

Simple Method of Calculation of Statically Indeterminate Trusses

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The paper presents a very simple method, which in two stages enables to calculate the plane statically indeterminate truss by the application of one of methods used for the force calculation in the statically determinate trusses [1]. The results are obtained in a very simple and quick way. Although the force values are approximated but they are relatively very close to those, which are determined by the exact methods. The point of the two-staged calculation process of the statically indeterminate trusses is to determine schemes of two independent and simple statically determined trusses, which after superposition of their patterns will give in the result a pattern of the initial, more complex form of the statically indeterminate truss. Each of the simple truss has to be of the same clear span, the load forces have to be of the half values and they have to be applied to the same nodes like in truss of the initial structural configuration. For example in the first stage, see Fig. 1, from the basic truss all members of the upper chord are excluded and the load forces are two times smaller than applied for the basic truss. In the second stage all the members of the lower chord are removed and like previously the load forces of half the initial values are applied to the same nodes of the upper chord. It is expected that after superposition of these two trusses and to sum up all the values of respective forces acting in appropriate members we should obtain in a result values of forces very close to real values of forces acting in the considered truss of the initial shape.

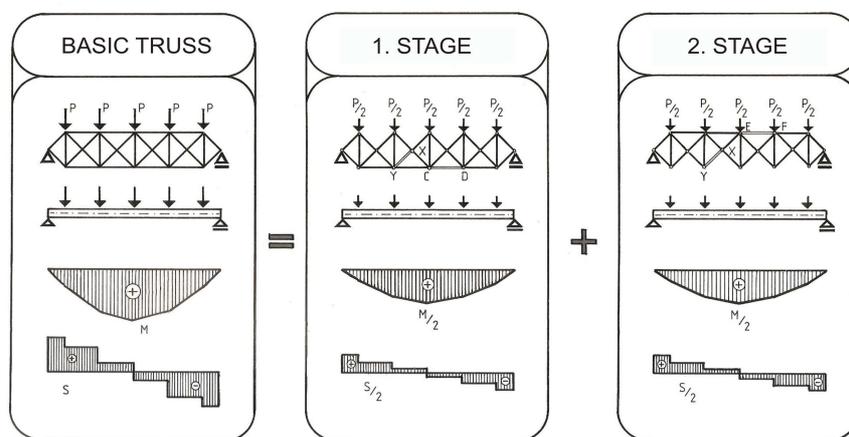


Figure 1. Schemes of the main stages of the proposed calculation method

Reference

- [1] J. Rębielak, A method of static calculation and shape of structural system developed by application of principles of superposition, *Lightweight structures in civil engineering – contemporary problems*, Local seminar of IASS Polish Chapter, Warsaw, 2012, pp. 155-158.

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