

عنوان مقاله:

Reduced Beam Section (RBS) Moment Connections-Analytical Investigation Using Finite Element Method

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خلاصه مقاله:

Reduced Beam Section (RBS) moment resisting connections are among the most economical and practical rigid steel connections developed in the aftermath of the 1994 Northridge and the 1995 Kobe earthquakes. Although the RBS connection effectiveness was widely investigated using US design and construction practices, only limited data exist from European research. Recommendations of RBS applications in steel frames were prescribed in EC8, Part3. However the reliability of these recommendations is under consideration due to above mentioned poor existing data. This paper examines numerous different contours of radius cut-out (Group A) and provides recommendations for the design and detailing of radius cut Reduced Beam Section (RBS) moment connections. Furthermore, it examines and compares different beam cross sections of European steel profiles (Group B) while the sizing of the RBS cut is kept at a constant ratio. Analytical approach was conducted investigating the adopted by EC8, Part 3 key parameters for the design. The main objective of the applied RBS geometry is to protect the connection and its components (endplate, column flange, bolts, welds) from either plastification or failure. Although the computational cost for optimization with ABAQUS is very large, the results of this study ensures on one hand that the performances of the structural parts can be effectively improved by shape optimization and on the other hand that adjustment in the geometry of the radius cut is needed for safe application to European profiles.

کلمات کلیدی:

Reduced Beam Section Connection; Moment Connection; Extended Endplate Connection; Bolts; Finite Element Analysis

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