

# INFLUENCE OF FLANGE STIFFNESS ON DUCTILITY BEHAVIOUR OF PLATE GIRDER

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## **ABSTRACT**

The ultimate strength of plate girders designed using tensional field theory is assumed to depend upon critical buckling strength, post buckling strength of web panel and yield strength of flanges. Though the load carrying mechanism depends on the above three contributions, the post yield failure of the girder is primarily governed by the flange stiffness. Experimental and analytical studies on plate girders by various researchers show that the flange parameter influences the post yield behaviour of girders significantly. In the present numerical study, a 3-D finite element model developed using ANSYS was employed to analyze plate girders in order to investigate further the influence of flange stiffness on the behaviour of plate girders. It was observed from the results that the girders with larger  $M_p/M$  ratio provide more ductile compared to the girders having lesser  $M_p/M$  thus confirming the influence of flange parameter on ductility behaviour of plate girders. Also, it was noted that the girders with larger  $d/t$  ratio provide more ductility compared to the girders with smaller  $d/t$  ratios. The paper presents the results obtained from the finite element analyses on girders having different values of flange stiffness.

**Keywords:** Plate girder, Flange, Buckling, Tension field, Stiffness, Post buckling.