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Investigation on Cold Formed Steel Rectangular Hollow Flanged 'Z' Beam Section

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Abstract: Advanced finite element tools are being used by the researchers for the analysis and design to predict the plausible performance of structural elements. In order to understand the actual behaviour experimental testing is indispensable. This paper presents the experimental and analytical investigation on cold formed Rectangular Hollow Flanged 'Z' Beam (RHFZB) section with two different profile connections, namely, self-piercing riveting and arc-spot welding. The beam is of half a meter length and has the dimension of 120 mm deep web, 50 mm wide flange with 30 mm of hollow depth. The thickness of the section is 1mm. Specimens are prepared and tested under four point loading. The same section is modelled and analyzed using the Finite Element software ANSYS. The results show that the load carrying capacity of the welded profile connection is about 7 % more than that of riveted profile connection. The failure in the connections is found to be due to distortional buckling and is well simulated in the FEM analysis.