

In the work were also considered the impact of the slip of the complex plane between precast and topping concrete on the process of the local redistribution of forces in the supporting area. At the ends of the test elements were used patented bars with threaded ends, connected by horizontal flat irons. The use of these bars prevented the delamination directly in the zone of their use. The author believes that the solution from the patent has also provided anchoring of the rigid steel profile. The effectiveness of such anchoring has changed as a result of excessive cracking in concrete.