Efficient implementation of a component-based joint model

Anas ALHASAWI*, Samy GUEZOULI and Mohammed HJIAJ

National Institute of Applied Sciences (INSA)
Rennes, France

e-mail: anas.alhasawi@insa-rennes.fr
e-mail: samy.guezouli@insa-rennes.fr
e-mail: mohammed.hjiaj@insa-rennes.fr

ABSTRACT

This paper deals with a nonlinear analysis of composite beam-to-column joint. The connection uses an end-plate welded to the steel cross-section of a steel-concrete composite beam and bolted to the column flange. The proposed model developed herein combines the knowledge of prior studies that used the component-based approach, on one hand and the Finite Element algorithms in plasticity, on second hand. The originality of this work is to efficiently take into account possible gaps between the end-plate and the column flange in case of plastic deformation of the bolts during the cyclic loading. The numerical investigation aims to study the force transfer mechanisms between different components of the model and to compare the behavior of a steel beam-to-column joint to the one of a "composite" beam-to-column joint.

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