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Civil Engineering '13

International Scientific Conference

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Būvniecība '13

Starptautiskā zinātniskā konference

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Jelgava 2013

LATVIA UNIVERSITY OF AGRICULTURE
FACULTY OF RURAL ENGINEERING
DEPARTMENT OF ARCHITECTURE AND BUILDING
DEPARTMENT OF STRUCTURAL ENGINEERING
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MANAGEMENT

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ARHITEKTŪRAS UN BŪVNICĪBAS KATEDRA
BŪVKONSTRUKCIJU KATEDRA
ZEMES IERĪCĪBAS KATEDRA
VIDES UN ŪDENSŠAIMNIECĪBAS KATEDRA

CIVIL ENGINEERING '13
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ABSTRACTS

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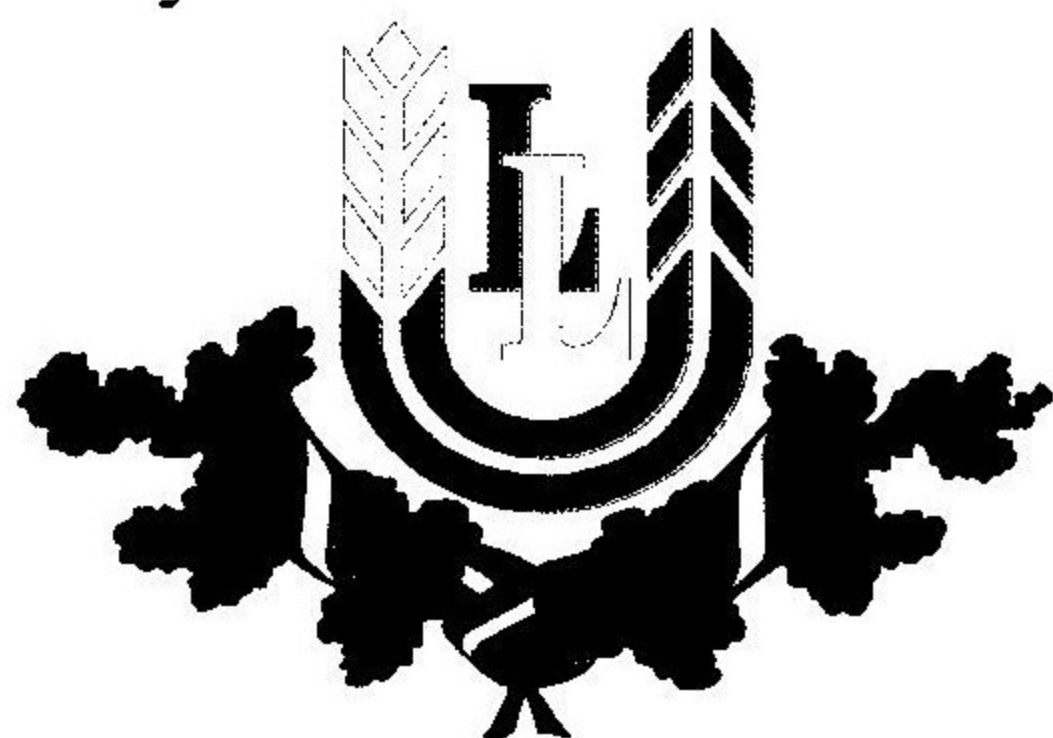
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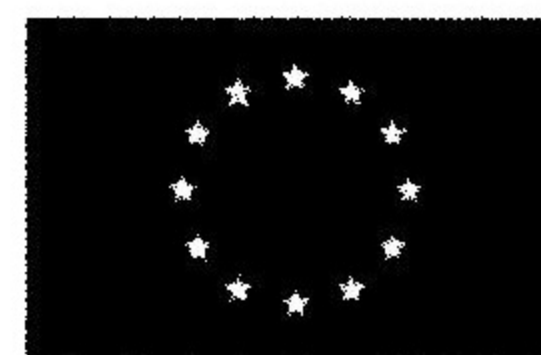
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BEHAVIOUR OF CABLE TRUSS WEB ELEMENTS OF PRESTRESSED SUSPENSION BRIDGE

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A suspension bridge is the most suitable type for a long-span one due to the rational use of structural materials. Increased deformability, which is conditioned by the appearance of the elastic and kinematic displacements, is the major disadvantage of suspension bridges.

The prestressing can solve the problem of increased kinematic displacements under the action of non-symmetrical load (Goremikins et al., 2011). A prestressed suspension bridge with the span of 200 m was considered as an object of investigation. The cable truss with the cross web was considered as the main load carrying structure of prestressed suspension bridge (Fig. 1).

