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Experimental Study on Radius-Cut RBS-CFT Connections with Bidirectional Bolts under Cyclic Loadings

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Abstract

This paper presents experimental investigation on evaluation of performance of radius cut steel reduced beam section (RBS) and on its role in improving overall behaviour of RBS-CFT connections subjected to cyclic load. The radius-cut RBS was designed as per steps proposed by Engelharth et.al. Behavior of radius cut RBS and concrete filled tube (CFT) connections with bidirectional bolts were examined. An experimental study was performed to find the performance of radius cut RBS under cyclic loading. It exhibited stable hysteretic behavior, and the RBS-CFT connection is found to be semi-rigid in nature. The strain data showed that the panel zone remained elastic always during the test. It reached a rotational capacity of 0.04 radians without any damage in the joint panel region, and thereby meets the seismic provisions of the AISC 2010 for a special composite moment-resisting frame.

Keywords: RBS, Semi-rigid joints, Bidirectional bolts, CFT