

Experimental Study on Shear Behavior of Perfobond Connector with Boot Shaped Slots

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1 Abstract

In order to solve the construction problem of perforating rebars' precise location and it's getting through the circular holes for the the conventional perfobond connector, a new type of perfobond connector with boot shaped slots was proposed. This new type perfobond connector has the advantage of convenient construction and precise location. Three groups of push-out tests with nine specimens were carried out to study the shear capacity of the new type perfobond connector. The effect of the number and the spacing of boot shaped slots on failure modes, shear capacity, peak slip and shear stiffness were mainly studied. The test results show that the new type of perfobond connector with boot shaped slots has a high shear capacity and a good ductility, it could be widely applied on the connection between the steel and the concrete structures.

Keywords: boot shaped slots; shear capacity; shear force-relative slip curves; shear stiffness.

2 Introduction

Steel-concrete composite and mixed structures have been widely applied both in buildings and bridge engineering, such as steel-concrete composite plate or box girders, steel-concrete connection joints in both main girder and pylon of long span cable-stayed bridges. The mechanism that steel and concrete components could work

together is the connection effect of shear connectors which allow the two components to transfer forces from one material to another. And the most commonly used shear connectors are headed studs and perfobond connectors[1]. A perfobond rib connector[2-4] is a steel plate with holes for rebar to transverse which is welded in steel component, and it was developed in Germany with the initial research by Leonhardt[5]. It resists horizontal shear forces and vertical uplift