Structural Behavior of Composite Hollow RC Column under Combined Loads

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Abstract : This paper is dealing with studying the structural behavior of a steel-composite hollow reinforced concrete (RC) column model under combined eccentric loading. The composite model consists of an inner steel tube surrounded via a concrete core with longitudinal and circular transverse reinforcement. The radius of gyration according to American and Euro specifications be calculated, in order to calculate the thinnest ratio for this type of composite column model, in addition to the flexural rigidity. Formulas for interaction diagram is given for this type of model, which is a general loading conditions in which an element is exposed to an axial load with bending at the same time. The structural capacity of this model, elastic, plastic loads and strains will be computed and compared with experimental results. The total eccentric axial load of the column model is calculated based on the effective length KL available from several relationships provided in the paper. Furthermore, the inner tube experiences buckling failure after reaching its maximum strength will be investigated.

Keywords : column, composite, eccentric, inner tube, interaction, reinforcement

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