

鋼骨梁柱梁翼內側加勁補強接頭之耐震行為研究

研究生：饒智凱

指導教授：周中哲 博士

國立交通大學土木工程學系

摘要

本研究主要探討鋼骨梁柱接頭於梁翼板內側加置加勁板之耐震行為，其中共進行九組實尺寸之梁柱接頭試驗，而試體之 I 形梁梁翼板與箱形柱全滲透焊接接合，而梁腹板與柱栓接接合。九組試體中，其中一組為傳統梁柱接頭，另外八組為梁翼內側加勁補強接頭，其中五組梁翼內側加勁補強接頭於試驗後其行為良好，且足以承受超越 AISC 規範所訂定之 4% 層間側位移角，而另外三組未能承受 AISC 規範所訂定之層間側位移角，其主要是因加勁板所提供的勁度及強度不足之故。而本研究並利用非線性有限元素分析程式 ABAQUS (2003)，將試驗之梁柱接頭試體更進一步的分析，並改變其各項參數以探討其可能之破壞區域，而經由實驗及有限元素分析之結果，提出此梁翼內側加勁補強接頭之設計方法。

Seismic Behavior of Steel Retrofitted Moment Connections with Stiffeners Inside Beam Flange

student : Chih-Kai Jao

Advisor : Dr. Chung-Che Chou

Department of Civil Engineering
National Chiao Tung University

ABSTRACT

This research describes the seismic performance for the rehabilitation of steel moment connections welding stiffeners between the face of the column and inner side of the beam flange. Nine large-scale moment connection specimens with a welded box column and steel beam were tested. A moment connection with bolted web-welded flange details was tested and use as a benchmark for the rehabilitated scheme. Eight rehabilitated moment connections with different sizes of stiffeners were tested to validate the performance. Five of eight rehabilitated moment connections showed excellent performance under the AISC seismic loads in excess of 4% drift, with minor strength degradation and no fracture of the welded joint. However, three rehabilitated moment connections failed as the un-rehabilitated moment connection due to insufficient stiffener stiffness and strength. The connection specimens were also modeled using the non-linear finite element computer program ABAQUS to further confirm the effectiveness of the stiffener in transferring beam moment to the column and to study potential sources of connection failure. A design guideline for the rehabilitating scheme was provided based on the tests and analyses conducted in this study.