

International Conference on

Design and Production Engineering

July 25-26, 2016 Berlin, Germany

Numerical analysis on the influence of the opening's shape on the mechanical behavior of steel beams with web openings

Amine Osmani

Djillali Liabes University, Algeria

Openings in the web of the metal sections can be created to pass the technical equipment of buildings instead of passing them below the beams, which reduces the height of the floor. The reduction of the building height reduces its external and its interior volume, which lowers the operational costs and maintenance, as well as the costs of construction. Negative side, the openings in the web can significantly reduce the shear strength and the flexural strength of the steel and composite beams. This study focuses on a numerical finite element analysis of the behavior of steel beams with web openings. The numerical analysis is based on a three-dimensional model with 20 nodes volume elements using software Cast3m based on the finite element method. The model takes into account the non-linearities material and geometric (plasticity and large displacements). This model is calibrated on the basis of analytical and experimental results given in the literature. From the numerical model, an analysis of the influence of the shape of the openings on the behavior of steel beams with web openings is made. This study will quantify the effects of these parameters on the overall behavior of the element and the structure and draw conclusions and recommendations to give engineers a simple calculation for this type of element increasingly used in construction.

Biography

Amine Osmani is a State Engineer in Civil Engineering since 2008. He received his Magister Diploma in 2012, a Post-graduate Diploma in Civil Engineering, Mechanics and Structural Stability. His Magister thesis was on the study of the behavior of steel and composite steel - concrete beams with openings in the web, the subject was an analytical and numerical study using the software Castem. Currently, he is a PhD student in Civil Engineering, Option Structures and Materials. His Doctoral thesis is on the study of the instability of steel slender beams. He is working on analytical and numerical studies using the ABAQUS software.

amineosmani@yahoo.fr

Notes: