FORMULATION ANALYTIQUE POUR LE CALCUL ÉLASTOPLASTIQUE DE SECTIONS EN I OU EN H FLECHIES AUTOUR DE L'AXE FORT

Analytical formulation for the evaluation of the elastic-plastic behaviour of I or H cross-sections bent over their strong axis

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SUMMARY

This paper presents the analytical expressions of an elastic-plastic model to study steel cross-sections bent over their strong axis.

The basic variables are the cross-section global deformations from which it is possible to evaluate the internal loads and the cross-section stiffness terms by means of simple mathematical expressions. These analytical expressions may also be used for the inverse calculation, of the global deformations as function of the cross-section internal loads.

The model allows the yielding spreading across the sections as well as the effects of the strain hardening to be taken into account on the non-linear cross-section behaviour in the elastic-plastic domain.

It represents an efficient, simple and accurate alternative to the models based on the analysis of the cross-section by means of numerical integration over the cross-section divided into elementary fibres or layers.

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