World Academy of Science, Engineering and Technology
International Journal of Structural and Construction Engineering
Vol:8, No:06, 2014

Analysis of Moment Rotation Curve for Steel Beam Column Joint

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Abstract : Connections perform a fundamental role in the steel structures as global behaviour. In order to evaluate the real influence of the physical and geometrical parameters that control their behaviour, many experimental tests and analysis have been developed but a definitive answer to the problem in question still stands. Here, various configurations of bolts were tried and the resulting moment rotation (M-θ) curves were plotted. The connection configuration is such that two bolts are located above each of the flanges and beside each of the webs. The model considers the combined effects of prying action, the formation of yield lines, and failures due to punching shear and beam section failure. For many types of connections, the stiffness at the service load level falls somewhere in between the fully restrained and simple limits and designers need to account for its behaviour. The (M-θ) curves are generally assumed to be the best characterization of connection behaviour. The moment rotation curves are generally derived from experiments on cantilever type specimens. The moments are calculated directly from the statics of the specimen, while the rotations are measured over a distance typically equal to the point of loading. Thus, this paper establishes the relationship between M-θ behaviour of different types of connections tested and presents the relative strength of various possible arrangements of bolts.

Keywords : bolt, moment, rotation, stiffness, connections
Conference Title : ICCSEE 2014 : International Conference on Civil, Structural and Earthquake Engineering
Conference Location : Toronto, Canada
Conference Dates : June 16-17, 2014