

## **ANALYSIS OF HYBRID COMPOSITE CABLE FOR PRESTRESSED SUSPENSION BRIDGE**

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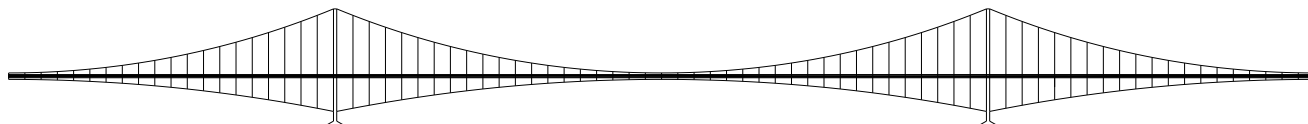
Prestressed suspension bridge is a type of structures which allows covering long spans due to rational use of structural materials. Prestressing of suspension bridge allows to minimize kinematic displacements and makes possible not to use cantlage.

The stress distribution by the length of the main load carrying cable of suspension bridge is non-uniform. Equalization of stresses by the length of the cable open possibility to increase degree of material usage. The effects of stress equalization by the length of the cable can be achieved with the using of cable with variable by it length cross-section.

The prestressed suspension bridge with main span equal to 200 m was considered as an object of investigation (Fig.1). Hybrid composite cable on the base of steel and CFRP with variable by it length cross-section of steel component is considered as a main load-carrying structure of the prestressed suspension bridge. Using of CFRP component allows increasing specific strength of the cable and decrease total dead weight of load-carrying structure. The hybrid composite cable was divided into the section with the length equal to the distances between the suspensions.

The considered prestressed suspension bridge was investigated by the FEM software ANSYS 12.

Rational cross-section of steel components of hybrid composite cable was determined for each section. Influence of the effect of stress equalization by the length of the cable on the materials consumption and displacements of prestressed suspension bridge was investigated.



*Fig.1. Prestressed suspension bridge.*

### **REFERENCES**

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