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CALCUL ET COMPORTEMENT DES POTEAUX ENCASTRES
SOLICITES EN FLEXION BIAXIALE

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ABSTRACT

Analytical procedures are developed for the determination of the load-deformation characteristics of elastically restrained, inelastic beam-columns under biaxial bending and torsion (Fig. 1).

The equilibrium equations are written with respect to an arbitrary system of axes. The resulting fourth order coupled nonlinear differential equations are solved using the method of finite differences.

The method is programmed for the CDC 6500 Computer at Federal Institute of Technology, Lausanne. This Computer program is utilized for the solution of various numerical examples.

Some of the salient features of the theory are given below :

- i) The member is prismatic, originally straight and untwisted.
- ii) The open cross-section considered in the theory is arbitrary in shape. However, the computer program is limited at present to H-shaped sections only.
- iii) Two rotational restraints are provided at each end to simulate the effect of minor and major axis beams on the behaviour of column.
- iv) Two directional restraints are considered at each end to simulate the effect of relative deflection of the ends (Sway or $P-\Delta$ effect) on the behaviour of column.
- v) At each end a rotational spring against rotation is also included.
- vi) The bar is subjected to end loads only. At each end, they may consist of : axial load, moments, transverse loads, torsional moment and bi-moment.

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