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KEY WORD: ELASTIC-PLASTIC / FRAMERS / P - Δ / MOMENT REVERSALS

BOONSAENG SIRIRATCHUWONG : ELASTIC-PLASTIC ANALYSIS OF
STEEL RIGID FRAMES CONSIDERING P- Δ EFFECT AND MOMENT
REVERSALS AT PLASTIC HINGES. THESIS ADVISOR : PROF.

THAKSIN THEPCHATRI, Ph.D., 70 PP. ISBN 974-582-351-1

This research presents a principle of the first-order elastic-plastic response of plane steel frames including P- Δ effect and moment reversals at plastic hinges. Reduction of plastic moment capacity due to axial force and in-plane stability effects are considered. The proposed algorithm is equivalent to the simplified second-order elastic-plastic analysis in which the reduction in flexural stiffness of the members due to axial force is neglected.

It has been shown here that results obtained from the proposed analysis are agreeable to those from second-order elastic-plastic analysis. The predicted maximum load factors are about 1% from those obtained by the second-order elastic-plastic analysis. However, large number of repetitive calculations are avoided, resulting in an enormous saving of computation time.