Topology optimization of cable truss web by 47 variable factors was realized with genetic algorithm (Goremikins et al., 2012) to find rational distribution of material in the cable truss space. It was stated, that the maximum total displacements are reduced up to 29.9% by using of cable truss with rational characteristics instead of single cable in the case of the worst situated load.

Cable truss web elements behaviours were analysed and it was shown, that some elements of the web are excluded from the work in some loading cases. It was stated, that removing of some elements of the web allows simplifying the web and minimizing displacements.

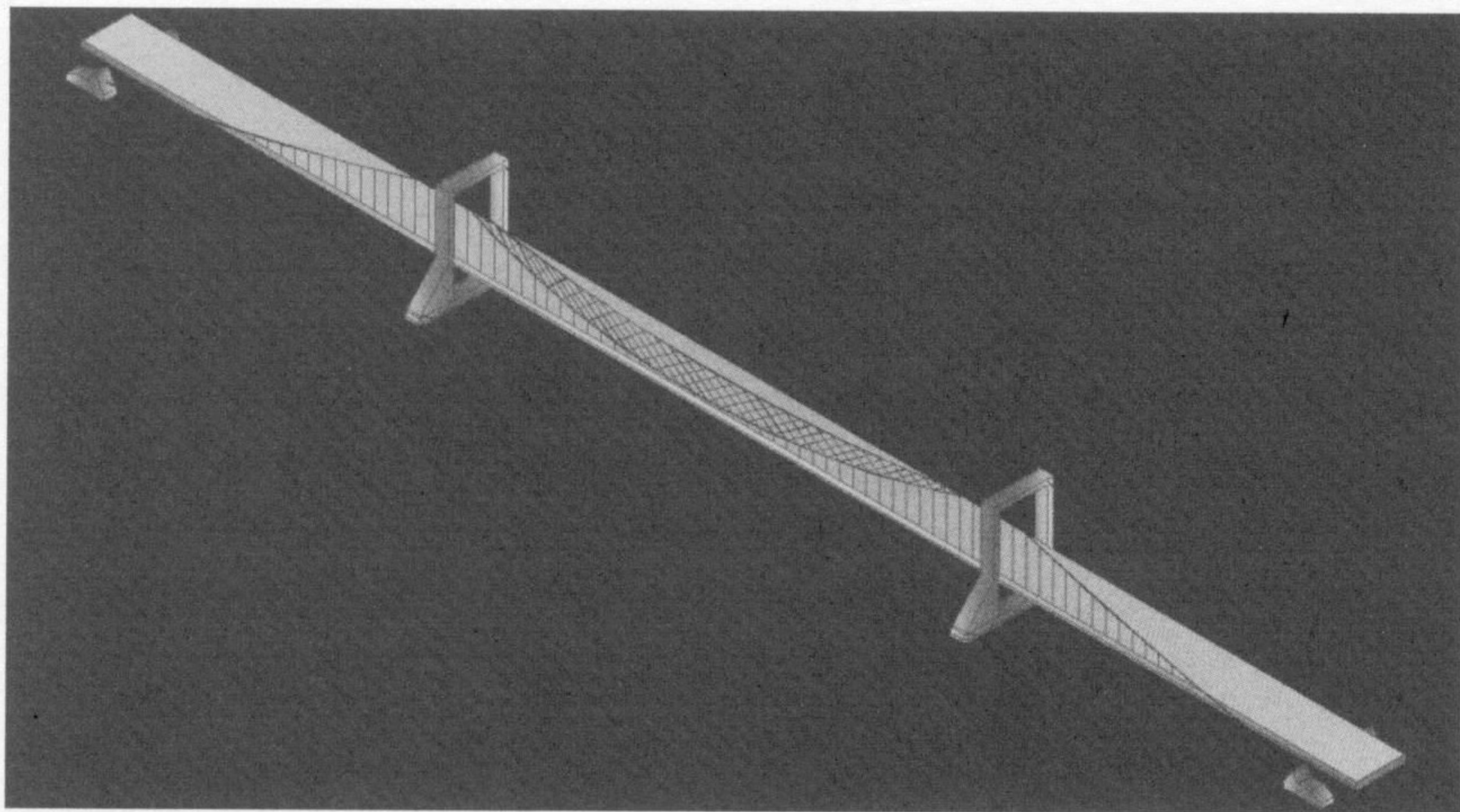


Figure 1. Prestressed suspension bridge with the cable truss as the main load carrying structure

References

- Goremikins V., Rocens K., Serdjuks D. (2011) Rational Structure of Cable Truss. *World Academy of Science, Engineering and Technology*. 76, pp. 571-578.
- Goremikins V., Rocens, K., Serdjuks, D. (2012) Decreasing Displacements of Prestressed Suspension Bridge. *Journal of Civil Engineering and Management*, 18(6), pp. 833-842.